

AHA-2940UW/OF and AHA-2944UW/OF

PCI to *Ultra*SCSI Host Adapters for Open
Firmware Systems



Adaptec, Inc.
691 South Milpitas Boulevard
Milpitas, CA 95035

© 1998 Adaptec, Inc.
All rights reserved. Adaptec, and the Adaptec logo are
trademarks of Adaptec, Inc. which may be registered in
some jurisdictions.

Printed in Singapore
STOCK NO.: 511612-00, Rev. A KL 3/98

•••• AHA-2940UW/OF and
AHA-2944UW/OF
Open Firmware

User's Guide

Copyright

© 1998 Adaptec, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written consent of Adaptec, Inc., 691 South Milpitas Blvd., Milpitas, CA 95035.

Trademarks

Adaptec, the Adaptec logo, AHA, PowerDomain, and SCSISelect are trademarks of Adaptec, Inc. which may be registered in some jurisdictions.

All other trademarks are owned by their respective owners.

Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, Adaptec, Inc. assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein.

Adaptec reserves the right to make changes in the product design without reservation and without notification to its users.

Adaptec Technical Support and Services

If you have questions about installing or using your Adaptec product, 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:

Electronic Support

Technical information, including product literature, answers to commonly asked questions, information on software upgrades and other topics is available electronically through the following:

- Adaptec World Wide Web (WWW) site at <http://www.adaptec.com>.
- File Transfer Protocol (FTP) server at [ftp.adaptec.com](ftp://ftp.adaptec.com).
- Adaptec USA Bulletin Board Service (BBS) at 408-945-7727; supports up to 28,800 bps (bits per second), 8 data bits, 1 stop bit, no parity. No product literature is available on the Adaptec BBS.
- Interactive Fax System at 303-684-3400; available 24 hours a day.

Technical and Product Support

- For technical support and information about many of Adaptec's electronic support services, call 800-959-7274 or 408-945-2550, 24 hours a day, 7 days a week.
- To use the Adaptec Interactive Support System, call 800-959-7274 or 408-945-2550, 24 hours a day, 7 days a week. The system prompts you with questions regarding your problem and then provides step-by-step troubleshooting instructions.
- To speak with a product support representative, call 408-934-7274, M-F, 6:00 A.M. to 5:00 P.M., Pacific Time. After hours, on weekends, and on holidays, product support is also available for a fee at 800-416-8066.

Sales and Ordering Information

- For sales information, call 800-959-7274 or 408-945-2550, M-F, 6:00 A.M. to 5:00 P.M., Pacific Time.
- To order Adaptec software and SCSI cables, call 800-442-7274 or 408-957-7274, M-F, 6:00 A.M. to 5:00 P.M., Pacific Time.
- To request additional documentation for Adaptec products, call 800-934-2766 or 510-732-3829, M-F, 6:00 A.M. to 5:00 P.M., Pacific Time.

Federal Communications Commission Radio Frequency Interference Statement

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

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

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Compliance Statement

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

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

▼▼▼▼ Contents

1 Getting Started

- Supported Platforms 1-1
- Audience 1-1
- Document Overview 1-2
 - Organization 1-2
 - Conventions 1-2
 - Notes, Cautions, and Warnings 1-3

2 Installation

- Board Layout 2-2
- Inserting the Host Adapter 2-3
- Installing SCSI Devices 2-4
 - Internal SCSI Devices 2-5
 - External SCSI Devices 2-8
- Installing the Device Driver (Version 2.0 or Later) for Solaris/SPARC 2.5.1 or 2.6 2-9
 - Installation from a Floppy Disk 2-9
 - Installation from the Adaptec Web Site 2-10
- Configuring SCSI Devices 2-11
- Troubleshooting Checklist 2-12

3 Using SCSISelect

- Selecting a Single-Chip Host Adapter with the P1275 User Interface 3-1
- Executing the SCSISelect Utility 3-2
- Using the Configure/View Host Adapter Settings 3-3
 - Configuring SCSI Channel Interface Definitions 3-6
 - SCSI Device Configuration 3-8
 - Advanced Configuration 3-9

- Using the SCSI Disk Utilities 3-10
 - Using the Verify SCSI Disk Media Utility 3-12
 - Using the Format SCSI Disk Utility 3-13

