

User's Guide

AVA-2820/2822/2825 VL-to-Fast SCSI and VL-to-EIDE Host Adapters with SCSISelect

AVA-2820/2822/2825 User's Guide
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▼▼▼ AVA-2820/2822/2825
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 **adaptec**[®]

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If you have questions about installing or using the host adapter, check this user's guide first—you will find answers to most of your questions here. If you need further assistance, please contact us. We offer the following support and information services:

- For Adaptec technical support (answers to technical questions, information about the Adaptec BBS, and access to the Interactive Fax system), call 800-959-SCSI (7274) or 408-945-2550, 24 hours a day, 7 days a week. To speak with a product support representative, call 408-934-SCSI (7274), M-F: 6:00 a.m. to 5:00 p.m., Pacific Time.
- If you need help with Disk Manager software, call Ontrack technical support at 612-937-2121, M-F: 8:00 a.m. to 5:00 p.m., Central Time. You can call the Ontrack BBS at 612-937-0860 (from the U.S. only). Information is also available via CompuServe (72662,33) and the Internet (Ontrack@mr.net).
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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 residential installations. 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 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
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered
- If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions

CAUTION: Only equipment certified to comply with Class B (computer input/output devices, terminals, printers, etc.) should be attached to this equipment, and must have shielded interface cables.

Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment.

Each host adapter is equipped with an FCC compliance label which shows only the FCC identification number. The full text of the associated label follows:

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.

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▼▼▼ Preface

Inside This Document

This document provides information on how to install and configure Adaptec® AVA™ -2820, AVA-2822, and AVA-2825 host adapters in 486 (and above) ISA VL-Bus computers. In this document, these host adapters are referred to collectively as the AVA-2820/2822/2825.

Chapter 1 Introduction

provides general information about and lists the features of the AVA-2820/2822/2825 host adapters.

Chapter 2 Installation

has the information needed to install the host adapter, SCSI devices, floppy devices, and standard IDE or EIDE devices.

Chapter 3 SCSI Configuration with SCSISelect

describes the SCSISelect™ configuration utility and how to use it to configure your host adapter and SCSI devices. The chapter also describes SCSISelect formatting and verifying utilities.

Chapter 4 Standard IDE or EIDE Configuration (AVA-2825 Only)

describes how to configure your standard IDE or EIDE drives for use with your AVA-2825 host adapter and computer.

Appendix A Troubleshooting

has information to assist you in troubleshooting problems that may occur during installation and configuration.

Appendix B Large SCSI Disk Drive Support

describes Adaptec's extended BIOS translation feature, which allows you to support SCSI disk drives up to 8 Gigabytes (GBytes) in size.

Appendix C Floptical Drive Support

has information about installing and using Floptical® drives.

Conventions

The following typographic conventions are used in this document.

bold

Used for keystrokes (... press the **Enter** key ...).

Helvetica

Used for operator entry that must be typed exactly as shown (... device=c:aspi2dos.sys ...) and for messages on the screen (... Enter Password ...).

Helvetica Italics

Used as a place holder for text you must determine and type in (... enter *nn* for number ...). Also used for program and file names that appear in body text (... the *autoexec.bat* file ...).

Italics

Used for emphasis (... is *only* supported ...) and for document references (... refer to Chapter 1, *Introduction*...).

Hexadecimal Numbers

Are followed by an 'h', e.g., 330h.

End Mark

The  symbol marks the end of a chapter or other section.

Advisories

Advisories are quick notes that stress an important point or warn of a potential hazard to you or your system. This document uses three kinds of advisories:



Note: Text set off in this way presents reminders, tips, or suggestions that may make it easier for you to install, configure, and use your host adapter.



Caution: Failure to observe this kind of advisory could result in loss of data or damage to your system and installed devices.



WARNING: Failure to observe this kind of advisory could result in personal injury.

Use caution when handling any electrical equipment. Advisories in this document can only cover the procedures contained here, and not all situations may have been addressed. Adaptec does not claim to have included every condition or situation that might require a Caution or Warning. You must refer to the documentation for your computer and peripheral equipment when you are installing equipment or changing its configuration.



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1

Introduction

About This Chapter

Read this chapter to find out

- An overview of the AVA-2820/2822/2825 host adapters
- The features of the AVA-2820/2822/2825
- Information on Adaptec's EZ-SCSI *Lite* software that provides driver support for most SCSI devices and makes driver installation easier than ever before

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Overview

Adaptec has combined the power of the VESA local bus (VL-Bus) and Adaptec's SCSI technology to give you a potent combination of I/O performance and connectivity for the DOS/Windows environment. Adaptec offers the following host adapters for 486 (and above) ISA VL-Bus computers:

- AVATM-2820 VL-to-Fast SCSI
- AVA-2822 VL-to-Fast SCSI with floppy support
- AVA-2825 VL-to-Fast SCSI and VL-to-EIDE with floppy support

Computer systems with a local bus, such as VL-Bus, take advantage of a wider, faster data pipeline between your computer's CPU and peripheral devices. The local bus connects directly to the computer's CPU bus. If the CPU runs at 33 MHz, so does the local bus, keeping right up with the CPU.

The AVA-2820/2822/2825 supports up to seven SCSI devices via internal and external 50-pin SCSI connectors. The AVA-2822/2825 onboard floppy controller supports two floppy drives (including 2.88 MByte) and two additional floppy tape drives.

The AVA-2825 also gives you the ability to connect up to two standard IDE or EIDE (Enhanced IDE) disk drives. Two software programs are included to help you use your IDE/EIDE drives more effectively. The Ontrack Disk Manager[®] partitioning utility enables you to access disk space above 528 MBytes on large IDE/EIDE drives. FLEXI-Driver[™] software enables 32-bit data transfers on the VL-Bus and supports 32-bit disk accessing in Windows.

FLEXI-Driver also increases EIDE disk drive performance by automatically optimizing data transfer rates. See the *FLEXI-Driver and Ontrack Disk Manager IDE/EIDE Hard Disk Software Installation Guide* for more information.

The AVA-2820/2822/2825 features the BIOS-resident Adaptec SCSISelect configuration utility. SCSISelect controls certain SCSI

features and minimizes the need to handle jumpers while installing the board or adding peripherals.

Adaptec EZ-SCSI™ *Lite* is a menu-driven software package that installs drivers and configures your DOS/Windows system and peripherals automatically. The *aspi2dos* ASPI manager enables optimal performance of SCSI devices in DOS and Windows. EZ-SCSI *Lite* allows your computer to access up to seven SCSI devices and has many features that make it easy to connect SCSI devices.



Note: AVA-2820/2822/2825 host adapters are sold with support for DOS and Windows only. However, due to our extensive relationships with other operating system companies, many Adaptec products are recognized by other operating systems.

Features

Compatibility

- VESA local bus (VL-Bus) standards
- DOS, Windows, third-party software, and SCSI-2 devices
- Boot capability from SCSI hard disk devices through onboard BIOS
- Standard IDE or EIDE drives, PIO Modes 0, 3, and 4 connected to the AVA-2825, through FLEXI-Driver software

Configuration Flexibility

- One internal 50-pin SCSI connector for standard 8-bit internal SCSI devices
- One external high-density 50-pin SCSI connector for standard 8-bit external SCSI devices
- One internal 40-pin standard IDE or EIDE connector for standard IDE or EIDE drives (AVA-2825 only)
- One internal 34-pin floppy connector for standard floppy drives (AVA-2822/2825 only)

- Easy configuration of features such as selection of interrupts, host adapter SCSI ID, parity checking, and termination with BIOS-resident *SCSISelect* configuration utility

Standard Device Support

- Up to two hard disk drives under DOS through onboard BIOS (whether SCSI, standard IDE or EIDE hard disk drives)
- Per computer, two physical standard IDE or EIDE drives on an installed AVA-2825
- Two floppy drives (including 2.88 MByte) and two additional floppy tape drives (AVA-2822/2825 only)

Additional Support Through Adaptec EZ-SCSI *Lite*

- Up to seven SCSI devices, simultaneously—including SCSI hard disk, removable-media, magneto-optical, CD-ROM including single and multisession Photo CDTM, SCSI tape, Floptical, and WORM drives; scanners, and plotters



Note: Since the computer sees Floptical drives as floppy devices and since up to four floppy type devices are usually supported per computer, you can install floppy disk drives, floppy tape drives, and Floptical drives in any combination up to a total of four. See Appendix C, *Floptical Drive Support*, for more information.

- Both fixed and removable-media SCSI devices with capacities above 1 GByte
- Removable-media removal and switching while your computer is running (for example, Bernoulli cartridges)
- The extended partitioning capabilities of DOS 5.0 and above for up to seven SCSI drives per host adapter
- *aspi2dos* ASPI manager enables optimal performance of SCSI devices in DOS/Windows environment
- *aspi2dos* supports up to eight simultaneous I/O tasks per host adapter

- Graphical, fully automated Windows-based installation program with extensive online Help (DOS installation program also included)
- Online tutorial application provides useful information about SCSI topics
- Utility programs to format and partition SCSI devices, view SCSI configuration information, play audio CDs, etc.
- Compatibility with advanced SCSI features available through Adaptec's ASPI software
- Modular software driver structure allows for an expanding library of off-the-shelf device modules
- Passthrough interface available to third-party software developers



Note: To install support for SCSI devices other than hard disk devices and CD-ROM drives, check the hardware documentation for those devices. If the device requires ASPI support, run Adaptec EZ-SCSI *Lite* to install an ASPI manager, then install any other software provided for the device. If the device is designed to interface directly with the host adapter, no ASPI manager is required.

Standard IDE or EIDE Support Through Disk Manager and FLEXI-Driver (AVA-2825 only)

- Support for standard IDE or EIDE drives, PIO Modes 0, 3, and 4, including Windows driver for 32-bit disk accessing
- More effective use of EIDE disk drives provided by Disk Manager and FLEXI-Driver software

Fast Data Transfer Rates

VL-Bus

- 32-bit PIO data transfers across the VL-Bus
- Up to 33 MBytes/sec on the VL-Bus

SCSI

- Up to 10.0 MBytes/sec synchronous Fast SCSI data rate
- Up to 5.0 MBytes/sec synchronous SCSI data rate
- Up to 3.0 MBytes/sec asynchronous SCSI data rate

Standard IDE or EIDE (AVA-2825 only)

- 3.3 MBytes/sec standard IDE data transfer rate
- 5.0, 8.3, 11.1, or 16.0 MBytes/sec EIDE data transfer rate depending on PIO Mode (must have an EIDE drive that supports the transfer rate, and FLEXI-Driver software must be installed)

Advanced Fast SCSI-2 Implementation

- Concurrent support for Fast SCSI, synchronous, and asynchronous devices
- Uses the superior SCSI-2 external high-density connector and standard internal ribbon connector
- Programmable single-ended active SCSI termination
- Multiple LUN support
- Parity handling in Data, Message, Command, Status, and Selection/Reselection phases

Host Adapter Performance

- Minimal SCSI overhead in single-tasking environments
- Disconnect/reconnect feature allows host to perform other I/O tasks while the disconnected device is busy
- Programmable interrupts
- 32-bit host bus data transfer widths
- Programmable command active and recovery times to optimize data transfer rates for standard IDE or EIDE drives on the AVA-2825
- Supports 16-KByte and 32-KByte BIOS through bank switching

System Requirements

The following are minimum requirements for installing the AVA-2820/2822/2825:

- An 486 VL-Bus computer system or higher
- An available VL-Bus expansion bus slot

The following are additional requirements for installing EZ-SCSI *Lite*, Disk Manager, and FLEXI-Driver software:

- MS-DOS and IBM DOS 3.3 or above
- Microsoft Windows 3.1x., for Windows installations
- 2 MBytes of RAM
- A hard disk with 2 MBytes or more of free disk space
(FLEXI-Driver software takes only 360 KBytes of space)

Product Specifications

The basic technical specifications of the host adapter are described below. If you need more detailed information, contact Adaptec's Literature Department at the phone number listed in *Adaptec Technical Support and Services* on page ii.

Physical Dimensions

Length: 9.75 inches (24.8 cm)

Width: 0.44 inches (1.0 cm)

Height: 3.75 inches (9.5 cm)

Standard VL-Bus compatible form factor

Power Requirements

+5.0 ± 0.25 Volts at 2.0 Amps maximum

Operating Temperature Requirements

0 °C (32 °F) to 55 °C (131 °F)

2 Installation

About This Chapter

Read this chapter to find out

- An overview of installing your host adapter and peripheral devices
- The default settings of the host adapter
- Jumper and switch settings and how to change them
- Instructions for installing the host adapter, SCSI devices, floppy drives, and standard IDE or EIDE drives

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Installation Overview

This chapter guides you through installing your host adapter and peripheral devices. An overview of the installation steps is listed below. The steps should be performed in the order they appear. See the referenced section for installation details:

- 1 Setting switches and jumpers on the host adapter—see *Setting Jumpers and Switches* on page 2-6
- 2 Installing the host adapter in the computer—see *Installing the Host Adapter* on page 2-8
- 3 Connecting SCSI cables and SCSI peripheral devices—see *Connecting SCSI Devices* on page 2-10
- 4 Terminating the SCSI bus—see *Terminating the SCSI Bus* on page 2-15
- 5 Setting SCSI IDs—see *Setting SCSI IDs* on page 2-17
- 6 Connecting floppy drives to the AVA-2822/2825—see *Connecting Floppy Drives (AVA-2822/2825 Only)* on page 2-18
- 7 Connecting standard IDE or EIDE drives to the AVA-2825—see *Connecting Standard IDE or EIDE Drives (AVA-2825 Only)* on page 2-21
- 8 Connecting your computer's LED cable to the host adapter to display SCSI/Standard IDE or EIDE activity—see *Connecting the SCSI/Standard IDE or EIDE Activity LED* on page 2-24
- 9 Reassembling the computer—see *Reassembling and Configuring the Computer* on page 2-25
- 10 Configuring the host adapter with the SCSISelect configuration utility—see Chapter 3, *SCSI Configuration with SCSISelect*
- 11 Configuring the computer to use standard IDE or EIDE drives connected to the AVA-2825—see Chapter 4, *Standard IDE or EIDE Configuration (AVA-2825 Only)*



Caution: The host adapter is sensitive to static electricity; even a mild shock can destroy a component on it. Keep the host adapter in its conductive wrapping until you are ready to install it in your computer. Before handling the host adapter, always ground yourself by touching an unpainted surface on your computer chassis.

Host Adapter Layout

Figure 2-1 shows the major components on the AVA-2820.

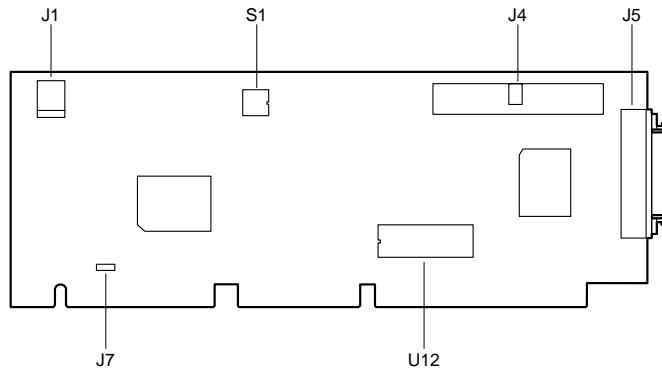


Figure 2-1. AVA-2820 Layout

Figure 2-2 shows the major components on the AVA-2822.

