Introduction
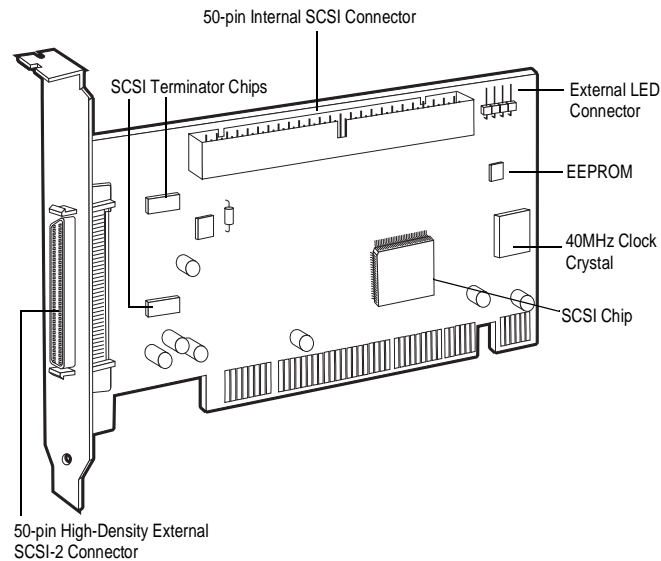
This installation guide provides step-by-step instructions on installing your AHA®-2910C host adapter. This process involves installing the following hardware and software:

- AHA-2910C host adapter
- Internal SCSI devices
- External SCSI devices
- AHA-2910C software

You will also find helpful hints on configuring your SCSI devices and customizing your host adapter settings with SCSI*Select*®.

The AHA-2910C host adapter provides a powerful multitasking interface between your computer's PCI bus and internal and external SCSI devices (disk drives, CD-ROM drives, tape drives, removable-media drives, etc.). The host adapter supports SCSI Configured AutoMatically (SCAM), which automatically assigns SCSI IDs to SCAM compatible devices. The figure below identifies the major components of the AHA-2910C host adapter.

50-pin Internal SCSI Connector

SCSI Terminator Chips

External LED Connector

EEPROM

40MHz Clock Crystal

SCSI Chip

50-pin High-Density External SCSI-2 Connector

With the Adaptec software drivers, you can use AHA-2910C host adapters in computers running DOS/Windows®, OS/2, Windows® 95, Windows NT™, UNIX, and NetWare.

Contents

Installation

Helpful Hints

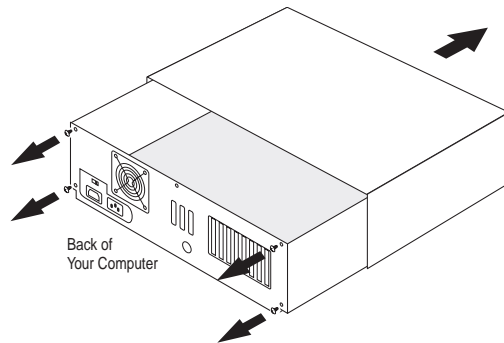# Installation

Installing the Host Adapter

Step 1: Turn OFF your computer and attached devices, and then disconnect the power cords.

Step 2: Touch the metal on the back of your computer with one hand to discharge any static electricity. With your other hand, handle the host adapter by the metal bracket or edges and remove it from the antistatic bag.

⚡ **WARNING:** Before you go any further, make sure you have completed Steps 1 and 2.

Step 3: Remove the cover from the computer case. (If necessary, refer to your computer documentation.)
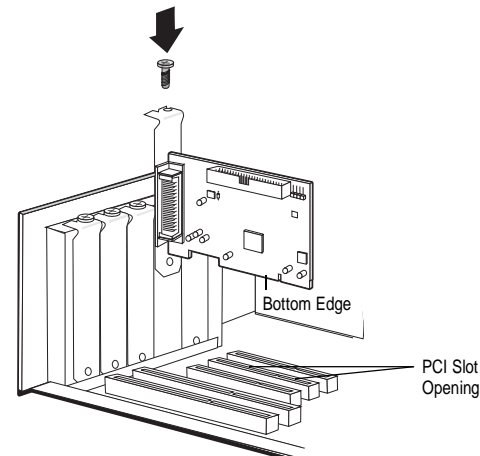
Back of Your Computer

✋ **Tip:** If you own a computer tower, lay it on its side for an easier installation.