A Default Device Configuration Data Settings

- Initial Program Load Data File (ipldata.fc) A-1
- Initial Program Load Data Settings A-1
 - SCSI ID Configuration Flags A-1
 - BIOS Control A-2
 - Host Adapter Control A-3
 - Host Adapter SCSI ID A-3
 - Bus Release Time A-3
 - Maximum # of Devices A-3
- Reset Initialization Default Data Adjustments A-4
 - SCSI ID Configuration Flags A-4
 - Host Adapter Control A-4
 - Maximum # of Devices A-5
- Adjusted Default Data Settings A-5
 - AHA-2940UW A-5
 - AHA-294XUW A-5

Index

Getting Started

The AHA[®] -2940UW/OF and AHA-2944UW/OF Open Firmware host adapters provide powerful features to your Solaris/UltraSPARC workstation. Your new SCSI (Small Computer System Interface) host adapter features

- Fast, reliable data transfer among the SCSI devices connected to it
- A configurable control utility that enables you to easily change SCSI-related settings directly from your desktop

The AHA-2940UW/OF supports single-ended SCSI devices; the AHA-2944UW/OF supports differential SCSI devices.

Supported Platforms

The AHA-2940UW/OF and AHA-2944UW/OF host adapters are designed for UltraSPARC workstations and servers with PCI which support the IEEE 1275 Open Firmware standard.

Audience

This publication is written for IS Managers and experienced users who are familiar with SCSI device configuration and who have a general understanding of Solaris/UltraSPARC workstations with PCI.

Document Overview

This section covers the structure of this users guide, typographical conventions, and notes, cautions, and warnings.

Organization

This chapter provides an overview of this user's guide and explains the typographical conventions and symbols used.

Chapter 2, *Installation*, describes how to install the AHA-2940UW/OF and AHA-2944UW/OF host adapters, SCSI devices, and device drivers.

Chapter 3, *Using SCSISelect®*, contains instructions for using the *SCSISelect* utility.

Appendix A, *Default Device Configuration Data Settings* provides device configuration settings.

Conventions

The following typographic conventions are used in this user's guide:

bold	Used for keystrokes (press the Enter key) and for options you are directed to select from a menu or list (select Refresh Display from the Controller menu).
Helvetica	Used for commands (container break) and system messages (Controller I/O has been paused...).

Notes, Cautions, and Warnings

Always use care when handling any electrical equipment. To avoid injury to people or damage to equipment and data, be sure to follow the cautions and warnings in this document.



Note: Notes are reminders, tips, or suggestions that may simplify the procedures included in this document.



Caution: Cautions alert you to actions that could cause damage to your system or your data.



WARNING: Warnings alert you to actions that could cause injury to you or someone else.

Adaptec does not claim to have included in this document every condition or situation that may require a caution or warning notice. Be sure to consult the documentation for your computer and any connected equipment when you are installing the equipment or changing its configuration.



WARNING: *Always* use caution when handling electrical equipment!



Installation

This chapter explains how to install AHA-2940UW/OF and AHA-2944UW/OF hardware and device drivers.



WARNING: Before you begin installation, turn OFF power to the computer and peripheral devices and disconnect the power cords.

Board Layout

The AHA-2940UW/OF host adapter supports single-ended SCSI devices. The AHA-2944UW/OF host adapter supports differential SCSI devices. The diagrams below identify the SCSI connectors on each host adapter.

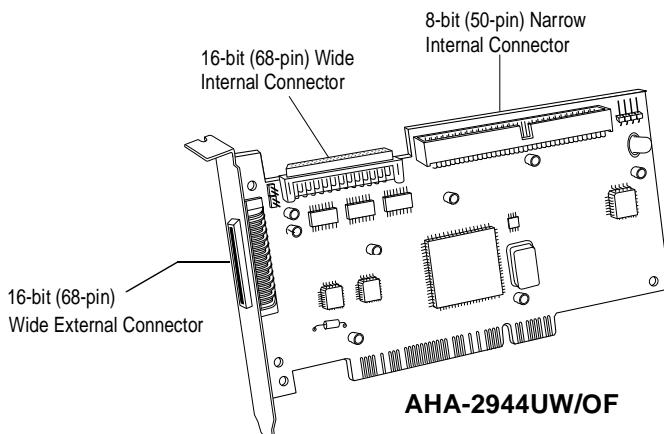
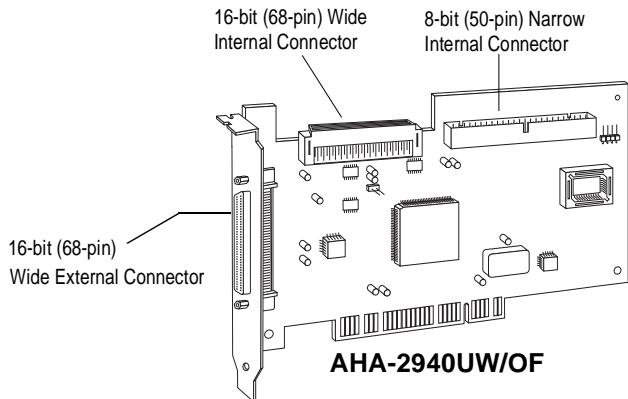