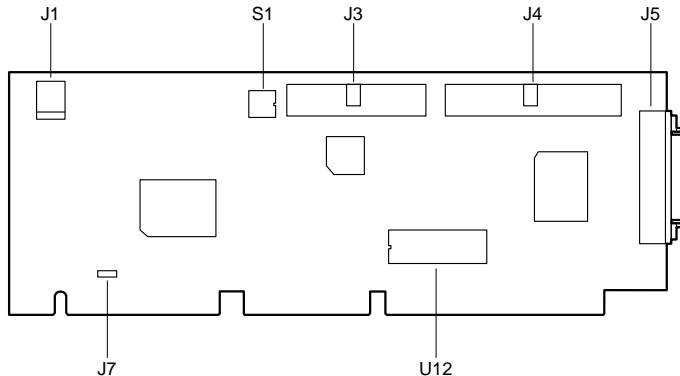


Figure 2-2. AVA-2822 Layout

Installation

Figure 2-3 shows the major components on the AVA-2825.

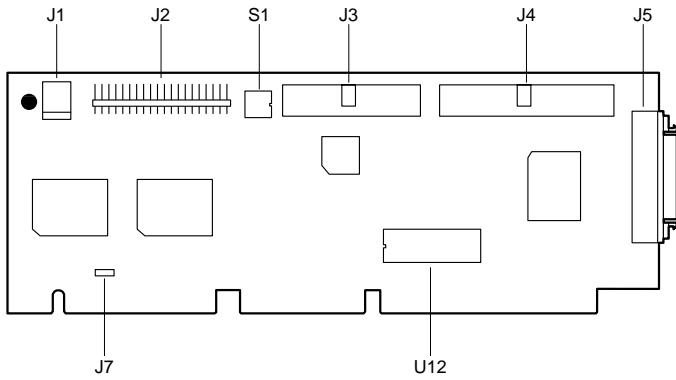


Figure 2-3. AVA-2825 Layout

The table below describes some components on the host adapters.

AVA-2820	AVA-2822	AVA-2825	Component Description
J1	J1	J1	External LED Connector
		J2	40-pin Standard IDE or EIDE Connector
	J3	J3	34-pin Floppy Connector
J4	J4	J4	50-pin Internal SCSI Connector
J5	J5	J5	50-pin High Density External SCSI Connector
J7	J7	J7	SCSI I/O Port Address Jumper
S1	S1	S1	4-position Switch Block
U12	U12	U12	Host Adapter BIOS ROM

Default Settings

Your host adapter is already configured for the majority of computers. The table below lists the default settings. See Chapter 3, *SCSI Configuration with SCSISelect* for other default settings available through *SCSISelect*.

Features	Default Setting	Select From
Host Adapter BIOS Address	DC000h	sw3 & sw4
Floppy Support	Enabled—AVA-2822/2825 Disabled—AVA-2820	sw1
Primary SCSI I/O Port Address	340h-35Fh	J7
Primary SCSI Configuration I/O Port Address	C344h, C378h, C37Ch	J7
Standard IDE or EIDE Support	Enabled—AVA-2825 Disabled—AVA-2820/2822	sw2

Setting Jumpers and Switches

The AVA-2820/2822/2825 has a jumper that controls the SCSI I/O port address. The adapter also has a single 4-position switch block (S1) that controls the settings for the floppy controller, standard IDE or EIDE controller, and host adapter BIOS address.

In most cases, you do not need to change any of the default settings; however, if you need to change any of them, do it now before installing the host adapter and configuring your computer.

SCSI I/O Port Address

Jumper J7 allows you to select the SCSI I/O port address for the AVA-2820/2822/2825. If you have another host adapter in your computer that uses 340h-35h addressing and it cannot be changed, set the AVA-2820/2822/2825 to the secondary SCSI I/O port address.

SCSI I/O Port Address	J7
Primary, 340h-35Fh (Default)	1-2
Primary Configuration, C344h, C378h, C37Ch	
Secondary, 140h-15Fh	2-3
Secondary Configuration, C144h, C178h, C17Ch	

Floppy Controller (AVA-2822/2825 Only)

Switch sw1 on the switch block allows you to enable or disable the onboard floppy controller on the AVA-2822/2825. The floppy controller is *enabled* by default.

Make sure only one floppy controller in the computer is enabled. See *Connecting Floppy Drives (AVA-2822/2825 Only)* on page 2-18 for more details.

Floppy Controller	sw1
Enabled (Default for AVA-2822/2825)	On
Disabled (Default for AVA-2820)	Off

Standard IDE or EIDE Controller (AVA-2825 Only)

Switch sw2 on the switch block allows you to enable or disable the onboard standard IDE or EIDE controller for the AVA-2825. The standard IDE or EIDE controller is *enabled* by default on the AVA-2825. For the AVA-2820/2822, it must remain *disabled*.

Standard IDE or EIDE Controller	sw2
Enabled (Default for AVA-2825)	Off
Disabled (Default for AVA-2820/2822)	On



Note: Standard IDE or EIDE I/O Port Address is hard-coded to 1F0h-1F7h, 3F6h, 3F7h and standard IDE or EIDE Configuration I/O Port Address is also hard-coded to B4h, B8h, BCh. The standard IDE or EIDE controller uses IRQ 14 and cannot be changed.

Host Adapter BIOS Address

Switches sw3 and sw4 on the switch block allow you to select the BIOS address for the AVA-2820/2822/2825. The BIOS is permanently enabled. The BIOS address is set to *DC000h* and can be changed using switches sw3 and sw4 as specified below:

Host Adapter BIOS Address	sw3	sw4
C8000h	Off	Off
CC000h	Off	On
D8000h	On	Off
DC000h (Default)	On	On

Installing the Host Adapter



Note: You cannot install more than one AVA-2825 host adapter in your PC.

To install the host adapter in your computer, the chassis cover must be removed and the motherboard exposed. Always refer to your computer documentation for instructions on removing the chassis cover and adding option boards, such as the AVA-2820/2822/2825.



WARNING: Ground yourself by touching an unpainted surface on your computer chassis, then turn OFF and disconnect power to the computer and external equipment before removing the chassis cover or attempting any motherboard modifications.

To install the AVA-2820/2822/2825 in your computer, follow these steps:

- 1 Remove the cover of your computer to expose the expansion bus slots on the motherboard.

- 2 Locate an unused VL-Bus slot in your computer and remove the corresponding slot cover.

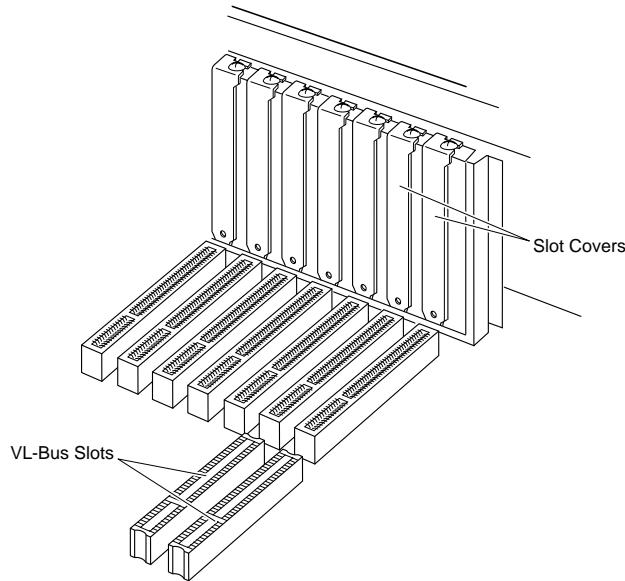


Figure 2-4. VL-Bus Slot Diagram

- 3 Carefully remove the host adapter from the antistatic bag. Place the host adapter on top of the bag if you need to set it down.
- 4 Align and insert the host adapter in the VL-Bus slot.
- 5 Secure the host adapter in your computer with the screw provided with the expansion slot cover. VL-Bus boards require firmer seating than typical ISA expansion boards. Make sure the host adapter is fully seated in its slot.



Note: *Do not* replace the chassis cover or reconnect the power yet!

Connecting SCSI Devices

This section details cabling SCSI devices. Connect Floptical drives as any other SCSI device, then see Appendix C, *Floptical Drive Support* for configuration information. For connecting floppy drives, see *Connecting Floppy Drives (AVA-2822/2825 Only)* on page 2-18. For connecting standard IDE or EIDE drives, see *Connecting Standard IDE or EIDE Drives (AVA-2825 Only)* on page 2-21.

Always use high-quality SCSI cables to connect the host adapter to devices on the SCSI bus. Poor-quality cables can cause data corruption, parity errors, and other problems. High-quality cabling is especially critical if you use Fast SCSI data transfer rates.

The round cables used for external SCSI devices vary widely in quality and electrical characteristics. Be sure that external SCSI cables meet SCSI-2 standards (your cable vendor should be able to tell you this).

Adaptec sells high-quality internal and external SCSI-2 cables. If your reseller does not stock these cables, call Adaptec directly at the number listed in the front of this document.

The AVA-2820/2822/2825 has two cable connectors: one for internal SCSI devices and one for external SCSI devices.



Note: AVA-2820/2822/2825 host adapters support only *single-ended* SCSI devices. *Differential* SCSI devices may be damaged if connected to the host adapter SCSI bus. Most SCSI devices currently produced are *single-ended* SCSI devices. Consult your SCSI device documentation for details.

Maximum SCSI Cable Lengths

When the SCSI bus contains a Fast SCSI host adapter, such as the AVA-2820/2822/2825, and one or more Fast SCSI devices, the total length of all cables (internal and external) connected to the bus must not exceed 3 meters (9.8 feet) to ensure reliable operation. If no Fast SCSI devices are connected, the total length of all cables must not exceed 6 meters (19.7 feet).

Connecting Internal SCSI Devices

Internal SCSI devices use a 50-pin flat SCSI ribbon cable with a 50-pin header internal connector. The cable has connectors at each end and two connectors in the middle; this allows you to connect three internal SCSI devices. To connect four or more internal SCSI devices to a SCSI bus, obtain a 50-pin SCSI ribbon cable with enough connectors to accommodate all of your internal SCSI devices.



Note: Refer to the device's documentation to install and mount internal SCSI devices inside your computer chassis.

To connect internal SCSI devices, follow these steps:

- 1 Attach the connector on one end of the 50-pin SCSI ribbon cable to the 50-pin internal SCSI connector on the host adapter. Maintain pin-1 orientation. Pin 1 of the SCSI ribbon cable is designated by a colored stripe on one edge of the ribbon cable. Pin 1 of the host adapter or SCSI device connector is usually designated by an arrow, a delta symbol (▲), or a '1' on the connector.

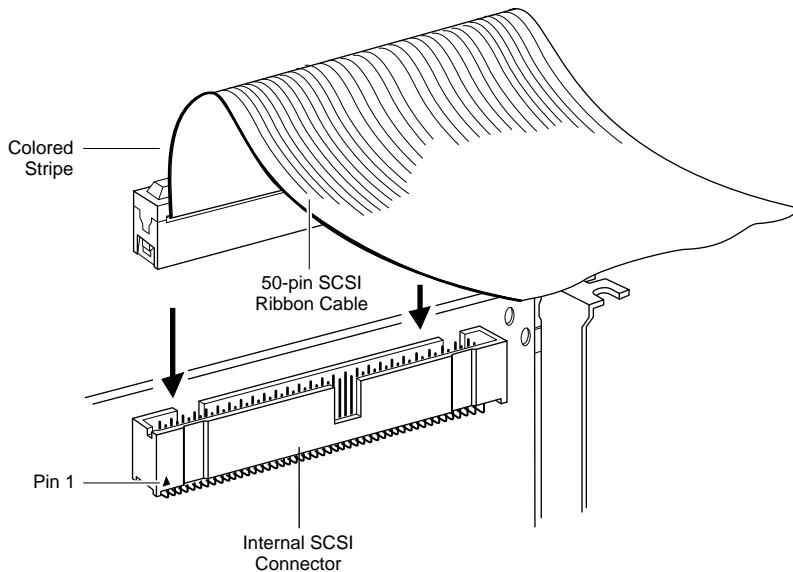


Figure 2-5. Connecting the SCSI Ribbon Cable to the Host Adapter

- 2 Attach the connector on the other end of the 50-pin SCSI ribbon cable to the SCSI connector on the internal SCSI device.

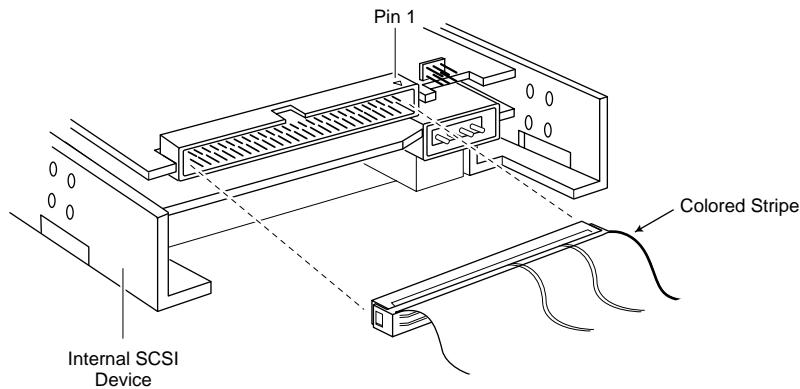


Figure 2-6. Connecting the SCSI Ribbon Cable to an Internal SCSI Device

- 3 To connect subsequent internal SCSI devices, plug the other connectors on the SCSI ribbon cable to the SCSI connectors on these devices.

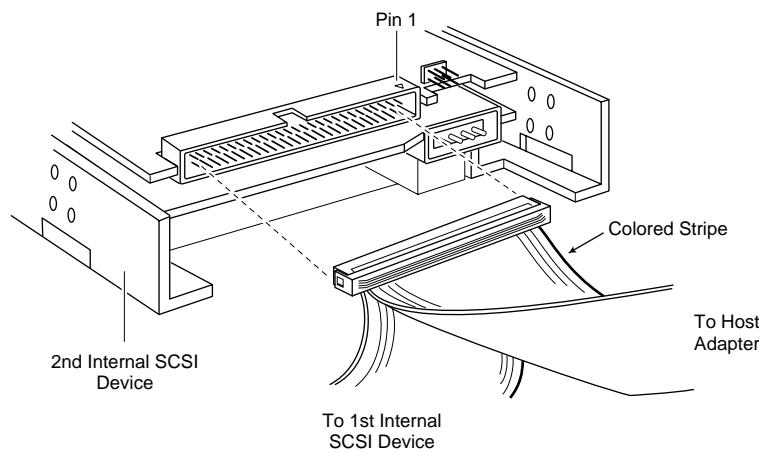


Figure 2-7. Connecting Subsequent Internal SCSI Devices

Connecting External SCSI Devices

External SCSI devices are usually daisy-chained to the host adapter. This means that a simple two-ended cable runs from the host adapter to the connector on the first external SCSI device. A second connector on the back of the external SCSI device allows another cable to connect it with the second device in the chain.

External SCSI devices use a 50-pin shielded cable with a high-density external connector. External cable connectors are keyed and can only be plugged in one way; pin-1 orientation is automatic.

To connect external SCSI devices, follow these steps:

- 1 Attach one connector of the external SCSI cable to the host adapter's external SCSI connector.

