

**1080MB and 2160MB SCSI-2 Disk Drives  
Installation and User's Guide**

### **Third Edition (April 1997)**

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## **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.**



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## **About This Book**

This book provides information about the 1080MB and 2160MB SCSI-2 Disk Drives, installing the drive, planning your SCSI device layout, setting the SCSI addresses (also called SCSI IDs), and configuring the device driver support. Use this book together with your specific system unit and operating system documentation.

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### **ISO 9000**

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

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### **Related Publications**

Refer to your system unit and operating system documentation for information specific to your hardware and software configuration.

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### **Trademarks and Acknowledgments**

AIX is a registered trademark of International Business Machines Corporation

PowerPC is a trademark of International Business Machines Corporation

Windows NT is a trademark of Microsoft Corporation





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## **Chapter 1. Overview**

The 1080MB and 2160MB SCSI-2 Disk Drives are 3.5-inch half-height drives that support SCSI-2 interface synchronous data rates up to 10 million bytes per second (fast SCSI). The formatted capacity of a 1080MB drive is approximately one billion bytes of data. The formatted capacity of a 2160MB drive is approximately two billion bytes of data.

The 1080MB and 2160MB SCSI-2 Disk Drives meet the Small Computer System Interface-2 (SCSI-2) set by the American National Standards Institute (ANSI).



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## Chapter 2. Preparing to Install the Disk Drive

**Attention:** Static electricity can damage your equipment. Leave the drive in its static-protective bag until you are ready to install it in your system unit.

Before you begin installing the 1080MB or 2160MB SCSI-2 Disk Drive, make sure that the following parts are included in the package:

- The 1080MB or 2160MB SCSI-2 Disk Drive
- Four 6/32 x 3/16-inch screws
- An 8- to 16-bit interposer (1080MB drive only)
- Jumpers (1080MB drive only)

Contact the place of purchase if any parts are missing or damaged.

To install the drive, you need:

- A small, flat-blade screwdriver
- A SCSI-2 adapter, which is either *built into*, or *on a separate adapter card inside* your system unit
- Your system unit documentation

**Note:** The 1080MB and 2160MB SCSI-2 Disk Drives are intended to be installed inside the system unit. You can connect either of these drives externally if you place the drive in an appropriate enclosure. If you choose to have an external connection, you will have to purchase the appropriate SCSI cable and terminator.

**Attention:** Be sure to use the screws specified in the instructions. Using the wrong size screws could cause damage to the drive.



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## Chapter 3. Hardware and Software Considerations

The operating system and hardware are two of the factors that determine the number of drives a system unit can support. The 1080MB and 2160MB SCSI-2 Disk Drives can be installed on several different system units. To determine the number and type of disk drives you can install on your system unit, refer to your system unit documentation.

The 1080MB and 2160MB SCSI-2 Disk Drives are supported on several operating systems, including the following:

- 1080MB — AIX 4.1.2 or later
- 2160MB — AIX 4.1.4 or later
- 1080MB and 2160MB — Windows NT (PowerPC Edition) 3.51

Please ensure that your operating system supports this drive before you install it. Contact your support representative for assistance.

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### Planning Your SCSI Device Layout

SCSI devices are attached in a daisy-chain configuration to a SCSI adapter installed inside the system unit. Devices include such hardware as disk drives, tape drives, scanners, printers, and CD-ROM drives.

Each device in the chain has a unique SCSI address (also called a SCSI ID). When you connect more than one SCSI device, it is important that you plan the location and address of each device in the chain. You must also be sure to connect a terminator at each end of the chain. The SCSI adapter is usually at one end of the chain, which provides termination for that end. The last attached device must terminate the other end of the chain. In some instances, you might have to connect an external terminator.

When you install the 1080MB and 2160MB SCSI-2 Disk Drives internally, you must connect the internal terminator to the end of the internal SCSI cable. If you connect the drives externally, you must connect a terminator to the last device on the chain. In some instances, you might need to connect an external terminator as well. If you have a configuration that includes both internal and external devices, you must connect a terminator to the last external device and ensure that you also terminate the internal SCSI cable. The adapter terminates one end of the chain and the last device terminates the other end.

