



16-Bit AT Fast SCSI Adapter (Plug & Play)

User's Guide

OPTIONS
by IBM

Note: If you are using this product in the United States, Canada, or Puerto Rico, be sure to read the information under Appendix D, “United States, Canada, and Puerto Rico Warranty” on page 3-17 before using this information and the product it supports.

For all other countries, the warranty terms and conditions applicable in the country of purchase are available from IBM or your reseller.

First Edition (March 1996)

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time.

It is possible that this publication may contain reference to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Requests for technical information about IBM products should be made to your IBM reseller or IBM marketing representative.

© Copyright International Business Machines Corporation 1996. All rights reserved.

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Contents

Read First	v
About This Book	vii

Part 1: Quick Installation Guide 1-1

Quick Installation Guide	1-1	Quick Installation Guide (Japanese)	1-13
Quick Installation Guide (German)	1-4	Quick Installation Guide (Italian)	1-16
Quick Installation Guide (French)	1-7	Quick Installation Guide (Portuguese)	1-19
Quick Installation Guide (Spanish)	1-10		

Part 2: User's Guide 2-1

Product Description	2-1	Step 1. Planning the SCSI Installation	2-5
Before You Begin	2-2	Step 2. Terminating the SCSI Chain	2-5
Installation for a Non-Plug and Play Computer	2-3	Step 3. Setting the SCSI IDs	2-6
Installation Requirements	2-3	Step 4. Installing Internal SCSI Devices	2-8
Installing the Adapter	2-4	Step 5. Installing External SCSI Devices	2-9
Installing the SCSI Chain	2-5	Step 6. Completing Installation	2-9
		Step 7. Installing the Software	2-10

Part 3: Appendixes	3-1
Appendix A. Safety Information	3-1
Appendix B. Installation in a Non-Plug and Play Computer	3-11
Computer Resources Required	3-11
Computer Resources Required by other Adapters	3-11
Configuration Steps	3-12
Using More Than One SCSI Adapter	3-13
Power Up States	3-13
Hard Disk Drives in a Non-PNP Computer	3-13
Appendix C. Help and Service Information	3-14
Step 1: Troubleshooting	3-14
Step 2: Preparing for the Call	3-17
Step 3: Placing the Call to IBM	3-17
Appendix D. United States, Canada, and Puerto Rico	
Warranty	3-17
Appendix E. Notices	3-20
Trademarks	3-20
Electronic Emission Notices	3-20

About This Book

This book is divided into three parts:

- Part 1 contains SCSI bus adapter installation instructions in abbreviated form for experienced users.
- Part 2 contains a product description and detailed installation instructions.
- Part 3 provides safety, problem solving information, how to get technical support, and warranty service.

You can find information on how to get help, technical support, and warranty service in Appendix C, “Help and Service Information” on page 3-14.

Note: The illustrations in this publication might be slightly different from your hardware.

Part 1: Quick Installation Guide

Quick Installation Guide

This guide contains installation instructions in abbreviated form. If you are knowledgeable about SCSI products and experienced in installing options, use these instructions to quickly install the 16-Bit AT Fast SCSI Adapter (Plug & Play). For more detailed information, go to "Part 2: User's Guide" on page 2-1.

In addition to this manual, this option package contains:

- 16-Bit AT Fast SCSI Adapter (Plug & Play)
- 50-pin internal (self terminating) ribbon cable for two SCSI devices
- *PowerSCSI! User's Manual*
- *PowerSCSI! Multi-lingual Quick Reference Manual*
- Package containing the *PowerSCSI! Universal Application Interface Software* (software is on both a CD and a diskette)

Installing the Adapter

1. Turn off the computer and any peripheral devices.
2. Remove the cover from the computer following the computer manufacturer's instructions.
3. Prepare an empty 16-bit AT bus slot by removing the expansion slot cover on the rear of the computer.

4. Touch the static-protective bag containing the SCSI bus adapter to an unpainted metal surface on the computer for at least 2 seconds. Remove the drive from the static-protective bag, holding the drive by the edges. Carefully insert the adapter card in the empty AT bus socket. Press the SCSI bus adapter firmly into place and secure it with the bracket screw.

The following features are on the adapter. (Refer to "Installing the Adapter" on page 2-4 for an illustration of the adapter.):

- Remote activity light connector
- Force inactive jumper (JP2)
- Activity light
- Internal SCSI connector
- External SCSI connector

After you install the SCSI bus adapter proceed with the following steps to install devices on the internal and external SCSI chains attached.