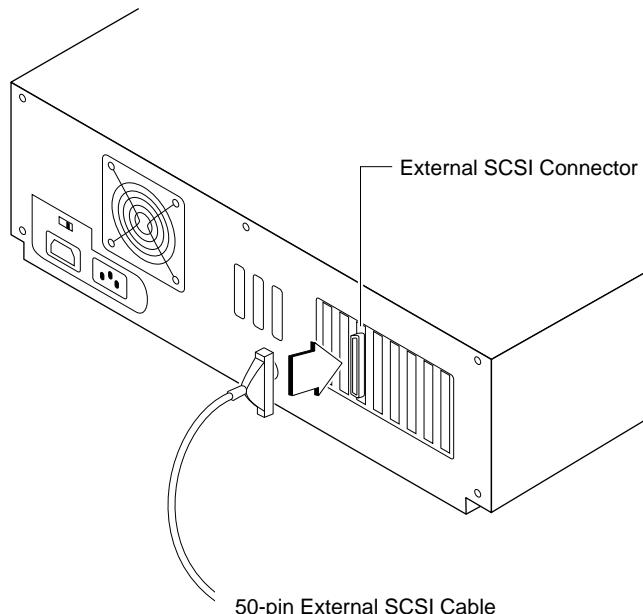


Figure 2-8. Connecting the External SCSI Cable to the Host Adapter

- 2 Attach the other connector of the external cable to either one of the SCSI connectors on the external SCSI device.

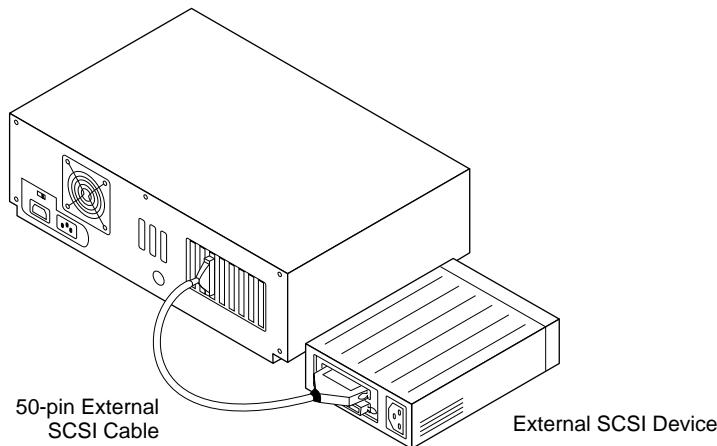


Figure 2-9. Connecting the External SCSI Cable to an External SCSI Device

- 3 To connect subsequent external SCSI devices, obtain additional external cables and daisy-chain each device to the previous device until all external SCSI devices have been connected.

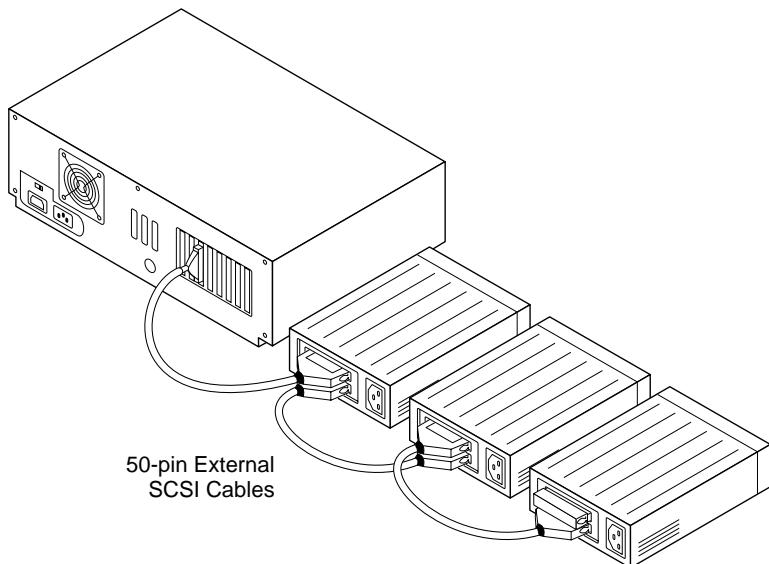


Figure 2-10. Connecting Multiple External SCSI Devices

Terminating the SCSI Bus

To reduce signal reflections on the SCSI bus, the first and last physical SCSI devices (including the host adapter) must have a set of resistors called *terminators* either installed or enabled.

Identify which two SCSI devices form the physical endpoints of your SCSI bus, then terminate these devices. All other SCSI devices installed between the ends of the SCSI bus must have their terminators either removed or disabled.

Some SCSI devices use a jumper or a switch located close to their SCSI connector(s) to control termination. On other SCSI devices, you must physically remove or install resistor module(s). Refer to the device's documentation to determine how to enable or disable termination on your particular SCSI device.



Note: Since the AVA-2820/2822/2825 always supplies termination power to the SCSI bus, disable SCSI devices from supplying termination power. See your device's documentation for details.

The AVA-2820/2822/2825 termination is software selectable and is *Enabled* by default. Host adapter termination must be disabled only if the host adapter is located in the middle of the SCSI bus. Refer to *Host Adapter SCSI Termination* on page 3-6 to disable host adapter termination.

Note the recommended termination possibilities listed in the subsections below.

Internal and External SCSI Devices

If both internal and external SCSI devices are connected to the host adapter, the last external SCSI device and the last internal SCSI device must be terminated. Since the host adapter is situated in the

middle of the SCSI bus, and does not form a physical endpoint, host adapter termination must be disabled with SCSISelect.

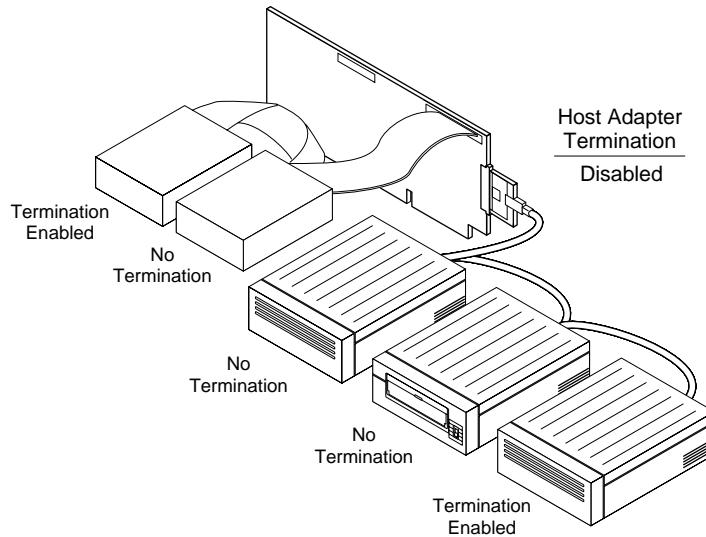


Figure 2-11. Termination Configuration with Internal and External SCSI Devices

Internal SCSI Devices Only

When only internal SCSI devices are connected to the host adapter and the host adapter is at the end of the SCSI bus, the last internal SCSI device and host adapter must be terminated.

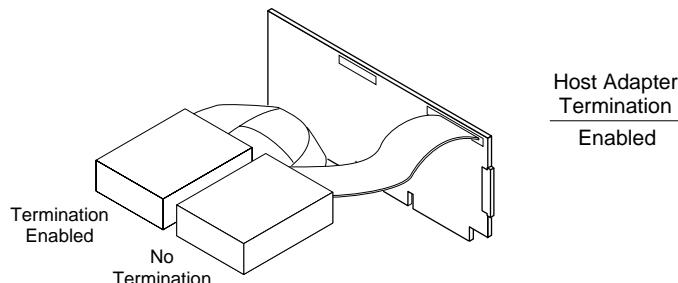


Figure 2-12. Termination Configuration with Internal SCSI Devices Only

External SCSI Devices Only

When only external SCSI devices are connected to the host adapter and the host adapter is at the end of the SCSI bus, the last external SCSI device and the host adapter must be terminated.

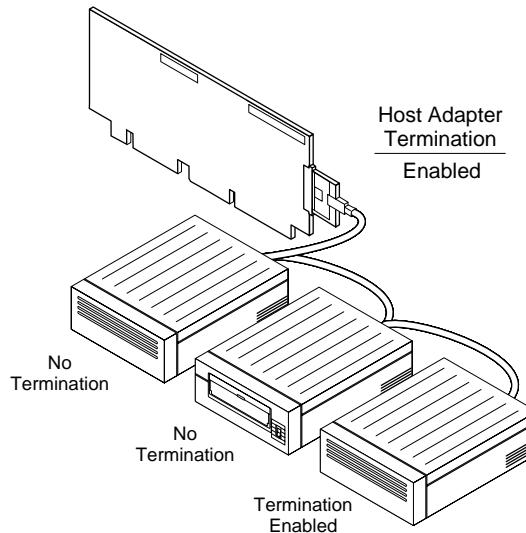


Figure 2-13. Termination Configuration with External SCSI Devices Only

Setting SCSI IDs

Each SCSI device (including the host adapter) on the SCSI bus must be set to a unique SCSI ID. The SCSI ID serves two purposes: it uniquely defines each SCSI device's address on the bus; and it determines the device's priority on the bus during the arbitration phase. The arbitration phase determines which device owns the bus when two or more devices simultaneously request to use it.

When selecting SCSI IDs, consider the following:

- The host adapter should always be set to SCSI ID 7 (the default), which has the highest priority on the SCSI bus.
- Standard 8-bit SCSI devices can be assigned IDs that range from 0 to 7; SCSI ID 0 has the lowest priority on the SCSI bus.
- You only need to change a device's SCSI ID if it conflicts with the SCSI ID of another device.

- SCSI ID 0 is best reserved for the SCSI hard disk drive used as your computer's boot device or the first SCSI drive in general.
- SCSI ID 1 is best reserved for a second SCSI hard disk drive.

Changing the SCSI ID setting for the host adapter is software selectable only and is done through your host adapter's *SCSISelect* utility. Refer to *Host Adapter SCSI ID* on page 3-6 for instructions.

The SCSI ID on most SCSI devices is typically set with jumpers or with switches on the SCSI device. Refer to the SCSI device documentation for information on changing the SCSI ID on other SCSI devices.

Connecting Floppy Drives (AVA-2822/2825 Only)

Up to two floppy disk drives can be connected to the host adapter by a 34-pin floppy ribbon cable with a 34-pin header connector. Additional floppy tape drives can be connected to the host adapter; a separate cable and device driver may be necessary, see your floppy tape drive documentation for details.

Note that up to four floppy type devices are usually supported per computer, and that you can install floppy disk drives, floppy tape drives, and Floptical drives in any combination up to a total of four per computer. Floppy disk and floppy tape drives are connected to the floppy connector, but Floptical drives are connected to the SCSI connector as a standard SCSI device. See Appendix C, *Floptical Drive Support* for more information.



Caution: More than one floppy controller enabled in your computer will cause your computer to hang. Make sure you disable one floppy controller, either the floppy controller in the system or on the AVA-2822/2825. If you disconnect the floppy drives from the floppy controller in your computer and connect them to the AVA-2822/2825, no modifications need to be made to your computer's CMOS *setup*.

If you are adding or removing floppy drives in your computer, be sure to modify the CMOS *setup* accordingly—do this after reassembling your computer. See your floppy drive documentation for details.

To connect floppy drives, follow these steps:

- 1 Attach the connector at one end of the 34-pin floppy ribbon cable to the floppy connector on the host adapter.



Note: Maintain pin-1 orientation. Pin 1 of the floppy ribbon cable is designated by a colored stripe on one edge of the cable. Pin 1 of the host adapter or floppy drive connector is usually designated by an arrow, a delta symbol (▲), or a '1' on the connector.

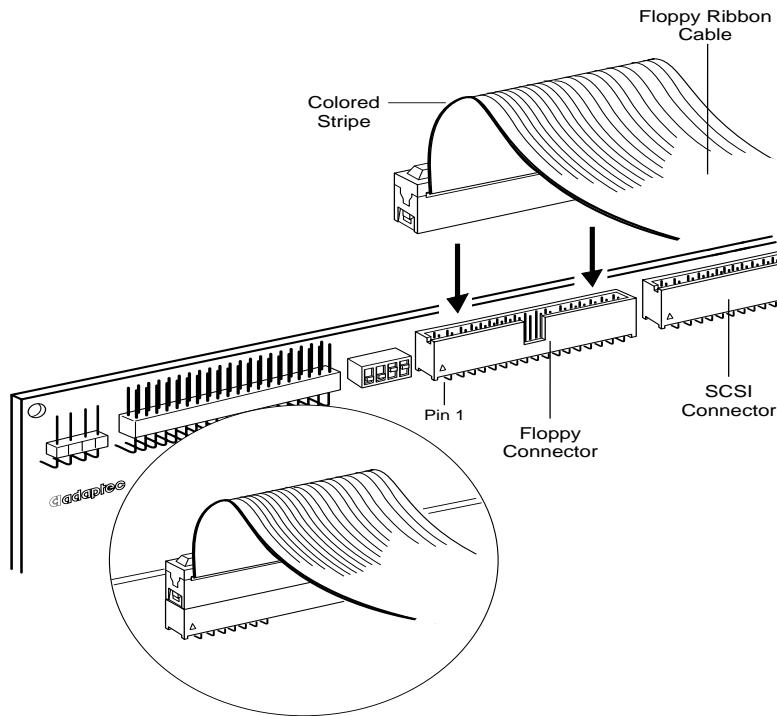


Figure 2-14. Connecting the Floppy Ribbon Cable to the Host Adapter

- 2 Attach the connector at the other end of the 34-pin floppy ribbon cable (the end with the twist in the cable) to the connector on the first floppy drive (Drive A). Maintain pin-1 orientation.

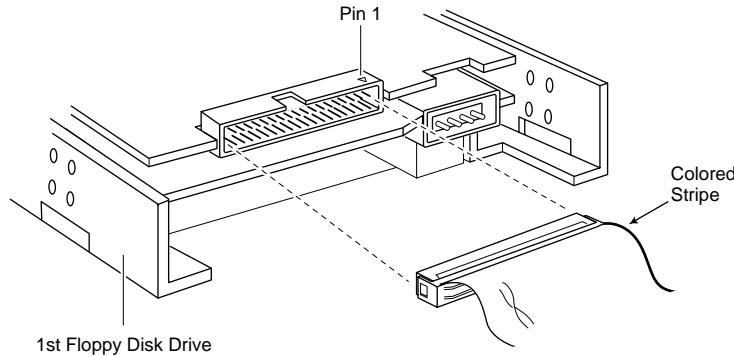


Figure 2-15. Connecting the Floppy Ribbon Cable to the First Floppy Drive

- 3 To connect a second floppy drive, plug the middle connector on the floppy ribbon cable to the connector on the second floppy drive (Drive B). Maintain pin-1 orientation.

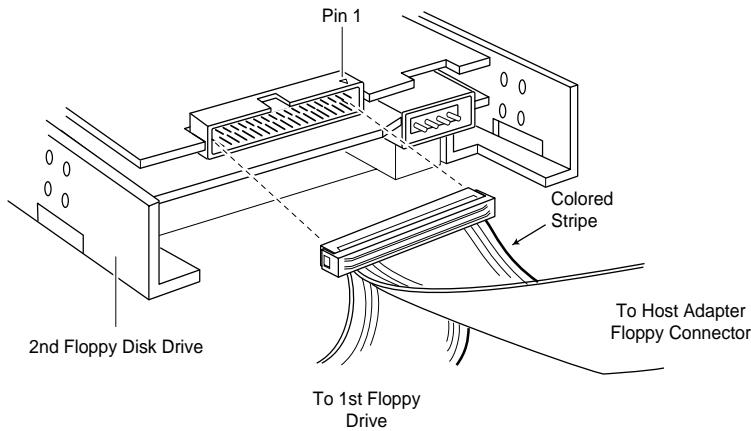


Figure 2-16. Connecting a Second Floppy Drive

Connecting Standard IDE or EIDE Drives (AVA-2825 Only)

Standard IDE or EIDE disk drives are connected to the host adapter by a 40-pin standard IDE or EIDE ribbon cable with a 40-pin header connector. Up to two physical standard IDE or EIDE disk drives can be connected to the host adapter. See Chapter 4, *Standard IDE or EIDE Configuration (AVA-2825 Only)* for configuring standard IDE or EIDE drives and *Standard IDE or EIDE Problems and Solutions* on page A-8 for troubleshooting information.



