



PC Server 3519 Rack Storage Expansion Enclosure

User's Handbook

Note

Before using this information and the product it supports, be sure to read the general information under Appendix B, “Product Warranties and Notices” on page 79.

First Edition (April 1997)

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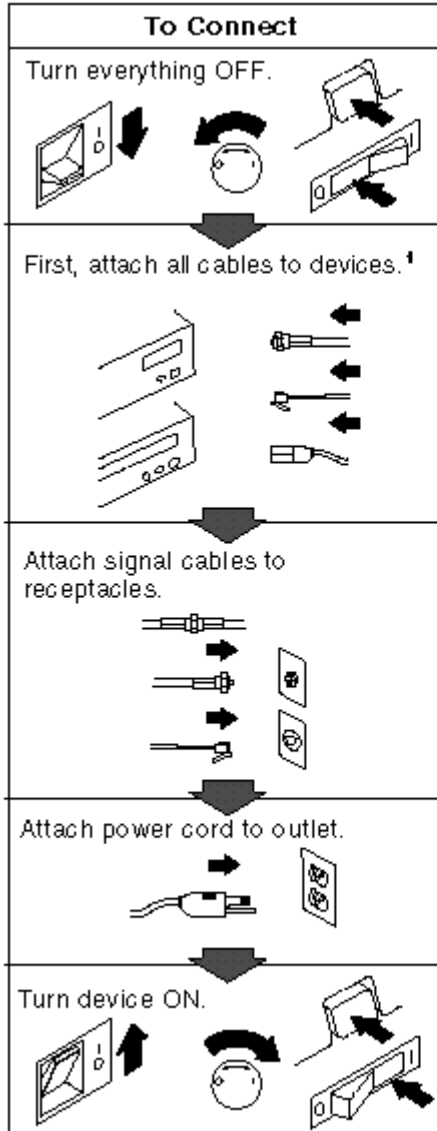
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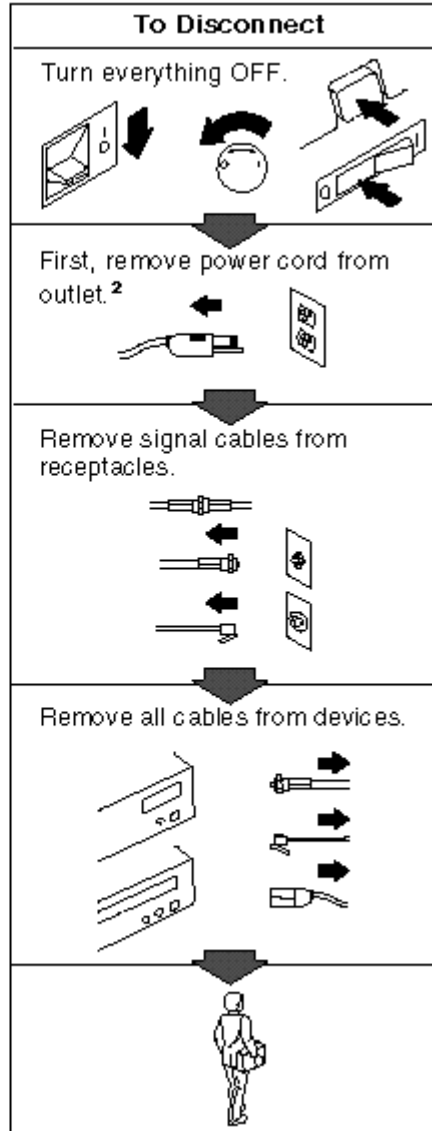


DANGER:

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.



¹In the U.K., by law, the power cord must be disconnected after the telephone line cable.

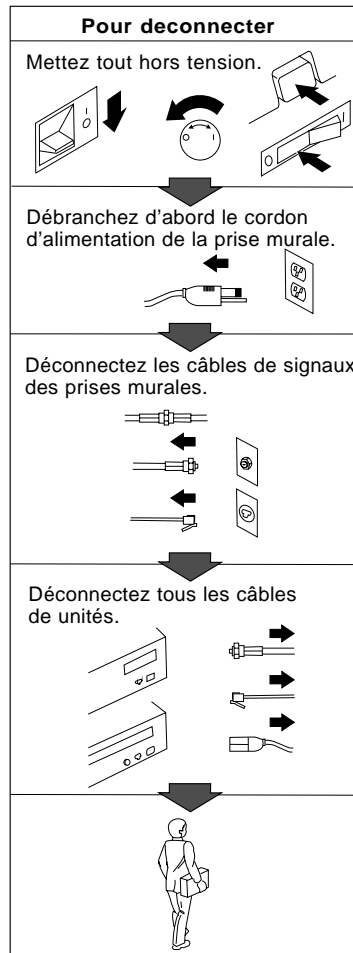
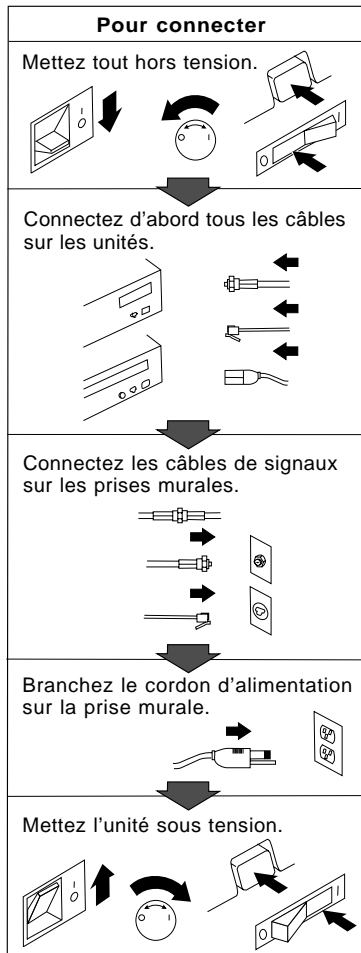


²In the U.K., by law, the telephone cable must be connected after the power cord.



DANGER:

Le courant électrique provenant des câbles d'alimentation, téléphoniques et de transmission peut présenter un danger. Pour éviter tout risque de choc électrique, connectez et déconnectez ces câbles comme indiqué ci-dessous lorsque vous installez ou déplacez ce matériel ou les unités connectées, ou que vous soulevez un carter.*



*Le cordon d'alimentation doit être branché sur un socle de prise de courant correctement mis à la terre.

About This Book

This book provides instructions for installing and removing options in your IBM PC Server Rack Storage Expansion Enclosure. It also provides information on troubleshooting your expansion enclosure. If you have not yet set up your expansion enclosure, refer to the *Setup and Installation* sheet for detailed information on attaching cables.

How This Book is Organized

Chapter 1, “Getting Started,” introduces and describes the expansion enclosure. This chapter also includes an overview of the expansion enclosure’s features and components. In addition, this chapter contains instructions for starting the expansion enclosure.

Chapter 2, “Installing Options,” contains step-by-step instructions for installing and removing options, such as internal drives and an additional SCSI Repeater Card.

Chapter 3, “Rack Installation,” describes how to install the expansion enclosure in a server rack.

Chapter 4, “Solving Problems,” contains the problem symptoms and error messages that are specific to your expansion enclosure. This chapter contains information about checking the expansion enclosure for damage. This chapter also provides instructions on how to obtain service and technical assistance for your expansion enclosure and other IBM products that you might plan to use.

Appendix A, “Records,” provides a section to record and update important information about your expansion enclosure, including serial number, key number, and device records. Whenever you add options to your expansion enclosure, be sure to update the information in this appendix.

Appendix B, “Product Warranties and Notices,” contains product notices, warranties, and trademarks.

Related Publications

Notices Used in This Book

This book contains notices to highlight information or provide safety information:

- **Notes**

These notices provide important tips, guidance, or advice.

- **Attention**

These notices indicate possible damage to programs, devices, or data. An attention notice is placed just *before* the instruction or situation in which damage could occur.

- **Caution**

These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just *before* descriptions of potentially hazardous procedure steps or situations.

Related Publications

The following publications come with your expansion enclosure:

- The PC Server 3519 Rack Storage Expansion Enclosure *Setup and Installation* sheet contains information about setting up your expansion enclosure.
- The *PC Server Service and Support* pamphlet contains important information and phone numbers to call for different types of support for your expansion enclosure.
- The Installation Template is an aid to installing a PC Server slide bracket assembly.

Additional publications are available for purchase from IBM. For a list of publications available in your country:

- In the U.S. and Puerto Rico, call 1-800-426-7282.
- In Canada, call 1-800-465-1234.
- In other countries, contact the IBM support organization that services your area, your IBM marketing representative, or your IBM reseller.

Welcome and Thank You

We appreciate your decision to purchase an IBM PC Server 3519 Rack Storage Expansion Enclosure. This expansion enclosure allows you to expand the storage capabilities of your system.

The expansion enclosure comes with a limited three-year on-site warranty. In addition, IBM's PC Server Startup Support provides coverage to PC Server customers during the first 90 days after installation at no additional charge.*

This comprehensive program enhances IBM's support for setup, installation, configuration, and problem determination. It provides assistance for popular network operating systems and network adapters from IBM and non-IBM vendors. In the U.S. and Puerto Rico, call IBM at 1-800-772-2227, or in Canada, call 1-800-565-3344 if you need assistance.

In all other countries, contact the IBM support organization that services your area, your IBM marketing representative, or your IBM reseller.

* Response time will vary depending on the number and nature of calls received.

Chapter 1. Getting Started

The PC Server Rack Storage Expansion Enclosure is a SCSI storage enclosure that you can attach to an external SCSI connector on your server.

The expansion enclosure supports up to six hot-swap hard disk drives. When they are connected to a redundant array of independent disks (RAID) adapter, you can configure these drives to increase the size of your existing disk array or configure them as a separate disk array.

Refer to the *Setup and Installation* sheet for instructions for setting up your expansion enclosure.

This chapter contains an overview of the expansion enclosure's features and components.



CAUTION:

To avoid possible injury while moving or lifting the expansion enclosure, ask another person to help you.

This chapter contains:

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Features at a Glance

Features at a Glance

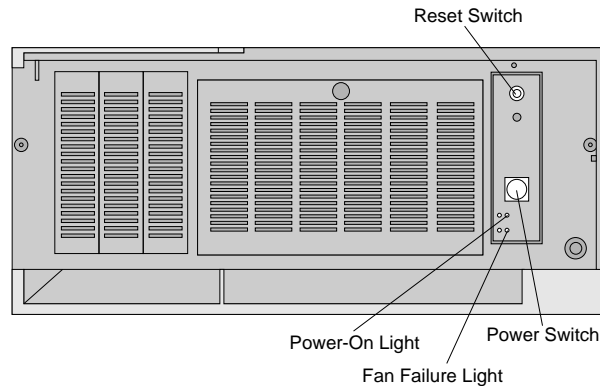
The following table summarizes the features of the expansion enclosure.

Expansion Bays <ul style="list-style-type: none">• Nine:<ul style="list-style-type: none">– Six hot-swap– Up to three slim-high or two half-high non-hot-swap devices Options Supported <ul style="list-style-type: none">• Up to six slim-high or three half-high hot-swap hard disk drives• Tape autoloader• 4/10 GB 3.5-inch DAT tape drive• CD-ROM drive	Security Features <ul style="list-style-type: none">• Door lock• Fan failure detection Integrated Functions <ul style="list-style-type: none">• LED usability support• SCSI Repeater Card:<ul style="list-style-type: none">– One card standard– Supports maximum of two	Power Supply <ul style="list-style-type: none">• 200-watt with manual voltage selection (100–240 V ac)• Built-in overload and surge protection Hard Disk Drives <ul style="list-style-type: none">• Supports up to six hot-swap and three non-hot-swap
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Note: For a list of the operating specifications, such as weight, height, and heat output, see Table 2 on page 52.

Controls and Indicators

The most commonly used controls and indicators are on the front of your expansion enclosure.



Reset Switch: Use this switch to cancel the fan failure warning buzzer.

Power Switch: Use this switch to turn your expansion enclosure on and off. To turn on your expansion enclosure, press the Power switch momentarily, and the Power On indicator will illuminate in approximately one second.

Note: Turn on your expansion enclosure and all other external devices before you turn on your server.

Power-On Light: This green LED lights when you turn on your expansion enclosure by pressing the Power switch.

Fan Failure Light: This amber LED lights if one or more of the internal fans fail.

Note: If one or more fans remain idle, a warning buzzer sounds. Press the Reset switch to silence the warning buzzer.