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## Determining Your SCSI Device Addresses

**Attention:** Static electricity can damage the disk drive. Before you remove it from its static-protective bag, be sure that you read and follow the precautions contained in "Handling Precautions" on page 3-3.

Before you install the 1080MB and 2160MB SCSI-2 Disk Drives, you must set the SCSI address on the drive. First, you must determine which SCSI addresses are available to use. Then you choose an address and install jumpers on the drive to set the selected address. You can use any available SCSI address for any device as long as no two SCSI devices on the same chain use the same address. No device can use address 7. This is reserved for the SCSI adapter.

SCSI addresses are in sequential order from highest to lowest priority. Refer to Table 3-1 below for the priority associated with each SCSI address. For the best performance, choose the highest unused SCSI address between 6 and 0. The address for this disk drive is preset to 6.

Priority	SCSI Address	SCSI Device Name
Highest Priority	7	Adapter
↓	6	
↓	5	
↓	4	
↓	3	
↓	2	
↓	1	
Lowest Priority	0	

To find an available SCSI address:

1. At a system prompt, type:

```
lsdev -Cs scsi
```

then press Enter. The following information displays:

Column 1: device name (for example, hdisk0)

Column 2: device status (for example, Available)

Column 3: SCSI information (the format is: *nn-nn-nn-a,b*)

Column 4: device type (for example, 2160MB SCSI disk drive)

The *a* in the *nn-nn-nn-a,b* string in Column 3 is the SCSI address of the device name displayed in column 1. The *b* is the SCSI bus number for that device.

2. Find the available SCSI address for a 1080MB or 2160MB SCSI-2 Disk Drive and choose the highest-priority unused address for yours. On Table 3-1 on page 3-2, record the address you picked for your disk drive and the names and SCSI addresses of any other installed SCSI devices. Save this information for future reference.
3. Set the jumpers on the back of the disk drive to the SCSI address you selected in step 2. For instructions on how to do this, go to “Setting the Jumpers on the 1080MB SCSI-2 Disk Drive” on page 3-4, “Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DORS32160” on page 3-6, or “Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DCAS32160” on page 3-9.

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## Handling Precautions

**Attention:** Do not open the static-protective bag containing the drive until instructed to do so. Static electricity can damage the drive.

It is recommended that you use a grounding wrist strap. If you do not have a strap, it is important that you become familiar with all of the following precautions:

- Turn power off to all attached devices, then turn power off to the system unit.
- Unplug all power cords from electrical outlets before starting the installation.
- Disconnect all power cables and attached devices from the system unit before starting the installation.
- Limit your movement, which can cause static electricity to build up around you.
- Handle the drive carefully and by the edges.
- Do not touch any exposed printed circuitry.
- Prevent others from touching the components or the drive.
- To eliminate static electricity from the package and your body, touch the static-protective package containing the drive to a metal expansion-slot screw or other unpainted metal surface on the system unit for at least 2 seconds.
- When possible, remove the drive and install it directly into the system unit or storage enclosure without setting it down. If this is not possible, place the drive, component side up, on the static-protective bag on a flat surface until you are ready to install it.
- Do not place the drive on the system unit cover or on a metal table.

