SSA Hot-Swap Disk Drives

Installation and Using Guide

SA23-2548-01

Note

Before you install this product and use this information, be sure to read the product warranties and notices information included with the system unit into which you are installing the product.

Second Edition (June 2000)

Before using this information and the product it supports, read the information in “Safety Information” on page v and “Appendix B. Notices” on page 21.

Contents

Safety Information

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

About This Book

This book provides information about SSA Hot-Swap Disk Drives and how to install, configure, remove, and use the drives. Use this book together with your specific system unit and operating system documentation.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The following publications contain related information:

- System unit documentation for information specific to your hardware configuration
- Operating system documentation for information specific to your software configuration

  This documentation is located on the AIX V4.3 Documentation CD. The documentation information is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

Trademarks and Acknowledgments

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- AIX

Other company, product, and service names may be trademarks or service marks of others.

Chapter 1. Overview

The 1.0 inch and 1.6 inch SSA Hot-Swap Disk Drives are high-performance drives that support a Serial Storage Architecture (SSA) interface. The 1.6 inch drive provides leading-edge high-capacity storage. The drives are factory-mounted in an auto-docking carrier. The carrier has a lever that makes it easy and safe to insert or remove the drives while the system unit is running. Light Emitting Diodes (LEDs) on the carrier indicate the *Power*, *Ready*, and *Check* status of the drive.

The SSA Hot-Swap Disk Drive installs in a hot-swap SSA six-pack backplane inside your system unit. The auto-docking carrier latch locks the disk drive into the slot to maintain connection with the backplane inside the system unit. Blank disk drive modules must be installed in any of the six-pack slots that do not contain a disk drive module so that SSA loop signal continuity is maintained.

Depending on your particular system unit, you can install up to a maximum of 12 to 18 1.0 inch drives or a maximum of six to nine 1.6 inch drives in the system unit. Refer to your system unit documentation for specific details.

Table 1 lists the features of each drive:

Table 1. SSA Hot-Swap Disk Drive Features

Feature	**4.5GB drive**	**9.1GB drive**	**9.1GB drive**	**9.1GB drive**	**9.1GB drive**
Form factor	3.5″	3.5″	3.5″	3.5″	3.5″
Size	1.0″ (25mm) high 3.5″ (101.6mm) wide	1.6″ (43mm) high 3.5″ (101.6mm) wide	1.0″ (25mm) high 3.5 (101.6mm) wide	1.6″ (43mm) high 3.5″ (101.6mm) wide	1.0″ (25mm) high 3.5″ (101.6mm) wide
Average seek time	8.0 ms	8.0 ms	6.8 ms	5.5 ms	5.1 ms
Latency	4.17 msec	4.17 msec	4.17 ms	3.0 ms	3.0 ms
Rotational speed	7200 RPM	7200 RPM	7200 RPM	10,000 RPM	10,000 RPM
Media data transfer rate	9.59-12.58MB/sec (10 bands)	10.3-15.4MB/sec (8 bands)	11.52-22.4MB/sec (16 bands)	23.4-30.5MB/sec (16 bands)	23.27-44.31MB/sec (15 bands)
SSA data transfer rate	20 MB/sec full duplex	20 MB/sec full duplex	20 MB/sec full duplex	20 MB/sec full duplex	20 MB/sec full duplex

Operating Environment

A set of specified operating environment requirements for the SSA Hot-Swap Disk Drives, as shown in Table 2 on page 2.

Table 2. Operating Environment for the SSA Hot-Swap Disk Drives

Condition	4.5GB, 1.0″, 7200 RPM	9.1GB, 1.6″, 7200 RPM	9.1GB, 1.0″, 7200 RPM	9.1GB, 1.6″, 10,000 RPM	9.1GB, 1.0″, 10,000 RPM
Temperature	41°F–122°F (5°C–50°C)	50°F–104°F (10°C–40°C)	41°F–122°F (5°C–50°C)	41°F–122°F (5°C–50°C)	41°F–122°F (5°C–50°C)
Relative Humidity (non-condensing)	5–90%	20–80%	5–90%	5–90%	5–90%
Maximum Wet Bulb	80°F (26.7°C)	80°F (27°C)	80°F (26.7°C)	80°F (26.7°C)	80°F (26.7°C)

Handling Static-Sensitive Devices

Attention: Static electricity can damage your equipment. Disk drives are sensitive to static electricity discharge.