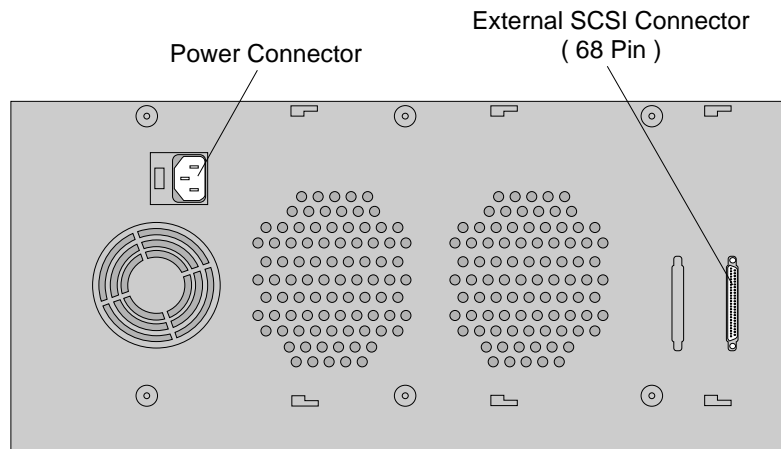
Controls and Indicators

Attention:

Your expansion enclosure produces heat. Fans in your expansion enclosure pull in fresh air and force out hot air. Operating the expansion enclosure with an idle fan can cause overheating, which might result in a malfunction or damage.

External Connectors

The rear of the expansion enclosure contains the power connector and the external SCSI connector.



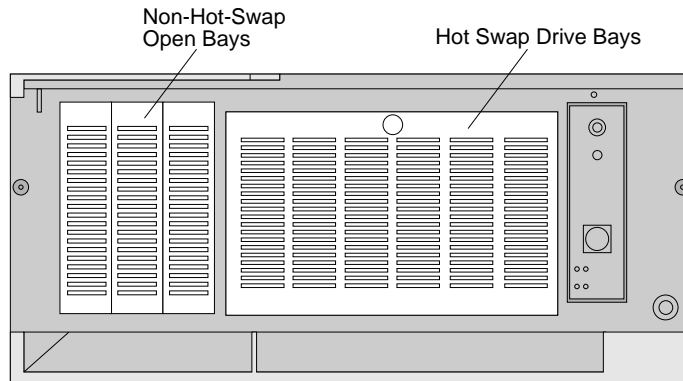
Power Connector: The expansion enclosure power cable connects here.

External SCSI Connector: A SCSI cable attaches here, and connects to the external SCSI connector on the server. For disk-array servers, the cable connects to the external SCSI connector on a RAID adapter.

See “Working with SCSI Repeater Cards” on page 40 for information on external connector requirements.

Expansion Bays

Expansion Bays



Open Bays: Your expansion enclosure's design accommodates 3.5-inch and 5.25-inch SCSI wide devices, such as hard disk drives, tape, and rewritable optical disc drives.

If you want to install narrow devices, you must purchase and install a 16-bit to 8-bit SCSI Internal Converter. To order the converter, contact your IBM marketing representative or your IBM reseller.

For information on the supported types of drives and their installation, see "Working with Internal Drives" on page 18.

See your server documentation for additional information about the SCSI subsystem and SCSI hard disk drives.

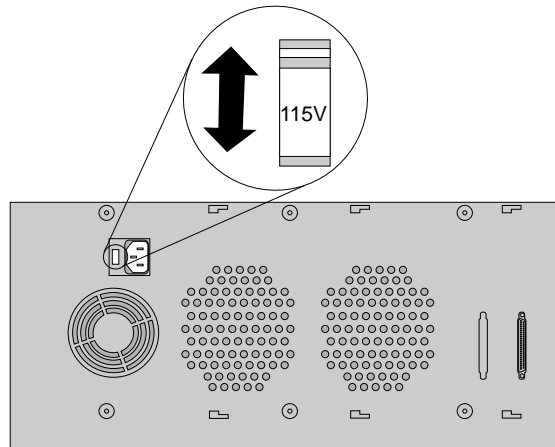
Checking the Voltage Setting

Check the voltage-selection switch and verify that it is in the correct position.

Attention: If you set the voltage switch to the wrong position, you might permanently damage your expansion enclosure when you turn it on.

- If the voltage range in your country is between 100 and 127 volts (nominal), check to see that 115 is visible. (Use the 115-volt setting in the U.S. and Canada.)
- If the voltage range in your country is between 200 and 240 volts (nominal), check to see that 230 is visible.

If you need to adjust the voltage setting, slide the switch to the correct position.



Getting Help on the World Wide Web

You can access the latest information about product compatibility and configuration on the World Wide Web. This information is updated as new PC Server products are announced.

The following is a sample of the information available at <http://www.pc.ibm.com/servers/> on the World Wide Web.

- Current updates to device drivers, flash BIOS, and other software.
- A listing of products that have been tested for compatibility with IBM PC Servers.
- Certification and compatibility information about network operating systems (NOS) and operating systems (OS).

For additional information, service, or assistance, see “Getting Help and Service Information” on page 73.

IBM PC Server Startup Support

The IBM PC Server Startup Support program provides comprehensive telephone assistance 24 hours a day, 7 days a week, during the first 90 days after installation of your server at no additional charge.* IBM gives you direct access to trained specialists who can help you set up, install, and configure your server.

Help is available for IBM and non-IBM network operating systems, network interface adapters, and other optional peripherals. To receive a list of the network products supported by the IBM PC Server Startup Support program, call the IBM PC Company Automated Fax System at 1-800-426-3395 in the U.S., or call 1-800-465-3299 in Canada, and ask for document number 16125.

* Response time will vary depending on the number and nature of calls received.

IBM PC Server Startup Support

For more information about this program, or for help with the installation of your server:

- In the U.S., call IBM at 1-800-772-2227.
- In Canada, call IBM at 1-800-565-3344.
- In all other countries, contact the IBM support organization that services your area, your IBM marketing representative, or your IBM reseller.

Note: For additional information, service, or assistance, see “Getting Help and Service Information” on page 73.

Chapter 2. Installing Options

This chapter provides instructions to help you add options to your expansion enclosure. Some option-removal instructions are provided, in case you need to remove one option to install another. If you have several internal options to install, these instructions enable you to add them all at one time.

This chapter contains:

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Before You Begin

Before You Begin

- Become familiar with the safety and handling guidelines specified under “Safety Information” on page v, “Electrical Safety” on page 13, and “Handling Static-Sensitive Devices” on page 14. These guidelines will help you work safely while working with your expansion enclosure.
- Make sure you have an adequate number of properly grounded electrical outlets for your expansion enclosure, server, monitor, and any other options you intend to install.
- Place your system in a location that is dry. Rain or spilled liquids might damage your expansion enclosure.
- Back up all important data before you make changes to storage devices, such as hard disk drives.
- Have a small, adjustable wrench or pliers, and a small, flat-blade screwdriver available.

If you are installing the expansion enclosure in a rack, be sure that the rack provides adequate space around the expansion enclosure to allow the expansion enclosure's cooling system to work properly. Refer to the documentation that comes with the rack.

Electrical Safety



CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid any shock hazard, disconnect all power cords and cables as described in the following information.

For your safety, always do the following *before* removing the cover:

1. Turn off your server. See your server documentation for instructions.
2. Turn off the expansion enclosure and any attached devices.
Note: To turn off the expansion enclosure, press the Power switch. The Power switch is located on the right side of the front of the expansion enclosure.
3. Unplug the power cord from the electrical outlet.
4. Disconnect all cables and power cords from the back of the expansion enclosure.
Note: Reconnect the cables or power cords only after you reassemble the expansion enclosure and put the covers back on.



CAUTION:

Never remove the cover on the power supply. If you have a problem with the power supply, have your system serviced.

Handling Static-Sensitive Devices

Static electricity, though harmless to you, can seriously damage expansion enclosure components or options.

Note: When you are adding an internal option, do not open the static-protective package containing the option until you are instructed to do so.

When you handle options and other expansion enclosure components, take these precautions to avoid damage from static electricity:

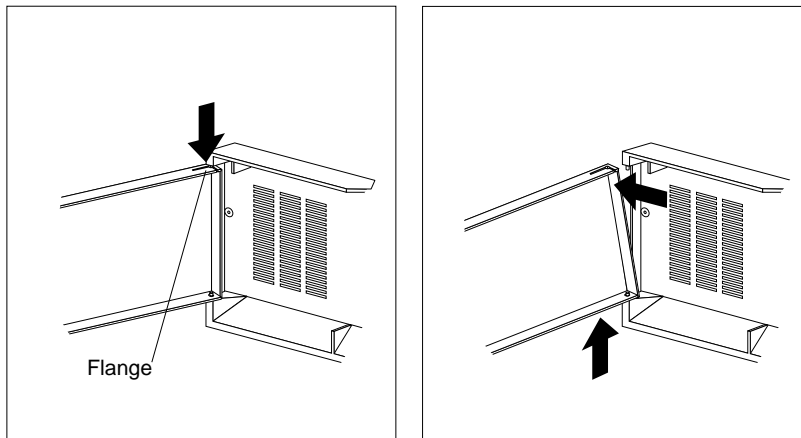
- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Never touch any exposed circuitry.
- Prevent others from touching components.
- When you are installing a new option, touch the static-protective package containing the option to a metal expansion-slot screw or other unpainted metal surface on the expansion enclosure for at least two seconds. (This reduces static electricity from the package and from your body.)
- When possible, remove the option and install it directly into the expansion enclosure without setting the option down. When this is not possible, place the static-protective package that the option comes in on a smooth, level surface and place the option on it.
- Do not place the option on the expansion enclosure's covers or any metal surface.

Preparing to Add Options

Before you begin

- Be sure your current system configuration is working properly.
- Locate the key to the cover lock.
- Obtain a small, flat-blade screwdriver.
- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- You can install the expansion enclosure in a rack unit. Refer to the documentation that comes with the rack for additional safety and operating information.

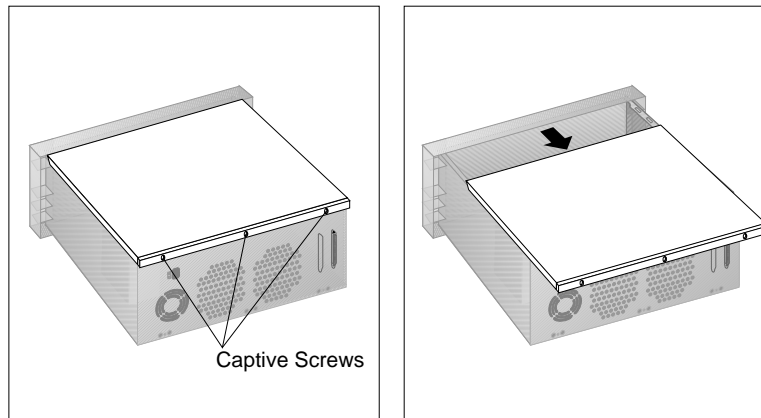
1. Unlock and open the expansion enclosure door.
2. Remove the front door:
 - a. Locate the flange on the top edge of the front door, near the hinge.
 - b. Press the flange while pressing out on the door; then, lift the door off the hinge and store in a safe place.



3. If you have installed the expansion enclosure in a rack:
 - a. Remove the screws on either side of the front bezel, and set them aside.

Preparing to Add Options

- b. Pull the drawer out until both slide rails lock, and you can easily reach the cables on the back of the expansion enclosure.
4. Unplug all power cords (cables) from electrical outlets, and then disconnect all other cables from the back of the expansion enclosure.
5. Remove the top cover, and if you are installing a 5.25-inch internal drive, remove the bottom cover:
 - a. Loosen the three screws in the recessed holes on the rear of the cover.
 - b. Slide the cover back about one inch; then, lift the cover and remove it.



- c. Set the cover aside in a safe place.
- Note:* The screws on the cover stay in place; do not attempt to remove them.
6. If you need to remove the expansion enclosure from the rack, go to “Removing the Expansion Enclosure from a Rack” on page 66; then, return here.

Preparing to Add Options

What to do next

To install or remove:

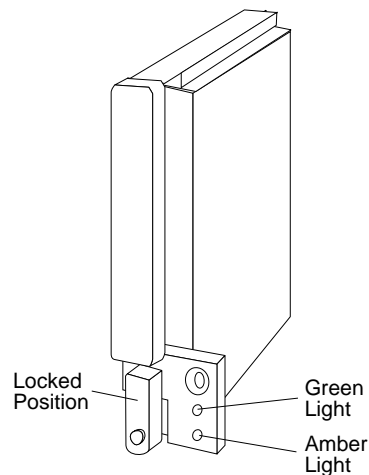
- An internal drive, go to “Working with Internal Drives” on page 18
- A SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40

Working with Internal Drives

Drives are devices that your system uses to store and retrieve data. You can add drives to your system to increase storage capacity and to enable your system to read other types of media.