Caution: When you connect standard IDE or EIDE drives to the AVA-2825, disable the standard IDE or EIDE controller in your computer; see your computer's documentation. If you do not connect standard IDE or EIDE drives to your AVA-2825, be sure to disable the standard IDE or EIDE controller on the AVA-2825, see *Setting Jumpers and Switches* on page 2-6.

To connect standard IDE or EIDE drives to the AVA-2825, follow these steps:

- 1 If you are connecting standard IDE or EIDE drives already installed in your computer, skip to step 2.
If you are adding a new standard IDE or EIDE drive to your computer, follow steps a and b below:
 - a Set up the first standard IDE or EIDE drive to function as the master drive, usually through setting jumpers or switches on the drive. Then install the drive. See your drive documentation for details.
 - b Set up the second standard IDE or EIDE drive (if there is one) to function as the slave drive, usually through setting jumpers or switches. Then install the drive. See your drive documentation for details.
- 2 Remove the 40-pin standard IDE or EIDE ribbon cable from the existing IDE controller, if it is connected.
- 3 Disable the existing IDE controller in your computer—not the standard IDE or EIDE controller on the AVA-2825. This is

usually done through setting jumpers or switches on the disk controller. See your computer's documentation for details.



Note: If the IDE controller is on a separate board, you may be able to remove it if the board is not also used for floppy drive support, serial ports, etc.

- 4 Attach the connector at one end of the 40-pin standard IDE or EIDE ribbon cable to the AVA-2825 standard IDE or EIDE connector.



Note: Maintain pin-1 orientation. Pin 1 of the standard IDE or EIDE ribbon cable is designated by a colored stripe on one edge of the cable. Pin 1 of the host adapter's standard IDE or EIDE connector is designated by a '1' near pin 1 on the connector.

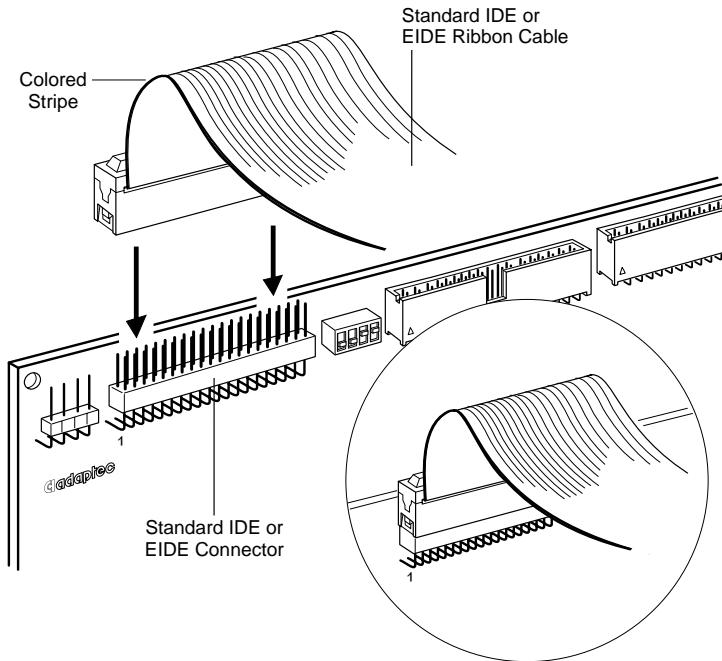


Figure 2-17. Connecting the Standard IDE or EIDE Ribbon Cable to the Host Adapter

- 5 Attach the connector at the other end of the 40-pin standard IDE or EIDE ribbon cable to the connector on the first standard IDE or EIDE drive. Maintain pin-1 orientation.

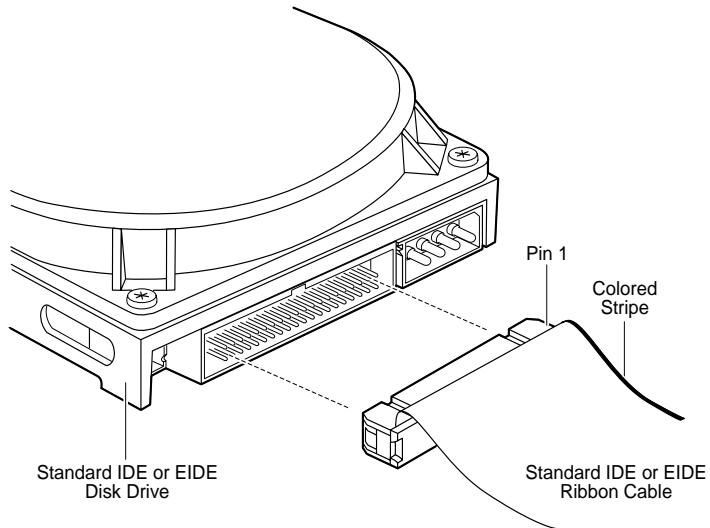


Figure 2-18. Connecting the Standard IDE or EIDE Ribbon Cable to the First Standard IDE or EIDE Drive

- 6 To connect a second standard IDE or EIDE drive, plug the other connector of the standard IDE or EIDE ribbon cable to the connector on the second standard IDE or EIDE drive; maintain pin-1 orientation. You can install up to two physical standard IDE or EIDE drives on the AVA-2825.



Note: Some standard IDE or EIDE drives may not be compatible with each other. See *Standard IDE or EIDE Problems and Solutions* on page A-8 if you have difficulty accessing both standard IDE or EIDE drives.

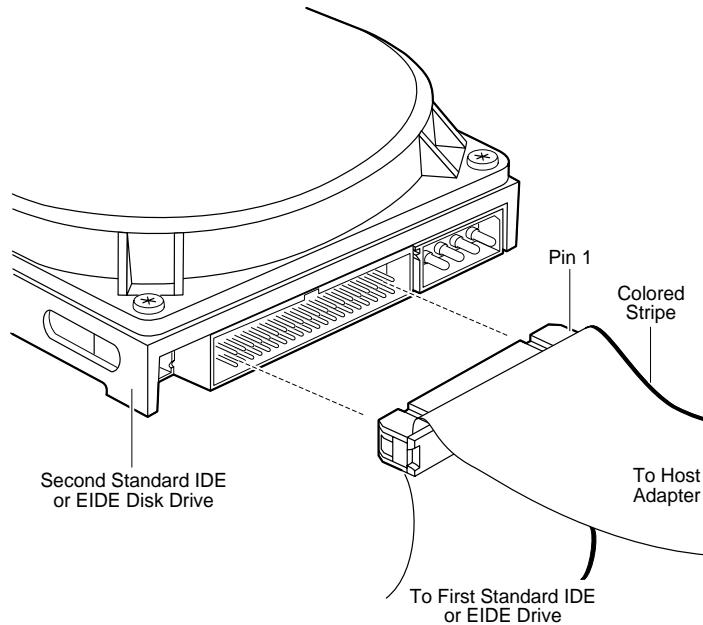


Figure 2-19. Connecting a Second Standard IDE or EIDE Drive

Connecting the SCSI/Standard IDE or EIDE Activity LED

Most computers have an LED (Light Emitting Diode) on the front panel. This light shows hard disk drive activity. If you connect your computer's LED cable to the host adapter, the LED lights to indicate SCSI bus activity on SCSI devices connected to AVA-2820/2822/2825. The LED also indicates standard IDE or EIDE drive activity on standard IDE or EIDE drives connected to the AVA-2825.

To connect the SCSI/Standard IDE or EIDE activity LED connector, follow these steps:

- 1 Refer to your computer documentation to locate and unplug the LED cable from the connector on the motherboard.
- 2 Connect the LED cable connector to the SCSI/Standard IDE or EIDE activity LED connector (J1) on the host adapter. Maintain pin-1 orientation.



Note: On computers with a two-position LED cable, connect the LED cable connector to pins 1 and 2 of J1.

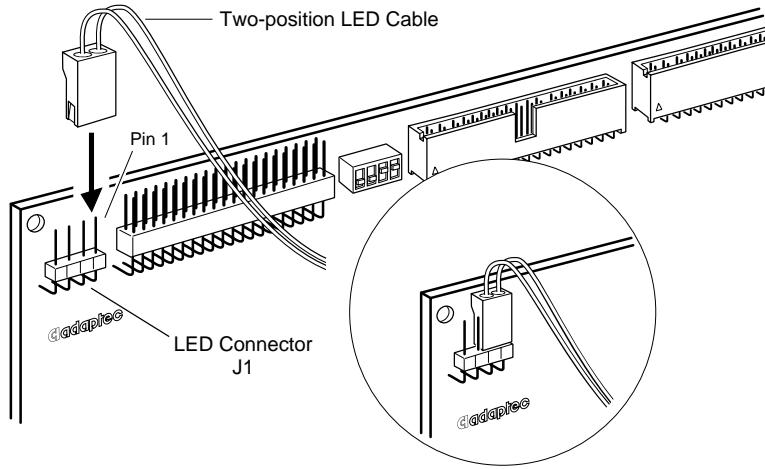


Figure 2-20. SCSI/Standard IDE or EIDE LED Connector

Reassembling and Configuring the Computer

- 1 Before reassembling your computer, be sure that:
 - The SCSI bus is properly terminated
 - Each SCSI device on the bus is set to a unique SCSI ID (0-7)
 - The host adapter is firmly seated and secured in the computer's VL-Bus slot
 - Internal SCSI devices are connected to the host adapter with a 50-pin SCSI ribbon cable with proper pin-1 orientation
 - External SCSI devices are cabled to the host adapter with 50-pin shielded cables
 - All computer and power cables are properly connected

- If you are using the AVA-2822/2825 floppy controller
 - Make sure that the floppy drive(s) is connected to the host adapter with the 34-pin floppy ribbon cable with proper pin-1 orientation.
 - Make sure the floppy controller in the computer is disabled.
- If you are using the AVA-2825 standard IDE or EIDE controller
 - Make sure that the standard IDE or EIDE drive(s) is connected to the host adapter with the 40-pin standard IDE or EIDE ribbon cable with proper pin-1 orientation.
 - Make sure the standard IDE or EIDE controller in the computer is disabled.

2 Replace the computer cover and connect all computer and device power cables; refer to your computer and device documentation.

3 Configure your host adapter and SCSI devices using *SCSISelect*. See Chapter 3, *SCSI Configuration with SCSISelect*.

4 Configure your computer to use your standard IDE or EIDE drives. See Chapter 4, *Standard IDE or EIDE Configuration (AVA-2825 Only)*.



3 SCSI Configuration with *SCSISelect*

About This Chapter

Read this chapter to find out about

- Configuring your host adapter and SCSI devices with the *SCSISelect* utility
- Disk formatting and verifying utilities available in *SCSISelect*

AVA-2820/2822/2825 User's Guide
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Current Date: 1/30/95 Page: 3-2
ECN Date: 1/31/95

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SCSISelect Overview

The AVA-2820/2822/2825 includes the onboard, menu-driven *SCSISelect* configuration utility, which allows you to change host adapter and SCSI bus settings without opening the computer or handling the host adapter.

Use *SCSISelect* to change the default settings which may conflict with other devices (e.g., SCSI ID), perform low-level formatting on new SCSI disk devices, or verify SCSI disk media.

Default Values

This table lists the settings you can change with the *SCSISelect* utility and their default values. Settings apply to the host adapter and all SCSI devices on the bus.

Settings that Apply Globally for the SCSI Bus	Default Values
Host Adapter Interrupt (IRQ) Channel	11
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	Enabled
Host Adapter BIOS (Configuration Utility Reserves BIOS Space)	Enabled
Support Removable Disks Under BIOS as Fixed Disks	Disabled
Extended BIOS Translation for DOS Drives >1 GByte	Disabled
Dynamically Scan SCSI Bus for BIOS Devices	Enabled
BIOS Support for Floptical Drives	Disabled
Settings that Apply Individually to Each Device	
Initiate Sync Negotiation	Yes
Maximum Sync Transfer Rate (MBytes/sec)	10.0
Enable Disconnection	Yes
Send Start Unit Command	No
Include in BIOS Scan	Yes

Running SCSISelect

To run SCSISelect, turn ON or reboot your computer.

During system startup, the AVA-2820/2822/2825 briefly displays a BIOS banner similar to Figure 3-1. The BIOS banner includes a description of each SCSI device connected to the host adapter and its corresponding SCSI ID number.

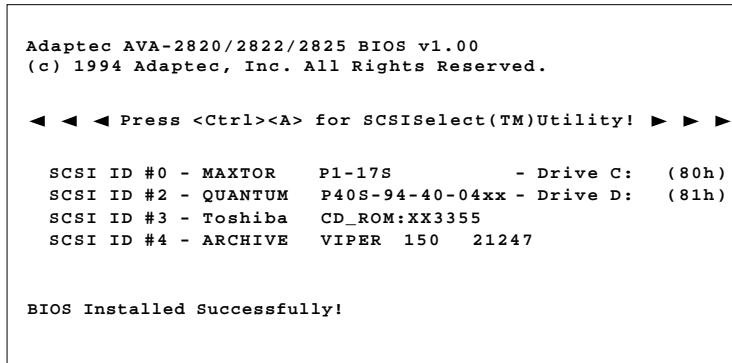


Figure 3-1. BIOS Banner

Press **Ctrl+A** while the BIOS banner appears on the screen. SCSISelect displays the Options menu shown in Figure 3-2.

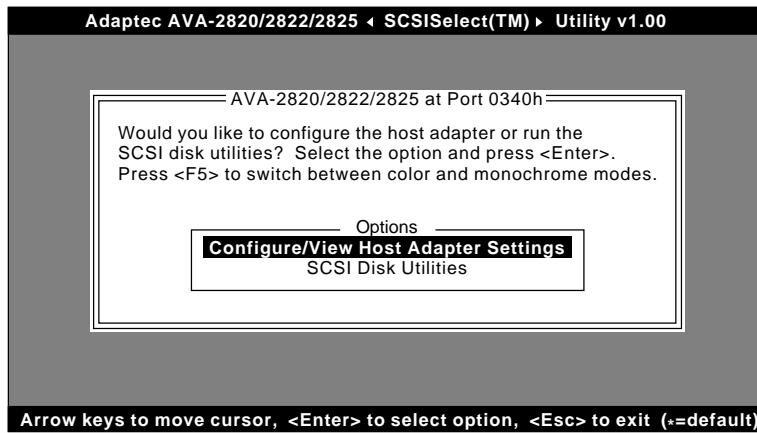


Figure 3-2. SCSISelect Options Menu

Use the cursor ($\uparrow\downarrow$) and **Enter** keys to make selections. Press **Esc** at any time to return to the previous menu.



Note: Press **F5** to toggle between color and monochrome modes. (This feature does not work on all monitors.) Press **F6** to reset all settings to their defaults. The defaults are marked with an asterisk (*) on all selection submenus.

Configure/View Host Adapter Settings

For most users, the first four settings shown on the menu in Figure 3-3 are the ones most likely to require adjustment.