Installing the SCSI Chain

You can connect as many as seven SCSI devices to the adapter in a *SCSI chain*.

Step 1. Terminating the SCSI Chain

Note: SCSI chains MUST be terminated at the internal and external ends!

1. The SCSI bus adapter has auto-sensing termination that forms one end of the chain on the adapter, if needed. With only an internal or external SCSI chain connected, the adapter terminates its end of the chain.
2. Remove or disable termination on the SCSI devices you are attaching, then follow the instructions to terminate the SCSI chain:
 - For the internal SCSI chain: Use the self-terminating SCSI cable provided to install internal devices. One end of the cable is permanently terminated and the other end connects to the SCSI bus adapter.
 - For the external SCSI chain: Terminate the last device connected in a series to the SCSI bus adapter. Follow the device manufacturer's instructions to terminate (enable termination) of this device. Typically you install an external terminating connector on the last device connected to enable termination.
3. The SCSI bus adapter provides terminator power for the internal and external SCSI chains attached to the adapter. Do not enable terminator power on any attached device.

Step 2. Setting the SCSI IDs

Each SCSI device must be assigned a unique SCSI ID number for proper computer operation. The procedures to set the SCSI IDs are different if you are installing Plug and Play and non-Plug and Play devices.

- ID Assignment for Plug and Play Devices: If you have a Plug and Play device (and a Plug and Play computer), the SCSI bus adapter automatically assigns the SCSI ID. You might have to resolve device conflicts if you install a mixture of Plug and Play and non-Plug and Play devices.
- ID Assignment for Non-Plug and Play Devices: Assign a unique SCSI ID number (0 to 6) to each SCSI device following the device manufacturers' instructions. Assign the higher SCSI ID number to those devices that are most often used or are faster than other devices in the SCSI chain.

Step 3. Installing the SCSI Devices

You can connect up to seven devices to the SCSI bus adapter. To install SCSI devices:

1. Mount internal devices inside your computer and place external devices in a convenient space next to your computer.
2. Attach the cables to the adapter and devices. Ensure that line 1 of the SCSI cable (usually color coded) aligns with pin 1 of the SCSI connector.

For internal SCSI devices, connect the internal SCSI ribbon cable to the adapter. Ensure that the tab on the cable connector aligns with the notch on the internal connector.

For external devices, attach an external 50-pin high-density SCSI cable to the adapter and to the first device in your chain. The cable you use depends on the first device connector:

- If your first device has two SCSI connector ports, use an IBM cable (part number 70G9874) or equivalent.
- If your first device has only one SCSI connector port, use an IBM cable (part number 8191286) or equivalent.

You need another cable for each additional device on the external chain. Use an IBM cable (part number 6451042) or equivalent.

3. Replace the cover on the computer and secure it in place.
4. Reconnect the ac power cord and cables. Turn on all attached devices; then turn on the computer.

Step 4. Installing the Software

Install the PowerSCSI! Universal Application Interface Software using the CD or the 3.5-inch diskette. Following the directions in the *PowerSCSI! Multi-lingual Quick Reference Manual* or the *PowerSCSI! User's Manual*. The PowerSCSI! software includes device drivers and utilities that you might need. You should install this software if you the adapter supports devices other than hard disk drives.

If you are installing the SCSI bus adapter in a non-Plug and Play computer, you must install the *PowerSCSI! Universal Application Interface* Software to obtain the setup utility, PNPFCG. Refer to Appendix B, "Installation in a Non-Plug and Play Computer" on page 3-11 for instructions to use the utility. With the setup utility, you configure the SCSI bus adapter base memory address, interrupt level, and base I/O address.

Product Description

The 16-Bit AT Fast SCSI Adapter (Plug & Play) is a 16-bit adapter for the commonly used ISA bus. The adapter conforms to the American National Standards Institute (ANSI) standard for the Small Computer System Interface (SCSI). The SCSI bus adapter features include:

- 10 MB¹ Fast Synchronous SCSI-2 performance
- Automatic adapter termination
- Automatic SCSI ID assignment for Plug and Play devices
- Synchronous and asynchronous SCSI support
- Activity light that illuminates when the card is active
- *PowerSCSI! Universal Application Interface* Software

The SCSI bus adapter lets you attach devices internally or externally to your computer. It supports both Plug and Play and non-Plug and Play devices.