Your expansion enclosure contains hardware that lets you replace a failed hard disk drive without turning off the expansion enclosure. Therefore, you have the advantage of continuing to operate your system while a hard disk drive is removed or installed. These drives are known as *hot-swap* drives.

The hot-swap drive tray III for your expansion enclosure has a small switch that stops the movement of the disk drive. The tray also provides two LEDs (one green and one amber) to indicate the current state of the drive and tray.



Working with Internal Drives

The following table summarizes the LED states on your hot-swap tray and their meanings.

Green	Amber	Description
On	Off	Drive tray is powered on; the hard disk drive is inactive; and the drive should <i>not</i> be removed.
Blinking	Off	The hard disk drive is inactive. The hot-swap drive can be removed safely. <i>Note:</i> This indication will only appear if you have attached your expansion enclosure to a RAID adapter.
On	On or Blinking	The hard disk drive is in use, and should <i>not</i> be removed.
Off	Off	The drive is defective, or no power is being supplied to the drive. The hot-swap drive can be removed safely. Attention: Press the small switch on the drive before you remove the drive.

Each hot-swap drive that you plan to install must have a hot-swap drive tray III attached. Trays are available for two drive types: narrow and wide. The narrow tray supports 8-bit drives; the wide tray supports 16-bit drives. Select the appropriate drive trays for your hot-swap drives. If necessary, contact your IBM reseller or IBM marketing representative to purchase the types of drive trays that you need.

The following table summarizes the drive requirements for the bays in your expansion enclosure.

Working with Internal Drives

Bay	Drive Width	Drive Type	Drive Height
1 - 3	3.5-inch	Removable media drive ¹ , hard disk drive	25.4 mm (1.0 in.)
	5.25-inch		41.3 mm (1.6 in.) ²
4 - 9	3.5-inch	Hard disk	25.4 mm (1.0 in.)
			41.3 mm (1.6 in.) ³

Notes:

1. Removable media includes CD-ROMs, optical discs, and tape.
2. You can install a maximum of two 41.3 mm drives.
3. A 41.3 mm drive installed in bays 4 through 9 occupies two bays.

Table 1. Maximum Allowable Drive Sizes

Your expansion enclosure supports drives that conform to the *small computer system interface* (SCSI). This design allows you to attach multiple drives to a single SCSI controller.

Note: Any information about SCSI drives also applies to other SCSI devices, such as scanners and printers.

Cabling Requirements

Drives in bays 1 through 3 connect to your expansion enclosure through cables. Each cable connector is designed to fit a corresponding connector on a drive. Two cables connect to the drives in bays 1 through 3.

- A four-wire power cable connects to each drive.
- A flat SCSI cable with three connectors connects SCSI devices to bays 1 through 3.

Your expansion enclosure comes with an external SCSI cable that connects from the SCSI Repeater Card to the server.

Note: If you install any 8-bit devices, you need the 16-bit to 8-bit SCSI Internal Converter. To order the converter, contact your IBM marketing representative or your IBM reseller.

SCSI IDs

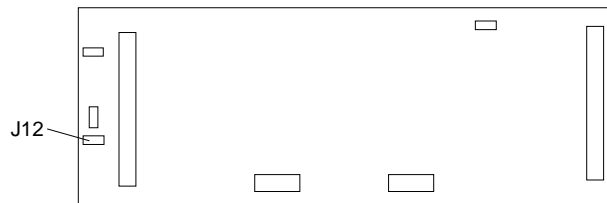
Each SCSI device installed in your expansion enclosure must have a unique SCSI identifier (ID). This unique ID enables the SCSI controller to recognize the device. This SCSI ID also prevents two devices from attempting to send or receive data on the SCSI bus at the same time. IBM PC Server SCSI controllers use ID 7. Therefore, you must not assign ID 7 to any device that you install in your expansion enclosure. SCSI devices support the following IDs:

- Narrow devices support SCSI IDs 0 to 6.
- Wide devices support 0 to 6 or 8 to 15.

When you install a hot-swap drive, the backplane behind bays 4 through 9 automatically assigns the drive its SCSI ID. However, when you install a drive in bays 1 through 3, you must set a unique SCSI ID for the drive that does not conflict with any of the IDs that the backplane assigns to drives in bays 4 through 9.

Depending on the setting of the SCSI ID address jumper (J12) on the rear of the backplane, the backplane sets the SCSI IDs for bays 4 through 9. SCSI IDs 8 to 13 are the default IDs for the hot-swap drives. SCSI IDs 0 to 5 are also available for the hot-swap drives.

The SCSI ID address jumper, a pin block with four pairs of pins (J12), is located on the rear of the backplane. The default, cover installed on the HI ID N pins, sets the addresses to HI.

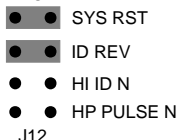
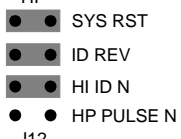


Working with Internal Drives

The backplane sets the SCSI IDs for bays 4 through 9 as follows:

LO Settings		HI Settings (default)	
Bay	SCSI ID	Bay	SCSI ID
4	0	4	8
5	1	5	9
6	2	6	10
7	3	7	11
8	4	8	12
9	5	9	13

The following table summarizes the jumper settings for the SCSI ID address jumper (J12).

Jumper Position	Description
<p>LO</p>  <p>J12</p>	No cover installed on the HI ID N pins, sets SCSI IDs to LO.
<p>HI</p>  <p>J12</p>	Sets SCSI IDs to HI. Use this setting, cover installed on the HI ID N pins, when you install narrow non-hot-swap devices and your configuration requires you to define some non-hot-swap devices with high IDs. This is the default setting.

SCSI devices use a variety of mechanisms to set the SCSI ID, such as jumpers, thumbwheels, or switches. Refer to the documentation that came with the drive for information about setting its SCSI ID.

If you have attached this expansion enclosure to a RAID adapter, refer to the information that came with the adapter for SCSI ID requirements.

Termination Requirements

Termination ensures that the quality of the signal is maintained throughout the SCSI chain. If you chain SCSI devices in bays 1 through 3, the backplane automatically sets termination for all devices. The backplane also automatically sets termination for hot-swap drives.

Before you install a SCSI device, set the termination to DISABLED. On some devices, you will need to remove jumpers. Refer to the information that came with the device for instructions.

Refer to the documentation that comes with your server for additional information about your server's SCSI subsystem.

Installing Internal Drives

Before you install drives in your expansion enclosure, verify that you have all of the cables, drive trays, and any other equipment specified in the documentation that comes with the internal drive.

Before you begin

- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- Read the instructions that come with the internal drive.
- Turn off the expansion enclosure.
- Disconnect all external cables and power cords, and then remove the expansion enclosure cover (see “Preparing to Add Options” on page 15).

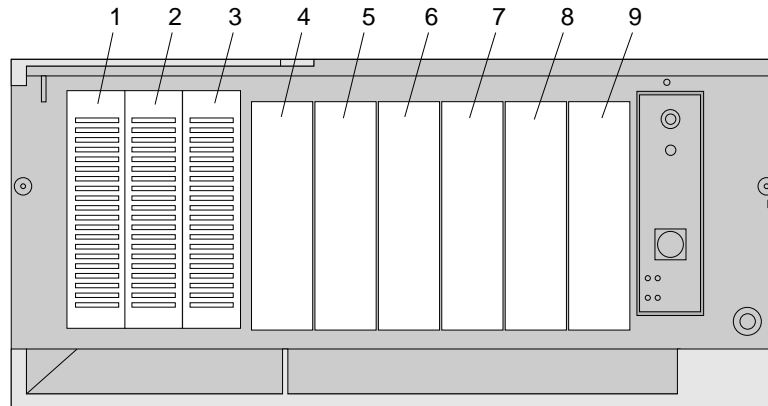
To install a drive in bays 1 through 3, go to “Installing a Drive in Bays 1 to 3” on page 24.

To install a hot-swap drive in bays 4 through 9, go to “Installing a Hot-Swap Drive” on page 29.

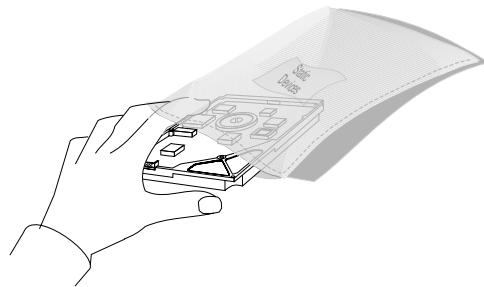
Working with Internal Drives

Installing a Drive in Bays 1 to 3

1. Determine the location for the drive that you want to install.



2. Touch the static-protective bag containing the drive to any *unpainted* metal surface on the expansion enclosure; then remove the drive from the bag.

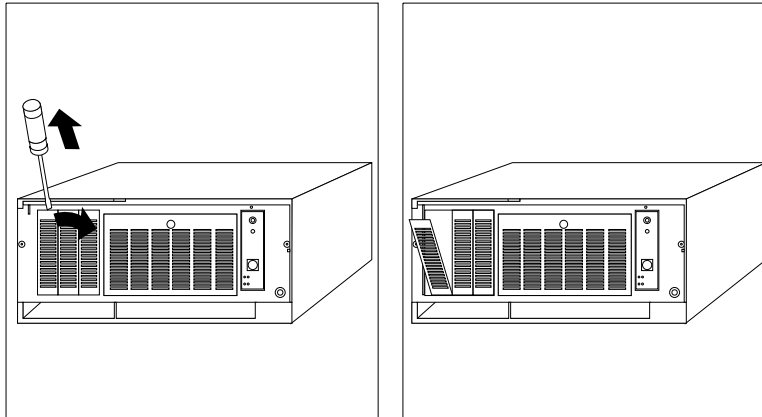


3. Using the instructions that come with the drive, check that any switches or jumpers on the drive are set correctly. Change them if necessary.

Note: Automatic SCSI ID settings apply only to hot-swap hard disk drives installed in bays 4 through 9. Therefore, if you install a drive in bays 1 through 3, you must set a SCSI ID for that drive.

Working with Internal Drives

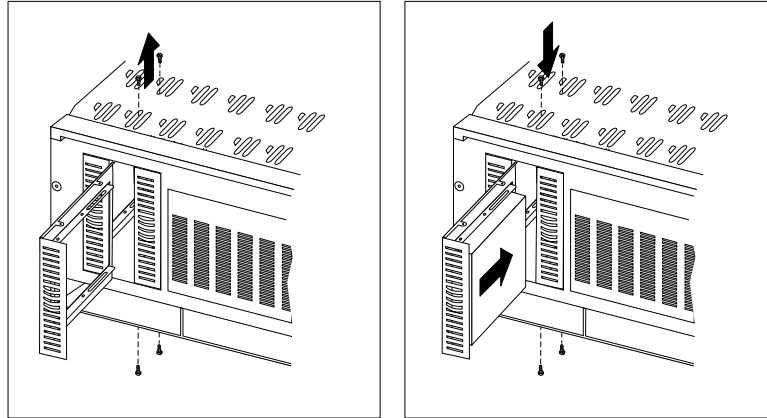
4. Remove the cover plate from the bay.
 - a. Insert a small flat-blade screwdriver under the side of the cover plate.
 - b. Lift the cover plate and remove it from the server front panel (save the cover plate for future use).



5. If a tray is attached to a drive that you intend to install, you must remove the tray before installing the drive. Follow the instructions in the documentation that comes with the drive.

Working with Internal Drives

6. Remove the screws that secure the tray (from both sides of the tray housing) in the target bay. Then, slide the tray out of the bay.



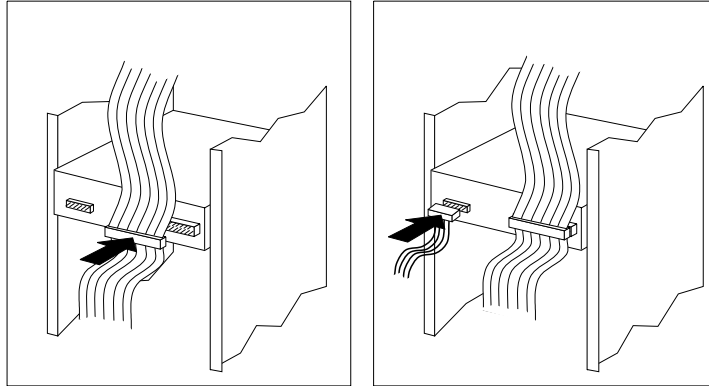
7. If you are installing a 5.25-inch drive, go to to step 8 on page 27. If you are installing a 3.5-inch drive, continue with step 7a.
 - a. Place the drive on the tray, with the connectors facing the rear of the tray.
 - b. Insert the screws that come with the drive into the holes on the tray. Tighten the screws.