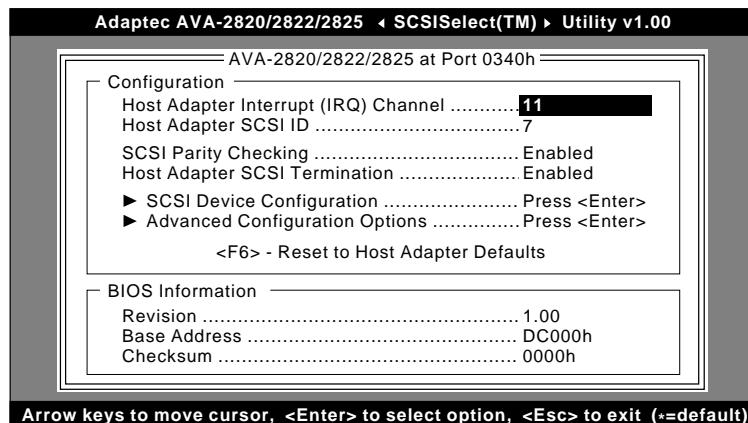


Figure 3-3. Configure/View Host Adapter Settings Screen

- Host Adapter Interrupt (IRQ) Channel—assigns the interrupt channel for the host adapter.
- Host Adapter SCSI ID—changes the SCSI address or ID of the host adapter.
- SCSI Parity Checking—enables or disables host adapter SCSI parity checking.
- Host Adapter SCSI Termination—configures host adapter SCSI termination.

More advanced users can access SCSI Device Configuration and Advanced Configuration Options through this menu.

Host Adapter Interrupt (IRQ) Channel

Each add-in board installed in your computer, including the host adapter, must be assigned a unique IRQ. This interrupt allows the host adapter to send a message and get the immediate attention of the computer's CPU (central processing unit). Select this option to configure the IRQ for the host adapter. The default setting is 11.

Host Adapter SCSI ID

This option allows you to change the host adapter SCSI ID. Eight SCSI IDs are available for the AVA-2820/2822/2825. The default setting is 7 which has the highest priority on the SCSI bus.

SCSI Parity Checking

Select this option to enable or disable SCSI Parity Checking on the host adapter. The default setting is *enabled*.

The host adapter always checks parity when reading from the SCSI bus to verify the correct transmission of data from your SCSI devices. If SCSI Parity Checking is enabled on the host adapter, it should be enabled on all SCSI devices. If any attached SCSI device does not support SCSI parity, then disable SCSI Parity Checking on the host adapter as well as on each SCSI device. Most devices today, however, support SCSI parity.

Host Adapter SCSI Termination

This option allows you to configure host adapter SCSI termination. Termination is *enabled* by default. Figure 3-4 displays your choices.

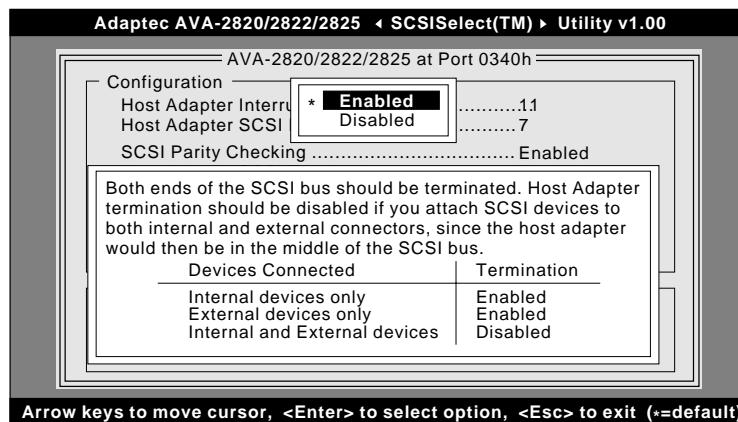


Figure 3-4. Host Adapter SCSI Termination Selection

SCSI Configuration with SCSISelect

Disable this feature only if the host adapter is in the middle of the SCSI bus, usually if both the internal and external SCSI connectors are used. Refer to *Terminating the SCSI Bus* on page 2-15 for additional termination information.

SCSI Device Configuration

This option allows you to configure certain parameters of each SCSI device connected on the SCSI bus. When this option is selected, a screen similar to Figure 3-5 appears.

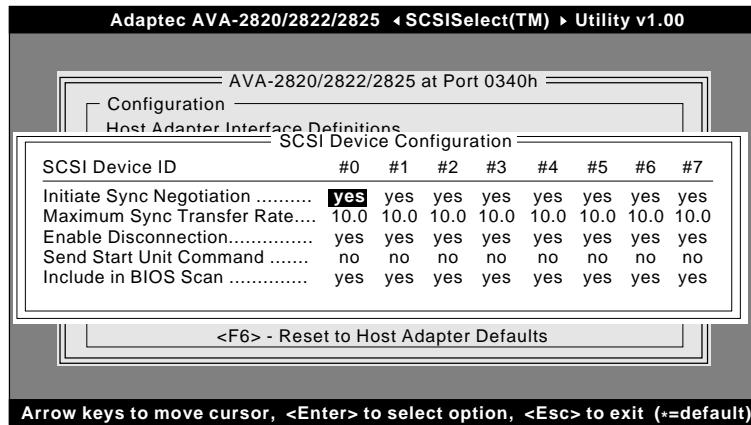


Figure 3-5. SCSI Device Configuration Screen

Configure the parameter desired. Parameters apply to all devices on the SCSI bus.



Note: Make sure all devices support the parameter; if one device does not support it, disable the parameter.

Initiate Sync Negotiation

This option determines whether the host adapter initiates synchronous negotiation with the SCSI device. Before data is transferred across the bus, the sending (initiating) and receiving (target) devices negotiate and agree on how long each piece of data is, and how many pieces are sent at a time—that is, they agree on how fast to talk.

Devices that negotiate synchronous data transfer rates can maintain a much higher *conversation* speed than devices that do not support this feature.

When *Initiate Sync Negotiation* is set to *yes*, the host adapter initiates synchronous negotiation with the SCSI device. When set to *no*, the host adapter does not initiate synchronous negotiation with the SCSI device. The host adapter, however, always responds to synchronous negotiation initiated from the SCSI device. The default setting is *yes*.

If this feature is set to *no* and neither the host adapter nor the SCSI device negotiate for synchronous data transfers, all data transfers are asynchronous.



Note: Some older SCSI-1 devices do not handle synchronous negotiation correctly, which may result in erratic behavior or a hang condition. If the device does not support synchronous negotiation, then set this option to *no* for the device.

Maximum Sync Transfer Rate

This option allows you to set the maximum synchronous transfer rate (MBytes/sec). The following values can be selected, however, make sure the device supports the value:

- 10.0 MBytes/sec (default)
- 8.0 MBytes/sec
- 6.7 MBytes/sec
- 5.0 MBytes/sec

If *Initiate Sync Negotiation* is set to *no* for the device, then the value selected here is the maximum transfer rate the host adapter allows during negotiation.



Note: Some older SCSI-1 devices do not accept the Fast data transfer rates, which may result in erratic behavior or a *hang* condition. For these devices, select 5.0 MBytes/sec for the Maximum Sync Transfer Rate.

SCSI Configuration with SCSISelect

Enable Disconnection

This option determines whether the host adapter allows a SCSI device to disconnect from the SCSI bus (sometimes called disconnect/reconnect). Disconnection allows the host adapter to perform other operations on the SCSI bus while the SCSI device is temporarily disconnected.

When set to *yes*, the SCSI device may disconnect from the SCSI bus. The SCSI device, however, may choose not to disconnect, even if allowed to by the host adapter (this can usually be configured on the SCSI device). Most SCSI devices today support disconnection. When set to *no*, SCSI device is not allowed to disconnect from the SCSI bus. The default setting is *yes*.

If you have only one device on the SCSI bus, setting the option for all devices to *no* may increase performance. If you have several devices on the SCSI bus, setting it to *yes* may increase performance.

Send Start Unit Command

This option can reduce the load on your computer's power supply by allowing the host adapter to power-up SCSI devices one-at-a-time when you boot your system. When set to *yes*, the Start Unit Command is sent to the SCSI device during bootup. Most drives that support this option require that a jumper be set on the drive. When set to *no*, the SCSI device powers up at boot time with the other devices. The default setting is *no*.

If this option is selected for more than one SCSI device, the host adapter sends the Start Unit Command to the SCSI device with the lowest SCSI ID. When the first device is ready and responds to the host adapter, the Start Unit Command is sent to the next highest SCSI ID with a setting of *yes*. This process continues until all supported devices respond to the host adapter. System boot time varies depending on how many drives have this option enabled and how long each drive takes to spin up.

Include in BIOS Scan

The AVA-2820/2822/2825 BIOS can boot your computer from drives at any SCSI ID. This option allows you to specify which device the host adapter should attempt to use as a boot device. The default is *yes*.

Dynamically Scan SCSI Bus for BIOS Devices must be enabled for Include in BIOS Scan to appear in the SCSI Device Configuration Options screen; refer to *Advanced Configuration Options* below.

Advanced Configuration Options

When this option is selected, a screen similar to Figure 3-6 appears. These settings do not normally need modification. *Do not* change these options unless you fully understand the ramifications.

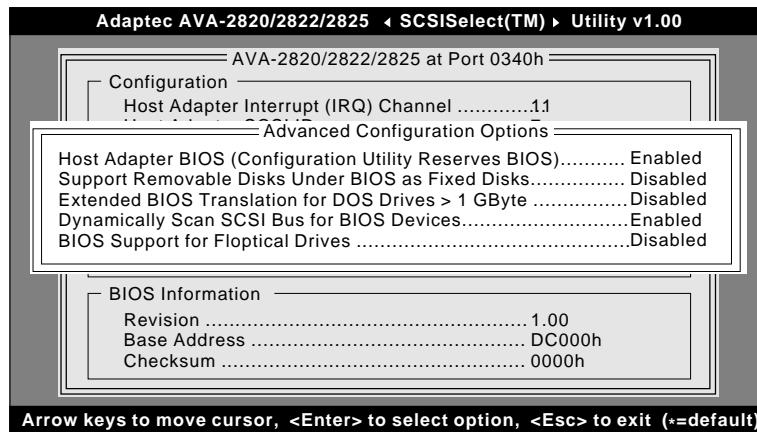


Figure 3-6. Advanced Configuration Options Screen

Host Adapter BIOS (Configuration Utility Reserves BIOS Space)

Use this option to disable the BIOS only for debugging purposes. The default is *enabled*.

Support Removable Disks Under BIOS as Fixed Disks

This option allows you to configure removable-media drives, such as Iomega Bernoulli and Syquest drives, to be supported by the BIOS, without installing additional software drivers. Support for removable-media drives means that the BIOS allows a removable-media drive to be used as if it were a fixed disk drive; it does not mean that the media can be removed during operation.



Caution: If a removable-media SCSI device is controlled by the host adapter BIOS, *do not* remove the media while the system is powered-on or data loss could occur! If you want to remove media while the system is powered, install device drivers. Refer to *Additional Support Through Adaptec EZ-SCSI Lite* on page 1-5.

The following choices are available for this option:

- **Boot Only**—Only the removable-media drive designated as the boot device is treated as a fixed disk. This is the default setting.
- **All Disks**—All removable-media drives supported by the BIOS are treated as fixed disk drives.
- **Disabled**—No removable-media drives are treated as fixed disks. In this situation, software drivers are needed because the drives are not controlled by the BIOS.

Removable disks configured as boot devices can be used to lock your system when they are removed. To do this, format a removable-disk cartridge and partition it to be a boot device. Make sure no other boot device is installed on your system. Then insert the boot cartridge before powering-up the system and remove it after you shut it down. Your system then will have no boot device when the cartridge is removed, and cannot be used without it.

Extended BIOS Translation for DOS Drives > 1 GByte

Extended BIOS translation allows your computer to access SCSI hard disks with a capacity greater than 1 GByte. The default setting is *disabled*. See Appendix B, *Large SCSI Disk Drive Support* for more details on using this feature.

If this option is enabled, the following translation schemes are used:

- SCSI hard disks 1 GByte or less use a translation scheme of 64 heads, 32 sectors per track.
- SCSI hard disks greater than 1 GByte use a translation scheme of 255 heads, 63 sectors per track, extending the disk drive capacity limit under DOS to 8 GBytes.

Dynamically Scan SCSI Bus for BIOS Devices

Enable this option to access and boot from a SCSI drive. When this option is enabled, the Include In BIOS Scan option appears on the SCSI Device Configuration screen; there, you can select which devices are scanned for booting. When this option is disabled, the SCSI boot drive must be set to SCSI ID 0. The default is *enabled*.

BIOS Support for Floptical Drives

When this option is enabled, the AVA-2820/2822/2825 BIOS supports standard 3.5-inch VHD (Very High Density) 21-MByte Floptical drives, without requiring additional software; it also supports booting from a Floptical drive. See Appendix C, *Floptical Drive Support* for more details. The default is *disabled*.

SCSI Disk Utilities

When you select SCSI Disk Utilities from the Options menu, SCSISelect scans the SCSI bus and lists all SCSI devices installed; a screen similar to Figure 3-7 appears.

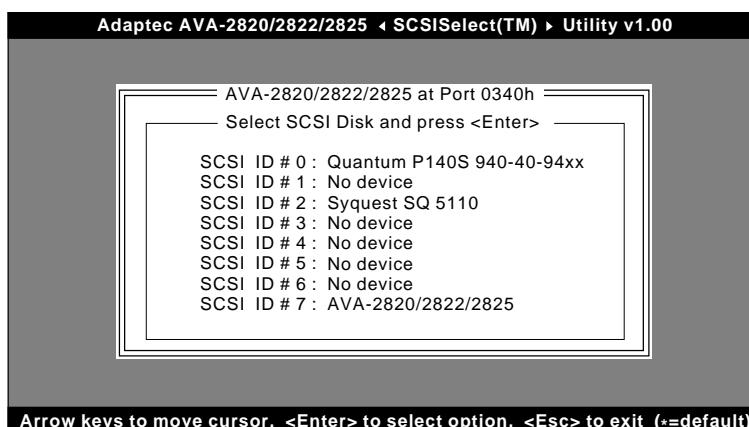


Figure 3-7. SCSI Disk Utilities Screen

To access the Format Disk and Verify Disk Media utilities, highlight a disk device (by using the arrow keys) and press **Enter**. A small menu window appears. Select either **Format Disk** or **Verify Disk Media**.

Format Disk

The Format Disk utility starts the Adaptec SCSI low-level format utility. This utility is compatible with the vast majority of SCSI disk drives. Your hard disk media must be low-level formatted before you can use your operating system's partitioning and file preparation commands, such as MS-DOS fdisk and format. Most SCSI disk devices are preformatted, and do not need reformatting. However, run the Format Disk utility on SCSI hard disk or removable-media drives that were previously connected to a non-Adaptec adapter.



Caution: All data on the drive will be lost when performing a low-level format. Back up your data before formatting. Once the low-level format is in progress, you cannot abort it.

Verify Disk Media

The Verify Disk Media utility scans the selected device's media for defects. If bad blocks are found, you are prompted to reassign them; if you select yes, those blocks will no longer be used.



Note: You can abort the media verification at any time by pressing **Esc**.