Step 4: Locate an unused PCI expansion slot (typically white or ivory). Unscrew the slot cover and set it aside.

Slot Cover

PCI Expansion Slots (typically white or ivory)
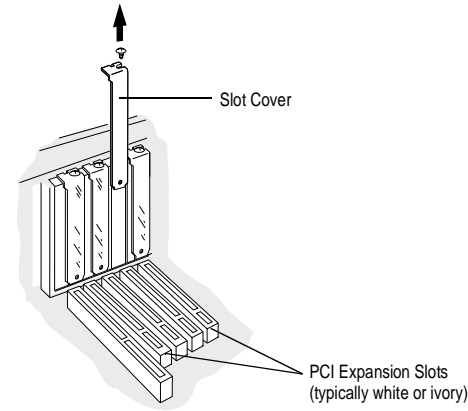
✋ **Note:** The PCI slot must support 5-volt bus master data transfers. (See your computer documentation or contact your vendor.)

Step 5: Position the host adapter over the PCI slot, and align the bottom edge to the slot's opening. Firmly push the host adapter into the PCI slot, so that it stands perpendicular to the PCI slot.

Bottom Edge

PCI Slot Opening

Step 6: OPTIONAL.   If you want the LED in your computer to light whenever there is activity on the SCSI bus, disconnect the LED cable from the LED connector on the motherboard and connect it to the LED connector on the host adapter.

LED Cable from Motherboard

2-pin LED Cable

LED Connector on Host Adapter

Pin 1
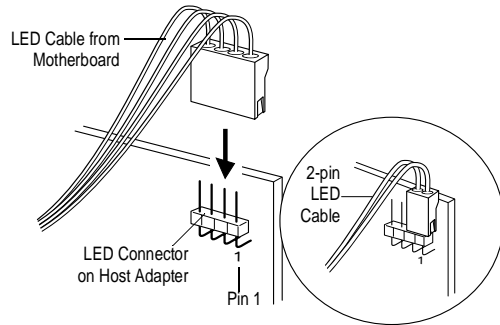
Step 7: Make sure that all your SCSI devices have been set with unique SCSI IDs from 0 to 6. (Refer to your device documentation for SCSI ID settings and instructions on changing the default settings.)

Caution: AHA-2910C host adapters support only *single-ended SCSI* devices. *Differential SCSI* devices may be damaged if you connect them to the host adapter. Read the device documentation.
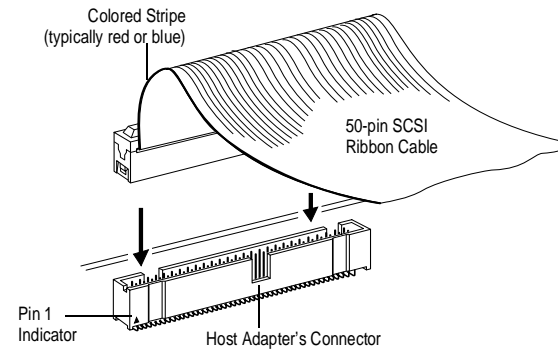
Installing Internal SCSI Devices

The SCSI devices inside a computer are attached to an internal SCSI cable. The last device on the cable must be terminated. Most internal SCSI devices have a jumper or switch that controls termination. Refer to the device's documentation on enabling or disabling termination.

If you purchased your AHA-2910C as part of an Adaptec kit, you can use the 50-pin internal SCSI cable to connect up to two internal SCSI devices.