Attention: To ensure that the drive functions properly, do not overtighten the screws.
 - c. Slide the drive and tray into the target bay.
 - d. Reinstall and tighten the four screws that you removed in step 6.
 - e. Go to step 9 on page 27.

Working with Internal Drives

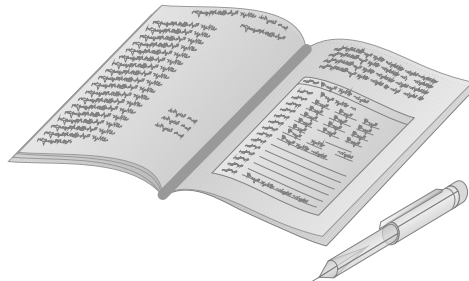
8. If you are installing a 5.25-inch drive:
 - a. Position the drive with the connectors facing the rear of the expansion enclosure.
 - b. Slide the drive to the rear until it stops.
 - c. Loosely reinstall the four screws that you removed from the tray housing in step 6 on page 26.

Attention: To ensure that the drive functions properly, do not overtighten the screws.
 - d. Store the drive tray in a safe place.
9. Connect the drive to a connector on the SCSI cable. See “Cabling Requirements” on page 20 for cabling information
10. Connect one of the 4-pin power cables to the drive.



Working with Internal Drives

11. If you are not installing a removable media device, (such as CD-ROM, optical disc, or tape), reinstall the cover plate:
 - a. Insert the tabs on the right end of the cover plate into the slots on the right side of the panel.
 - b. Swing the plate and press it into place.
12. Close the internal drive door.
13. Go to Table 3 on page 76, and update the device information.



Note: If you have attached this expansion enclosure to a RAID adapter, you must reconfigure your disk arrays after installing or removing hard disk drives. See your server documentation for details.

What to do next

- To install a hot-swap drive in bays 4 through 9, go to “Installing a Hot-Swap Drive” on page 29.
- To install or remove a SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40.
- To complete the installation, go to “Completing the Installation” on page 47.

Installing a Hot-Swap Drive

Each drive you plan to install in bays 4 through 9 must have a hot-swap drive tray III attached. If your drive has a different tray attached, remove it and attach the appropriate hot-swap drive tray III to your drive. Follow the instructions that came with the hot-swap-drive tray.

Notes:

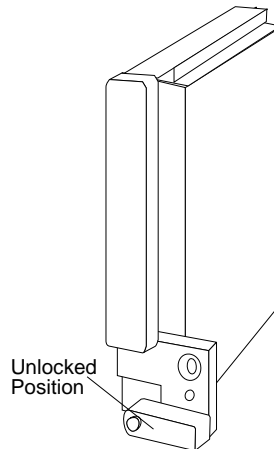
- Bays 4 through 9 support hot-swap drives only.
- You do not have to turn off the system to install additional hot-swap drives.

Attention: Before you hot-swap a drive, make sure it is defective. If you partially or completely remove a good drive instead of a defective one, your system might lose valuable data.

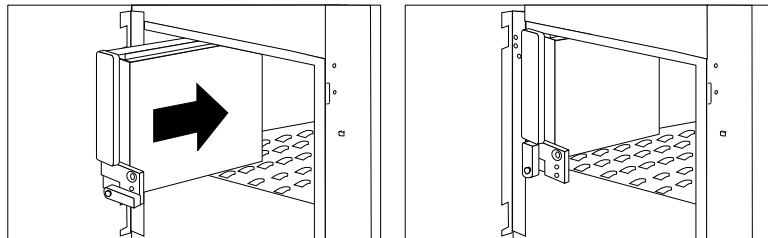
- If you have attached this expansion enclosure to a RAID adapter, you must reconfigure your disk arrays after installing or removing hard disk drives. See your server documentation for more information.

Working with Internal Drives

1. Open the internal drive door.
2. Move the tray knob to the unlocked position.

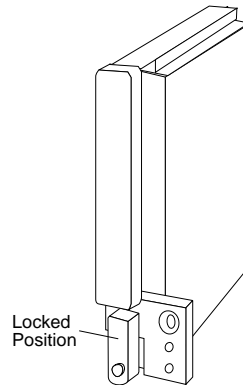


3. Position the drive tray assembly vertically, with the connector facing the rear of the expansion enclosure.
4. Align the side of the tray with the raised guides on the bottom of the bay. (Note the arrows pointing toward the back of the bays.)
5. Slide the tray to the rear of the bay until it stops. Be sure it is connected properly to the backplane.

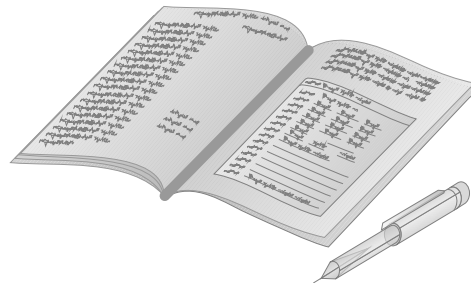


Working with Internal Drives

6. Move the tray's knob to the locked position.



7. Close the internal drive door.
8. Go to Table 3 on page 76, and update the device information.



Note: If you have attached this expansion enclosure to a RAID adapter, you must reconfigure your disk arrays after installing or removing hard disk drives. See your server documentation for details.

Working with Internal Drives

What to do next

- To remove an internal drive, go to “Removing Internal Drives” on page 33.
- To install or remove a SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40.
- To complete the installation, go to “Completing the Installation” on page 47.

Removing Internal Drives

Before you begin

- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- Turn off the expansion enclosure. However, if removing hot-swap drives, you can leave the expansion enclosure turned on.
- Disconnect all external cables and power cords, and then remove the expansion enclosure cover (see “Preparing to Add Options” on page 15).
- Determine the location of the drive that you want to remove.

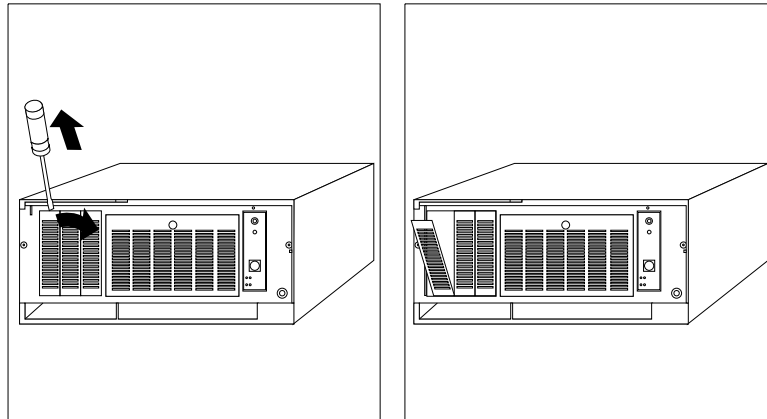
To remove a drive from bays 1 through 3, continue with “Removing a Drive from Bays 1 to 3” on page 34.

To remove a hot-swap drive from bays 4 through 9, go to “Removing a Hot-Swap Drive” on page 36.

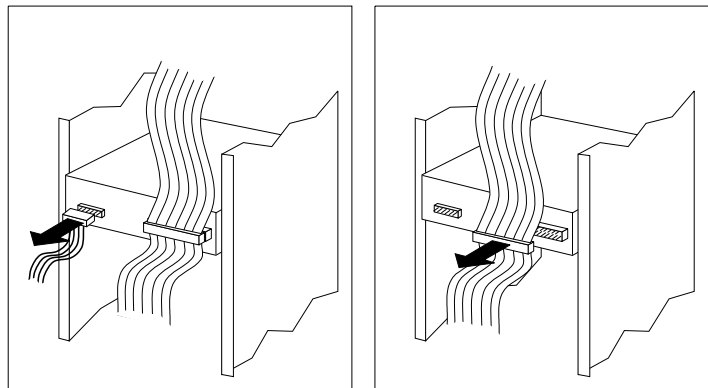
Working with Internal Drives

Removing a Drive from Bays 1 to 3

1. If you are removing a non-removable device, remove the cover plate from the bay.
 - a. Insert a small flat-blade screwdriver under the side of the cover plate.
 - b. Lift the cover plate and remove it from the server front panel (save the cover plate for future use).



2. Disconnect the SCSI and power cables from the drive.



Working with Internal Drives

3. Remove the screws that secure the drive (from both sides of the drive housing) in the target bay.
4. Slide the drive out of the bay.
5. Store the drive in a safe place. If the drive is attached to a drive tray, remove the drive before storing it.
6. Reinstall the drive housing, using the screws that you removed in step 3.
7. Reconnect the signal and power cables to each remaining drive.
Note: Cable connectors are keyed and connect only one way.
8. Reinstall the cover plate:
 - a. Insert the tabs on the right end of the cover plate into the slots on the right side of the panel.
 - b. Swing the plate and press it into place.
9. Go to Table 3 on page 76 and update the device information.



Note: If you have attached this expansion enclosure to a RAID adapter, you must reconfigure your disk arrays after installing or removing hard disk drives. See your server documentation for details.

Working with Internal Drives

What to do next

- To remove a hot-swap drive from bays 4 through 9, go to step 1 on page 36.
- To install or remove a SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40.
- To complete the installation, go to “Completing the Installation” on page 47.

Removing a Hot-Swap Drive

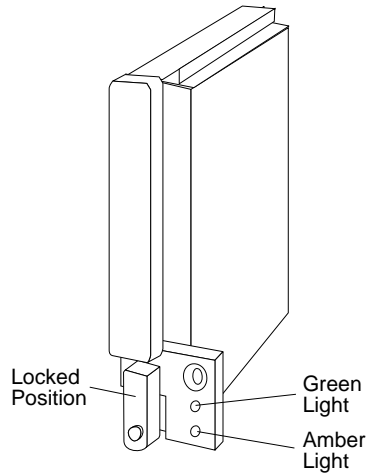
1. Open the internal drive door.
2. Determine the location for the drive you want to remove.
Note: You do not have to turn off the system to remove a drive from bays 4 through 9.
3. Ensure that you have selected the correct drive for removal by verifying that the light on the tray's knob is blinking or not illuminated.

Attention: Before you hot-swap a drive, make sure it is defective. If you partially or completely remove a good drive instead of a defective one, your system might lose valuable data.

Thoroughly review the information displayed on your server monitor to determine the location of the failed drive.

Working with Internal Drives

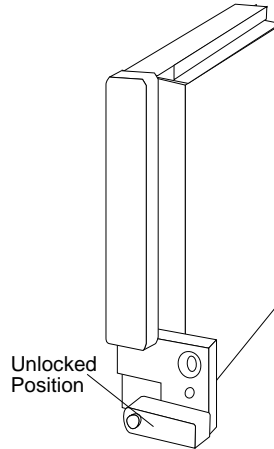
Hot-swap drives have two lights on the front of the tray that contains the drive. If the drive has a good electrical connection upon installation, the green light illuminates.



4. Press the power-off switch on the drive tray. When the green LED begins to blink, it is safe to remove the drive.

Working with Internal Drives

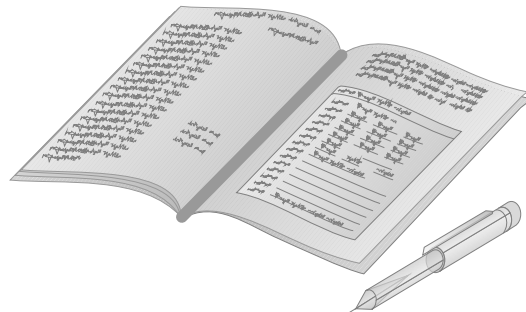
5. Unlock the drive by turning the knob clockwise 90 degrees.



6. Disconnect the drive from the connector on the backplane, by grasping the handle on the drive tray and pulling the drive out of the expansion enclosure. Store the drive in a safe place.

Note: If you have attached this expansion enclosure to a RAID adapter, you must reconfigure your disk arrays after installing or removing hard disk drives. See your server documentation for details.