Figure 2-1. AHA-2940UW/OF and AHA-2944UW/OF Board Locations



Note: For detailed information on mixing wide and narrow SCSI devices, refer to the Adaptec web site *Connecting 8-Bit and 16-Bit Devices to an Adaptec Wide Host Adapter* at <http://www.adaptec.com/cables/>

Inserting the Host Adapter

- 1 Remove the cover from the computer case. (If necessary, refer to your computer documentation.)

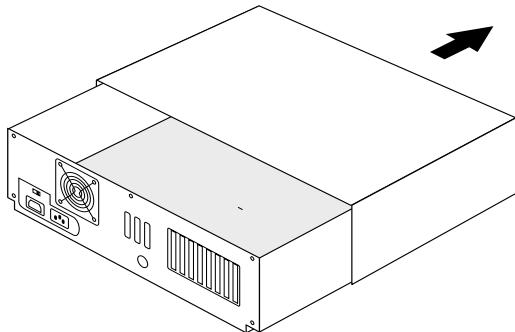


Figure 2-2. Removing the Chassis Cover

- 2 Locate an unused PCI expansion slot. (This slot is typically white or ivory.) Unscrew the expansion slot bracket that covers the card-slot opening.

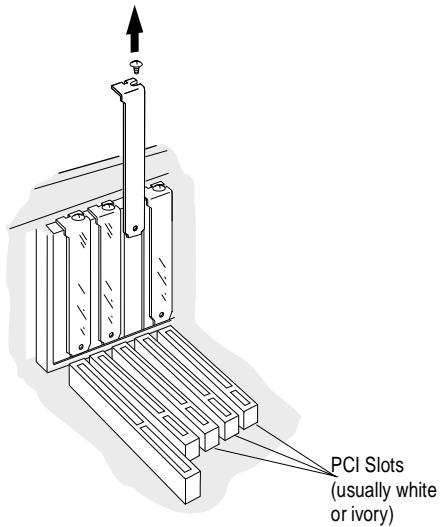


Figure 2-3. PCI Slot Location

The PCI slot must support bus master data transfers, or the host adapter will not work. Refer to your computer documentation or contact your vendor.

3 Insert the host adapter in a 32-bit or 64-bit PCI expansion slot. Press it down firmly so that the contacts are securely seated in the slot and secure it with the screw that you removed in Step 2.

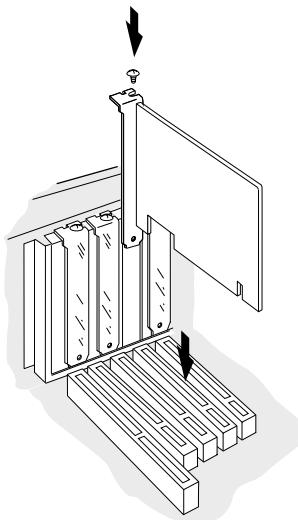


Figure 2-4. Host Adapter Installation

Installing SCSI Devices

Make sure that all SCSI devices have unique SCSI ID's. (Refer to your device documentation for SCSI ID settings and instructions on manually changing the default settings.¹)



Note: If your computer comes with preterminated SCSI cables, leave all devices unterminated.

Make sure that you connect only single-ended SCSI devices to the AHA-2940UW/OF and only differential SCSI devices to the AHA-2944UW/OF.

¹ When narrow 50 pin SCSI devices are connected, the SCSI ID of the host adapter should be set to 7.

Internal SCSI Devices

- 1 Install or enable terminators on the device that you plan to install at the *end* of the internal cable. Then remove or disable terminators on all remaining devices.

On most internal SCSI devices, you control termination by setting a jumper or a switch, or by physically removing or installing a resistor module(s). Refer to the device's documentation to determine how to enable or disable termination on your particular device.

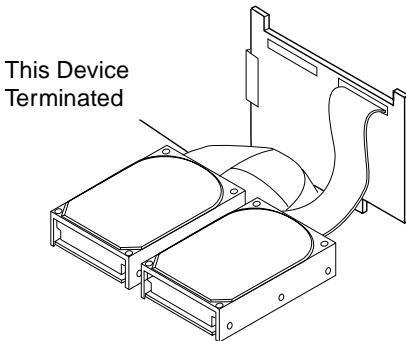


Figure 2-5. Installing Internal SCSI Devices

- 2 Install and mount each internal SCSI device inside your computer. (Refer to your computer and device documentation for instructions.)