You can connect up to seven SCSI devices to the adapter, such as:

- SCSI hard disk drives
- CD-ROM drives
- WORM optical drives
- Erasable optical tape drives
- Tape drives
- Other devices that conform to the SCSI and SCSI-2 specifications

Before Plug and Play technology, installing an add-on product, such as a network or sound card, required a relatively experienced computer user. This user needed to know how the other components of the system were configured and how to resolve resource conflicts. This could be a frustrating process that involved setting jumpers or DIP switches and some hours of trial and error.

The design of Plug and Play computers, operating system software, and devices lets installed devices work the first time you plug them in. Plug and Play eliminates the time-consuming frustration of figuring out which interrupt level and memory address to assign. All you have to do is turn the computer's power off, plug in the new device, close the cover, turn the power on, and install the driver software.

¹ One 1 MB is approximately 1 000 000 bytes of data.

The *PowerSCSI! Universal Application Interface* Software provides components to allow you to configure and manage a variety of SCSI peripherals. The software consists of:

- Set of SCSI device drivers and utilities for hard disk and CD-ROM drives for DOS, Windows and Netware 386
- CD-ROM audio play utility (MCS CDMaster) for Windows
- Image management utility (ImagePals 2 LE Album) for Windows
- Set of SCSI device drivers and utilities (Corel ISO for DOS/Windows) for optical devices, such as MO, WORM, and removable drives

In addition to this manual, this option package contains:

- SCSI bus adapter
- Internal (self terminating) 50-pin ribbon cable for two SCSI devices
- *PowerSCSI! User's Manual*
- *PowerSCSI! Multi-lingual Quick Reference Manual*
- Package containing the *PowerSCSI! Universal Application Interface* Software (software is on both a CD and a diskette)

Contact your place of purchase if anything is missing or damaged. Be sure to retain your proof of purchase because it might be required to receive warranty service.

Before You Begin

Use the following information to help select the right cables for your SCSI device connections.

Internal Cable

The adapter comes with a 50-pin ribbon cable for connecting one or two internal SCSI devices. This cable has an integrated termination feature. You will not need to terminate the last device on the internal SCSI chain. If you need to replace the cable with another self-terminating cable, use IBM part number 07H0448 or equivalent.

External Cables

The SCSI bus adapter requires a 50-pin high density external cable. If you are installing external devices, you must provide appropriate SCSI cables. The specific cable you choose depends on your device connectors. You need the following external cables:

- If your first device has two SCSI connector ports, use an IBM cable (part number 70G9874) or equivalent.
- If your first device has only one SCSI connector port, use an IBM cable (part number 8191286) or equivalent.
- You need another cable for each additional device on the external chain. Use an IBM cable (part number 6451042) or equivalent.

Maximum Cable Length

SCSI specifications limit total cable length to 6 meters (about 19 feet). The total cable length includes the internal and external cables.

Short lengths of cable inside SCSI devices can reduce this maximum length. For a fast synchronous device such as a SCSI hard disk that supports a 10 MB per second transfer rate, the maximum cable length is limited to 3 meters (about 9 feet).

Installation for a Non-Plug and Play Computer

Although the SCSI bus adapter is designed for a Plug and Play computer, you can install it in a non-Plug and Play computer. To prepare to install the adapter, first read Appendix B, "Installation in a Non-Plug and Play Computer" on page 3-11. After you plan your configuration, you can proceed with the installation.

To find out if your computer has a Plug and Play system Basic Input Output System (BIOS), refer to your system documentation. If you are still not sure, call your dealer or the manufacturer of the computer.

Installation Requirements

To install the SCSI bus adapter, provide:

- Installation instructions for your computer
- Installation instructions for SCSI devices you will install
- Flat-bladed screwdriver
- CD-ROM or diskette drive to install the PowerSCSI! software
- Cables if you are installing external devices

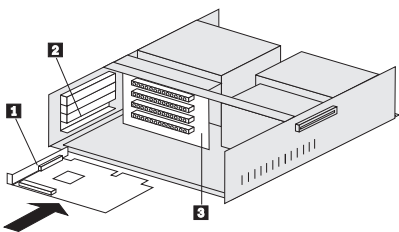
Attention: Electronic devices are sensitive to static electricity discharge. The devices are wrapped in a static-protective bag to prevent damage.