7. Close the internal drive door.
8. Go to Table 3 on page 76 and update the device information.



Working with Internal Drives

What to do next

- To install an internal drive, go to “Installing Internal Drives” on page 23.
- To install or remove a SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40.
- To complete the installation, go to “Completing the Installation” on page 47.

Working with SCSI Repeater Cards

Before you begin

- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- Read the instructions that come with the SCSI Repeater Card.
- Turn off the expansion enclosure.
- Disconnect all external cables and power cords, and then remove the expansion enclosure cover (see “Preparing to Add Options” on page 15).
- Have a small, adjustable wrench or pliers available.

Your expansion enclosure comes equipped to connect to one server. Optionally, you can:

- Connect two servers and one expansion enclosure, continue with “Connecting Two Servers and One Expansion Enclosure” on page 41.
- Connect one server and two expansion enclosures, go to “Connecting One Server and Two Expansion Enclosures” on page 43.

Note: If you connect your expansion enclosure to a non-disk-array server, the SCSI bus must be dedicated to the expansion enclosure. That is, you cannot connect other devices to the SCSI bus.

Connecting Two Servers and One Expansion Enclosure

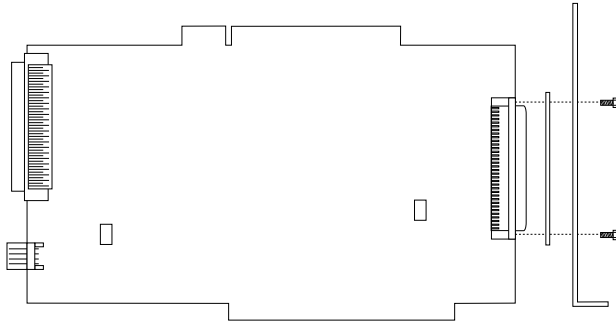
You can install a second SCSI Repeater Card to connect two servers and your expansion enclosure.

Before you begin

- You must set the SCSI ID address jumper on the backplane of the expansion enclosure to HI. See “SCSI IDs” on page 21 for information on the SCSI ID address jumper.
- You must assign a unique SCSI ID to the SCSI controller of each server. For example, if the SCSI controller in both servers is set to 7, set the SCSI ID of one SCSI controller to 6.
- Contact your IBM marketing representative or your IBM reseller to obtain a SCSI Repeater Card and all cables.

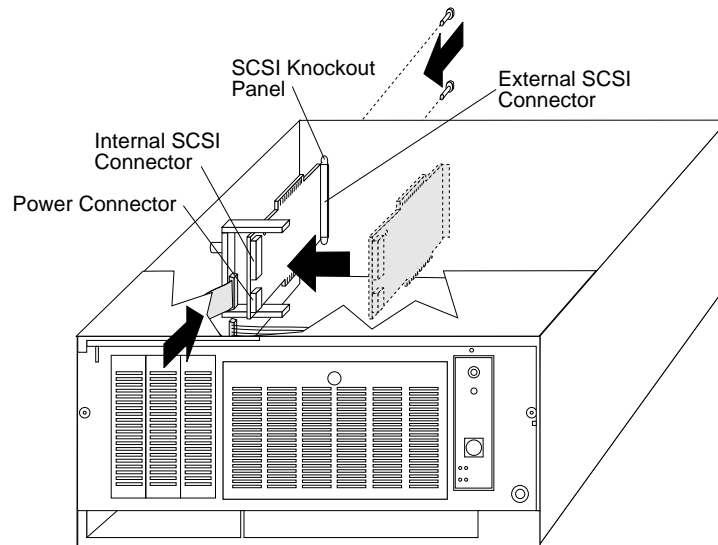
To install a second SCSI Repeater Card:

1. Remove the PCI mounting bracket and plate from the SCSI Repeater Card. Discard the two screws.



2. Locate the center of the SCSI knockout panel on the rear of the expansion enclosure.
3. Use a screwdriver to carefully tap on the middle of the knockout panel, near the bottom edge. The panel will bend toward the interior of the expansion enclosure.
4. Bend the knockout back and forth several times, until it comes off.

5. Insert the connector on the SCSI Repeater Card through the knockout opening.
6. Insert the SCSI Repeater Card in the open end of the card holder and slide into place.
7. Insert the two new screws that come with the SCSI Repeater Card in the SCSI Repeater Card and tighten.
8. Connect the power cable to the SCSI Repeater Card.
9. Connect one end of the SCSI option cable to the internal SCSI connector on the SCSI Repeater Card; then, connect the other end of the cable to the backplane on the expansion enclosure.

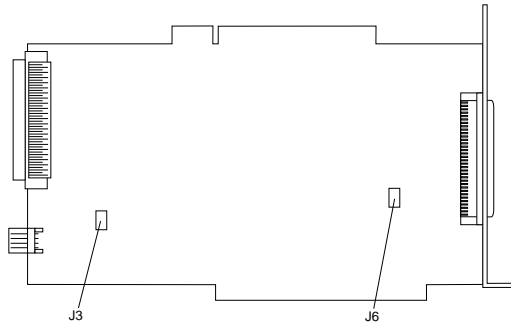


Connecting One Server and Two Expansion Enclosures

Before you begin

You must have a Y-cable available for connecting the server and expansion enclosures. To order the Y-cable, contact your IBM marketing representative or your IBM reseller.

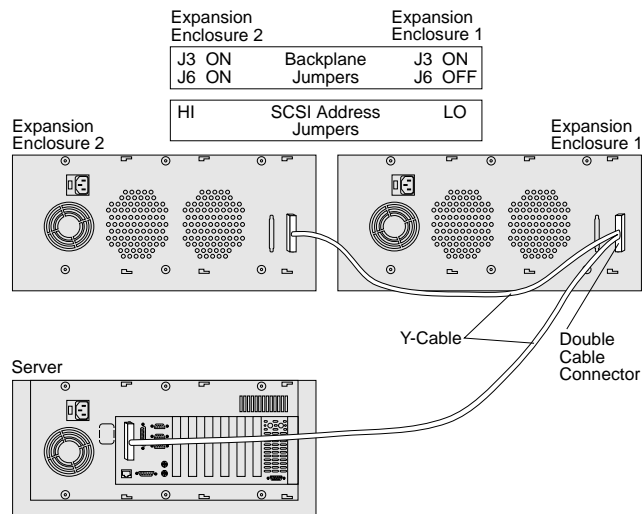
To connect your expansion enclosure to one server and another expansion enclosure, you must set jumpers (J3 and J6) on the SCSI Repeater Card.



The default settings for both jumpers is ON (covers on each jumper). The following table summarizes the jumper settings for the SCSI Repeater Card jumpers.

Jumper	Description
J3	Leave the jumper in the ON position.
J6	<ul style="list-style-type: none">Use the OFF position (cover removed) to connect the expansion enclosure to the double connector of a Y-cable.Use the ON position (cover in place) in all other cases.

You must also set the SCSI ID address jumpers on the backplanes of the expansion enclosures. See “SCSI IDs” on page 21 for information on the SCSI ID address jumpers. The following illustrates cabling and jumper setting requirements.



The expansion enclosures can contain a maximum of twelve slim-high, or six half-high hot-swap drives.

What to do next

- To install or remove an internal drive, go to “Working with Internal Drives” on page 18.
- To remove a SCSI Repeater Card, go to “Removing a SCSI Repeater Card” on page 45.
- To complete the installation, go to “Completing the Installation” on page 47.

Removing a SCSI Repeater Card

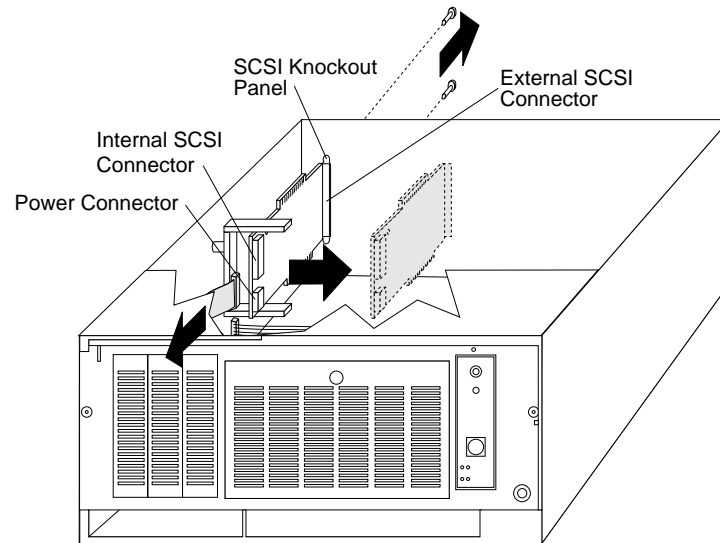
Before you begin

- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- Turn off the expansion enclosure.
- Disconnect all external cables and power cords, and then remove the expansion enclosure cover (see “Preparing to Add Options” on page 15).

To remove a SCSI Repeater Card:

1. Locate the SCSI Repeater Card that you want to remove.
2. Disconnect the SCSI cable from the backplane.
3. Disconnect the SCSI cable from the SCSI Repeater Card.
4. Disconnect the power cable from the SCSI Repeater Card.
5. Remove the screws from the SCSI Repeater Card at the rear of the server.
6. Gently pull up on the upper arm of the card holder and remove the SCSI Repeater Card from the card holder.

7. Carefully remove the SCSI Repeater Card from the expansion enclosure.



What to do next

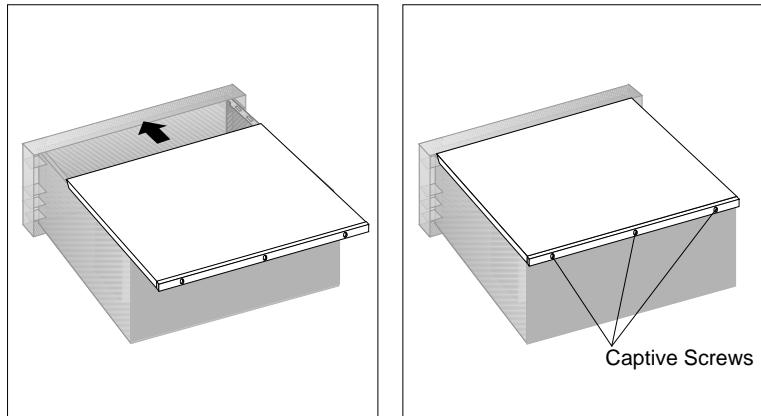
- To install or remove an internal drive, go to “Working with Internal Drives” on page 18.
- To install a SCSI Repeater Card, go to “Working with SCSI Repeater Cards” on page 40.
- To complete the installation, go to “Completing the Installation” on page 47.

Completing the Installation

When you have finished installing options, follow these instructions to complete the installation.

Replace the top or bottom cover:

1. Align the cover over the frame of the expansion enclosure.
2. Press the cover into place; then, slide the front edge of the cover under the rear edge of the expansion enclosure frame.
3. Tighten the screws in the back of the cover.



Completing the Installation

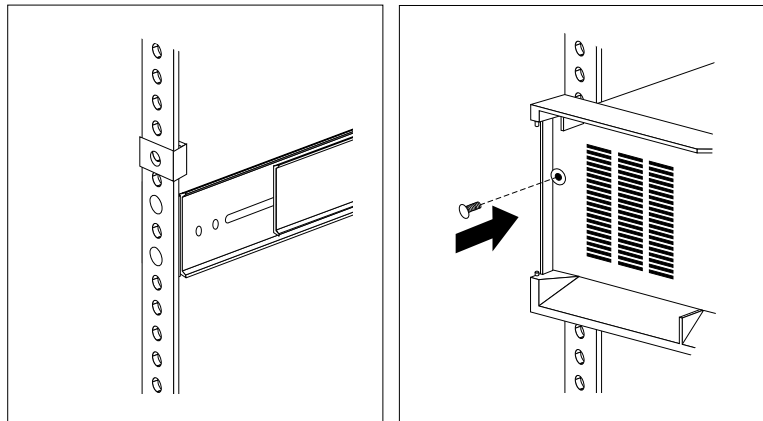
4. Attach the power cable and the external SCSI cable to the expansion enclosure.

Notes:

- If you are connecting one server and two expansion enclosures, attach a Y-cable. See “Connecting One Server and Two Expansion Enclosures” on page 43 for cabling instructions.

To order a Y-cable, contact your IBM marketing representative or your IBM reseller.