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Standard IDE or EIDE Configuration (AVA-2825 Only)

About This Chapter

Read this chapter to find out about

- Setting up your standard IDE or EIDE drives with the AVA-2825 host adapter
- Configuring your computer's CMOS *setup* to recognize the standard IDE or EIDE drives
- Installing Disk Manager and FLEXI-Driver software for use with your standard IDE or EIDE drives on the AVA-2825

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Standard IDE and EIDE Overview

Standard IDE and EIDE is an interface scheme used to transport data in most computers. It has different specifications and requirements than SCSI. Configuration for standard IDE or EIDE disk drives is done by the motherboard BIOS, not the SCSI controller. Keep the following items in mind when you install and configure standard IDE or EIDE drives in your computer:

- Most computers can recognize up to two physical standard IDE or EIDE drives in the computer when the drives are connected to the AVA-2825.
- The first standard IDE or EIDE drive must be set up as the master drive and the second (if any) as the slave drive; the master drive must be set up as drive *C* in the CMOS *setup*.
- You may need to modify the CMOS *setup* when adding or removing standard IDE or EIDE drives.
- When both standard IDE or EIDE and SCSI hard disk drives are installed, the computer always boots from the master standard IDE or EIDE drive.
- Standard IDE or EIDE drives larger than 528 MBytes may require the Disk Manager partitioning utility for use in DOS. See *Using Disk Manager Software with Large Standard IDE or EIDE Drives* on page 4-4.
- To achieve the best performance, install FLEXI-Driver software and its respective Windows driver. See *Installing FLEXI-Driver Software* on page 4-6

Configuration involves the following steps which must be done in the order they appear in this chapter:

- 1 *Configuring the Computer's CMOS Setup* on page 4-4.
- 2 *Using Disk Manager Software with Large Standard IDE or EIDE Drives* on page 4-4.
- 3 *Installing FLEXI-Driver Software* on page 4-6.

Configuring the Computer's CMOS Setup

If you simply moved your standard IDE or EIDE drive(s) from the computer's disk controller to the AVA-2825, skip to *Installing FLEXI-Driver Software* below.

If you added one or two standard IDE or EIDE drives to the computer, follow these steps:

- 1 Enter the CMOS *setup* for your computer. See your computer documentation for details.
- 2 Specify drive type information (cylinders, heads, etc.) as required for your computer. See your computer and drive documentation for details.
- 3 Make sure the master standard IDE or EIDE drive is assigned to drive C for booting purposes.

If you removed an standard IDE or EIDE drive from your computer, enter the CMOS *setup* and specify that the drive is no longer installed. See your computer and drive documentation for details.

Using Disk Manager Software with Large Standard IDE or EIDE Drives

Due to a limitation caused by the combination of DOS and standard IDE/EIDE, you cannot access more than 528 MBytes on standard IDE or EIDE drives under DOS. Some standard IDE or EIDE drives over 528 MBytes support master/slave emulation and thereby produce two physical standard IDE or EIDE drives when this emulation is enabled.

However, other drives require a disk partitioning utility to access the additional space. If you have a standard IDE/EIDE drive larger than 528 MBytes, you should install the Disk Manager partitioning utility that is included with your AVA-2825. (Do not use any other disk partitioning utility!) Disk Manager works together with FLEXI-Driver, which is also included with the AVA-2825, to allow you to access all the disk space on your larger IDE/EIDE drives.



Caution: You *must* use the version of Disk Manager included with the AVA-2825. If an older version of Disk Manager is already installed on your computer, update it with this newer version. Otherwise, your IDE/EIDE disk drive may not operate reliably with the AVA-2825.

Before you use Disk Manager, consider the following items:

- When a standard IDE or EIDE drive over 528 MBytes is partitioned, the first partition is the physical standard IDE or EIDE device and the second or subsequent partitions become logical standard IDE or EIDE drives, controlled by drivers, not by the BIOS.
- If Disk Manager creates the first partition on the first IDE/EIDE drive, it automatically prepares this partition as the bootable drive *C*.
- After connecting SCSI disk drive(s) and installing EZ-SCSI *Lite*, logical devices *may* be reassigned the last drive letter, after physical disk drives in the computer. For example,

First standard IDE or EIDE partition (physical standard IDE or EIDE drive)	Drive C
First SCSI disk drive	Drive D
Second SCSI disk drive	Drive E
Second standard IDE or EIDE partition (logical standard IDE or EIDE drive)	Drive F

Follow these steps to install Disk Manager:



Caution: All data will be lost when the drive is partitioned. Back up all data on the disk before running Disk Manager.

- 1 Make a copy of the Disk Manager installation diskette and use this copy as your working diskette.
- 2 Insert the copy of the Disk Manager diskette in a floppy drive in your computer. Change to the drive letter where the diskette is inserted by typing **A:** or **B:** as appropriate and pressing **Enter**.
- 3 Type **dm** and press **Enter** to start the installation.
- 4 Follow the instructions that appear on the screen.

Disk Manager then partitions the disk, and performs a high-level format.

Other Disk Manager installation options are available. For more information, see the *FLEXI-Driver and Ontrack Disk Manager IDE/EIDE Hard Disk Software Installation Guide*.

Installing FLEXI-Driver Software

FLEXI-Driver is a device driver that allows you to easily use standard IDE or higher performance EIDE drives with your AVA-2825 host adapter. For both standard IDE or EIDE drives, FLEXI-Driver provides 32-bit transfers on the VL-Bus and provides a Windows driver that supports 32-bit disk accessing in Windows. For EIDE drives, FLEXI-Driver software automatically detects the drive's data transfer rates and configures data transfer between the computer and the drive according to this rate.

FLEXI-Driver supports DOS and Windows. The installation program installs the DOS driver and gives you the option of installing the Windows driver, if Windows is already installed. If Windows is installed in your computer, be sure to install the FLEXI-Driver for Windows; it increases performance on standard IDE and EIDE drives in Windows applications.

Follow these steps to install FLEXI-Driver:



Note: The AVA-2825 must be installed with your standard IDE or EIDE drive(s) connected to it, or FLEXI-Driver will not install.

- 1 Make a copy of Adaptec's FLEXI-Driver installation diskette and use this copy as your working diskette.
- 2 Insert the copy of FLEXI-Driver diskette in a floppy drive in your computer. Change to the drive letter where your diskette is inserted by typing A: or B: as appropriate and pressing **Enter**.
- 3 Type **install** and press **Enter** to start the installation.
- 4 Follow the easy onscreen instructions; steps a through e below briefly describe the installation. In most cases, you can accept the defaults suggested by *Install*. Press **F1** on any screen to

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view Help information. Press **Esc** to exit from a Help screen or to exit the *Install* program.

- a** The *Install* program scans your computer for an Adaptec standard IDE or EIDE controller. Controller information is then listed on the bottom of the screen. Press **Enter** to continue.
- b** The *Install* program scans your computer for standard IDE or EIDE drives and displays them at the bottom of the screen. To view information on a drive, select it and press the **Spacebar**. To continue with the installation press **Enter**.
- c** The *Install* program displays a screen allowing you to select the directory where FLEXI-Driver files will be copied to your hard disk.

Accept the default directory of *c:\flexidrv* or type in the directory you want. Press **Enter** to continue. The *Install* program creates the directory you specified, if it does not exist already, and copies the files into it.

- d** Another screen prompts you to approve modifications to your *config.sys* file. Select **Make all modifications for you** and press **Enter**. *Install* updates your *config.sys* file. The previous version is saved as *config.ide*.



Note: *Install* adds a line similar to the following to your *config.sys*. If you have a second standard IDE or EIDE drive connected, a parameter similar to */dtme=id* is added at the end of the line. *Do not* modify this parameter.

device=c:\flexidrv\flexidrv.sys /ctime=id

If you do not want your *config.sys* modified, select **Let you make the modifications later** and press **Enter**. *Install* saves a copy of the suggested modifications in *config.ide*.

- e The *Install* program prompts you to install FLEXI-Driver for Windows. Accept the default directory of *c:\windows* or type the full path name where Windows is located and press **Enter**. *Install* updates your *system.ini* file and saves the previous version as *system.bak*.
If you do not want to install FLEXI-Driver for Windows, press **Esc**. If Windows is not installed, you will not be able to install FLEXI-Driver for Windows; press **Esc**.
- 5 When *Install* is finished, remove the diskette from your floppy drive and reboot your computer by pressing **Ctrl-Alt-Del**.



•••• A Troubleshooting

About This Appendix

Read this appendix to find out

- How to use the troubleshooting checklist to diagnose problems that may occur when you install a host adapter in your system
- How to fix problems you may encounter
- How to resolve conflicts with other options

A-1

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SCSI Troubleshooting Checklist

The AVA-2820/2822/2825 host adapters have been tested for compatibility with popular SCSI devices. Most problems that might occur during installation can be traced to errors in preparing devices on the SCSI bus.

The following suggestions should help you to solve any problems you may encounter. If you need more help in getting the host adapter running properly, see *Adaptec Technical Support and Services* on page ii.

If a problem occurs during installation, check the following items first:

- All cables are properly connected. Check power, SCSI, floppy, and standard IDE or EIDE interface cables. See *Connecting SCSI Devices* on page 2-10, *Connecting Floppy Drives (AVA-2822/2825 Only)* on page 2-18, and *Connecting Standard IDE or EIDE Drives (AVA-2825 Only)* on page 2-21.

Connect internal peripherals to your computer's power supply; plug external peripheral power cables into a grounded line power outlet. Follow the instructions in the device's documentation.

- The host adapter is firmly seated and secured in a VL-Bus slot.
- The SCSI devices and host adapter are each set to a unique SCSI ID (0-7). See *Setting SCSI IDs* on page 2-17.
- Check SCSI bus termination—the ends of the SCSI bus must be terminated. See *Terminating the SCSI Bus* on page 2-15.

If your problem is still not resolved, continue with the next section.

SCSI Problems and Solutions

The screen is difficult to read when I run *SCSISelect*.

Press **F5** to toggle the display between color and monochrome modes. This may make the screen easier to read.

I installed the host adapter, and my computer will not boot from the SCSI disk drive. If both SCSI and non-SCSI disk drives are installed, then the non-SCSI disk drive is *always* the boot device. If you have the AVA-2825 installed with standard IDE or EIDE drives connected, your computer will boot from the standard IDE or EIDE drive. If your system has only SCSI disk drives, check the following:

- Make sure your computer system's CMOS *setup* is set to No Drives Installed, as is required for SCSI host adapters.
- Try setting the SCSI boot drive to SCSI ID 0. This is normally done by changing jumpers or switches on the drive. See *Setting SCSI IDs* on page 2-17.
- Make sure the SCSI bus is properly terminated. See *Terminating the SCSI Bus* on page 2-15.
- You may need to low-level format the SCSI hard drive. If so, first back up all data on the disk, then run the *Format Disk* utility accessible through *SCSISelect*. See *SCSI Disk Utilities* on page 3-12.

Similar low-level formatting utilities for removable-media devices are included in the Adaptec EZ-SCSI *Lite* software package for the DOS/Windows environment. Refer to *Additional Support Through Adaptec EZ-SCSI Lite* on page 1-5.

When I tried to use the format/verify utility on a disk device, I got an Unexpected SCSI Command Failure pop-up box with a lot of error information. What does this mean?

This probably means that the utility encountered a problem with the SCSI disk device or the media and therefore cannot run. The following information appears in the pop-up window:

- SCSI Target ID of the device
- SCSI CDB Sent (e.g., 2F 00 00 00 00 00 00 08 00 00)
- Host Adapter Status (e.g., 11h - Selection timeout)
- Target Status (e.g., 00h - Good status)

Troubleshooting

- Sense Key (e.g., 06h - Unit Attention)—You can probably determine from the Sense Key information both the cause of the problem and its solution. The following 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 the 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 media. If it is a hard disk drive, the disk may be physically damaged.

04h - Hardware error

The disk drive may be defective. Consult the device documentation and contact the manufacturer.

05h - Illegal request

The Adaptec formatting utility does not support a low-level format of this device; however, the device may already be low-level formatted by the manufacturer. (This error rarely occurs.)

06h - Unit Attention

The removable media may be write-protected. Remove write protection and run the utility again.

- Additional Sense Code—provides more information about the error. The meaning of these codes may be listed in your hardware manual.
- Additional Sense Code Qualifier

My computer locks up when I press Esc to exit SCSISelect.

Turn your machine OFF and then ON to reboot. If you saved the settings before you tried to exit the program, they have been registered in the EEPROM and are not lost.

One of the SCSI devices on my system does not allow termination to be disabled. How can I attach it to the SCSI bus?

Attach this device at the end of the SCSI bus so you do not need to disable termination on it. If this is not possible, contact the manufacturer about possible work-arounds.

Host Adapter Conflicts

I installed my host adapter at IRQ 12, and it does not work properly. What is wrong? Another device such as a mouse may be using IRQ 12. Change the adapter's IRQ to the default value (IRQ 11) or to another value that is not being used by another board in the computer. See *Configure/View Host Adapter Settings* on page 3-5.

I'm having problems with my host adapter; it is not working properly. You will encounter problems if your host adapter uses overlapping BIOS or SCSI I/O Port addresses. Change the Host Adapter BIOS Address through Switch Block S1. If this does not help change the SCSI I/O Port Address through J6. See *Setting Jumpers and Switches* on page 2-6.

BIOS Startup Messages

After you have successfully installed your host adapter, the host adapter BIOS displays a message when you boot your computer. Normally, this message lists the SCSI ID, manufacturer, model number, and other information for each SCSI device that has been successfully identified by the BIOS.

If an initialization failure occurs, the host adapter BIOS displays a specific error message followed by a BIOS Installation Failure message. The following lists some error messages and their meanings:

WARNING!!!

A drive larger than 1 gigabyte has been detected with 64 head / 32 sector partitioning. This drive is not compatible with the 255 head / 63 sector translation which has been enabled on this adapter. Data could be corrupted! Please check your system setup!

Press any key to continue.

This message only occurs if the Extended BIOS Translation is enabled in *SCSISelect Advanced Configuration Options*, and if a large capacity drive is found to have invalid partition information in the master boot record.

Extended BIOS Translation is used only with MS-DOS 5.0 or above. If you are running a larger than 1 GByte drive under MS-DOS 5.0 or above and this message appears, complete the following steps:

- 1 Run *SCSISelect* and set Extended BIOS Translation to **Disabled**. See *Advanced Configuration Options* on page 3-10.

- 2 Back up the data on the disk device, if you want to save it.



Caution: All data on the target drive will be lost when you run the *Format Disk* utility. Back up your data!

- 3 Perform a SCSI low-level format with the *Format Disk* utility under SCSI Disk Utilities. See *Format Disk* on page 3-13.
- 4 Run *SCSISelect* again and set Extended BIOS Translation to **Enabled**.
- 5 Partition the drive again.
- 6 Restore data to the disk device.

Time-out failure during SCSI Inquiry command!

or

Time-out failure during SCSI Test Unit Ready command!

The device did not respond to the SCSI command in the time allotted. Disconnect the SCSI peripherals from the host adapter and restart the computer; if the computer successfully starts, reconnect SCSI peripherals, check SCSI bus termination and cable connections carefully. If this does not resolve it, one of the devices on the SCSI bus may be defective.

Standard IDE or EIDE Problems and Solutions

Hardware

I connected two standard IDE or EIDE drives to the AVA-2825 and the system only sees one.

The first standard IDE or EIDE drive must be set up as the master drive and the second (if any) as the slave drive. The master drive must be assigned drive *C* in the CMOS *setup*. See your drive's documentation.

Some standard IDE or EIDE drives may not be compatible with each other in a specific configuration. If you install and configure your computer according to *Connecting Standard IDE or EIDE Drives (AVA-2825 Only)* on page 2-21 and Chapter 4, *Standard IDE or EIDE Configuration (AVA-2825 Only)*, and you still cannot access the standard IDE or EIDE drives, try the following options:

- Change the master standard IDE or EIDE drive to the slave, and the slave standard IDE or EIDE drive to the master, usually using jumpers or switches on the standard IDE or EIDE drives and using the CMOS *setup*. See your drive's and computer's documentation for details.



Note: Pay close attention to the jumper settings and/or switches on the drives.

- If the previous step did not work, disconnect one drive at a time from the standard IDE or EIDE ribbon cable. When either drive works correctly by itself, this probably indicates that the drives are incompatible with each other.

I am unable to get my SyQuest removable IDE drive to work properly when connected to the AVA-2825 host adapter.