---

## Setting the Jumpers on the 1080MB SCSI-2 Disk Drive

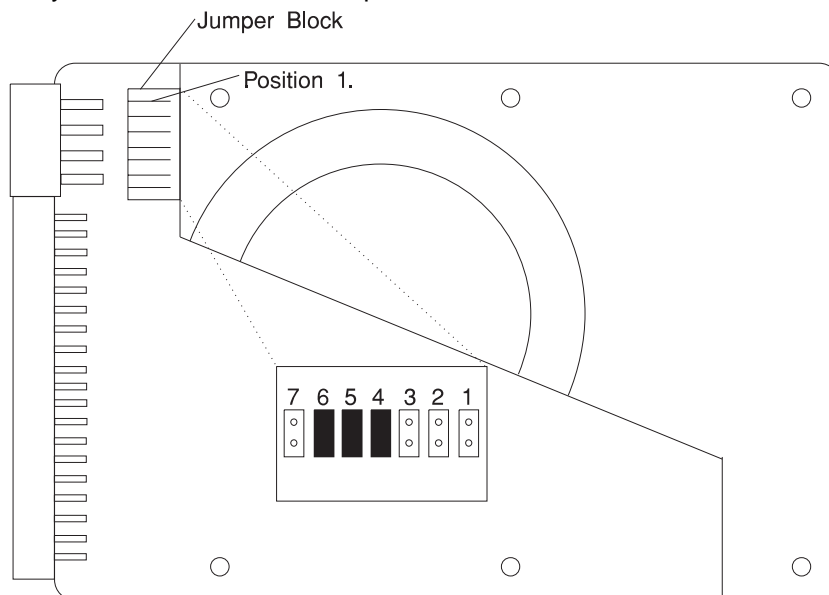
After you choose an available SCSI address for your 1080MB SCSI-2 Disk Drive, you can set the jumpers on the drive to match the selected address. Be sure you have picked a SCSI address before continuing. If you have not, go to “Determining Your SCSI Device Addresses” on page 3-2, then return here.

To set the jumpers to the SCSI address:

1. Remove the drive from its static-protective bag, making sure to hold it by the edges. Do not touch any exposed components on the drive.
2. Place the drive on top of the bag on a flat surface.
3. Install a jumper on position **4** to disable the Auto Start, which keeps the hard disk drive motor from starting when you turn on the system unit. The operating system spins up each drive in sequence.

**Note:** Position **4** *must always* have a jumper.

To install a jumper, line up the two holes in the bottom of the jumper with the appropriate two pins on the drive. Push the jumper onto the pins until it is completely seated and covers both pins.



4. Refer to the above illustration, then locate positions **5**, **6**, and **7** on your drive. These positions are always used to set the SCSI address on the 1080MB SCSI-2 Disk Drive. In this example, jumpers are installed in positions **5** and **6**, which sets the SCSI address to 6.



5. Refer to Table 3-2 on page 3-5 to determine where to install the jumpers to correctly set your new SCSI address.

**Note:** Do *not* install jumpers in positions **1**, **2**, and **3**.

Table 3-2. Jumper Settings

SCSI ID	POSITION		
	<b>7</b>	<b>6</b>	<b>5</b>
7	Reserved	Reserved	Reserved
6	:	■	■
5	■	:	■
4	:	:	■
3	■	■	:
2	:	■	:
1	■	:	:
0	:	:	:

**Notes:**

1. A ■ indicates that a jumper is installed in this position.
2. A ":" indicates that there is no jumper installed in this position.

Store any jumpers you do not use in a safe place in case you need to change the SCSI address for this drive later.

**Attention:** Do not store extra jumpers on any of the extra pins on the connector, as doing so could damage the drive.

---

## Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DORS32160

Before you begin, verify that your Model Number is DORS32160. The Model# is typed on a label located on the top of your drive. (If your Model# is DCAS32160, go to “Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DCAS32160” on page 3-9.)

After you choose an available SCSI address for your 2160MB SCSI-2 Disk Drive, you can set the jumpers on the drive to match the selected address. Be sure you have picked a SCSI address before continuing. If you have not, go to “Determining Your SCSI Device Addresses” on page 3-2, then return here.