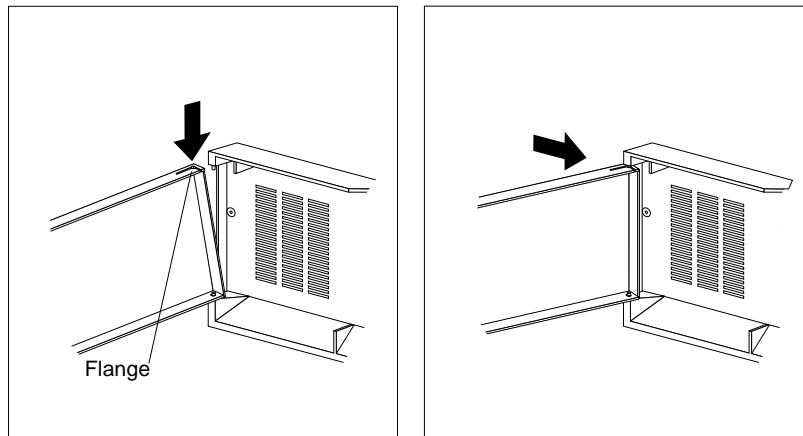
- If you are connecting two servers to your expansion enclosure, you will attach two external SCSI cables. See “Connecting Two Servers and One Expansion Enclosure” on page 41 for instructions.
5. Attach the external SCSI cable or Y-cable to your server.
See “Working with SCSI Repeater Cards” on page 40 for information on server external connector requirements.
 6. If you are using a rack, secure the drawer in the rack.
 - a. Slide the drawer into the rack.



- b. Locate the screws that you removed in step 3 on page 15.

Completing the Installation

- c. Insert the screws through the bezel, mounting rail, and nut clip.
7. Replace the front door.
 - a. Align the bottom hinges on the front door with the pin on the expansion enclosure.
 - b. Press the flange on the top edge and slide the door over the pin.
 - c. Release the flange.
 - d. Close and lock the door.



What to do next

- If you attached this expansion enclosure to your server during the initial setup of your server and expansion enclosure, go to your server documentation to complete the installation procedure.
- If you installed hot-swap drives, you might need to update your server configuration parameters.
- If you have attached this expansion enclosure to a RAID adapter, refer to your server documentation for information on RAID configuration and server configuration.

Chapter 3. Rack Installation

This chapter provides instructions for installing a PC Server Rack Storage Expansion Enclosure in a rack.

Your expansion enclosure comes with a PC Server Rack Mount Kit. Review the preinstallation information in “Before You Begin”; then, continue with “Installing the Expansion Enclosure in a Rack” on page 53.

Before You Begin

- You will need the following items:
 - Flat-blade screwdriver
 - 8-inch adjustable wrench or pliers
 - Tape
 - Pencil

Some of the installation procedures require two people.

- Before you begin to install your expansion enclosure in the rack, review the safety and handling guidelines specified under “Safety Information” on page v, and “Electrical Safety” on page 13. These guidelines will help you work safely while working with your expansion enclosure and options.
- Review the documentation that comes with your rack enclosure for safety or cabling considerations. Ensure that your planned installation is within the rack's guidelines for heat generation, electrical requirements, air flow, and mechanical loading.
- To ensure cabinet stability, plan the installation of servers and expansion enclosures in the rack starting from the bottom.
- Verify that the rack can meet the operating parameters, as detailed in Table 2 on page 52.

Before You Begin

<p>Size</p> <ul style="list-style-type: none"> - Depth: 465 mm (18.3 in.) - Height: 216 mm (8.5 in.) - Width: 482 mm (19.0 in.) <p>Weight</p> <ul style="list-style-type: none"> • Typical expansion enclosure as shipped: 17 kg (37.5 lb) <p>Environment</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> - Expansion Enclosure on: 10° to 35° C (50° to 95° F) Altitude: 0 to 914 m (3000 ft.) - Expansion Enclosure on: 10° to 32° C (50° to 90° F) Altitude: 914 m (3000 ft.) to 2133 m (7000 ft.) - Expansion Enclosure off: 10° to 43° C (50° to 110° F) Maximum Altitude: 2133 m (7000 ft.) 	<ul style="list-style-type: none"> • Humidity: <ul style="list-style-type: none"> - Expansion Enclosure on: 8% to 80% - Expansion Enclosure off: 8% to 80% • Maximum altitude: 2133 m (7000 ft) <p>Electrical Input</p> <ul style="list-style-type: none"> • Sine-wave input (50 to 60 Hz) is required • Input voltage: <ul style="list-style-type: none"> - Low range: <ul style="list-style-type: none"> - Minimum: 90 V ac - Maximum: 137 V ac - High range: <ul style="list-style-type: none"> - Minimum: 180 V ac - Maximum: 265 V ac 	<ul style="list-style-type: none"> - Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> - Minimum configuration as shipped: 0.08 kVA - Maximum configuration: 0.52 kVA <p>Total Power Available for Drives</p> <ul style="list-style-type: none"> • Nominal Operating Current allowed: <ul style="list-style-type: none"> - +5 V dc line: 5.3 A - +12 V dc line: 5.0 A <p>Heat Output</p> <ul style="list-style-type: none"> • Approximate heat output in British Thermal Units (Btu) per hour: <ul style="list-style-type: none"> - Minimum configuration: 350 Btu (102 watts) - Maximum configuration: 860 Btu (251 watts)
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Table 2. Expansion Enclosure Operating Specifications

Installing the Expansion Enclosure in a Rack

During this procedure, you must install parts on the rack and the expansion enclosure. This process can be divided into three parts:

- Preparing the expansion enclosure
- Preparing the rack
- Installing the expansion enclosure in the rack

Before you begin

- Turn off the expansion enclosure.
- Refer to your rack documentation for additional information on preparing the rack.

Preparing the Expansion Enclosure

In this section, you will use the following parts:

- Two chassis brackets
- One cable arm bracket
- The inner slide from two slide brackets
- 18 short screws (8/32 by 0.325 inch)



CAUTION:

Due to the weight of the expansion enclosure, do not attempt to lift the expansion enclosure by yourself. To avoid risking possible injury, get another person to help you.

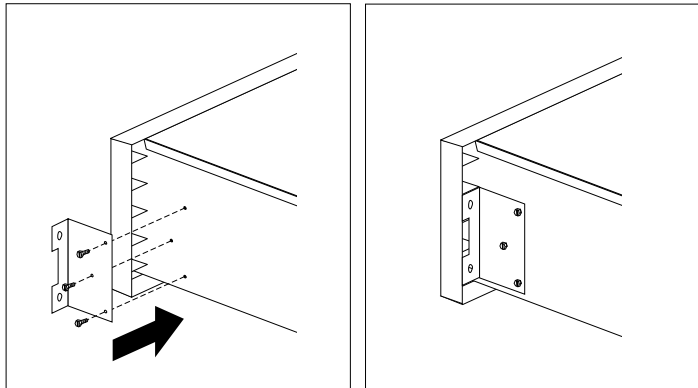
To prepare the expansion enclosure for installation in a rack enclosure:

1. Attach the chassis brackets to the sides of the expansion enclosure.
 - a. Align the holes on each chassis bracket with the holes on the side of the expansion enclosure.

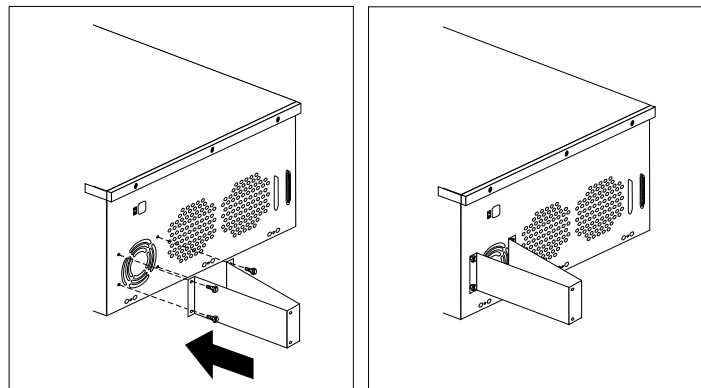
Installing the Expansion Enclosure in a Rack

Attention: To avoid damage to internal components, use only the 8/32 by 0.325-inch screws included with the Rack Mounting kit.

- b. Attach the chassis bracket using three 8/32 by 0.325-inch screws.

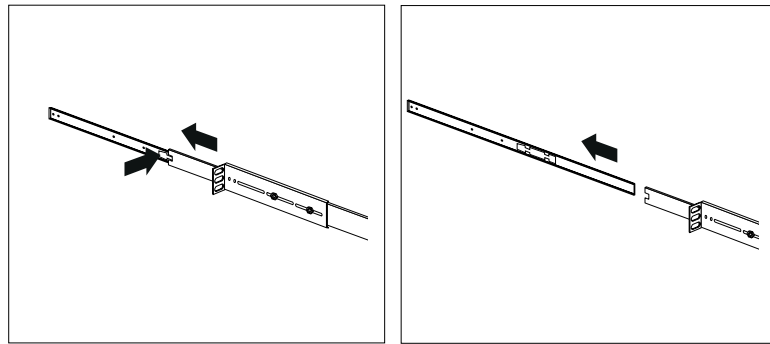


2. Attach the cable arm bracket to the rear of the expansion enclosure.
 - a. Align the cable arm bracket with the holes on the sides of the fan, keeping the longer, angled arm of the bracket toward the middle of the expansion enclosure.
 - b. Attach the bracket with four 8/32 by 0.325-inch screws.

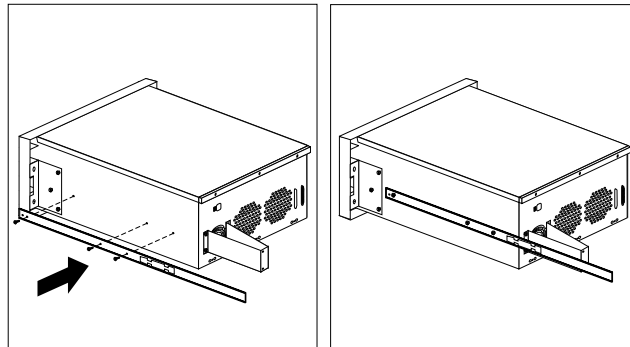


Installing the Expansion Enclosure in a Rack

3. Attach the inner slide section of each slide rail to the side of the expansion enclosure.
 - a. Pull the inner slide until the safety latch locks.
 - b. Press the safety latch; then, pull the inner slide firmly until it detaches from the outer slide rail.



- c. Align the holes on the inner slide with the holes on sides of the expansion enclosure; then, attach the slide with three 8/32 by 0.325-inch screws.



Preparing the Rack

In this section, you will use the following parts:

- Installation Template
- Two slide brackets
- Two outer slide rails

Installing the Expansion Enclosure in a Rack

- One cable-management arm
- Eight long screws (10/32 by 0.5-inch long)
- Four short screws (8/32 by 0.325-inch long)
- Four nuts
- Four washers
- Four bar nuts
- Tape

Attention: To ensure cabinet stability, plan the installation of expansion enclosures and servers in the rack starting from the bottom.

CAUTION:
This procedure requires two people.

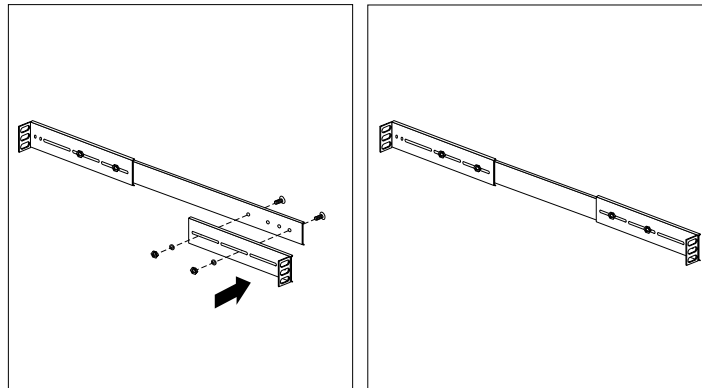
To attach the mounting hardware to the rack:

1. Mark the positions of the slide brackets on the mounting rails on the rack.
 - a. Position the Installation Template on the front mounting on the rack, aligning the holes. Secure the template in place with tape.
 - b. Mark the holes for the slide brackets and nut clips.
 - c. Carefully remove the tape from the mounting rails, and attach the template to the rear mounting rails. Mark the locations for the slide brackets.

Note: You must align the slide brackets properly, or the installation cannot be completed.
2. Attach an outer slide rail to each slide bracket.
 - a. Align the outer slide rail and the slide bracket.
 - b. Extend the outer slide rail in the rack to determine the approximate length needed.
 - c. Insert two short (8/32 by 0.325-inch) screws through the slide rail and bracket, at the appropriate holes.