If you have problems during or after installation of the SCSI bus adapter, you can find information on how to get help, technical support, and warranty service in Appendix C, "Help and Service Information" on page 3-14.

Installing the Adapter

To install the adapter:

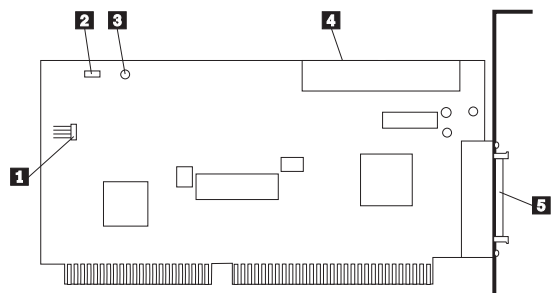
1. Turn off your computer and any devices connected to it. Unplug all power cords.
2. Remove the cover from the computer. Refer to the documentation that comes with your computer if you need more information.
3. Locate an open expansion slot. Refer to the following illustration of the open side of your computer showing the expansion slots **2** and the adjacent bus sockets **3**. Remove the bracket screw and expansion slot cover.



4. Touch the static-protective bag containing the SCSI bus adapter to an unpainted metal surface on the computer for at least 2 seconds. Remove the drive from the static-protective bag, holding the drive by the edges. Carefully insert the adapter card **1** in the empty AT bus socket **3**. Press the SCSI bus adapter firmly into place and secure it with the bracket screw.

Refer to the illustration of the SCSI bus adapter card to locate the following:

- 1** Remote activity light connector
- 2** Force inactive jumper (JP2)
- 3** Activity light
- 4** Internal SCSI connector
- 5** External SCSI connector



On the adapter card, you will use the internal **4** and external **5** connectors for the SCSI bus adapter installation. The activity light **3** is *on* when the SCSI bus adapter is active. With the connector **1**, you can use a remote activity light. The force inactive jumper **2** is for servicing the adapter.

After you install the SCSI bus adapter proceed with the following steps to install devices on the internal and external SCSI chains attached.

Installing the SCSI Chain

You can connect as many as seven SCSI devices to the adapter in a SCSI chain.

Step 1. Planning the SCSI Installation

Determine how your SCSI devices will be connected to the adapter. Devices in the SCSI chain can be installed both internally and externally.

You can start (boot) your computer from a SCSI hard disk drive unless your computer contains a non-SCSI (IDE) hard disk drive. Some Plug and Play computers do allow booting from a SCSI hard disk drive even if an IDE drive is present. Refer to your computer documentation for more information.

Step 2. Terminating the SCSI Chain

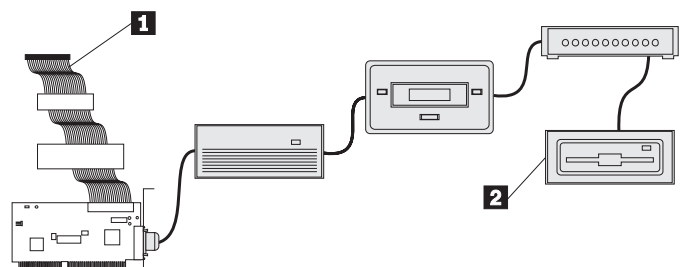
Note: SCSI chains MUST be terminated at the internal and external ends!

1. SCSI devices connect to one another in a chain. For the devices to work properly, each end of the chain must be terminated. The basic rules of termination are:
 - Terminate both ends of the chain (bus).

- Do not terminate devices in the middle of the chain.

The SCSI bus adapter has auto-sensing termination that forms one end of the chain on the adapter, if needed. With only an internal or external SCSI chain connected, the adapter terminates its end of the chain.

2. Remove or disable termination from the SCSI devices you are attaching. Plug and Play devices have no termination to remove. Non-Plug and Play devices have termination jumpers or equivalent. See the documentation that comes with your device(s) for instructions on how to disable termination.



Follow the instructions terminate the SCSI chain:

- For the internal SCSI chain:

Use the self-terminating SCSI cable provided to install internal devices. One end of the cable **1** is permanently terminated and the other end connects to the SCSI bus adapter.

- For the external SCSI chain:

Terminate the last device **2** connected in a series to the SCSI bus adapter. Follow the device manufacturer's instructions to terminate (enable termination) the device. Typically you install an external terminating connector on the last device to make the termination.