- 3 Plug one end of the 50-pin or 68-pin internal SCSI cable into the host adapter's internal SCSI connector. Use a SCSI cable with enough connectors to accommodate all of the internal devices you want to attach.

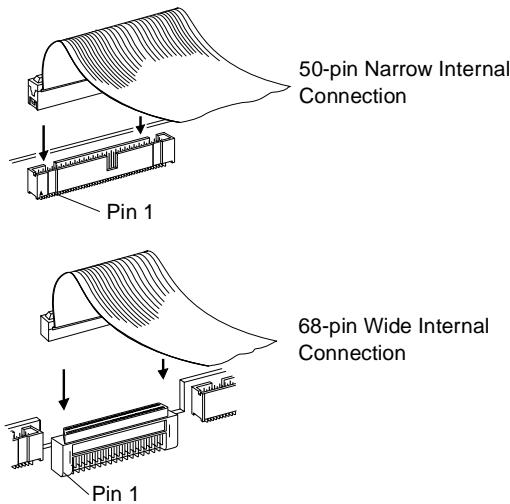


Figure 2-6. Internal Ribbon Cable Connection

Make sure that the colored stripe on one side of the cable is aligned with pin-1 of the host adapter's connector. Pin-1 of the connector is usually designated by a small triangle (\blacktriangle), or a "1" on the connector.

- 4 Plug the other end of the internal SCSI cable into the connector on the last internal SCSI device in the chain. This device must be terminated. Make sure the colored stripe on the side of the cable is aligned with pin-1 of the SCSI device's connector.

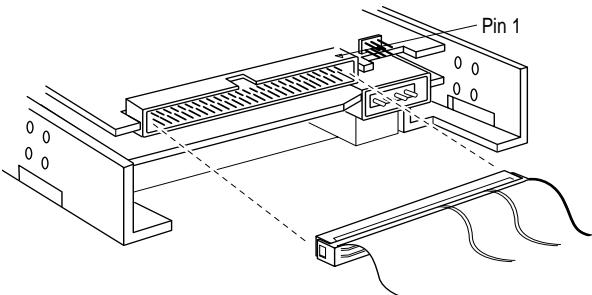


Figure 2-7. SCSI Cable Connector Location

- 5 Plug the remaining cable connectors into any remaining internal devices. These devices must *not* be terminated.
- 6 Connect a DC power cable from your computer's power supply to the power connector on the SCSI device(s).

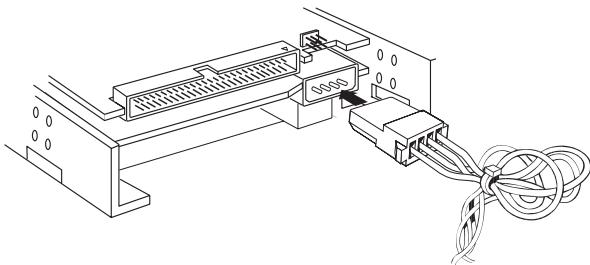


Figure 2-8. Power Cable Connection

- 7 Replace the computer chassis cover.

External SCSI Devices

- 1 Plug one end of a 68-pin external SCSI cable into the host adapter's external SCSI connector. Plug the other end of the external SCSI cable into one of the connectors on the external SCSI device.

If you are installing only one external device, enable the device termination or attach a terminating plug to the device.

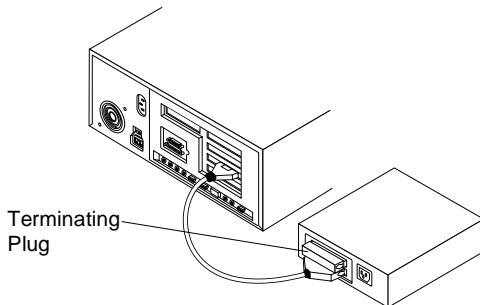


Figure 2-9. External SCSI Device Connection

- 2 To connect additional external SCSI devices, daisy-chain each device to the previous device until all devices are connected to each other.

Terminate the device at the end of the chain by attaching a terminating plug or enabling the onboard terminator.