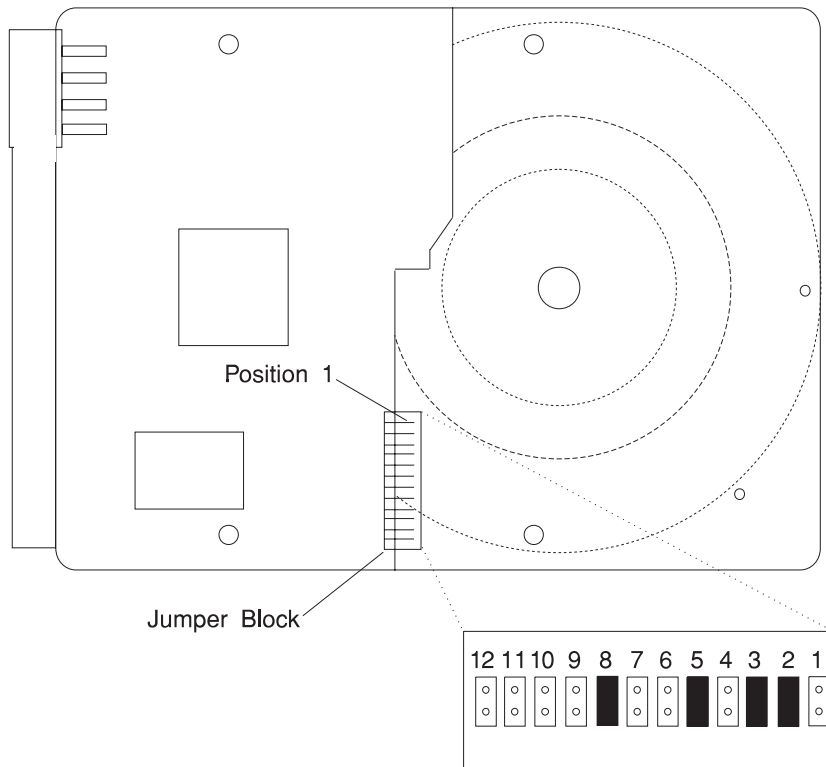
To set the jumpers to the SCSI address:

1. Remove the drive from its static-protective bag. Hold the drive by its edges, and do not touch any exposed components on the drive.
2. Place the drive on top of the bag on a flat surface.
3. To disable the Auto Start function for Model# DORS32160, install a jumper on position **5**. When the Auto Start function is disabled, the operating system does not automatically spin up each drive in sequence.

**Note:** To install a jumper, line up the two holes in the bottom of the jumper with the appropriate two pins on the drive. Push the jumper onto the pins until it is completely seated and covers both pins.

4. If this drive is the last connector at the end of the cable, install a jumper on position **6** to enable SCSI Term On. SCSI Term On should always be enabled (On) whenever the drive is the last connector at the end of the cable unless an external terminator is attached to the cable or the cable end is plugged into the system planar.
5. Install a jumper on position **8** to enable Target Sync Mode. This allows the drive to initiate synchronous transfers, which improves performance since data is sent at a higher rate of speed.

**Note:** Position **8** *must always* have a jumper.



6. Refer to the above illustration and locate positions **2**, **3**, and **4** on your drive. These positions are always used to set the SCSI address on the 2160MB SCSI-2 Disk Drive. In this example, jumpers are installed in positions **2** and **3**, which sets the SCSI address to 6.
  7. Refer to Table 3-3 on page 3-8 to determine where to install the jumpers to correctly set your new SCSI address.
- Note:** Do *not* install jumpers in positions **1**, **7**, **9**, **10**, **11**, and **12**.

*Table 3-3. Jumper Settings*

SCSI ID	POSITION		
	4	3	2
7	Reserved	Reserved	Reserved
6	:	■	■
5	■	:	■
4	:	:	■
3	■	■	:
2	:	■	:
1	■	:	:
0	:	:	:

**Notes:**

1. A ■ indicates that a jumper is installed in this position.
2. A ":" indicates that there is no jumper installed in this position.

Store any jumpers you do not use in a safe place in case you need to change the SCSI address for this drive later.

**Attention:** Do not store extra jumpers on any of the extra pins on the connector, as doing so could damage the drive.

---

## Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DCAS32160

Before you begin, verify that your Model Number is DCAS32160. The Model# is typed on a label located on the top of your drive. (If your Model# is DCOR32160, go to “Setting the Jumpers on the 2160MB SCSI-2 Disk Drive for Model# DORS32160” on page 3-6.)

After you choose an available SCSI address for your 2160MB SCSI-2 Disk Drive, you can set the jumpers on the drive to match the selected address. Be sure you have picked a SCSI address before continuing. If you have not, go to “Determining Your SCSI Device Addresses” on page 3-2, then return here.