3. The SCSI bus adapter provides terminator power for the internal and external SCSI chains attached to the adapter. Do not enable terminator power on any attached device.

Step 3. Setting the SCSI IDs

Each SCSI device must be assigned a unique SCSI ID number for proper computer operation. If two SCSI devices are set to the same SCSI ID, your system will not run properly. The available IDs are 6, 5, 4, 3, 2, 1, and 0. SCSI ID number 7 is reserved for the SCSI bus adapter.

The procedure for setting the SCSI IDs is different if you are installing Plug and Play and non-Plug and Play devices.

ID Assignment for Plug and Play Devices

Plug and Play adapters and devices support a process known as SCSI Configured Automatically (SCAM). The 16-Bit AT Fast SCSI Adapter (Plug & Play) uses this process to resolve SCSI ID conflicts. If the adapter determines that the SCSI ID of a Plug and Play device conflicts with the SCSI ID of another device, the adapter automatically assigns it a new ID. You might have to resolve device conflicts if you install a mixture of Plug and Play and non-Plug and Play devices.

While SCAM devices are compatible with SCSI devices manufactured prior to the adoption of the Plug and Play SCSI specification, you might find that the SCSI bus adapter is not able to resolve all SCSI ID settings to ensure each has a unique SCSI ID. If this occurs, review the SCSI ID settings on all devices and make sure each has a unique SCSI ID.

You can tailor the SCSI ID assignments with the PowerSCSI! software provided. You might choose to change the SCSI ID automatically set to ensure that a particular device receives a higher priority on the SCSI chain. This is particularly true if the SCSI chain supports a mixture of devices such as a disk drives, tapes, and optical devices. See the section below on a suggested relative order to assign the SCSI IDs.

ID Assignment for Non-Plug and Play Devices

Assign a unique SCSI ID for each SCSI non-Plug and Play device. Manufacturers use different methods to set SCSI IDs including jumpers, DIP switches, and push-buttons. Refer to the instructions that comes with each device if you need more information. Follow the following steps to make the SCSI ID assignment.

1. Determine each device SCSI ID

For new devices, the SCSI IDs are set at the factory. For existing devices installed, you can review your SCSI ID assignments. For most computers, you can press F1 during startup to view your computer and SCSI bus adapter configuration. Other computers can have different procedures to view the configuration. For more information, refer to the documentation that comes with your computer.

2. Assign a SCSI ID to each device.

Assign the higher SCSI ID number to those devices that are most often used or are faster than other devices in the SCSI chain. For example, assign SCSI ID number 6 to your main SCSI hard disk drive so its gets priority over other SCSI devices. If you are planning to boot the system from a SCSI hard disk drive, set the disk drive SCSI ID to 6.

The following is a suggested relative order of priority:

Hard disk drives

Re-writable optical drives
CD-ROM drives
Scanners and other peripherals
Tape drives

You can use the following chart to list your SCSI ID assignments for each device.

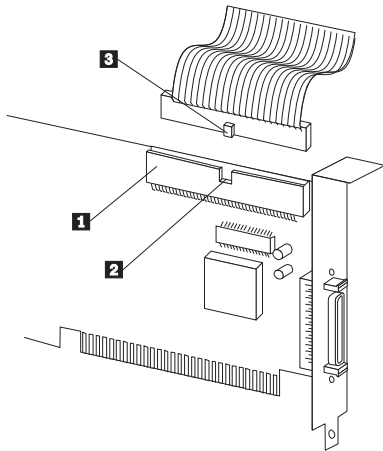
ID	Device
7	SCSI bus adapter
6	
5	
4	
3	
2	
1	
0	

3. After you have made the SCSI ID assignments, change the IDs of your SCSI devices as described in the documentation that came with each device. Write the SCSI ID on a piece of tape and put it on the device. When putting the tape on a hard disk drive, do not put pressure on the cover since the pressure could damage the drive.

Step 4. Installing Internal SCSI Devices

Set up your SCSI devices as described in the documentation that came with each device. For most internal devices, you first need to secure the device inside the computer and connect a power cable.