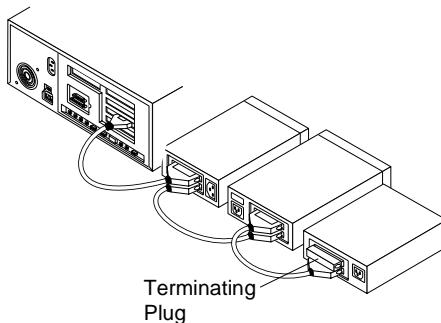


Figure 2-10. Daisy-chain Connection of External Devices

- 3 Reconnect the power cables to your computer and SCSI devices. Turn the SCSI devices on, then turn the computer on.

- 4 Install the host adapter device driver, as described in the following section.

Installing the Device Driver (Version 2.0 or Later) for Solaris/SPARC 2.5.1 or 2.6

You can install AHA-2940UW/OF and AHA-2944UW/OF device drivers either from a floppy disk or from the Adaptec Web Site. Follow the procedures below to install the device drivers.

Installation from a Floppy Disk

- 1 Log on to the Solaris operating system as root.
- 1 Insert the *7800 Family Open Firmware Manager Set, v2.0* device driver installation diskette into the floppy drive.
- 2 At the superuser prompt (#), type the following command and press **Enter**:

`/etc/init.d/volmgt stop`

- 3 Then type the following and press **Enter**:

`pkgadd -d /dev/fd0`

The following software package is displayed:

1 ADPadp Adaptec 294X(U)W/394X(U)W/4944(U)W SCSI
Host Adapter Driver
(UltraSparc) release v2.00

- 4 Select the package by typing 1 or all and pressing **Enter** to install the device driver.
- 5 Press **Y** to answer yes to each question that follows.
- 6 When the following message is displayed, type **q** to quit the installation:

Installation of <ADPadp> was successful.

- 7 Reboot the system to enable the new device driver to take effect.

Installation from the Adaptec Web Site

- 1 Visit the Adaptec web sit at <http://www.adaptec.com>
- 2 Select the *Products* link.
- 3 Select the *Sun/UltraSparc Solutions* link.
- 4 Follow the links and download the latest driver onto your system.
- 5 If you are not logged on at root, re-log on as root.
- 6 At the superuser prompt (#), type the following command and press **Enter**:

```
pkgadd -d /dirname/driver.img
```

(where *dirname* is the location of the downloaded *driver.img* file)

The following software package is displayed:

1	ADPadp	Adaptec 294X(U)W/394X(U)W/4944(U)W SCSI Host Adapter Driver (UltraSparc) release v2.00
---	--------	--

- 7 Select the package by typing 1 or all and pressing **Enter** to install the device driver.
- 8 Press **Y** to answer yes to each question that follows.
- 9 When the following message is displayed, type q to quit the installation:

Installation of <ADPadp> was successful.
- 10 Reboot the system to enable the new device driver to take effect.

Configuring SCSI Devices

Your host adapters can transfer data up to 40 MBytes per second on each SCSI channel when connected to devices on a wide bus that support *UltraSCSI*. *UltraSCSI* and non-*UltraSCSI* devices can coexist on the same cable, and each device can transfer data at its own negotiated or assigned transfer rate. However, to reliably transfer data at the higher transfer rate of *UltraSCSI*, the following requirements must be met:

- Internal and external cables must be terminated with *active* terminators, either provided by the SCSI device at the end of the cable or by a separate terminating plug. The terminators on the AHA-2940UW/OF and AHA-2944UW/OF are active terminators.
- For all SCSI devices connected to the host adapter, make sure you use high-quality SCSI cables to ensure reliable data transfer.
- When four or more *UltraSCSI* devices are connected to the host adapter, the combined length of all cables (internal and external) must not exceed 1.5 meters for single-ended devices or 25 meters for differential devices to ensure reliable operation.

If fewer than four *UltraSCSI* devices are used the combined cable length must not exceed 3.0 meters for single-ended devices or 25 meters for differential devices.

Troubleshooting Checklist

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

- Are the power cables and SCSI cables properly connected?
- Is the host adapter firmly seated and secured in the PCI expansion card slot?
- Does each SCSI device including the host adapter, have a unique SCSI ID?
- Is SCSI termination set correctly?

If you still haven't resolved your problem, read on.

If your computer hangs or the host adapter cannot always find the SCSI devices

- Be sure SCSI termination is set correctly.
- Check cable length and integrity.
- After a hang, turn OFF your computer and any devices connected to it, and then turn the devices and computer ON again to reset the SCSI bus.
- Try another PCI slot.



Using *SCSISelect*

The *SCSISelect* utility enables you to change host adapter and SCSI configuration settings directly from your computer's desktop. *SCSISelect* also contains utilities that allow you to low-level format or verify the disk media of your SCSI hard disk drives.