Note: Before you begin, make sure your internal SCSI devices are *not* terminated.

Step 1:   Find the colored stripe on the 50-pin internal SCSI cable and then align it with Pin-1 on the host adapter's connector. Pin-1 is usually identified by a ▲, or "1" on the connector.

Colored Stripe (typically red or blue)

50-pin SCSI Ribbon Cable

Pin 1 Indicator

Host Adapter's Connector

Step 2: Plug the internal SCSI cable into the host adapter's connector.

Step 3: Align the SCSI cable's colored stripe with Pin-1 on the SCSI device connector, and then plug it in.
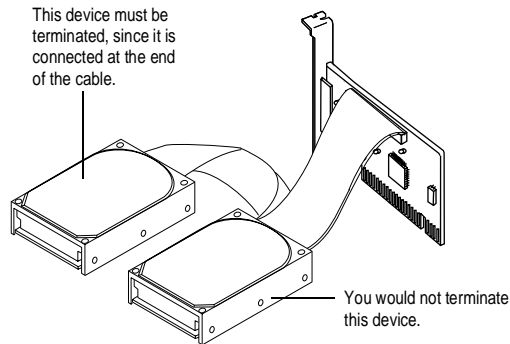
Internal SCSI
Device

Pin 1

Colored Stripe
(typically red or blue)
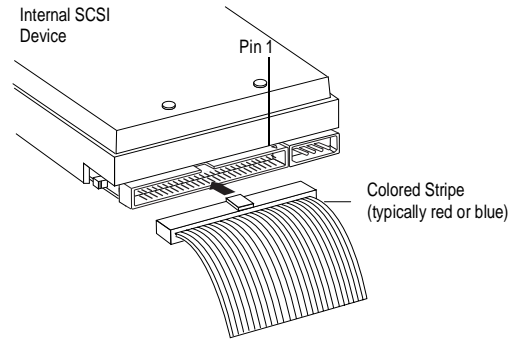
Step 4: Attach the remaining devices using the remaining connectors. These devices should not be terminated.
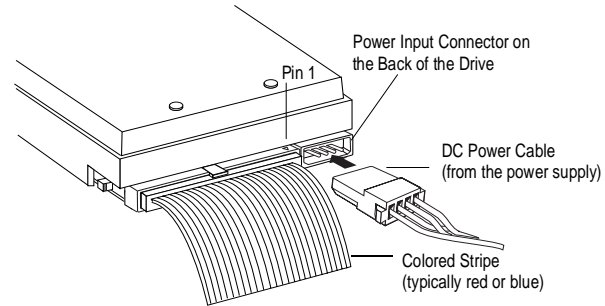
Step 5: Terminate the SCSI device that is attached at the end of the internal SCSI cable.

Caution: If you are attaching an AHA-2910C between *two* terminated SCSI devices, or if you are using both internal and external SCSI devices, you must disable host adapter SCSI termination with SCSI*Select*, (see *Using SCSISelect* on page 7).

This device must be
terminated, since it is
connected at the end
of the cable.

You would not terminate
this device.

Step 6: Connect a DC power cable from your computer's power supply to the power connector on the SCSI device.

Power Input Connector on
the Back of the Drive

Pin 1

DC Power Cable
(from the power supply)

Colored Stripe
(typically red or blue)

Step 7: Replace the computer cover.

Installing External SCSI Devices

Connecting One Device

Step 1: Plug one end of the 50-pin high-density external SCSI cable into the host adapter's external SCSI connector.

Step 2: Plug the other end of the external SCSI cable into one of the connectors on the external SCSI device.

Step 3: Enable the device termination or attach a terminating plug to the device.