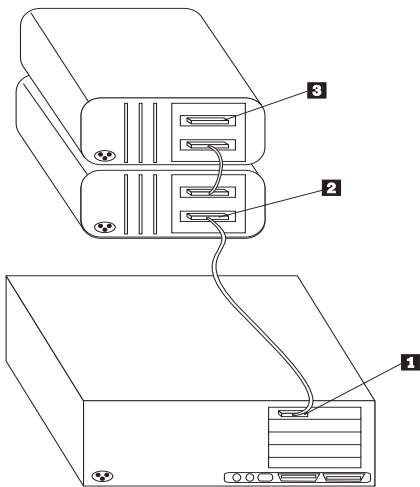
1. Connect one end of the internal cable to the adapter connector **1**. The internal cable is keyed and will fit properly only one way. Align the tab **3** on the cable connector with the slot **2** in the adapter connector.



2. Connect the cable to your internal SCSI devices. Ensure that line 1 of the SCSI cable (usually color coded) aligns with pin 1 of the SCSI connector. Connect any power cables to the internal device, as needed.

Step 5. Installing External SCSI Devices

For external devices, connect the power cables, but do not plug the devices to an electrical power outlet yet. Refer to “External Cables” on page 2-2 if you need information on cable requirements. When connecting the SCSI connectors ensure that line 1 of the SCSI cable (usually color coded) aligns with pin 1 of the SCSI connector.



To connect external devices:

1. Connect the 50-pin high-density SCSI cable to the adapter external connector **1**.
2. Connect the cable to your external SCSI device **2**.
3. Connect cables to additional SCSI devices, if any. The illustration shows cabling for two external SCSI devices. Note that the last device has a terminator **3** on its top SCSI connector.

Step 6. Completing Installation

Check your work before closing the computer.

1. Power and interface connectors are securely attached.
2. Cables are neatly routed. They must not:
 - Get in the way when the cover is replaced
 - Impede the power supply fan blade
 - Block air flow paths
3. Replace the computer cover and secure it in place.
4. Reconnect the ac power cord and other cables. Turn on all attached devices; then turn on the computer.

Step 7. Installing the Software

Install the *PowerSCSI! Universal Application Interface* Software using the CD or the 3.5-inch diskette. Following the directions in the *PowerSCSI! Multi-lingual Quick Reference Manual* or the *PowerSCSI! User's Manual*. The PowerSCSI! software includes device drivers and utilities that you might need. You should install this software if you the adapter supports devices other than hard disk drives.

The PowerSCSI! software contains device drivers for many types of devices. If you are using other devices, you might also have to install the appropriate device drivers.

If you are installing the SCSI bus adapter in a non-Plug and Play computer, you must install the *PowerSCSI! Universal Application Interface* Software to obtain the setup utility, PNPCFG. Refer to Appendix B, "Installation in a Non-Plug and Play Computer" on page 3-11 for instructions to use the utility. With the setup utility, you configure the SCSI bus adapter base memory address, interrupt level, and base I/O address.

Use this table to record the resource values of your devices.

Device	Base Memory Address	Interrupt (IRQ)	Base I/O Address

Configuration Steps

Proceed with performing the following steps after you have completed the installation of the SCSI bus adapter and the PowerSCSI! software. The PowerSCSI! directory contains the PNPCFG setup utility.

1. Turn on the computer and go to the DOS prompt.
2. At the DOS prompt, change directories to the directory for PowerSCSI!, type **pnpcfg**, and press **Enter**. The utility displays a Main Menu that lists each SCSI bus adapter you installed and assigns a number to each one. The utility displays the following information about each SCSI bus adapter:
 - Number (ID)
 - Plug and Play ISA Description
 - Serial number of the adapter

3. Use the up and down arrow keys, select a SCSI bus adapter and press **Enter**. The utility displays a Configuration Menu that has a column for:
 - Base Memory Address
 - Interrupt
 - Base I/O Address
4. Use the arrow keys to identify the base memory address, interrupt, and base I/O address settings. Press the **spacebar** to make each selection. An asterisk moves to your new selection.
5. Press **F3** to save and exit the menu. If you press **Esc**, all changes are lost.

Note: You must press **F3** or the changes you make will not be saved.

6. Press **Esc** to exit the setup utility.
7. Restart the computer by turning it off and on. The computer now recognizes the add-on SCSI bus adapters and all SCSI devices connected to it.
8. Run the PowerSCSI! software, as needed. See the *PowerSCSI! User's Manual* for more information.

Using More Than One SCSI Adapter

If you install a second SCSI bus adapter, you will see two adapters listed on the PNPCFG Main Menu. Be careful! Notice that the the SCSI bus adapter with the highest serial number is first in the Main Menu list with an ID number of 1. The utility always places the adapters in the list in serial number order.