Take the following precautions any time you are handling the disk drive:

- Do not remove the drive from its anti-static bag until you are ready to install it.
- If you have an anti-static wrist strap, use it while handling the drive.
- Limit your movement. Movement can cause static electricity to build up around you.
- With the drive still in its anti-static bag, touch it to an unpainted metal part of the system unit, such as an expansion slot.
- Hold the drive carefully by its frame. Avoid touching solder joints or pins.
- Do not place the drive on the system unit cover or on a metal table. If you must set it aside, put it back into its anti-static bag. Before you pick it up again, touch the bag and metal frame of the system unit at the same time.
- Be very careful when you handle the drive during cold weather, as low humidity and heating increase static electricity.

7200 RPM SSA Hot Swap Disk Drive Module

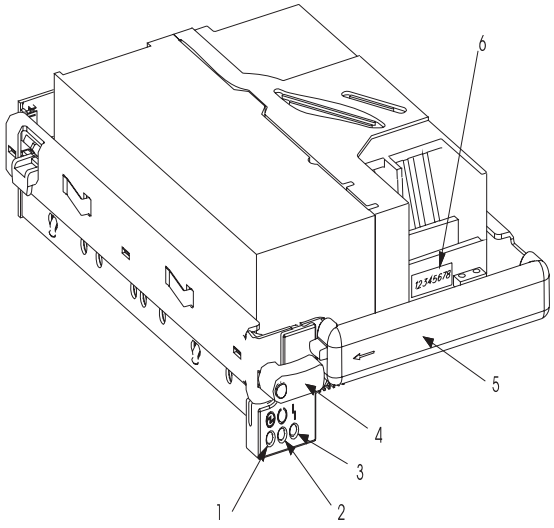

Figure 1. 7200 RPM SSA Hot-Swap Disk Drive

1	Power light
2	Ready light
3	Check light
4	Latch
5	Carrier handle
6	Serial number

10,000 RPM SSA Hot Swap Disk Drive Module

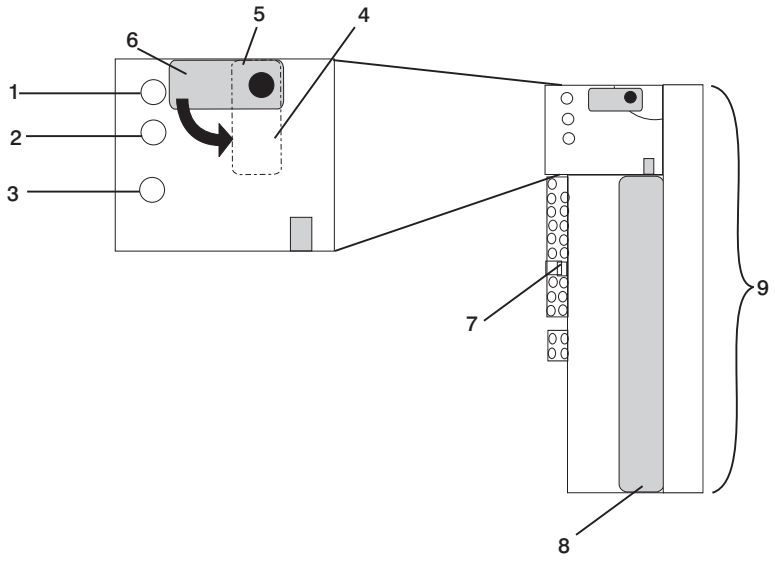

Figure 2. 10,000 RPM SSA Hot-Swap Disk Drive

1 Power Light

2 Ready Light

3 Check light

4 Locked Position

5 Latch

6 Unlocked Position

7 Jumper

8 Carrier handle

9 Plastic Spacer

Note: Your disk drive may or may not have a plastic spacer. If your disk drive does have a plastic spacer, *do not remove* the spacer.

Lights

Refer to Figure 1 on page 3 or Figure 2.

Power light This green light is on when the required power supply is present and within the specified limits.