Terminating Plug

External SCSI Cable
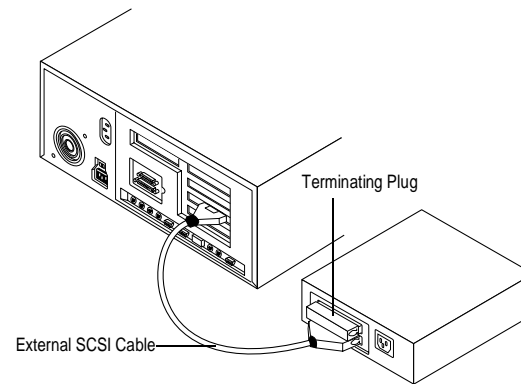
Step 4: Reconnect the power cables to the computer and external SCSI device.

Step 5: Turn ON the external device and computer.

Step 6: Go to *Installing AHA-2910C Software*.

Connecting Two or More Devices

You can connect two or more SCSI devices by creating a "daisy-chain," that is, plugging one device into the next. To do this, make sure you have a 50-pin high-density external SCSI cable for each device.
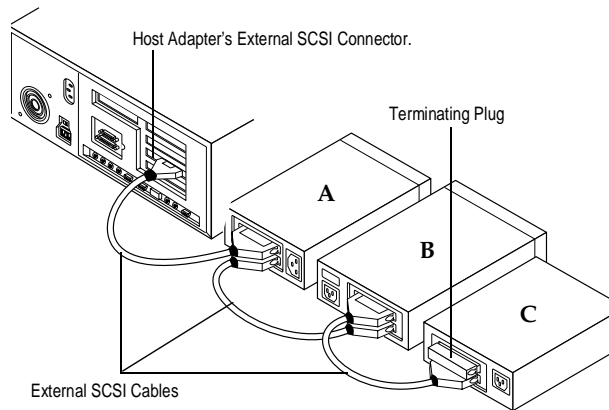
Host Adapter's External SCSI Connector.

Terminating Plug

A

B

C

External SCSI Cables

Step 1: Plug one end of the 50-pin high-density external SCSI cable into the host adapter's external SCSI connector.

Step 2: Plug the other end of the external SCSI cable into one of the connectors on the external SCSI device. (In the figure above, SCSI device **A** is connected to the host adapter's external SCSI connector.)

Step 3: Take another external SCSI cable and plug it into the next external SCSI device and the one you connected in Step 2. (In the figure above, SCSI device **B** is connected to SCSI device **A**.)

Step 4: Connect your remaining devices the same way you connected SCSI devices **A** and **B**.

Step 5: On the last device , attach a terminating plug or enable the terminator on the device. (In the figure above, SCSI device **C** is terminated with a terminating plug.)

Step 6: Reconnect the power cables to the computer and external SCSI devices.

Step 7: Turn ON the external devices and computer.

Step 8: Go to *Installing AHA-2910C Software*.

Installing AHA-2910C Software

Install the appropriate host adapter device driver for your operating system.

■ **DOS and Windows 3.x:** DOS and Windows 3.x do not have embedded driver support for your AHA-2910C product, so you must load the drivers yourself. If your host adapter came with Adaptec's EZ-SCSI® software, see the EZ-SCSI software documentation for driver installation instructions.

■ **Windows 95:** Windows 95 has embedded driver support for the AHA-2910C. To verify that your AHA-2910C device driver has been properly installed under Windows 95, see *Windows 95 Driver Installation* on page 7.

Note: After installing your AHA-2910C product and restarting Windows 95, you will be prompted through the rest of the installation.

■ **Windows NT:** Windows NT 4.0 has embedded driver support for the Adaptec AHA-2910C product. *However, earlier versions of Windows NT do not have embedded driver support, so you must load the driver yourself.*

If your AHA-2910C came with Adaptec EZ-SCSI software (v4.01 or later), install the Windows NT driver from the diskette provided for your AHA-2910C to support previous versions of Windows NT. (Refer to the Adaptec EZ-SCSI documentation.) Otherwise, if your host adapter came with Adaptec's 7800 Family Manager Set software (v1.3), see the 7800 Family Manager Set software documentation for driver installation instructions.