AVA-2820/2822/2825 host adapters fully support SyQuest SCSI removable disk drives. However, the AVA-2825 does not support Syquest IDE removable disk drives. Contact the Adaptec BBS for a complete list of supported IDE devices.

Troubleshooting

I connected my Mode 1 IDE drive to the AVA-2825, and it is not performing as well as I expected.

IDE drives operate in a range of performance levels, and some drives report their mode incorrectly. For these reasons, Mode 1 and Mode 2 drives do not always perform as well as expected.

I installed two IDE drives on the AVA-2825 host adapter. Now a phantom partition which I cannot access appears on the second drive.

Remove the partition from the second drive. Then remove *flexidrv* (FLEXI-Driver) from the drive and reinstall Disk Manager.

I installed two EIDE drives on the AVA-2825, and I cannot access the second drive. Be sure that the *dmdrvr.bin* file is installed in *config.sys*. (This problem could only occur if the first drive is \leq 528 MBytes and the second drive is $>$ 528 MBytes.)

I installed my standard IDE or EIDE drive, and I cannot access more than 528 MBytes. Check your device documentation to see if the standard IDE or EIDE drive supports simultaneous master/slave emulation; if so, you may use this feature to emulate two physical standard IDE or EIDE drives. If the drive does not support emulation, use the Disk Manager partitioning utility to partition the drive. See *Using Disk Manager Software with Large Standard IDE or EIDE Drives* on page 4-4.

Software and Performance Problems

EIDE Disk performance seems unchanged after FLEXI-Driver installation

Verify that you have an EIDE drive; performance does not increase with standard IDE drives.

Verify that the command line device=c:\flexidrv\flexidrv.sys appears in the *config.sys* file by typing the following command at the DOS prompt. (The path listed in *config.sys* may be different if you changed the destination path during installation):

```
type config.sys
```

Next, change to the directory where FLEXI-Driver is installed and type this command to verify that the *flexidrv.sys* file is in that directory:

```
dir flexidrv.sys
```

If the line is missing from *config.sys* or the file is not in the directory, reinstall FLEXI-Driver from the floppy diskette as described in *Installing FLEXI-Driver Software* on page 4-6. FLEXI-Driver software must be installed from the floppy diskette for correct operation. If you simply copy the driver from the floppy disk to the hard disk the installation utility cannot evaluate your system configuration and set the appropriate driver features.

I tried to install FLEXI-Driver, but it would not install.

FLEXI-Driver installs only when it recognizes the AVA-2825 with one or two standard IDE or EIDE drives connected to it. Check to see that the requirements have been met for installing FLEXI-Driver. See *Installing FLEXI-Driver Software* on page 4-6.

My system hangs when I try to load FLEXI-Driver with turbo mode disabled.

Be sure to enable turbo mode before loading FLEXI-Driver.

I modified the FLEXI-Driver line in the config.sys and now my drive runs too slow.

We recommend that you *do not* change the FLEXI-Driver *config.sys* entry. Reinstall FLEXI-Driver.

My system hangs during startup after FLEXI-Driver software installation.

Try one of the following suggested fixes:

- FLEXI-Driver may not have installed properly. Reboot the system with a system diskette. Edit the *config.sys* file and delete the command line *device=c:\flexidrv\flexidrv.sys*. Then remove the floppy, restart the system, and reinstall the software.
- Your system may only support 16-bit operation with a 486SX, 486SLC, or 486SLC2 CPU. Using a system diskette, reboot the system. Edit the *config.sys* file and add the */io16* switch to the command line so that it reads as follows:

```
device=c:\flexidrv\flexidrv.sys /io16
```

Then remove the floppy diskette and restart the system.

- There may be a conflict with an existing local bus disk controller. For example, some VL-bus motherboards have a local bus IDE controller that cannot be disabled. Installing an alternate IDE controller into the VL-bus will cause a variety of operation and/or reliability problems. Review the computer documentation for a way to disable the existing controller.

The system reports a disk allocation problem (or equivalent) at bootup.

Try one of the following suggested fixes:

- Boot your system from a floppy diskette. In the *config.sys* move the command line *device=c:\flexidrv\flexidrv.sys* after any memory or disk management utility commands.
FLEXI-Driver may conflict with some versions of memory and disk management utilities. Typically this type of problem is easily solved by changing the order of the commands. The line that loads FLEXI-Driver *must* be placed after the line that loads Disk Manager. (The FLEXI-Driver *Install* program does this automatically.)
- The physical disk drive parameters as set in the BIOS are incorrect. Cross-check the disk drive parameters against the programmed BIOS values and make any necessary corrections. Some BIOS can auto-detect hard disk parameters.

Windows

Windows 3.1 does not load

For correct operation the Windows driver requires that the DOS driver be previously loaded. If the *system.ini* file was updated during installation but the *config.sys* file was not, Windows will not load. Also, if the *device=c:\flexidrv\flexidrv.sys* command in the *config.sys* is later removed or commented out, Windows will not load. Try one of the following suggested fixes:

- Verify that the command line *device=c:\flexidrv\flexidrv.sys* appears in the *config.sys* file by typing the following command at the DOS prompt. (The path listed in *config.sys* may be different if you changed the destination path during installation):

```
type config.sys
```

Next, change to the directory where FLEXI-Driver is installed and type this command to verify that the *flexidrv.sys* file is in that directory:

```
dir flexidrv.sys
```

If the line is missing from *config.sys* or the file is not in the directory, reinstall FLEXI-Driver from the floppy diskette as described in *Installing FLEXI-Driver Software* on page 4-6.

- Make sure that the following lines are in the [386Enh] section of your *system.ini* file and that the device=*&wdctrl line is commented out:

```
32BitDiskAccess=On  
device=c:\windows\system\flexidrv.386
```

- If the changes are correct as described, and Windows still does not load properly, edit the *system.ini* file and reverse the changes to enable the standard Windows operating mode.

When I start Windows with 32-bit access enabled, I get an "Insufficient Memory" message, and the system returns to the DOS prompt.

For correct 32-bit operation, Windows requires that the *flexidrv.386* driver be active. During installation, if for some reason the *config.sys* file was updated with the device=c:\flexidrv\flexidrv.sys command, but the *system.ini* file was not updated with the *flexidrv.386* driver, then Windows reports this error.

Try one of the following suggested fixes:

- Use the DOS dir command to verify that the *flexidrv.386* file is located in the Windows *system* subdirectory.
- Make sure that the following lines are in the [386Enh] section of your *system.ini* file and that the device=*&wdctrl line is commented out:

```
32BitDiskAccess=On  
device=c:\windows\system\flexidrv.386
```

If either of these items are missing, reinstall FLEXI-Driver from the floppy diskette or make the necessary changes with a text editor.

- Windows operates properly with its standard 16-bit driver. To set this mode, change the disk access control to off by changing the line as follows:

```
32BitDiskAccess=off
```

Troubleshooting

My standard IDE (or EIDE) drive runs very slowly under Windows.

Be sure that FLEXI-Driver for Windows is installed. If it is installed, be sure that the following lines are in the [386Enh] section of your *system.ini* file and that the device= *wdctrl line is commented out:

```
32BitDiskAccess=On  
device=c:\windows\system\flexidrv.386
```



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..... **B** Large SCSI Disk
Drive Support

About This Appendix

Read this appendix to find out

- An overview of Extended BIOS Translation and the DOS 1 GByte limit for SCSI drives
- When to use the Extended BIOS Translation feature
- Questions and answers about Extended BIOS Translation

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Extended BIOS Translation

As SCSI disk drives have recently grown beyond 1 GByte in formatted capacity, they have run up against the DOS cylinder limit. All current versions of DOS are limited to 1024 cylinders per drive. The standard translation scheme for SCSI host adapters, using 64 heads and 32 sectors, provides a maximum accessible capacity of 1 GByte.

To eliminate the 1 GByte limit, Adaptec's Extended BIOS Translation feature uses 255 heads and 63 sectors, extending the disk drive capacity limit under DOS to 8 GBytes. To enable this feature, refer to *Advanced Configuration Options* on page 3-10.



Caution: If you have already partitioned a large disk drive with one translation method, conversion to another method will erase your data. Be sure to back up your disk drive prior to any change in the translation method used.

Using Extended BIOS Translation

With SCSI Disk Drives Only

The Extended BIOS Translation feature on the AVA-2820/2822/2825 works with SCSI disk drives only. For standard IDE or EIDE drives, see *Using Disk Manager Software with Large Standard IDE or EIDE Drives* on page 4-4.

With MS-DOS 5.0 and Above

The Extended BIOS Translation feature works with DOS 5.0 and above. Adaptec does not provide drivers for other operating systems for the AVA-2820/2822/2825 host adapters; however, due to our extensive relationships with other companies, many Adaptec products are recognized by many operating systems.



Caution: *Do not* enable the Extended BIOS Translation feature in non-DOS environments.

With Mixed Partition Drives

Do not use Extended BIOS Translation on drives formatted with two or more partitions for different operating systems. Use standard translation because the sum of the DOS partitions will be less than 1 GByte. Partitions for UNIX and NetWare can be larger than 1 GByte when using standard translation. UNIX is understood to be AT&T/USL all versions, SCO v3.2.4 (or later), ISC v3.0 (or later), and Novell UnixWare v1.0 (or later).

Using fdisk

To install a new disk, or to repartition an existing disk, use the *fdisk* DOS utility as you normally would. The cylinder size increases to 8 MBytes when you enable Extended BIOS Translation. The size of the partition you request must therefore be a multiple of 8 MBytes. If you request a partition size that is not a multiple of 8 MBytes, *fdisk* rounds up to the nearest whole multiple of 8 MBytes.

Questions and Answers About Extended BIOS Translation

What happens if I enable Extended BIOS Translation with SCSI drives that are less than 1 GByte in capacity?

Drives handled by the BIOS will use Extended BIOS Translation provided they are over 1 GByte in formatted capacity. Drives with less than 1 GByte of formatted capacity will use standard translation regardless of whether Extended BIOS Translation is enabled.

What if I have more than two SCSI hard disk drives on the host adapter?

You can use up to two physical hard disk drives under the BIOS (this includes standard IDE or EIDE and SCSI hard disk drives). To support more SCSI devices, load EZ-SCSI *Lite*.



..... **C** Floptical Drive Support

About This Appendix

Read this appendix to find out

- How the host adapter supports Floptical drives
- Floptical drive assignment
- Necessary formatting utilities

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Floptical and Floppy Device Support

Floptical drives are only supported by the DOS (3.0 and above) and Windows (3.0 and above). Floptical support for the host adapter BIOS is enabled with *SCSISelect*, see *BIOS Support for Floptical Drives* on page 3-12 for instructions.

The AVA-2820/2822/2825 BIOS supports standard 3.5-inch VHD (Very High Density) 21 MByte Floptical diskettes, without requiring driver software. The 3.5-inch Floptical drives also support 720 KByte and 1.44 MByte diskettes.

The AVA-2820/2822/2825 host adapter supports two Floptical drives connected to the SCSI bus. However, since Floptical drives are interpreted by the computer as floppy devices, only four floppy devices may be installed and used in your computer. You may choose your own mix of standard floppy drives, floppy tape drives, and Floptical drives, up to four drives. That is, if you already have two standard floppy drives, you can install a floppy tape and a Floptical drive, or two Floptical drives, for a total of four floppy devices.

Floptical Installation

Follow the regular SCSI peripheral device installation instructions in Chapter 2, *Installation*. Floptical drives are SCSI devices and are installed in the same way as other SCSI devices.

The AVA-2820/2822/2825 allows you to install Floptical drives at any available SCSI ID.

Floppy Device Drive Assignment

Since Floptical drives are similar to floppy drives, Drives *A* and *B* in the DOS environment may be assigned to either standard floppy drives or Floptical drives. Drive assignments vary, however, according to DOS versions. In general, versions of DOS prior to 5.0 map third and fourth floppy devices *before* hard disk drives. DOS 5.0 and later map third and fourth floppy drives after the hard disk drives.

A Floptical drive may be configured as the bootable *A* drive, with a standard (non-SCSI) floppy drive installed as floppy *B*. This is possible only if your system CMOS *setup* utility allows you to configure a standard floppy as *B* without setting a standard *A*. See your computer documentation for details on configuring CMOS *Setup*.

VHD Format

A special VHD formatting utility is necessary to format Floptical diskettes. See your Floptical drive manufacturer or dealer for such a utility.

Adaptec provides this kind of utility in the standard Adaptec EZ-SCSI software package; it is called *vhdfmt.exe*. *vhdfmt.exe* is a DOS application program that performs low-level formatting, partitioning, and high-level formatting of Floptical VHD diskettes. Call Adaptec if you want to upgrade your EZ-SCSI *Lite* software to EZ-SCSI, see page ii for the telephone number.

The SCSISelect SCSI Disk Utilities Format Disk option may also be used to low-level format VHD diskettes.



▼▼▼▼ Glossary

A

Adaptec EZ-SCSI

A software program that automatically configures your computer to use the Adaptec SCSI host adapter and SCSI devices connected to it. EZ-SCSI copies applications and device drivers to the computer's hard disk drive. In nearly every case, the computer and SCSI devices are configured correctly when the default values are accepted.

Advanced SCSI Programming Interface
See ASPI.

AIC-6260/6360

Adaptec's SCSI protocol chip, which provides an interface between the ISA bus and the SCSI bus.

ASPI

Advanced SCSI Programming Interface. A standard SCSI software interface that acts as a liaison between host adapters and SCSI device drivers. ASPI enables host adapters and device drivers to share a single SCSI hardware interface.

ASPI Manager

A software module that provides an interface between ASPI modules, a host adapter(s), and the SCSI devices connected to the adapter. A single ASPI

manager can handle multiple I/O requests from multiple ASPI modules. ASPI managers are written for a specific operating system—such as DOS, OS/2, or NetWare—and a specific family of host adapters.

Asynchronous Data Transfer

A method of transferring data over the SCSI bus. In an asynchronous data transfer, bytes are sent in irregular intervals. Start and stop bits are used to signal the beginning and end of bytes. Asynchronous data transfer is slower than synchronous data transfer and is not affected by external timing constraints, such as cable length and circuit response time.

AT Bus

See ISA.

AVA-2820/2822/2825

A family of high-performance Adaptec host adapters designed for computers with a VESA local bus (VL-Bus). The AVA-2822 and AVA-2825 have a floppy disk controller.

B

BIOS

Basic Input/Output System. Software coded into computer chips for various purposes. The BIOS on the motherboard of a

Glossary-1

computer is the special program used to boot and control the computer. Most Adaptec host adapters include an onboard BIOS that initializes the SCSI bus, runs bootup diagnostics, and performs other functions.

BIOS Address

The address in computer memory where the host adapter BIOS code is stored when you boot the computer.

Bus

A pathway for data in a computer. All computers have an expansion bus which is designed to accept add-on (expansion) devices, such as modems, sound cards, and video adapters. Expansion devices use the bus to send data to and receive data from the computer's CPU or memory. ISA, EISA, Micro Channel, VL-Bus, and PCI are the major bus standards used in computers.

Bus Device Reset

A SCSI message that clears all pending activity in the SCSI peripheral device to which it is addressed.

Byte

An 8-bit unit of data. A byte is normally the smallest addressable unit of memory and the smallest unit of data transfer on the SCSI bus.

C

CD-ROM

Compact Disk Read Only Memory. A high-capacity disc medium for storing data files and software programs. Like the audio CDs used in consumer CD players, the data on CD-ROM discs cannot be changed once it is encoded. A single CD-ROM can hold 600 MBytes or more of data.

CD-ROM Drive

A disk device used to retrieve data and software programs from CD-ROMs (compact disks) for use on computer systems. Some CD-ROM drives are installed internally in the computer case, others are used as external devices. Most CD-ROM drives can also play audio CDs.