Ready light This green light indicates the following conditions:

Light Status	Meaning
Off	Both SSA links are inactive because one of the following conditions exists: • The disk drives, blank disk drive modules, or adapter that are on both sides of and next to this module are not connected or are missing. • The disk drives or adapter that are on both sides of, and next to, this disk drive are inactive. • An SSA adapter that is in the loop is inactive. • A power-on self-test (POST) is running on this disk drive module.
Permanently on	Both SSA links are active, and the disk drive is ready to accept commands from the using system. The Ready light does not show that the motor of the disk drive is spinning. The module might be waiting for a **Motor Start** command or might have received a **Motor Stop** command.
Slow flash (2 seconds on, 2 seconds off)	Only one SSA link is active. A drive or blank disk drive module on one side is inactive.
Fast flash (5 times per second)	The disk drive is active with a command in progress.

Check light This amber light indicates the following conditions:

Light Status	Meaning
Off	Normal operating condition.
Permanently on	One of the following conditions exists: • An unrecoverable error that prevents the normal operation of the SSA link has been detected. • The power-on self-tests (POSTs) are running or have failed. The light comes on as soon as the disk drive module is turned on, and it goes off when the POSTs are complete. If the light remains on for longer than 1 minute after the disk drive is turned on, the POSTs have failed. • Neither SSA link is active. • The disk drive module is in Service Mode and can be removed.
Flashing	The check light has been set by a service aid to identify the position of a particular disk drive.

SSA Service Aids

The SSA service aids, which are provided with your system unit, provide the following services:

Set Service Mode
Helps you determine the location of a specific disk drive module on the SSA link and to remove that module from the link

Link Verification
Provides the operational status of an SSA link

Configuration Verification
Helps you determine the relationship between physical and logical disk drives

Format Disk
Formats an SSA disk drive module

Certify Disk
Verifies that the data on a disk drive can be read

To start the service aids:

1. Run diagnostics on your system unit. Refer to your system unit documentation if you need instructions.
2. Select **Diagnostic Operating Instructions**.
3. Follow the instructions to select **Function Selection**.
4. Select **Service Aids** from the Function Select menu.

For a more detailed explanation of the SSA Service Aids and how to use them, refer to your system unit documentation.

Chapter 2. Preparing to Install the SSA Hot-Swap Disk Drive

This chapter covers those things you should do before you install your SSA Hot-Swap Disk Drive. Preparing to install the drive involves the following tasks:

- Verifying your hardware and software requirements
- Making sure your package is complete
- Gathering tools and documentation

Verifying Your Hardware Requirements

The system unit in which you are installing the SSA Hot-Swap Disk Drive must contain the hardware required to support an SSA drive, such as available disk bays, an SSA adapter, and, depending on your specific system unit, up to three hot-swap SSA 6-pack backplanes. Refer to your system unit documentation or contact your customer service representative for assistance.

Verifying Your Software Requirements

The 7200 RPM SSA Hot-Swap Disk Drive are supported on AIX Versions 4.1.5., 4.2., 4.3. or later. The 10,000 RPM SSA Hot-Swap Disk Drive are supported on AIX Versions 4.2. and 4.3. or later. Ensure that your version of AIX supports this disk drive drive before you install it. Contact your customer service representative for assistance.

Checking Your Disk Drive Package

Your disk drive package contains only the SSA Hot-Swap Disk Drive.

Important: Be sure to retain your proof of purchase as it might be required to receive warranty service.

Gathering Tools and Documentation

No tools are required to install the drive. You may want to have your system unit and operating system documentation available for any information not covered in this guide.

Chapter 3. Installing the SSA Hot-Swap Disk Drive

This chapter covers the following topics:

- Guidelines for installing the SSA Hot-Swap Disk Drive
- Installing SSA disk drive modules
- Installing and removing blank disk drive modules

Attention: Be sure to read “Handling Static-Sensitive Devices” on page 2 before you remove the SSA Hot-Swap Disk Drive from its anti-static bag.

Guidelines for Installing the SSA Hot-Swap Disk Drive

Attention: Always let the disk drive acclimate to its new operating environment before you install it. Place the drive, in its package, in the current operating environment for at least three hours to allow it to acclimate.