■ **NetWare, OS/2, and UNIX:** Drivers for these operating systems are *not* embedded, so you must load them yourself. If your host adapter came bundled with Adaptec's 7800 Family Manager Set software (v1.3), see the 7800 Family Manager Set software documentation for driver installation instructions.

> **Note:** If you purchased your host adapter from a third-party vendor, you can use the drivers they provide. (Refer to the third-party documentation for installation instructions and problem resolution.) To obtain any of the Adaptec device drivers, contact Adaptec directly.

Congratulations! You have successfully installed your host adapter. For more information on configuring your host adapter, see *Helpful Hints.*

Helpful Hints

Configuring SCSI Devices

Your host adapter can transfer data up to 10 MBytes/sec. SCSI devices can coexist on the same cable, and each will transfer data at its own negotiated or assigned transfer rate. However, in order to reliably transfer data at the transfer rate of Fast SCSI, the following requirements must be met:

■ The internal cable must be terminated with an *active* terminator, either provided by the SCSI device at the end of the cable or by a separate terminating plug. The terminator on the AHA-2910C is an active terminator.

■ Be sure to use a high-quality internal SCSI cable to ensure reliable data transfer for SCSI devices connected to the host adapter.

> **Note:** Always leave parity checking enabled to verify reliable data transfers.

■ When one or more Fast SCSI devices are connected to the host adapter, the combined length of all cables must not exceed 3 meters (9.8 feet) to ensure reliable operation and data transfers of up to 10 MBytes/sec.

■ Your host adapter can support the SCSI Configured AutoMatically (SCAM) protocol, which automatically assigns SCSI IDs dynamically and resolves SCSI ID conflicts. To enable or disable SCAM support, see *Advanced Configuration Options* on page 8.

Configuring Disk Drives

■ The AHA-2910C product does not support the boot option. To boot your system, use an IDE board or a second SCSI host adapter with boot capabilities.

■ Every SCSI hard disk must be physically low-level formatted, partitioned, and logically formatted before you can use it to store data.

If you connected a new SCSI hard disk drive to your host adapter, you must partition and logically format the drive. For DOS and Windows (3.x and 95) use the AFDISK and FORMAT commands (see your computer and DOS documentation). For other operating systems, see your operating system documentation.

Installing Multiple Adapters

■ You can install multiple SCSI host adapters if the system resources are available (e.g., I/O port must be unique).

■ Each host adapter you install forms a separate SCSI bus with a different set of SCSI devices.

■ In a system with multiple host adapters, all devices on each SCSI bus (attached to each host adapter) must have a unique SCSI ID.

Windows 95 Driver Installation

To make sure that your AHA-2910C driver software has been properly installed and is operating under Windows 95, do the following:

1 On the Win95 desktop click **Start**. An options menu appears.

2 On the options menu click on **Setting** and select **Control Panel**.

3 Click on **System.** The System Properties window appears.

4 Click on **Device Manager**.

5 Click on the **SCSI Controllers** icon.

6 If the Adaptec AIC-7850 PCI SCSI Controller is not listed, follow the instructions in the EZ-SCSI or the 7800 Family Manager Set documentation for installing driver support.

<u>**OR**</u>

If you see a yellow exclamation point or red **X** in front of the listing for the AIC-7850 Controller, double-click the icon to see the error message and correct the problem.

Using SCSISelect

The SCSI*Select* configuration utility allows you to change host adapter settings without opening the computer case. SCSI*Select* also contains SCSI disk utilities that allow you to perform a low-level format or verify the disk media of your SCSI hard disk drives.

Starting the SCSISelect Utility

To enter the SCSI*Select* utility, insert the SCSI*Select* floppy disk and then boot your system. To select either a color or monochrome display, press **F5** *(this feature may not work on all monitors)*.

Using SCSISelect Menus

SCSI*Select* uses menus to list the options you can select. To select an option, use either the **Tab** key or the up/down arrow keys to move the cursor. Then press **Enter**.

