

**SCSI-2 Fast/Wide Disk Drives
ULTRA SCSI Fast/Wide Disk Drives
Installation and User's Guide**

Note

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

Second Edition (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.

About This Book

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

ISO 9000

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

Related Publications

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

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

Chapter 1. Overview

The SCSI-2 Fast/Wide Disk Drives are 3.5" drives that support a fast and wide SCSI synchronous data transfer rate of up to 20 MB per second. The low-profile 1" high form factor drives allow you to increase the number of drives that you can install in your system unit. The 9.1 GB drive is a high-capacity, high-performance drive with a 1.6" full-high form factor. The ULTRA SCSI Fast/Wide Disk Drives support synchronous data transfer up to 40MB per second.

The following table lists the capacity of each drive:

Feature	Feature Capacity (bytes)
1.1GB SCSI-2 Fast/Wide Disk Drive	1,126,337,536
2.2GB SCSI-2 Fast/Wide Disk Drive	2,255,098,368
4.5GB SCSI-2 Fast/Wide Disk Drive	4,512,701,440
9.1GB SCSI-2 Fast/Wide Disk Drive	9,100,369,920
4.5GB ULTRA Fast/Wide Disk Drive	4,512,701,440
9.1GB ULTRA Fast/Wide Disk Drive	9,100,369,920

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 3-1.

Chapter 2. Preparing to Install the Disk Drive

This chapter covers all the things you should do before you install your Fast/Wide Disk Drive. Preparing to install the drive involves the following tasks:

- Verifying your hardware and software requirements
- Making sure your package is complete
- Gathering the tools you need for installing the drive
- Planning your SCSI device layout
- Determining your SCSI device addresses

Verifying Your Hardware Requirements

The Fast/Wide Disk Drive requires the following hardware:

- ___ A SCSI-2 adapter or ULTRA SCSI adapter, which is either *built into* or *on a separate adapter card inside* your system unit
- ___ An available half-high disk bay

Verifying Your Software Requirements

The SCSI-2 Fast/Wide Disk Drives are supported on several operating systems. In addition, the 9.1 GB drive is supported on the following operating systems:

- ___ AIX 4.1.5 or later
- ___ Windows NT (PowerPC Edition) 4.0.

If your operating system is an earlier level of AIX 4.1, please contact your support representative for assistance in determining whether that level of AIX supports this drive.

The ULTRA SCSI Fast/Wide Disk Drives are supported on AIX versions 4.1.5 and 4.2.1. If your system has an earlier level of AIX, please contact your support representative for assistance in determining what maintenance is required to support this drive.

Checking Your Disk Drive Package

Make sure your package contains the following items:

- ___ The Fast/Wide Disk Drive
- ___ Four 6/32 x 3/16 inch screws
- ___ A package of jumpers
- ___ A registration card

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

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

Gathering Your Tools

To install the drive, you need the following items:

- A small, flat-blade screwdriver
- Your system unit documentation

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 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.

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.

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 3-1.

Before you install the Fast/Wide Disk Drive, 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 addresses for any device, as long as no two SCSI

devices on the same chain use the same address. No device can use address 7, which is reserved for the SCSI adapter.

SCSI addresses are in sequential order from highest to lowest priority. Refer to Table 2-1 below for the priority associated with each SCSI address. For the best performance, choose the highest unused SCSI address between 6 and 0.

<i>Table 2-1. Data Access Priorities for SCSI Addresses</i>		
Priority	SCSI Address	SCSI Device Name
Highest	7	SCSI-2 Fast/Wide PCI Adapter / ULTRA SCSI Fast/Wide PCI Adapter
↓	6	
↓	5	
↓	4	
↓	3	
↓	2	
↓	1	
↓	0	
↓	15	
↓	14	
↓	13	
↓	12	
↓	11	
↓	10	
↓	9	
Lowest	8	

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, scsi0)
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, CD-ROM drive,
2.3GB tape drive)
```

The *a* in the *nn-nn-nn-a,b* string displayed 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. If the displayed device type is *SCSI disk drive*, type:

```
lscfg -vl hdisk*
```

at the system prompt, then press Enter to display information about the drive capacity.

3. Find an available SCSI address for the Fast/Wide Disk Drive and choose the highest-priority unused address for yours. On Table 2-1 on page 2-3, 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.

Chapter 3. Installing the Disk Drive

This chapter takes you through the steps to install and connect your Fast/Wide disk drive. Installing the drive involves the following tasks:

- Setting the jumpers to the SCSI address you previously selected
- Installing any required jumpers on the drive
- Installing the drive in your system unit
- Connecting the drive

Attention

Static electricity can damage the disk drive. Before you remove it from its static-protective bag, be sure that you read the following handling precautions.

Handling Precautions

Be sure to take the following precautions before and while you are installing the disk drive:

- Turn off all external devices and follow shutdown procedures before turning off the power to your system unit.
- Unplug all power cords from electrical outlets.
- Disconnect all power cables from your system unit and attached devices.
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the drive carefully and hold by the edges.
- Do not touch any exposed printed circuitry.
- Prevent others from touching the components or the drive.
- Before you remove the drive from its static-protective bag, touch the bag to a metal expansion-slot screw or other unpainted metal surface on your system unit for at least 2 seconds to drain static electricity from the package and from your body.
- Do not place the drive on the system unit cover or on any other metal surface.

Fast/Wide Disk Drive Model Types

There are many different models of the Fast/Wide Disk Drive. Before you set the SCSI address, you must determine which type of disk drive you have. Physically, the drives differ in height (form factor), number of jumper block pin positions, and the placement of factory installed jumpers. All the drives have a 68-pin connector.

Table 3-1 below lists the different features and characteristics of each drive.

Model Type	Form Factor	Capacity (in GB)	Required Jumper	Jumper Pins	Drive Type
A	1"	1.1	6 ¹	32	IBM DFHS ²
A	1"	2.2	6 ¹	32	IBM DFHS ²
A	1.6"	4.5	6 ¹	32	IBM DFHS ²
B	1"	1.1	None	12	Quantum
B	1"	2.2	None	12	Quantum
B	1.6"	4.5	None	12	Quantum
C	1"	4.5	2 and 6 ¹	32	IBM DCHS ³
C	1.6"	9.1	2 and 6 ¹	32	IBM DCHS ³
D	1"	2.2	2	32	Quantum
D	1"	4.5	2	32	Quantum
D	1.6"	9.1	2	32	Quantum

Notes:

¹Jumper 6 is factory installed

²DFHS = High performance 7200 rpm

³DCHS = High performance 7200 rpm

On drive types A, C, and D, Term Power Enable (**1**) and Enable Active Termination (**11**) should 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: If you move the Term Power Enabled drive to another bay or to another system unit, be sure to check whether you still need the jumpers in **1** and **11**.

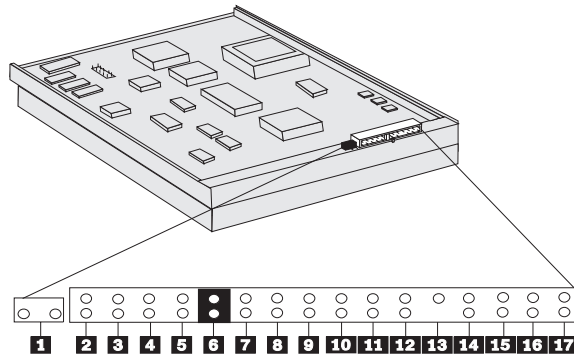


Figure 3-1. Pin Positions on the Type A Drive

The Type A jumper block has 16 pin positions (**2** through **17**). Term Power Enable (**1**) is located to the left of the jumper block. Type A drives have a factory installed jumper in Option Blk Mode (**6**), which is required for this drive.

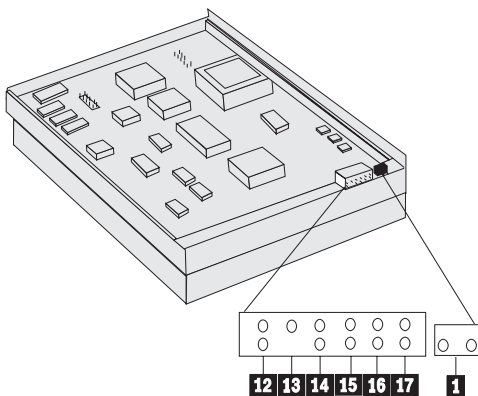


Figure 3-2. Pin Positions on the Type B Drive

The Type B jumper block is smaller than Type A and Type C drives. It has 6 positions (**12** through **17**). Term Power Enable (**1**) is located to the right of the jumper block. Type B drives have no factory installed jumpers.

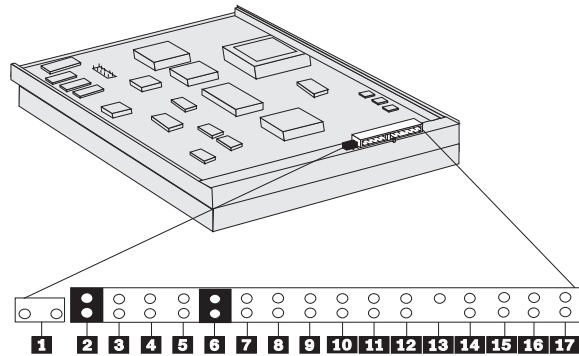


Figure 3-3. Pin Positions on the Type C Drive

The Type C IBM jumper block has 16 pin positions (**2** through **17**). Term Power Enable (**1**) is located to the left of the jumper block. You must install jumpers in **2** and **6** , which are required jumpers for this drive.

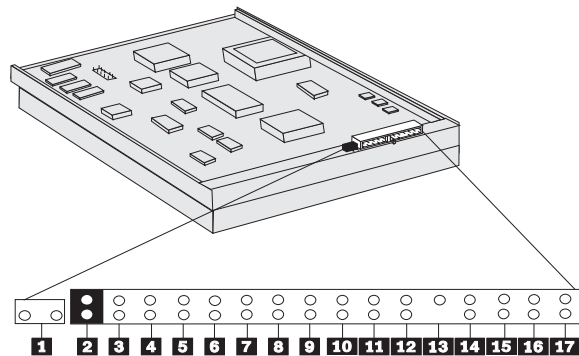


Figure 3-4. Pin Positions on the Type D Drive

The Type D Quantum jumper block has 16 pin positions (**2** through **17**). Term Power Enable (**1**) is located to the left of the jumper block. You must install a jumper in **2** , which is required for this drive.

Setting the SCSI Address on the Drive

After you choose an available SCSI address and determine the type of drive you have, you can install the jumpers on the drive to match the selected address. The SCSI address can be set from 0 to 6 and from 15 through 8. Address 7 is reserved for the adapter. Refer to “Determining Your SCSI Device Addresses” on page 2-2 if you need instructions for selecting the SCSI address.

To set a SCSI address, insert jumpers into pin positions 14, 15, 16, or 17, located on the jumper block, to set each position to either *On* or *Off*. To set a position to On, insert a jumper into both the top and bottom pins. To set a position to Off, either insert a jumper into the top pin only or remove the jumper from the jumper block.