Central Processing Unit

See CPU.

Conventional Memory

The first 640 KBytes of computer memory. DOS uses this memory area to run software applications.

CPU

Central Processing Unit. The microprocessor chip that provides the actual computational power of a computer. The 386 and 486 are widely used types of CPUs.

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Cylinder

A pair of tracks that lie over each other on the opposite sides of a disk. The heads in a disk device can write data to the tracks in a cylinder without moving. Cylinders are arranged in concentric circles radiating from the center of the disk device.

D

Data Mode

For CD-ROM drives, the mode of operation in which data is read from the CD-ROM disc.

Device Driver

A software program that enables a computer to communicate with peripheral devices, such as hard disk drives and CD-ROM drives. Each type of device needs a different driver. Device drivers are stored on a computer's hard disk and are typically loaded into memory at boot time.

Differential SCSI

A hardware standard for connecting SCSI devices. Differential signals allow the SCSI bus to operate reliably over greater distances than single-ended signals. Differential SCSI uses two wires per signal, which decrease noise on the SCSI bus and allows the SCSI bus to be up to 25 meters long. (The maximum bus length for single-ended SCSI is 3 meters.)

Disconnect/Reconnect

Disconnect occurs when a target releases control of the SCSI bus, allowing the bus to go to the Bus Free phase. Reconnect occurs when a target selects an initiator to continue an operation after a disconnect. This feature allows the device to use the SCSI bus while other devices prepare to transfer data or complete commands.

DOS

Disk Operating System. An operating system developed by Microsoft Corporation for use with their x86 family of processors. DOS is used on most personal computers.

DOS Partition

A section of a disk storage device, created by the DOS *fdisk* program, in which data and/or software programs are stored. Computers have a primary DOS partition that contains the special files needed to boot the computer. A computer's disk devices may also have extended DOS partitions. Each DOS partition is assigned a unique drive letter, such as *C* or *D*. A single disk device can have multiple partitions.

Double Buffering

A feature of the Windows SMARTDrive utility. The Windows setup program usually enables SMARTDrive's *double buffering* option if it detects a SCSI disk drive in your

computer. Double buffering means that the driver keeps one data buffer in the area between 0 KByte and 640 KBytes (for compatibility with older disk drive software) and another identical buffer in the memory area above 1 MByte.

Driver

See Device Driver.

E

ECU

EISA Configuration Utility. The configuration program included with all EISA class computers that allows you to configure the computer's motherboard and option boards.

EEPROM

Electrically-Erasable Programmable Read Only Memory. An integrated circuit typically used to store configuration information. Some host adapters have an EEPROM that contains configuration information entered via the SCSISelect utility. The data stored in an EEPROM can be updated while it is installed in the host adapter.

EIDE (Enhanced IDE)

An enhanced higher performance version of IDE. PIO Modes 1 through 5 are supported in the specification. See IDE for more details.

EISA

Extended Industry Standard Architecture. A kind of computer bus. EISA, an extension of the 16-bit ISA bus standard, allows expansion devices like network cards, video adapters, and modems to transfer data across the computer bus 32 bits at a time.

EISA Configuration

The operation that occurs when the host configures a device on the EISA bus by changing values in the device's registers. This replaces the method of using jumpers commonly found on ISA bus devices.

EPROM

Erasable Programmable Read Only Memory. An integrated circuit used to store the host adapter BIOS and firmware. EPROMs can be erased by exposure to ultraviolet light and then reprogrammed with different data.

External SCSI Device

A SCSI device such as a hard disk drive or tape drive installed outside the computer case. External SCSI devices are connected to the SCSI bus with round cables that have layered twisted pair assemblies with electrical shielding.

EZ-SCSI

See Adaptec EZ-SCSI.

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F

Fast SCSI

A SCSI standard that allows data to be transferred at up to 10 MBytes/sec on an 8-bit SCSI bus and up to 20 MBytes/sec on a 16-bit (Wide) SCSI bus. The Fast SCSI bus is limited to 3 meters of cable.

FAT

File Allocation Table. A table, stored on disk media, that DOS uses to locate the blocks in which it writes data to a disk. A single computer file, such as a text file, is usually broken up in segments and stored in various locations on the disk. DOS needs to read the FAT in order to find these segments when the file is retrieved.

File Allocation Table

See FAT.

Firmware

A computer chip on which is embedded special permanent codes or software. It is called *firm* as opposed to *soft* because the information is designed into the chip and cannot be modified by the user. A host adapter BIOS is firmware.

Floppy Format

A type of formatting used with removable media. Floppy formatting causes removable media to be treated as a very large floppy disk. You cannot create

DOS partitions on the media if you use this format.

G

GByte

Gigabyte. A measure of computer storage. One GByte equals 1,073,741,824 bytes. (A byte is the amount of storage needed to hold one character.)

H

High Memory

See Upper Memory Block.

High Sierra Format

The de facto standard for CD-ROM file-format structure. This standard enables a high degree of intersystem compatibility for CD-ROM disks.

Host

A microcomputer system in which a SCSI host adapter is installed. The host uses software to request the services of the host adapter in transferring information to and from peripheral devices attached to the host adapter.

Host Adapter

A printed circuit board or integrated circuit that installs in a standard microcomputer system and provides a SCSI bus connection so that SCSI devices can be connected to the microcomputer.

Host Adapter BIOS

See BIOS.

I

IBM PC-AT Compatible

Any computer that emulates exactly the IBM PC-AT and uses an ISA backplane bus.

ICU

ISA Configuration Utility. This utility helps users to determine optimal configurations. The ICU is for use on ISA systems only.

IDE

A bus interface standard that defines physical and electrical characteristics for hardware devices. IDE provides a standard interface that enables hard disk devices to interface with the host computer. PIO Mode 0 is supported.

Industry Standard Architecture

See ISA.

Initiator

A SCSI device that requests an operation to be performed by another SCSI device (the target). The initiator provides all the command information and parameters required to perform the operation, but the target carries out the details of the operation. The host adapter is usually called the initiator; other devices on the SCSI bus, such as disk drives, are called SCSI targets.

Internal SCSI Device

A SCSI device such as a hard disk drive or a CD-ROM drive installed inside a computer case. Internal SCSI devices are connected to the SCSI bus with a flat ribbon cable.

Interrupt Request Channel

See IRQ.

IRQ

Interrupt Request Channel. An electrical channel through which a hardware device can send a message to get the immediate attention of the computer's CPU.

ISA

Industry Standard Architecture. The type of computer bus used in most computers. An ISA bus enables expansion devices like network cards, video adapters, and modems to send data to and receive data from the computer's CPU and memory either 8 bits or 16 bits at a time. Expansion devices are plugged into sockets in the computer motherboard. ISA is sometimes called the *AT bus*, because it was first used in the IBM PC-AT.

ISO 9660

A standard for CD-ROM file-format structure used by most producers of CD-ROM disks. This standard is based on the High Sierra format, with minor modifications.

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J

Jumper Shunt

A small removable metal and plastic device used to make an electrical connection between pairs of metal pins on a jumper block. You can install a jumper shunt on a jumper block to enable or disable certain features of a host adapter or some other device.

K

KByte

Kilobyte. A measure of computer storage. One KByte equals 1024 bytes. (A byte is the amount of storage needed to hold one character.)

L

Local Bus

An internal control path in a computer which connects peripherals, like video boards or disk drives, directly to a computer's CPU and memory. Local buses bypass the slower ISA and EISA expansion buses and allow much faster data transfer rates. VL-Bus is an example of local bus standards.

Logical Drive

A computer disk storage device that can be addressed as a specific drive letter, such as *C* or *D*. A single physical disk device, such as a hard disk drive, can be partitioned into two or more

logical drives with different drive letters.

Logical Unit

A device that is addressed when an initiator (usually the host adapter) sends a Read or Write command to a target. For example, a tape drive is a target and the tape cartridge in the drive is the Logical Unit (LU). Most SCSI targets have only one LU; a single SCSI target can have up to eight LUs.

Logical Unit Number

An encoded 3-bit identifier for a Logical Unit.

LU

See Logical Unit.

LUN

See Logical Unit Number.

M

Manager

See ASPI Manager.

MByte

Megabyte. A measure of computer storage. One MByte equals 1,048,576 bytes. (A byte is the amount of storage needed to hold one character.)

Microsoft CD-ROM Extensions

A software program (file name *mscdex.exe*) from Microsoft that enables a computer system to recognize a CD-ROM drive as a single logical drive letter under DOS.

Motherboard

The main printed circuit board in a computer. The motherboard normally contains the computer's CPU, memory chips, expansion bus, and other important components. It also has expansion slots in which host adapters and other expansion boards can be inserted.

Multisession

A CD-ROM drive that is multisession capable can read CD-ROMs containing data written in more than one session. For example, if you have 36 photographic exposures stored on a photo CD and later add 36 more exposures from another roll of film, you must have a multisession capable CD-ROM drive in order to read all 72 photos.

Multitasking Operation

The execution of commands in such a way that more than one command is processed at the same time. Multitasking allows a computer to overlap activities by using resources that are temporarily not required for other operations. This means that multiple programs or portions of programs may be operating in parallel.

Multithreaded I/O

A method by which data is accessed simultaneously from multiple SCSI devices to increase a computer's data transfer rate. For example, if the

computer needs data from two disk devices it requests data from the first device, which temporarily disconnects from the SCSI bus while it is seeking the data. During this delay the computer requests data from the second device, and while that device disconnects from the bus to seek the data, the first device starts sending the requested data over the bus, etc.

O

Operating System

The software that controls the basic operation of the host computer. Examples are MS-DOS, UNIX, and Netware.

OS

See Operating System.

P

Parity Checking

A SCSI feature used to verify whether data has been transmitted correctly over the SCSI bus. A check bit is added to each byte of data to make the sum of all the 1 bits either odd or even, depending on the protocol. If the sum of the bits is even when it should be odd, or vice-versa, data has been corrupted and an error message appears.

Partition

See DOS Partition.

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Glossary

PC-AT

A family of small computers sold by IBM, also called the Personal Computer-AT family of computers. The name is trademarked by IBM.

Peripheral Device

Any optional input or output device, such as a printer or CD-ROM drive, that connects to a computer's CPU. For SCSI peripherals this connection is made via the SCSI bus.

Photo CD

An application of CD-ROM technology developed by Kodak that allows you to compress and store many high-quality photographs digitally on a single CD-ROM disk. The photographic images can then be displayed on a television or on a computer screen where, with the appropriate graphics software, they can be cropped, rotated, and edited in other ways.

Pin-1 Orientation

The orientation of pin 1 on a SCSI cable relative to the pin-1 position on the connector into which it is plugged. The SCSI bus does not work properly if this orientation is reversed. Correct pin-1 orientation is automatic with external SCSI connectors because they can only be plugged in one way. It is possible, however, to accidentally reverse the pin-1 orientation of internal SCSI cables.

PIO

See Programmed Input/Output.

Port Address

Or *I/O Port Address*. A window through which software programs send commands to the host adapter board.

Programmed Input/Output

A method of data transfer in which the host microprocessor transfers data to and from memory. PIO enables very fast data transfer rates, especially in single-tasking operating systems like DOS.

R

RAM

Random Access Memory. Memory of which any byte can be accessed directly in a single memory cycle. Information can be read from and written to the memory.

Removable Media

Disk media such as the cartridges used with Iomega Bernoulli drives that can be removed from a disk drive after data is copied to them. The media can then be stored or can be inserted in another removable disk drive.

ROM

Read-Only Memory. Memory in which any byte can be read but not written.

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S

SCSI

Small Computer Systems Interface. A bus interface standard that defines physical and electrical characteristics for hardware devices. (The original SCSI standard is sometimes called SCSI-1.) SCSI provides a standard interface that enables many different kinds of devices, such as disk drives, magneto-optical disks, CD-ROM drives, and tape drives to interface with the host computer.

SCSI-2

A computer bus interface standard that adds features to the SCSI-1 standard. Included among these features are 32-bit data transfer, command queuing, Fast SCSI, and support for a wider variety of peripheral devices.

SCSI Bus

One or more SCSI peripheral devices and a host adapter, connected by cables in a daisy-chain configuration. The bus may include both internal and external SCSI devices. In a computer with two or more host adapters, each adapter has its own separate SCSI bus.

SCSI Device

A device such as a host adapter, hard disk drive, or CD-ROM drive that conforms to the SCSI interface standard and is attached to a SCSI bus cable. The

device may be an initiator, a target, or capable of both types of operation.

SCSI ID

A unique identifier assigned to SCSI devices that enables them to communicate with a computer when they are attached to a host adapter via the SCSI bus. Each SCSI host adapter board has eight available SCSI IDs with the numbers 0 through 7 (or 0 through 15 for Wide SCSI adapters). Usually the host adapter itself is assigned SCSI ID 7, and hard disk devices are assigned to SCSI IDs 0 and 1.

Setup Program

A CMOS-resident configuration utility built into most computers that is used to configure the computer's motherboard and option boards. You typically run the *Setup* program after you install new peripherals, upgrade the computer memory, etc. Configuration information is stored in an EEPROM which retains the data when the computer power is turned OFF. Adaptec's *SCSISelect* utility is a setup program included with many Adaptec host adapters.

Single-ended SCSI

A term referring to the electrical characteristics of the signals used on the SCSI bus. Single-ended signals occupy a single conductor. Single-ended SCSI references each signal to a

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common ground carried on the cable between the attached SCSI components. Most SCSI devices use *single-ended* grounding. Single-ended is less expensive than differential SCSI and allows a maximum bus length of 3 meters.

Single-threaded Operation

A mode of computer operation in which only one program or process can operate or be active at any time. The computer must wait until all resources are available before starting an operation, and it cannot start another operation until the first one is completed.

Small Computer Systems Interface
See SCSI.

Synchronous Data Transfer

A high-speed data transfer method in which data on the SCSI bus is clocked with fixed-length, fixed-frequency strobe pulses. The acknowledgments may be delayed several clock periods from the data requests. Synchronous data transfer can be used only for data transmission on the SCSI bus. It cannot be used for Command, Message, and Status transmission.

Synchronous Data Transfer Negotiation
The process in which the host adapter and the peripherals on the SCSI bus negotiate the data transfer frequency and the delay between requests and acknowledgments. This

negotiation process is required for synchronous data transfer.

T

Target (or Target Device)

A SCSI device that performs an operation requested by an initiator. The initiator is usually the host adapter. The target may be a peripheral device such as a disk drive performing a data transfer for an initiator.

Termination

A physical requirement of the SCSI bus. The devices at the physical ends of the SCSI bus must have terminating resistors either installed or enabled; devices in the middle of the bus must have terminating resistors either removed or disabled. Proper termination allows electrical signals to be transmitted reliably on the SCSI bus.

U

UMB

See Upper Memory Block.

Upper Memory Block

A block of available memory in the area of a computer's memory between 640 KBytes and 1 MByte. If you have a 386 or 486 computer you can load software programs such as Adaptec's ASPI managers and ASPI modules in upper memory blocks. This frees up more conventional memory for other programs to

run and generally improves system performance.

V

VESA

Video Electronics Standard Association. An international, non-profit organization of computer equipment and software manufacturers that defines and promotes video standards for the VL-Bus technology.

VL-Bus

VESA Local Bus. A local bus technology that allows hard disk drives, video cards, and other peripherals to send data directly to and receive data directly from the computer's CPU. This is much faster than transferring data on the computer's ISA or EISA bus.

Volume Label

A name that you can assign to any disk device or disk media by using the DOS label command. Volume labels can be up to 11 characters long.

W

Word

A 2-byte (16-bit) unit of data.

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