When you select an option by pressing **Enter**, the system may display an additional options menu. Return to the previous menu at any time by pressing **Esc**. To restore the original SCSI*Select* default values, press **F6**.

Exiting SCSISelect

To exit SCSI*Select* press **Esc** . A message prompts you to exit (if you changed any host adapter settings, you are prompted to save the changes before you exit). At the prompt, select **Yes** to exit, then press any key to reboot the computer. Any changes you made in SCSI*Select* take effect after the computer boots.

Default Settings

The AHA-2910C has default settings appropriate for most PCI systems (see the table of settings below). *Do not* run SCSI*Select* unless you want to change a default setting.

SCSI Bus Interface Definitions	Default
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	Automatic
Additional Options ➤ **SCSI Device Configuration**	**Default**
Initiate Sync Negotiation	Yes (Enabled)
Maximum Sync Transfer Rate	10 MBytes/sec
Enable Disconnection	Yes (Enabled)
Additional Options ➤ **Advanced Configuration Options**	**Default**
Plug and Play SCAM Support	Disabled

Definitions of SCSISelect Settings

This section defines the SCSI device settings for the host adapter and for each device on the SCSI bus.

SCSI Bus Interface Definitions
The following definitions are most likely to require modification:

■ **Host Adapter SCSI ID**—This option sets the SCSI ID of the host adapter.

To give the host adapter the highest priority on the SCSI bus, we recommend that you leave the host adapter at its default setting of SCSI ID 7.

■ **SCSI Parity Checking**—This option determines whether the host adapter verifies the accuracy of data transferred on the SCSI bus. The default setting is *Enabled*.

If any SCSI device connected to the host adapter does *not* support SCSI parity, disable SCSI Parity Checking on the host adapter and all SCSI devices. To determine if a device supports SCSI parity, consult the device documentation.

■ **Host Adapter SCSI Termination**—This option sets termination on the host adapter. You can set termination to *Automatic*, *Enabled*, or *Disabled*. In general, you should leave this option set to its default setting of *Automatic*.

SCSI Device Configuration Options
SCSI device configuration options allow you to configure parameters for each device on the SCSI bus. To configure a specific device, you must identify the SCSI ID assigned to that device. To determine the SCSI ID of a device, see *Using the SCSI Disk Utilities* on page 9.

■ **Initiate Sync Negotiation**—This option determines whether or not synchronous data transfer negotiation between the host adapter and a device is initiated by the host adapter.

The default setting is *Yes (Enabled)*. Set **Initiate Sync Negotiation** to **No** for devices that do not support Sync Negotiation.

■ **Maximum Sync Transfer Rate**—This option sets the maximum synchronous data transfer rate that the host adapter supports. The host adapter supports rates up to 10 MBytes/sec.

If Initiate Sync Negotiation is set to No, then the maximum synchronous transfer rate is the maximum rate that the host adapter accepts from the device during negotiation.

■ **Enable Disconnection**—This option lets a SCSI device temporarily disconnect the SCSI device from the SCSI bus. This allows the host adapter to perform other operations while the SCSI device is disconnected. The default setting is *Yes*. Set **Enable Disconnection** to **Yes** if two or more SCSI devices are connected to the host adapter.

Advanced Configuration Options

Plug and Play SCAM Support—This option allows the host adapter to automatically assign SCSI IDs to SCSI devices that support the SCAM protocol.

> ⚠ **Caution:** The default setting is *Disabled*. Most non-SCAM legacy devices tolerate the SCAM protocol, so you can enable this option even if you have a non-SCAM device.

Using the SCSI Disk Utilities

To access the SCSI disk utilities, select the **SCSI Disk Utilities** option from the menu that appears after starting SCSI*Select*.

Once the option is selected, SCSI*Select* immediately scans the SCSI bus and displays a list of all SCSI IDs and the devices assigned to each ID. When you select a specific ID and device, a menu appears, displaying the options Format Disk and Verify Disk Media.