Installing the Expansion Enclosure in a Rack

- d. Attach a washer and a nut to each screw. *Do not tighten the nuts at this time.*

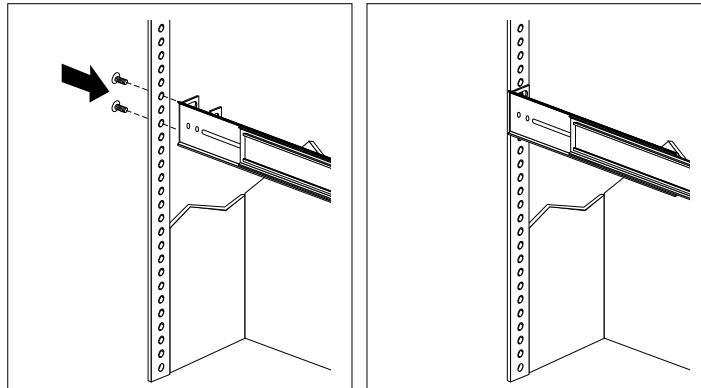


3. Attach the brackets to the left side of the rack:
- Extend the outer slide rail until it is flush against the inside of the left front mounting rail. Align the slide rail with the marked holes on the mounting rail.
 - Align the holes on the bar nut with the holes on the slide rail and mounting rail.

Note: Some slide brackets have threaded holes on the flange. These brackets do not require the bar nuts.

Installing the Expansion Enclosure in a Rack

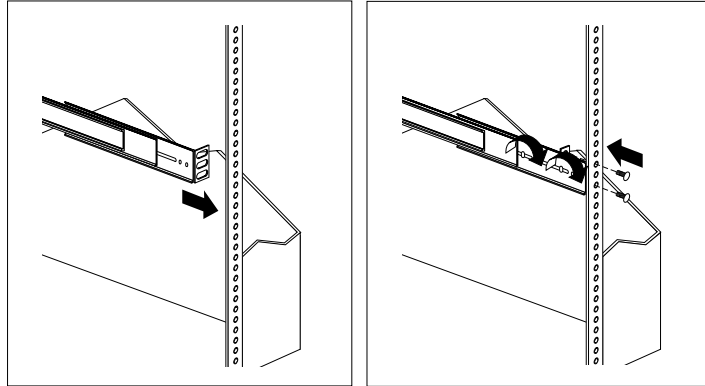
- c. From the front of the rack, insert two long screws through the mounting rail, slide rail, and bar nut. Press the slide rail until it is flush with the inner edge of the mounting rail; then, tighten the screws.



- d. Attach the slide bracket to the left rear side of the rack.
- 1) Align the holes on the bracket with the bar nut.
 - 2) Align the holes on the bracket and bar nut assembly with the marked holes on the rear mounting rail.
 - 3) From the rear of the rack, insert two long screws through the mounting rail, slide bracket, and bar nut; then, tighten the screws.

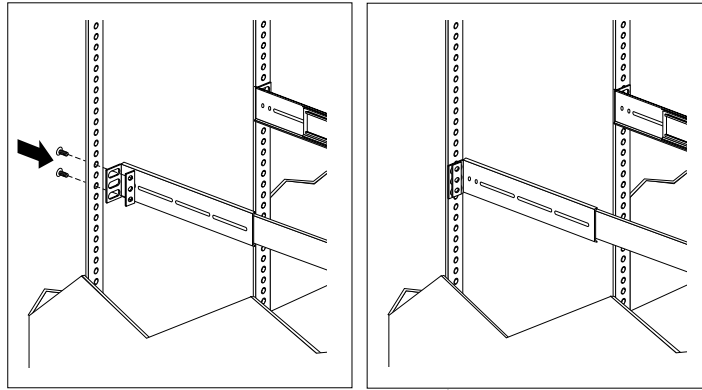
Installing the Expansion Enclosure in a Rack

- 4) Tighten the nuts on the slide rail, using pliers or an adjustable wrench.



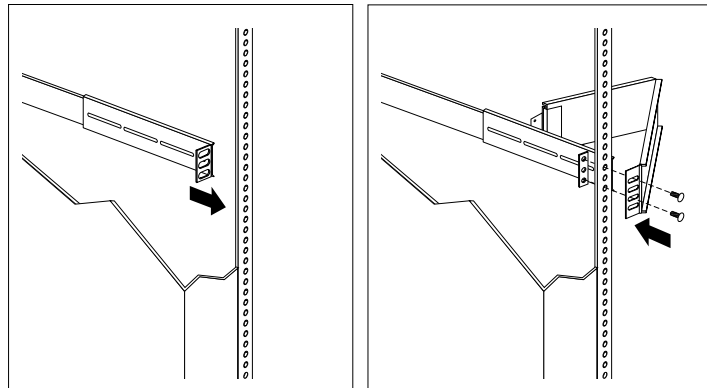
Installing the Expansion Enclosure in a Rack

4. Attach the slide rail to the right side of the rack.
 - a. Extend the outer slide rail until it is flush against the inside of the right front mounting rail. Align the slide rail with the marked holes on the mounting rail.
 - b. Align the holes on the bar nut with the holes on the slide rail.
 - c. From the front of the rack, insert two long screws through the mounting rail, slide rail, and bar nut. Press the slide rail so that it is flush with the inner edge of the mounting rail and tighten the screws.



Installing the Expansion Enclosure in a Rack

- d. Attach the slide bracket and cable management arm to the right rear of the rack.
- 1) Align the holes on the bracket with the bar nut.
 - 2) Align the holes on the bracket and bar nut assembly with the marked holes on the rear mounting rail.
 - 3) From the rear of the rack, align the holes on the cable arm mounting panel with the marked holes on the rear mounting rail.



- 4) From the rear of the rack, insert a long screw through holes in the cable arm bracket, mounting rail, slide bracket, and bar nut; then, tighten the screws.
Note: To facilitate alignment of the cable arm, be sure to insert the screws through the first and third holes, as shown.
- 5) Tighten the nuts on the slide rail, using pliers or an adjustable wrench.

Installing the Expansion Enclosure in a Rack

Installing the Expansion Enclosure in the Rack

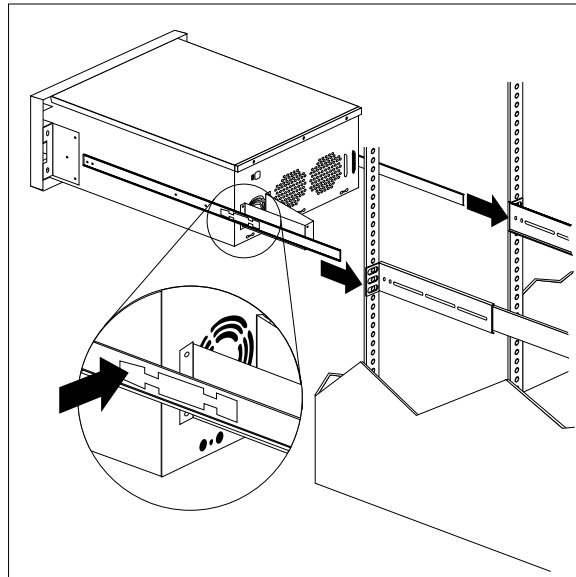
In this section, you will use the following parts:

- Two screws (10/32 by 0.5-inch long)
- Two nut clips
- Cable ties
- Two screws (10/32 by 1.0-inch long)

To install the expansion enclosure into the rack:

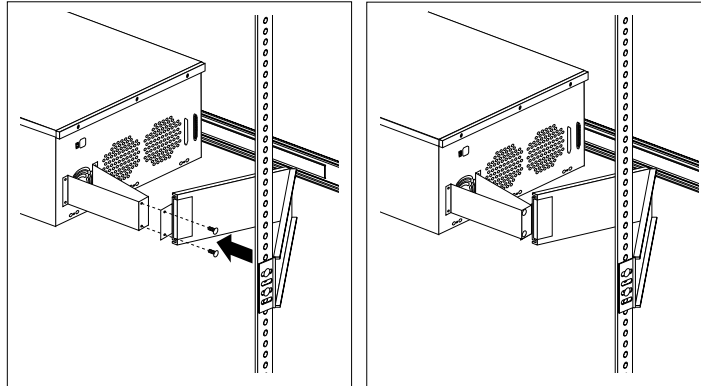
1. Position the expansion enclosure horizontally, with the 3.5-inch drive bays on the top.
2. Align the inner slides on the sides of the expansion enclosure with the slide rails; then, slide the expansion enclosure onto the outer slide, until the slide rails click into place.

Note: When the drawer is fully extended, safety latches on the slide rails lock into place. This prevents the expansion enclosure from being accidentally pulled out too far and dropped. To release the safety latch, press the latch.



Installing the Expansion Enclosure in a Rack

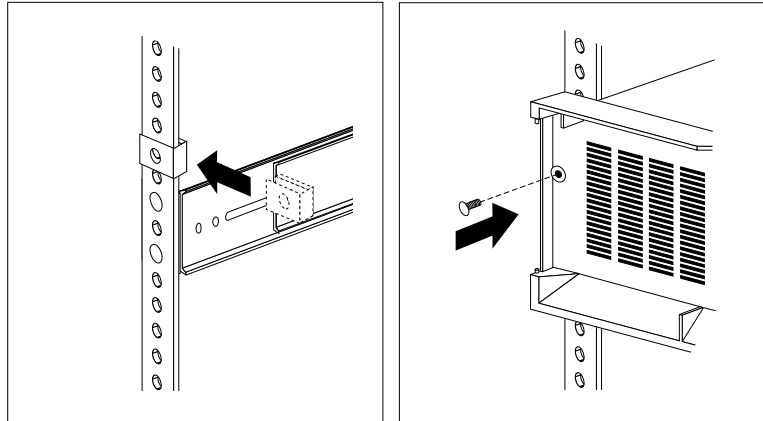
3. Press the safety latches and slide the drawer about halfway into the rack.
4. Attach the cable-management arm to the cable arm bracket, using two long (10/32 by 0.5-inch) screws.



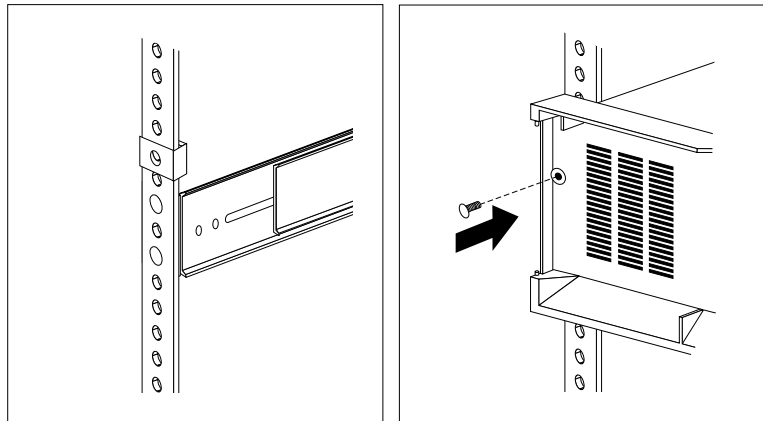
5. Attach the monitor, keyboard, and power cables to the corresponding connectors on the expansion enclosure. Refer to the rack documentation for instructions.
6. Attach the cables to the cable-management arm using the cable ties.

Installing the Expansion Enclosure in a Rack

7. Secure the drawer in the rack.
 - a. Install a nut clip on each front mounting rail, as shown.
 - b. Slide the drawer into the rack.

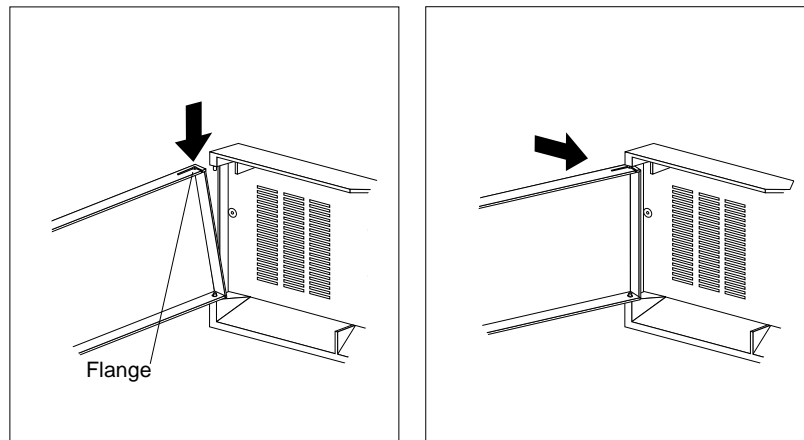


- c. Secure the expansion enclosure to both sides of the rack by inserting an extra long screw (10/32 by 1.0-inch long) through the bezel, mounting rail, and nut clip.