If you used the default settings for the first SCSI bus adapter you installed, you notice that the setup utility detects the same resources (factory settings) in the second controller. This causes a resource conflict and means that you must change the configuration for one of these adapters. You must run the PNPCFG setup utility and assign unique resources to each adapter.

When you reset the computer and view the banner during startup, do not be confused. The adapter numbers (0 and 1) displayed by the banner do not relate to the ID numbers assigned by the setup utility.

Power Up States

When you turn the computer on, the SCSI bus adapter can be active or inactive. Inactive is the factory default. (When setup as active on a Plug and Play computer, the SCSI bus adapter remains dormant until the Plug and Play ISA configuration sequence is detected.) For a non-Plug and Play computer, you must change the setting to Active.

The Power Up Active field is on the Configuration Menu. Select Yes in the Power Up Active field to make it active. You must press **F3** or this change will not be saved.

Hard Disk Drives in a Non-PNP Computer

Always set the SCSI ID of the first SCSI hard disk drive to 6.

Some computers have only SCSI drives. Others may have a combination of SCSI and non-SCSI drives, such as an IDE drive. In a multi-drive computer, one drive must be designated as the primary drive. The computer uses this drive to load the operating system (unless you start the computer from a diskette).

If there is a non-SCSI hard disk drive in your system, you will not be able to boot the computer from the SCSI hard disk drive. The computer recognizes only the non-SCSI device as the primary boot device. You can access the SCSI hard disk drive(s) using a drive letter, such as D or E, depending on the number of non-SCSI drives in your system.

Appendix C. Help and Service Information

During the warranty period, you can get toll-free technical support 24 hours a day, 7 days a week (except select holidays), to answer any questions about your new IBM option. If you need warranty service, return or exchange is available. In addition, if your IBM option is 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.

You might be able to solve the problem yourself. Before calling IBM, you might want to try some or all of the following troubleshooting procedures.

Attention: To avoid electrical shock, unplug your computer and all attached devices from electrical outlets before performing any troubleshooting procedure.

Attention: Pour éviter tout risque de choc électrique, débranchez le cordon d'alimentation de votre ordinateur et de toute autre unité avant d'exécuter des procédures de dépannage.

Step 1: Troubleshooting

If your computer does not start up correctly or the SCSI diagnostics do not recognize a device, check these items:

1. Are the external SCSI devices plugged in and turned on before starting the computer?

Some devices must be turned on before starting the computer.

2. All cables installed correctly?

Make sure all cables are firmly attached to the correct ports. Switching the order of devices in the SCSI chain may solve the problem.

3. Are the SCSI IDs set properly?

Each device must have a unique SCSI ID from 0 through 6.

4. Is the SCSI bus properly terminated?

The first and last devices in the SCSI chain must be terminated. Devices in the middle of the chain cannot be terminated.

5. Are the device drivers installed?

The adapter supports SCSI hard drives, but you must install device drivers for tape drives. Additional device drivers might be needed for other devices.

6. Are the devices properly installed?

Remove the SCSI bus adapter. Check for bent or misaligned pins and then reinstall the drive if there are no problems. Check the

computer documentation for instructions about the installation of upgrades. Look for a section about system setup or system configuration and follow all procedures.

7. Do you get one of the following symptoms when you turn the computer on?

- **Cursor does not appear**
- **Future Domain banner does not appear after the system completes its memory test**
- **System seems to start normally, but you can't log onto the network**

Try the following. Turn the computer off and make sure the controller is fully seated in the expansion slot.

If, when you turn the computer back on, the same symptoms occur, a resource conflict might have occurred. For example, it is not unusual for a resource conflict to occur with a network adapter. If such a conflict occurs, the system might start, but you will not be able to connect to the network.

If your computer has a Plug and Play computer BIOS, your system comes with a special utility to resolve conflicts. Run this configuration utility to resolve resource conflicts. For many systems, you can view the configuration utility by pressing F1 during the power up sequence. Refer to your system documentation for how to run this program.

If yours is a non-Plug and Play system, follow these steps:

- a. Turn the computer off.