You can use *SCSISelect* directly from the P1275 User Interface.

Selecting a Single-Chip Host Adapter with the P1275 User Interface

To select a single-chip host adapter with the P1275 User Interface:

- 1 Enter the system's Forth evaluator.
- 2 To display a list of attached devices, type the following command at the *ok* prompt (also known as the *Forth prompt*, *Forth evaluator*, or *ROM monitor*):
`show-devs`
- 3 From the *ok* prompt, select the Adaptec single-chip host adapter to be configured. The word *select* is used to establish a device instance for the adapter. For example, to select a single-chip host adapter, type the following command:

```
select /pci/pci@2/scsi@4
```

Some systems may allow abbreviated forms of the device path name for selection, for example:

```
select /pci/@2/@4
```

4 To verify the selection, type the following command at the **ok** prompt:

pwd

5 To view the configuration properties of any selected single-chip host adapter, type the following command at the **ok** prompt:

.properties

6 To obtain firmware release and copyright information, type the following at the **ok** prompt:

release

copyright

Executing the **SCSISelect** Utility

At the **ok** prompt enter the following command:

scsiselect

The first screen is the **SCSISelect** Options screen which displays options, one line at a time. Two options are available to you:

- Configure/View Host Adapter Settings
- SCSI Disk Utilities

To select an option, use the **↑** and **↓** keys or **Spacebar** to display the option, then press **Enter**. To exit **SCSISelect**, press **Esc**.

A screen similar to the one in Figure 3-1 appears:

```
AHA-294XU/UW/D          SCSISelect(R) Utility      v1.06
Copyright(c) 1996-1998 Adaptec, Inc. All rights reserved

-----[      SCSISelect Options      ]-----

Do you wish to configure the host adapter or run the SCSI disk
utilities?

{<Space> to select option  <Enter> to accept option  <Esc> to exit}

Select Option: [Configure/View Host Adapter Settings]
```

Figure 3-1. **SCSISelect** Options Screen

- 1 To select an option
 - Press **↑**, **↓**, or **Space** to scroll through the options: Configure/View Host Adapter Settings and SCSI Disk Utilities.
 - When the option you want appears at the **Select Option** prompt, press **Enter**.
- 2 To exit **SCSISelect**, press **Esc** in the **SCSISelect Options** screen.

Using the Configure/View Host Adapter Settings

- 1 Select **Configure/View Host Adapter Settings** from the **SCSISelect Options** screen.

SCSISelect scans the device's PCI bus for other devices identical to the one selected. If **SCSISelect** locates other identical devices, the utility displays a list of these devices, including the originally selected device. Figure 3-2 shows an example of this list.

```
-----[ Configure/View Host Adapter Settings ]-----
-----[ AHA-294XU/UW/D - Bus 1 - Device 4 ]-----

      Name          Model      Bus      Device
AHA-294XU/UW/D    ADPT,AIC-7881    1        4  (active)
pci9004,8178      ADPT,AIC-7881    1        5

{<Space> to select device  <Enter> to accept device  <Esc> to exit}
Select Host Adapter to Configure: [Device 4]
```

Figure 3-2. Configure/View Host Adapter Settings Screen for Identical Devices

The device from which **SCSISelect** was activated is shown in the header. Additionally, the word *active*, in parenthesis, appears to the right of the device information.

When the active device is reset (which occurs during system initialization), various device configuration settings, such as initiator support for Wide SCSI or automatic cable termination, may be altered to accommodate the device's environment. Because **SCSISelect** does not know the

environment of the other devices, the utility must make assumptions for configuration settings based on the active device.

To select a device

- Press **↑, ↓, or Space** to scroll among the list of devices.
- When the device you want to configure appears at the **Select Host Adapter to Configure** prompt, press **Enter**.

The top portion of the configuration screen (Host Adapter SCSI ID and above) for the selected device appears. The remaining options are displayed line-by-line as you set each parameter.