■ **Format Disk**—This utility allows you to perform a low-level format on a hard disk drive. Most SCSI disk devices are preformatted at the factory and do not need to be formatted again.

The Adaptec Format Disk utility is compatible with nearly all of SCSI disk drives.

> ⚠ **Caution:** A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You *cannot* abort a low-level format once it is started.

■ **Verify Disk Media**—This utility allows you to scan the media of a hard disk drive for defects.

If the utility finds bad blocks on the media, it prompts you to reassign them. If you select **Yes**, those blocks are no longer used. You can press **Esc** at any time to abort the utility.

Troubleshooting Checklist

If you have any problems during the installation, check the following items first:

■ Have you installed the host adapter into a PCI Rev 2.0 compliant computer?

■ Are all SCSI devices powered?

■ Are all SCSI bus cables and power cables properly connected? Is pin 1 oriented correctly?

■ Does the host adapter and each device on the SCSI bus have a unique SCSI ID?

■ Did you install your host adapter in a bus master PCI slot? Refer to your computer's documentation for instructions or try another slot.

■ Are the devices at the extreme ends on the SCSI bus terminated properly?

■ Does your system CMOS setup require you to enable PCI bus parameters? If so, refer to your computer's documentation for instructions. Check that IRQ channel assignment, board, and BIOS settings have been made.

Some configuration options apply to a specific PCI bus slot, so if you change these options be sure you are applying them to the slot in which the host adapter is installed.

Check your computer documentation to verify which slot corresponds to which number.

– If there is an Interrupt Type or Interrupt Line option in the Setup program, be sure to select **Int-A** or **Interrupt Type = A**. Depending on your system design, you may also be required to change a motherboard jumper setting.

– If there is a Triggering Interrupt option, be sure to select **Level**.

– If there is an option to enable or disable bus mastering for the PCI slots, be sure to select **Enabled**.

– If there is an option to enable or disable individual PCI slots, be sure the slot in which you install the host adapter is **Enabled**.

– If your computer has a combination of ISA (or EISA) boards and PCI boards, you may need to mark the IRQs used by ISA/EISA boards as *Used* so the system BIOS will not try to assign these IRQs to other PCI boards.

– In some systems the BIOS reserves a set of available IRQs for PCI boards, and you have to assign these IRQs manually.

Common Problems and Solutions

■ **Changed Values Not Loaded**—If you changed any values on the host adapter in a Setup program or on a SCSI device, select the **Saved** option to ensure that the new values are loaded.

■ **Format/Verify Disk Device Utility Startup Fails**—If you tried to use the Format/Verify utility on a disk device and got an Unexpected SCSI Command Failure pop-up box with error information, the utility probably encountered a problem with the disk device or the media and therefore cannot run.

You can probably determine from the Sense Key information (e.g., 06h - Unit attention) both the cause of the problem and its solution. Listed below are some of the more common Sense Key values and their meanings:

02h - Not ready—The media is not ready to format. Be sure that media is inserted in the drive and that the media is spun up.

03h - Medium error—The disk media may be defective. If it is a removable-media drive, try using a different disk media. If it is a fixed disk drive, the disk may be physically damaged. Verify and format the media with SCSI*Select*.

04h - Hardware error—The disk drive may be defective. Consult the hardware documentation and contact the manufacturer.

06h - Unit attention—The removable media may be write-protected. Disable write protection and run the utility again.

## Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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 equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

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.

Adaptec, Inc.   AHA-2910C

FC   Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE
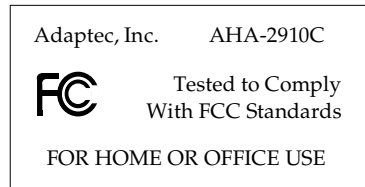
Canadian Compliance Statement

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

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

Installation Guide

AHA-2910C

PCI-to-Fast SCSI Host Adapter

adaptec®