- b. Connect the force inactive jumper across JP2 **2** (refer to the illustration on page 2-4) and restart your system.
- c. Turn the power on again. You will not see the Future Domain banner.
- d. Run PNPCFG (refer to Appendix B, "Installation in a Non-Plug and Play Computer" on page 3-11) and change the resource settings. Make sure the Power Up Active setting is set to Yes.
- e. Turn the computer off and remove the force inactive jumper.
- f. Turn the computer on again.

If the problem does not go away, try changing the resource settings again.

8. Do you see a Future Domain banner appear followed by one of the following messages?

No SCSI Drives

or

Adapter Port Failed

Try one or more of the following:

- Make sure all SCSI devices have power and are turned on.
- Make sure the SCSI chain is terminated properly and turned on. If you are using internal devices with the internal SCSI cable provided, remove termination on all internal devices. The cable comes with active termination permanently installed.

- Check all cable connections. If you are using internal SCSI devices, make sure the stripe on the internal ribbon cable lines up with pin 1 on each SCSI device it attaches.
- Check your SCSI device IDs. Valid IDs are 6, 5, 4, 3, 2, 1, and 0 in order of bus priority.

9. Do you see following message appear:

Fatal Disk Error

This message indicates that during setup, the system included your SCSI hard disk drives when it counted the total number of hard disk drives in the system.

If you have only SCSI hard disk drives, run your computer setup program and indicate zero (0) for the number of non-SCSI hard disk drives installed. If you have another type of hard disk drive(s), make sure the number in the setup reflects the quantity of non-SCSI hard disk drives.

10. Has the SCSI bus adapter assigned a SCSI ID that conflicts with another device in the system?

If the other device is a non-Plug and Play device, change its SCSI ID.

If necessary, you may have to manually change the SCSI ID on the Plug and Play device. Refer to the manual for the device.

Advice

- Setting the Force Inactive jumper (JP2) **2** (refer to the illustration on page 2-4) makes it possible to boot the system with the SCSI bus adapter physically installed. PNPCFG will recognize the SCSI bus adapter so you can resolve any resource conflicts that might otherwise hang the system. Make sure you turn the computer off and remove the jumper after you have resolved resource conflict(s).

If you have to use the Force Inactive jumper, you will not see the Future Domain banner, but you will see the SCSI bus adapter listed when you run PNPCFG.

- If your computer has SCSI drives only, and you are replacing your current SCSI adapter with the 16-Bit AT Fast SCSI Adapter (Plug & Play):
 - You might want to make a bootable diskette that contains PNPCFG.EXE before you switch the adapters. This way you can boot the system from the floppy and run PNPCFG. Refer to your system documentation for the procedure to create a bootable diskette.
 - Remove any ASPI drivers from the previously installed SCSI adapter.

Step 2: Preparing for the Call

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

1. Computer manufacturer and computer model
2. Option name and description
3. Proof of purchase
4. Exact wording of the error message (if any)
5. Description of the problem
6. Hardware and software configuration information for your system

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

Step 3: Placing the Call to IBM

Use one of the following numbers:

- Within the United States, call the Options by IBM HelpCenter at 1-800-426-7299.
- Within Canada
 - For support, call HelpPC at 1-800-565-3344.
 - For more information or to place an order, call 1-800-465-7999.
- Outside the United States and Canada, contact your IBM HelpWare number, your place of purchase, or your local branch office.

Appendix D. United States, Canada, and Puerto Rico Warranty

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: 16-Bit AT Fast SCSI Adapter (Plug & Play)

Warranty Period*: Three Years

**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 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 **1-800-426-7299**. 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.

THESE WARRANTIES REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable only for:

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages 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.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU

FOR LOSSES OR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU.

Appendix E. Notices

This appendix includes notices and trademark information.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Subject to IBM's valid intellectual property or other legally protectable rights, any functionally equivalent product, program, or service may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
500 Columbus Avenue
Thornwood, NY 10594
U.S.A.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

IBM	HelpCenter	HelpWare
AT		

The following terms are trademarks of other companies:

CDMaster	Animation Development Corporation
Corel	Corel Corporation
Future Domain	Future Domain Corporation
ImagePals	U-Lead Systems, Inc.
PowerSCSI!	Future Domain Corporation

Windows is a trademark of Microsoft Corporation.

Other company, product, and service names, which may be denoted by a double asterisk (**), may be trademarks or service marks of others.

Electronic Emission Notices

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.

The following FCC statement applies to

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.



Part Number: 52H3349

Printed in Singapore

52H3349