Figure 3-3 shows the complete configuration screen for the selected device.

```
-----[AHA-294XU/UW/D - Bus      1 - Device 4]-----  
  
{<Space> to select settings      <Tab> to select device          }  
{<Enter> to accept setting       <Esc> to abort configuration   }  
{!=select default setting        F6=restore all default settings }  
{@=select saved setting         F7=restore all saved settings   }  
{#=select previous setting       F8=restore all previous settings }  
  
Host Adapter SCSI ID ..... [    7 ] (default)  
SCSI Parity Checking ..... [  ENABLED ] (default)  
Support for Ultra SCSI Speed..... [  ENABLED ] (default)  
Host Adapter SCSI Termination ..... [ AUTOMATIC ] (default)  
Initiate Sync Negotiation -- SCSI ID [  0] [  YES ] (default)  
Maximum Sync Transfer Rate - SCSI ID [  0] [  40.0 ] (default)  
Enable Disconnection ----- SCSI ID [  0] [  YES ] (default)  
Initiate Wide Negotiation -- SCSI ID [  0] [  YES ] (default)  
Reset SCSI Bus at Host Adapter Initialization [  YES ] (default)  
  
Do you wish to save your settings? .... [ YES ] ..settings saved  
Do you wish to reboot the system? .... [ NO ]  
Do you wish to reinitialize the device? [ YES ] . device reinitialized
```

Figure 3-3. Device Configuration Screen

2 Use the keys listed in the table below for the device configuration screen. Alternate keys, where possible, are provided for terminal emulators that do not support certain keyboard inputs.

Key	Function
↑ or ↓ Alternate: Space	Scrolls through the settings of an option.
← or → Alternate: Tab	Scrolls through the devices (SCSI IDs) of an option.
Enter	Accepts the setting for the selected device.
?	For some fields, displays a help screen.
Esc	Returns to the <i>SCSISelect</i> Options menu or aborts an operation.
!	Restores the default setting for the currently displayed option.
@	Restores the last-saved setting for the currently displayed option.
#	Restores the previous setting for the currently displayed option.
F6 ¹	Restores all default settings on the device configuration screen.
F7 ¹	Restores all last-saved settings on the device configuration screen.
F8 ¹	Restores all previous settings on the device configuration screen.

¹ If your keyboard does not support **F6**, **F7**, and **F8**, use **!**, **@**, and **#** to restore settings. To restore settings for an option you set previously, press **Esc** and begin the configuration process again.

Configuring SCSI Channel Interface Definitions

The following four options enable you to configure the SCSI channel interface:

- **Host Adapter SCSI ID**— This option allows you to select the single-chip host adapter's SCSI Initiator ID. The default setting for all models is 7, which has the highest priority on the SCSI bus. Each SCSI device on the bus, including the host adapter, must have a unique SCSI ID. The SCSI ID identifies each SCSI device on the SCSI bus and is used to determine the device's priority on the bus during arbitration, as follows:

Highest	Lowest
7 6 5 4 3 2 1 0 15 14 13 12 11 10 9 8	

Consider the following before you select the host adapter SCSI ID:

- If more than one SCSI host adapter is installed in the computer, each has its own SCSI bus. Devices can have the same SCSI IDs as long as they are not on the same bus.
- If two host adapters are installed in two different computers and are attached to the same SCSI bus so they can share SCSI devices, the Host Adapter SCSI ID settings for each adapter must be different. (IDs 6 and 7 are preferred because they have the highest priority on the SCSI bus.)
- When using both Wide and Narrow SCSI devices, it is necessary that you limit the Host Adapter SCSI ID setting to 0 through 7 because using SCSI Initiator IDs of greater than 7 will preclude host adapter reselection by Narrow devices.
- **SCSI Parity Checking**— This option enables or disables SCSI parity checking. The single-chip host adapter always checks parity when reading from the SCSI bus to verify the correct transmission of data from the attached SCSI devices. Set SCSI Parity Checking to **Disabled** only if any attached devices do not support SCSI parity. The default setting is *Enabled*.

- **Support for *Ultra*SCSI Speed**— This option determines whether the single-chip host adapter negotiates for double-speed synchronous transfer rates in support of *Ultra*SCSI devices on the selected SCSI bus. The setting of this option affects the values displayed for the Maximum Sync Transfer Rate option available for each SCSI device on the SCSI bus.
- **Host Adapter SCSI Termination**— This option enables you to configure the SCSI cable termination on the single-chip host adapter. The default setting for single-chip host adapters that support cable-sensing termination is *Automatic*.

Host Adapter SCSI Termination is determined by which SCSI connectors on the single-chip host adapter have devices attached to them. The Manual termination settings are listed in the table below:

Single-Chip Host Adapter Termination		Devices Attached To...
LOW	HIGH	Devices Attached To...
ON	ON	68-pin internal connector only
ON	ON	68-pin external connector only
ON	ON	50-pin internal connector only
OFF	OFF	68-pin internal and 68-pin external connectors
OFF	ON	50-pin and 68-pin internal connectors
OFF	ON	50-pin internal and 68-pin external connectors
INVALID		50-pin and 68-pin internal connectors and 68-pin external connector ¹

¹ You cannot connect devices to all three connectors at the same time.