Installing the Expansion Enclosure in a Rack

8. Attach the front door to the expansion enclosure.
 - a. Align the bottom hinges on the front door with the pin on the expansion enclosure.
 - b. Press the flange on the top edge and slide the door over the pin.
 - c. Release the flange.



9. Close and lock the door.
10. To complete the installation, refer to the documentation that comes with the rack.

Removing the Expansion Enclosure from a Rack

In some configurations, installing options in the expansion enclosure might be more convenient if you remove the expansion enclosure from the rack. For example, you might prefer to remove the expansion enclosure if you are installing an internal drive in an enclosure that is installed in the bottom position in a rack.

Before you begin

- Read “Electrical Safety” on page 13 and “Handling Static-Sensitive Devices” on page 14.
- Turn off the expansion enclosure.
- Follow any additional installation and safety instructions that come with the rack.

Removing the Expansion Enclosure



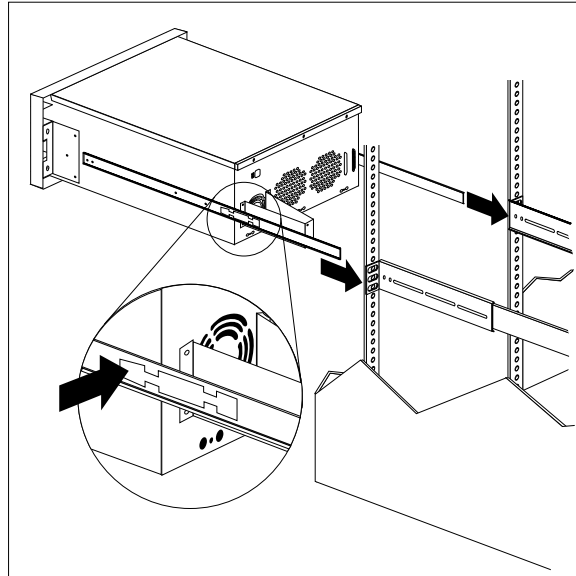
CAUTION:

Due to the weight of the expansion enclosure, do not attempt to lift the expansion enclosure by yourself. To avoid risking possible injury, get another person to help you.

Removing the Expansion Enclosure from a Rack

To remove the expansion enclosure from a rack:

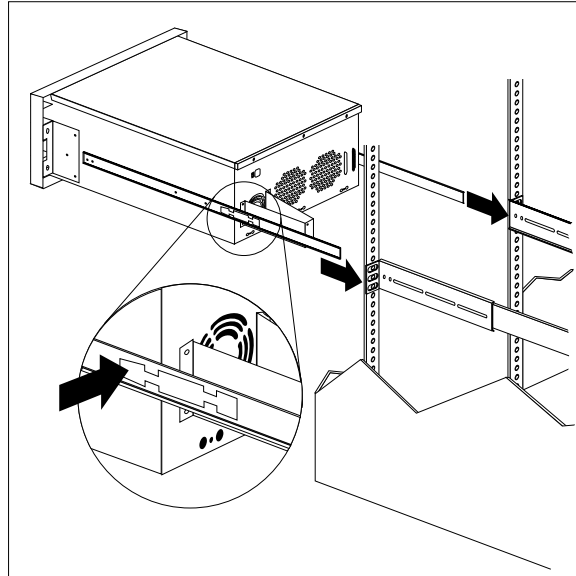
1. Unlock and remove the front door on the expansion enclosure.



2. Remove the screw from each side of the front bezel. Set the screws aside for later use.
3. Slide the expansion enclosure out of the rack.
4. Disconnect all cables and power cords from the rear of the expansion enclosure.
5. Remove the two screws from the cable arm bracket.

Removing the Expansion Enclosure from a Rack

6. Press the safety release latch on each slide rail.



7. Lift the expansion enclosure at a slight angle, and pull it from the slide rails. Then place the expansion enclosure on a flat, nonconductive surface.

Chapter 4. Solving Problems

This chapter contains information to help you solve some of the simpler problems you might have with your expansion enclosure.

This chapter contains:

Overview of the Diagnostic Tools	69
Troubleshooting Charts	70
Checking the System for Damage	72
After Dropping It	72
After Spilling Liquid on It	72
Getting Help and Service Information	73
Placing the Call to IBM	73

Overview of the Diagnostic Tools

System problems can be caused by hardware, software, or user error. (An example of a user error is pressing the wrong key.) You might be able to solve the problem yourself or provide helpful information to a service technician.

Troubleshooting Charts

You can use the troubleshooting charts in this section to find solutions to problems that have definite symptoms.

Look for the symptom in the left column of the chart. Instructions and probable solutions to the problem are in the right column of the chart.

Problem Symptoms and Error Messages	Description and Resolution
Expansion Enclosure does not come on	<p>There might be a problem with your electrical power source or the connectors to it.</p> <p><i>Action:</i> Make sure that:</p> <ol style="list-style-type: none">1. Power cords or cables are properly plugged in or connected.2. The expansion enclosure is powered on.3. Voltage switch is set correctly.4. Electrical power source is active. <p>If the problem persists, have the system serviced.</p>
Fan Failure buzzer sounds or Fan Failure LED lights	<p>One or more of the internal fans is not operating.</p> <p><i>Action:</i> Make sure that:</p> <ol style="list-style-type: none">1. All fans can operate without obstruction.2. All fans are properly connected. <p>If the problem persists, replace the failed fan.</p> <p>Attention: Do not operate the expansion enclosure unless all fans are working properly.</p>
<hr/>	
SCSI Repeater Card Problems	Description and Resolution
A SCSI Repeater Card that was just installed does not work	<p><i>Action:</i> Make sure that:</p> <ol style="list-style-type: none">1. The SCSI Repeater Card is designed for the system.2. You followed the installation instructions that came with the SCSI Repeater Card.3. The SCSI Repeater Card is installed correctly.4. You have not loosened any other options or cables. <p>If all of the above items are correct, have the system serviced.</p>

Troubleshooting Charts

SCSI Repeater Card Problems	Description and Resolution
A SCSI Repeater Card that used to work does not work now	<p>The hardware and cable connections might not be secure.</p> <p><i>Action:</i> Make sure that:</p> <ol style="list-style-type: none">1. The SCSI cables are connected correctly.2. All SCSI devices are terminated correctly. (See “Termination Requirements” on page 23 for more information on SCSI termination.)3. All external SCSI options are turned on. External SCSI options must be turned on before the system is turned on. <p>If the above are correct, run the test program provided with your server for additional information about the SCSI Repeater Card. If the error recurs, have the system serviced.</p>

SCSI Device Problems	Description and Resolution
A SCSI device that was just installed is not recognized.	<p>The device termination or SCSI ID might be set incorrectly.</p> <p><i>Action:</i> Make sure that:</p> <ol style="list-style-type: none">1. The device termination is disabled.2. You have assigned the device a unique SCSI ID.

Note: If you cannot find the problem in the troubleshooting charts, test the entire system. See your server documentation for more detailed information on testing and diagnostic tools.

If you already have run the server's test program, or if running the test does not reveal the problem, have the system serviced. (See “Getting Help and Service Information” on page 73.)

Checking the System for Damage

Checking the System for Damage

This section provides instructions on what to do if your system might be damaged.

After Dropping It

Look for loose cables and obvious damage. If any cables are loose, reconnect them securely. If there is obvious damage to the system, have it serviced.

If you see no damage, turn on the system. If it works correctly, the system probably did not suffer any damage.



CAUTION:

Observe all safety and electrostatic precautions listed in this book to avoid personal injury or damage to your system.

If the expansion enclosure does not work correctly, turn it off and check the cables and drives to ensure that they are connected correctly. Go to “Electrical Safety” on page 13 and follow the instructions for opening your system; then reseal all cables and drives.

If the expansion enclosure still does not work properly, start the server's test programs and test the expansion enclosure. See the server documentation for instructions.

After Spilling Liquid on It

If liquid gets inside the system:

1. Turn off the system and all attached devices.
2. Unplug the system from the electrical outlet and all attached devices.
3. Have the system serviced immediately.

Getting Help and Service Information

During the warranty period, you can get toll-free technical support 24 hours a day, 7 days a week, to answer any questions about your expansion enclosure.* If you need warranty service, return or exchange is available. In addition, if your IBM options are installed in an IBM computer, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

To assist the technical support representative, have available as much of the following information as possible:

- Option name, description, and serial number (if any)
- Proof of purchase
- Computer manufacturer, model, serial number, and manual
- Exact wording of the error message (if any)
- Description of the problem
- Hardware and software configuration information for your system

If possible, be at your server. Your technical support representative might want to walk you through the problem during the call.

Placing the Call to IBM

Use one of the following numbers:

- In the United States and Puerto Rico, call 1-800-772-2227
- In Canada, call 1-800-565-3344
- In all other countries, contact your IBM reseller, IBM marketing representative, or your place of purchase.

* Response time will vary depending on the number and nature of calls received.

Appendix A. Records

Whenever you add options to your expansion enclosure, be sure to update the information in this appendix. Accurate, up-to-date records make it easier to add other options and, if the need should arise, to report a hardware problem.

Record the Identification Numbers

Record and retain the following information.

Product Name	IBM PC Server 3519 Rack Storage Expansion Enclosure
Serial Number	_____
Key Serial Number	_____

The serial number and other identification numbers are located on a label on the rear of the expansion enclosure.

The serial number is also located on the front bezel. The model number is located to the right of the 5.25-inch drive bays.

Note: Two keys are provided with your expansion enclosure. Store the keys in a safe place. If you lose the keys, you must order a replacement lock mechanism and keys from IBM.

Installed Device Records

Installed Device Records

Use the following tables to keep a record of the options installed in or attached to your expansion enclosure. This information can be helpful when you install additional options or if you ever need to report a hardware problem. Copy these tables before recording information in them, in case you need extra space to write new values later, when you update your system's configuration.

Record the types and SCSI IDs for drives or devices attached to your expansion enclosure in the following table. If you attach a drive or other device, be sure to record the descriptive information appropriately.

Location	Drive or Device Description	SCSI ID
	Internal Devices	
Bay 1	_____	_____
Bay 2	_____	_____
Bay 3	_____	_____
Bay 4	_____	0
Bay 5	_____	1
Bay 6	_____	2
Bay 7	_____	3
Bay 8	_____	4
Bay 9	_____	5
<i>Notes:</i>		
1. You can install a maximum of two 41.3 mm drives in bays 1 through 3.		
2. A 41.3 mm drive installed in bays 4 through 9 occupies two bays.		

Table 3. Internal Drives and Devices

Installed Device Records

SCSI Repeater Card Slots	Description
1	Preinstalled
2	_____

Table 4. SCSI Repeater Card Slots

Appendix B. Product Warranties and Notices

The following is the statement of limited warranty for the United States, Canada, and Puerto Rico.

International Business Machines Corporation

Armonk, New York, 10504

Statement of Limited Warranty

The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. If you have any questions, contact IBM or your reseller.

Machine: PC Server 3519 Rack Storage Expansion Enclosure

Warranty Period*: Limited Three-Year On-Site Service

**Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if authorized by IBM, will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

For IBM or your reseller to provide warranty service for a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many of these transactions involve the removal of parts and their return to IBM. You represent that all removed parts are genuine and unaltered. A part that replaces a removed part will assume the warranty service status of the replaced part.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair it or replace it with one that is at least functionally equivalent, without charge. The replacement may not be new, but will be in good

Notices

working order. If IBM or your reseller is unable to repair or replace the Machine, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user. However, for Machines which have a life-time warranty, this warranty is not transferable.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

IBM or your reseller will provide certain types of repair and exchange service, either at your location or at IBM's or your reseller's service center, to restore a Machine to good working order.

When a type of 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. 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 ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange.

You agree to:

1. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
2. where applicable, before service is provided —
 - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
 - b. secure all programs, data, and funds contained in a Machine, and
 - c. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

The warranties may be voided by misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal or alteration of Machine or parts identification labels, or failure caused by a product for which IBM is not responsible.

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2. the amount of any other actual direct damages or loss, up to the greater of U.S. \$100,000 or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

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Federal Communications Commission (FCC) Statement

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

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

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

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

Notices

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. **European Community 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.

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