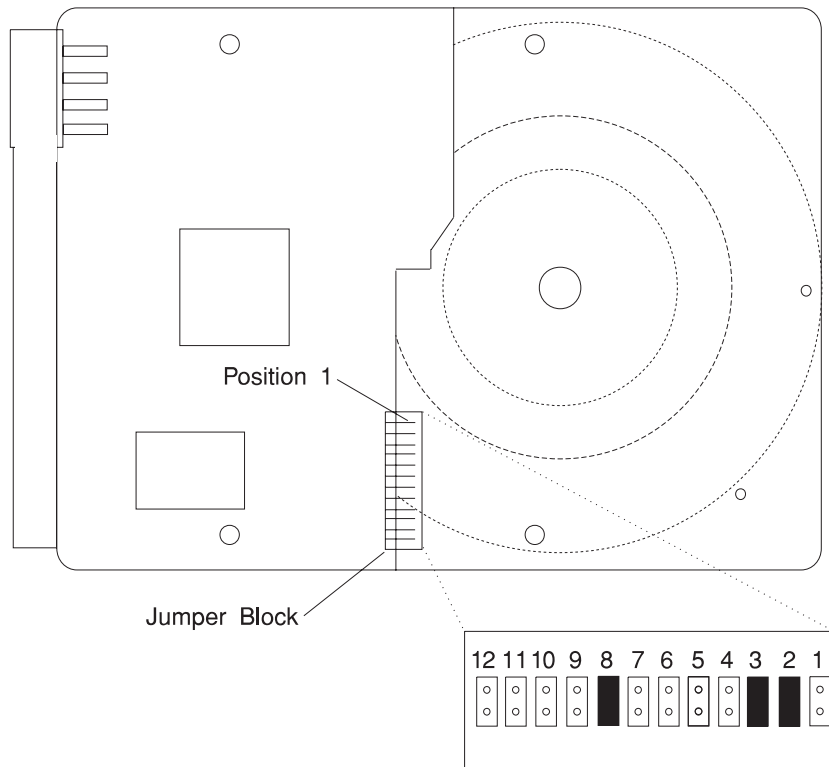
To set the jumpers to the SCSI address:

1. Remove the drive from its static-protective bag. Hold the drive by its edges, and do not touch any exposed components on the drive.
2. Place the drive on top of the bag on a flat surface.
3. For Model# DCAS32160, do NOT install a jumper on position **5**.
4. If this drive is the last connector at the end of the cable, install a jumper on position **6** to enable SCSI Term On. SCSI Term On should always be enabled (On) whenever the drive is the last connector at the end of the cable unless an external terminator is attached to the cable or the cable end is plugged into the system planar.

**Note:** To install a jumper, line up the two holes in the bottom of the jumper with the appropriate two pins on the drive. Push the jumper onto the pins until it is completely seated and covers both pins.

5. Install a jumper on position **8** to enable Target Sync Mode. This allows the drive to initiate synchronous transfers, which improves performance since data is sent at a higher rate of speed.

**Note:** Position **8** *must always* have a jumper.



6. Refer to the above illustration and locate positions **2**, **3**, and **4** on your drive. These positions are always used to set the SCSI address on the 2160MB SCSI-2 Disk Drive. In this example, jumpers are installed in positions **2** and **3**, which sets the SCSI address to 6.
  7. Refer to Table 3-3 on page 3-8 to determine where to install the jumpers to correctly set your new SCSI address.
- Note:** Do *not* install jumpers in positions **1**, **5**, **7**, **9**, **10**, **11**, and **12**.

*Table 3-4. Jumper Settings*

SCSI ID	POSITION		
	4	3	2
7	Reserved	Reserved	Reserved
6	:	■	■
5	■	:	■
4	:	:	■
3	■	■	:
2	:	■	:
1	■	:	:
0	:	:	:

**Notes:**

1. A ■ indicates that a jumper is installed in this position.
2. A ":" indicates that there is no jumper installed in this position.

Store any jumpers you do not use in a safe place in case you need to change the SCSI address for this drive later.

**Attention:** Do not store extra jumpers on any of the extra pins on the connector, as doing so could damage the drive.





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## Chapter 4. Installing the Disk Drive

**Attention:** Be sure to read “Handling Precautions” on page 3-3 before proceeding with the installation.

Refer to your system unit documentation for instructions on how to install a disk drive in your specific system unit. After you install the 1080MB or 2160MB SCSI-2 Disk Drive, ensure that you connect the signal and power cables to the drive. Save this guide and any extra parts for future reference and use.