This section provides general guidelines for installing the SSA disk drive modules:

- After you install a disk drive module, remember to add it to your system configuration.
- It is not necessary to turn off the power to your system unit when you install a disk drive module unless you have a particular reason for doing so.
- Both slots 1 and 5 of each backplane in your system unit must always contain a disk drive module.
- The middle slots of each backplane inside your system unit must contain either disk drive modules or blank disk drive modules.
- Handle disk drives with care, following the instructions in “Handling Static-Sensitive Devices” on page 2.
- If you change a disk drive module in your system unit, you must restore it into your system unit configuration. For complete instructions, refer to your system unit documentation.
- Make sure that you understand the purpose of the lights on the disk drive module (see Installing the 7200 RPM or 10,000 RPM SSA Hot-Swap disk drive Module on page 3-3).

Refer to Figure 3 on page 10 as you follow the steps in the “SSA Hot-Swap Disk Drive Installation Procedures” on page 11.

Installing the 7,200 RPM SSA Hot-Swap Disk Drive

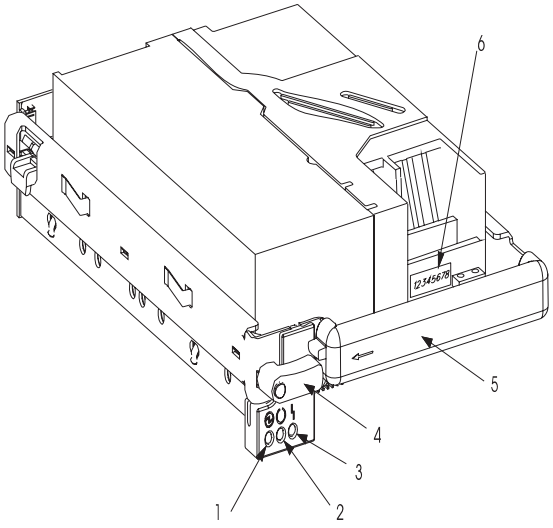

Figure 3. Installing the 7200 RPM SSA Hot-Swap Disk Drive

1	Power light
2	Ready light
3	Check light
4	Latch
5	Carrier handle
6	Serial number

Installing the 10,000 RPM SSA Hot-Swap Disk Drive Disk Drive Module

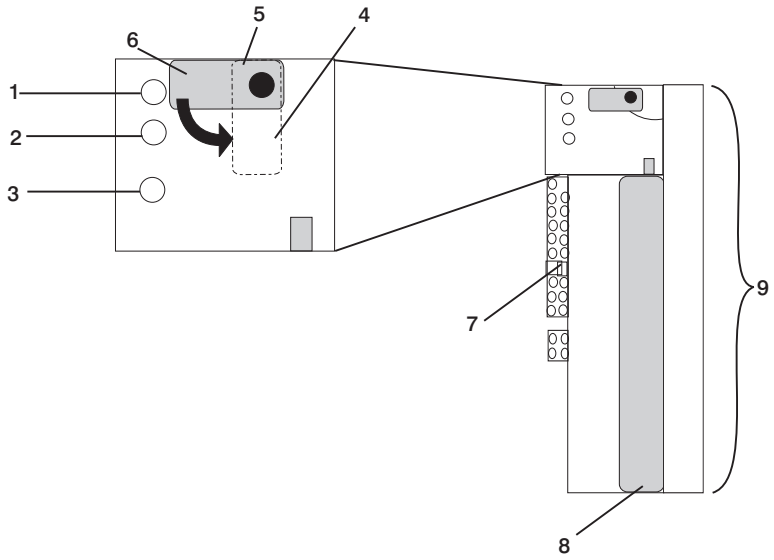

Figure 4. Installing the 10,000 RPM SSA Hot-Swap Disk Drive

1	Power Light
2	Ready Light
3	Check light
4	Locked Position
5	Latch
6	Unlocked Position
7	Jumper
8	Carrier handle
9	Plastic Spacer

Note: Your disk drive may or may not have a plastic spacer. If your disk drive does have a plastic spacer, *do not remove* the spacer.

SSA Hot-Swap Disk Drive Installation Procedures

The following steps describe how to install the SSA Hot-Swap Disk Drive into a slot of the backplane. If required, prepare your system unit for the drive, following the instructions in your system unit documentation.

To install the SSA Hot-Swap Disk Drive:

1. Open or remove your system unit cover following the instructions in your system unit documentation.
2. If a blank disk drive module is currently installed in the slot into which you are installing the SSA Hot-Swap Disk Drive, refer to “Removing or Replacing a Blank Disk Drive Module” on page 13 to remove the module, and return here to continue with installing your SSA Hot-Swap Disk Drive.
3. Push the hot-swap disk drive’s carrier latch clockwise, until it is perpendicular to the carrier handle, to unlock it.