Note: Jumpers are also installed in other positions on the jumper block to enable or disable other functions. See Table 3-2 below for a definition of the function of each pin position.

1	Term Power Enable	10	Master Sync
2	Reserved/Customize	11	Enable Active Termination
3	Disable Unit Attention	12	Auto Start
4	Disable SCSI Parity	13	Reserved - Key
5	Disable Target Initiated (TI) Sync Negotiation	14	SCSI Address
6	Option Blk Mode	15	SCSI Address
7	Auto Start Delay	16	SCSI Address
8	Write Protect	17	SCSI Address
9	External Activity LED		

Refer to the figures on pages 3-3 and 3-4, Table 3-1 on page 3-2, and Table 3-3 on page 3-6 as you go through the following steps to set the SCSI address and other functions on your drive:

- ___ 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. Place the drive on top of the bag on a flat surface.
- ___ 2. Refer to Table 3-1 on page 3-2, then check your drive to make sure that the required factory installed jumpers are present. If necessary, install any missing required jumpers.

- ___ 3. If your drive is Type C, install jumpers on positions **2** and **6**.
If your drive is Type D, install a jumper on position **2**.
- ___ 4. Locate positions **14**, **15**, **16**, and **17** on the jumper block. Using Table 3-3 as your guide, install jumpers in the correct positions to set the SCSI address you previously chose.

Save any unused jumpers in a safe place in case you ever need to change the SCSI address.

Table 3-3. SCSI Address Settings

SCSI Address	Position 14	Position 15	Position 16	Position 17
0	Off	Off	Off	Off
1	On	Off	Off	Off
2	Off	On	Off	Off
3	On	On	Off	Off
4	Off	Off	On	Off
5	On	Off	On	Off
6	Off	On	On	Off
7	N/A	N/A	N/A	N/A
8	Off	Off	Off	On
9	On	Off	Off	On
10	Off	On	Off	On
11	On	On	Off	On
12	Off	Off	On	On
13	On	Off	On	On
14	Off	On	On	On
15	On	On	On	On

Installing and Connecting the Drive

After you set the SCSI address on the drive, you can install it in your system unit. Install the drive according to the installation procedures provided in your system unit documentation.

Important: Be sure to use the 6/32 x 3/16 inch screws provided with this drive. Using the wrong size screws might cause damage to the drive.

Completing the Installation Procedure

When you finish installing the drive, reinstall the cover to your system unit according to the procedures provided in your system unit documentation. Save this book and store any extra parts in a safe place in case you ever change your configuration. When you bring up your system unit, turn on all attached devices first, then turn the system unit power on.

If you encounter any problems with the drive, turn off all attached devices, then turn the system unit power off and check that:

- ___ The cables are installed correctly
- ___ No jumpers or cables are loose
- ___ The SCSI address is properly set
- ___ No two SCSI devices on the same bus have the same SCSI address
- ___ Termination is properly set

Turn on all attached devices, then turn the system unit power on. If the problem still exists, refer to the diagnostics information in your system unit documentation.

Verifying the Installation

See the instructions provided in your system unit documentation for verifying the successful installation of the drive and device driver software. To verify the installation on an AIX system, type:

```
lsdev -Cs scsi
```

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

Chapter 4. Installing and Configuring the Device Driver Software

Device driver software is provided in AIX, Windows NT (PowerPC Edition), and other operating systems that support this disk drive. After you install the Fast/Wide 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.

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 from which 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 dialog 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 shut down 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 page 3-7.

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 SCSI-2 and ULTRA Fast/Wide 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

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

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

International Electrotechnical Commission (IEC) Statement

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

United Kingdom Telecommunications Safety Requirements

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

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

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

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

VCCI Statement

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

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

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

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

Read the instructions for correct handling.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者:

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

The following is a summary of the EMI Taiwan statement above.

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

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.

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