**Attention:** Use only the 6/32 x 3/16 inch screws provided with the drive. Using the wrong size screws could cause damage to the drive.

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### Completing the Installation Procedure

After you have installed the drive, do the following to complete the installation:

1. Reinstall the cover to your system unit.
2. Restart your system unit. Ensure that you turn power on to all the attached devices first, then to the system unit.

If you encounter any problems at restart, perform the following steps:

1. Turn power off to all the attached devices.
2. Turn power off to the system unit.
3. Check that
  - the cables are installed correctly
  - there are no loose jumpers or cables
  - the SCSI address is properly set
  - no two SCSI devices on the same bus have the same SCSI address
  - termination is properly mounted on the SCSI cable
4. Turn power on to all the attached devices.
5. Turn power on to the system unit.

If the problem remains, refer to the troubleshooting information in your system unit documentation.

---

## Verifying the Installation on an AIX System

On an AIX system, you can check that the drive installed successfully. At the system prompt, type:

```
lscdev -Cs scsi
```

then press Enter. A list of SCSI devices displays. An *Available* status indicates that the drive is installed and ready to use.

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## Preparing the Drive for Use

After you install the 1080MB or 2160MB SCSI-2 Disk Drive, you must prepare it for use. For example, you might need to format and partition the drive. If you are using an operating system other than AIX, refer to your operating system documentation for information about preparing the disk drive.

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## Chapter 5. Installing and Configuring the Device Driver Software

Device driver software is provided in AIX, Windows NT, and other operating systems that support this disk drive. After you install the 1080MB or 2160MB SCSI-2 Disk Drive, reboot your system unit. Your operating system should recognize the drive and should automatically update your system unit configuration.

If you must install device driver software, follow the installation procedures provided in your operating system documentation. Instructions for installing device driver software on an AIX system is provided in this chapter.

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### Installing the Device Driver on an AIX System

To install the device driver software:

1. At the system prompt, log in as **root**.
2. Insert the device driver software media into the media device.
3. To start SMIT, type:  
`smit devinst`  
at the prompt, then press Enter. The Install Additional Device Software panel displays. The **INPUT device/directory for software** option is highlighted for selection.
4. Press F4 to display a list of input devices that you can select. The cursor is already positioned on the input device entry field.
5. Either type the name of the input device in the entry field or select the appropriate device, then press Enter. The Install Additional Device Software panel displays the device you selected in the **INPUT device/directory for software** field. The **SOFTWARE to install** option is highlighted.
6. Press F4 to display a list of the device packages you can install.
7. To display a Find box, type:  
`/`  
in the field where the cursor is positioned.
8. Type the following device package name:  
`devices.scsi.disk.rte`  
then press Enter.

9. Press F7 to select the device package name, then press Enter. The Install Additional Device Software panel displays the completed required fields.
10. Press Enter. The **ARE YOU SURE** list displays.
11. Press Enter. The COMMAND STATUS panel displays. The term RUNNING is highlighted, indicating that the software is being installed and configured.
12. When RUNNING changes to OK, scroll down to the bottom of the panel and locate the Installation Summary. If the installation was successful, SUCCESS appears at the bottom of the panel in the Result column of the Installation Summary.
13. Remove the device driver software media from the media device.
14. Press F10 to exit SMIT.
15. To shutdown and restart your system, type:  
    shutdown -Fr  
    then press Enter.

If you want to verify the installation, follow the steps provided in "Verifying the Installation on an AIX System" on page 4-2.

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## **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 1080MB and 2160MB SCSI-2 Disk Drives have 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  
Old Orchard Road  
Armonk, New York 10504  
Telephone: (919) 543-2193

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## **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.

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## **International Electrotechnical Commission (IEC) Statement**

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

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## **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.

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**Avis de conformité aux normes du ministère des Communications du Canada**

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

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**Canadian Department of Communications Compliance Statement**

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

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**VCCI Statement**

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

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 equipment is in the Class 2 category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

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### **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.





Part Number: 93H5753

Printed in U.S.A.

93H5753