   Note: Your disk drive might have a plastic spacer installed. If it does, *do not remove the spacer*, it is required when you mount the 9.1GB 10,000 RPM SSA Disk Drive.
4. Slide the hot-swap disk drive into the backplane slot.
5. Press the hot-swap disk drive to seat it firmly on the backplane.
6. Push the hot-swap disk drive’s carrier latch counterclockwise, until it is parallel to the carrier handle, to lock it in place.
7. Verify that the front of all the disk drives are aligned.
8. Verify that the disk drive Ready light is on steady. If the Ready light is not on steady, check that the new disk drive is properly installed. If you determine a problem exists, run the system unit diagnostic program.
9. If the Check light on the disk drive is on steady, the disk drive is in service mode and must be reset. Start the SSA service aids (see “SSA Service Aids” on page 6) and follow the screen prompts and instructions to take it out of service mode.
10. Configure the drive on your system unit (see “Chapter 4. Configuring the SSA Hot-Swap Disk Drive” on page 15).
11. Close or reinstall your system unit cover.

Installing and Removing Blank Disk Drive Modules

You must install blank disk drive modules in any backplane slot that does not contain a disk drive so that you maintain the SSA loop continuity. This section provides steps for installing and removing blank disk drive modules.

Installing a Blank Disk Drive Module

To install a blank disk drive module:

1. Open or remove your system unit cover, following the instructions in your system unit documentation.
2. Push the blank disk drive module’s carrier latch clockwise, until it is perpendicular to the carrier handle, to unlock it.
3. Slide the blank disk drive module into the desired backplane slot.
4. Press the blank disk drive module to firmly seat it on the backplane.
5. Push the blank disk drive module’s carrier latch counterclockwise, until it is parallel to the carrier handle, to lock it in place.
6. Close or reinstall your system unit cover.

Removing or Replacing a Blank Disk Drive Module

To remove a blank disk drive module:

1. Following the instructions in your system unit documentation, open or remove your system unit cover.
2. Push the carrier latch of the blank disk drive module you are removing clockwise, until it is perpendicular to the carrier handle, to unlock it.
3. Pull out the blank disk drive module, keeping it straight to prevent damage.
4. Follow the steps in “Installing a Blank Disk Drive Module” on page 12 to replace the blank disk drive you removed with another.
5. Close or reinstall your system unit cover.

Chapter 4. Configuring the SSA Hot-Swap Disk Drive

This chapter provides instructions for configuring the SSA Hot-Swap Disk Drive and making it available to use. For complete configuration instructions and information, refer to your operating system documentation.

To configure the drive and make it available:

1. At the command line, type:

   ```
   cfgmgr
   ```

   and press Enter.
2. To identify the SSA Hot-Swap Disk Drive and other drives installed in your system unit, start the SSA Service Aids utility and access the Link Verification screens. See “SSA Service Aids” on page 6 for instructions on starting the service aids. Refer to your system unit documentation for detailed information.
3. Follow the prompts on the Link Verification screens to verify that the disk drive configuration on the SSA link is specified.

   If the Link Verification service aid shows no currently configured disk drives, run diagnostics to determine the reason for this problem. It may be that a loop configuration is not valid.
4. Run system diagnostics in the system verification mode to all attached SSA disk drive modules.

Appendix A. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

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

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Responsible Party:

- International Business Machines Corporation
- New Orchard Road
- Armonk, New York 10504
- Telephone: (919) 543-2193

FOR HOME OR OFFICE USE

European Union (EU) 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. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

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

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

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

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Appendix B. Notices

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

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SSA Hot-Swap Disk Drives Installation and Using Guide

Order Number: 09P0240

Overall how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall Satisfaction	☐	☐	☐	☐	☐

How satisfied are you that the information in this book is:

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Complete	☐	☐	☐	☐	☐
Easy to find	☐	☐	☐	☐	☐
Easy to understand	☐	☐	☐	☐	☐
Well organized	☐	☐	☐	☐	☐
Applicable to your tasks	☐	☐	☐	☐	☐

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