SCSI Device Configuration

The next four options allow you to configure certain parameters for each SCSI device on the SCSI bus. The settings apply to all SCSI IDs, even if they have not been assigned to a device. If you are configuring the *active device*, use the SCSI Disk Utilities option, which is explained on page 3-10, to determine which SCSI IDs are assigned to which devices.

- **Initiate Sync Negotiation**— This option determines if the single-chip host adapter initiates synchronous negotiation with each SCSI device. When Initiate Sync Negotiation is set to *Yes*, the single-chip host adapter initiates synchronous negotiation with the SCSI device. When the option is set to *No*, the single-chip host adapter does not initiate synchronous negotiation. The default setting is *Yes* for all SCSI devices because most SCSI devices support synchronous negotiation and because a *Yes* setting may allow faster data throughput.

The single-chip host adapter always responds to synchronous negotiation if the SCSI device initiates it; however, data is transferred in asynchronous mode if neither the single-chip host adapter nor the SCSI peripheral negotiates for synchronous data transfers.



Note: Some older SCSI-1 devices do not support synchronous negotiation while Initiate Sync Negotiation is set to *Yes*, causing the computer to operate erratically or hang. If you use these devices, set Initiate Sync Negotiation to *No*.

- **Maximum Sync Transfer Rate**— This option determines the maximum synchronous data transfer rate that the single-chip host adapter can support for a given device. The single-chip host adapter supports rates up to the *UltraSCSI* maximum of 20.0 MB/sec. *UltraSCSI* host adapters attached to a Wide SCSI bus support an effective maximum synchronous transfer rate of 40.0 MB/sec. The default setting is the maximum rate supported by the single-chip adapter:

- 40.0 MB/sec for Wide *UltraSCSI*
- 20.0 MB/sec for Narrow *UltraSCSI* or Wide SCSI

- 10.0 MB/sec for Narrow SCSI

If the single-chip host adapter is configured so it will not initiate synchronous data transfers (Initiate Sync Negotiation is set to *No*), the maximum synchronous transfer rate is the maximum rate the single-chip host adapter accepts from the device during negotiation.

- **Enable Disconnection**— This option determines whether the single-chip host adapter will allow the SCSI device to disconnect from the SCSI bus. When Enable Disconnection is set to *Yes*, the single-chip host adapter can perform other operations on the SCSI bus while the SCSI device is temporarily disconnected. The default setting is *Yes*.
- **Initiate Wide Negotiation**— This option determines whether the single-chip host adapter attempts 16-bit data transfers (Wide Negotiation) instead of 8-bit data transfers. The default setting is *Yes*. (The Initiate Wide Negotiation option is only displayed if the single-chip host adapter is connected to a Wide SCSI bus.)

When Initiate Wide Negotiation is set to *Yes*, the single-chip host adapter attempts 16-bit data transfers with the device. When the option is set to *No*, the single-chip host adapter performs 8-bit data transfers unless the SCSI device itself requests Wide Negotiation.



Note: If you use 8-bit SCSI devices that have trouble handling Wide Negotiation while Initiate Wide Negotiation is set to *Yes*, the computer may operate erratically or hang. If you use these devices, set Initiate Wide Negotiation to *No*.

Advanced Configuration

- **Reset SCSI Bus at Host Adapter Initialization**— This option allows you to enable or disable SCSI bus resets generated by the single-chip host adapter during power-on initialization and after a hard reset. The default setting is *Yes*. In most cases, Reset SCSI Bus at Host Adapter Initialization should be set to *Yes*.

Using the SCSI Disk Utilities

To use the **SCSI Disk Utilities** option

- 1 Select **SCSI Disk Utilities** from the **SCSISelect** Options screen.

SCSISelect immediately scans the active device's SCSI bus for all devices connected to the single-chip host adapter. **SCSISelect** displays a list of all SCSI IDs and the devices assigned to them. Figure 3-4 shows an example of a SCSI Disk Utilities target selection screen.

```
-----[          SCSI Disk Utilities          ]-----  
  
SCSI ID:  0 - No Device      -  
SCSI ID:  1 - No Device      -  
SCSI ID:  2 - No Device      -  
SCSI ID:  3 - No Device      -  
SCSI ID:  4 - Disk           -CONNER CFP1060W  
SCSI ID:  5 - No Device      -  
SCSI ID:  6 - No Device      -  
SCSI ID:  7 - Host Bus Adapter -AHA-294XU/UW/D  
SCSI ID:  8 - No Device      -  
SCSI ID:  9 - No Device      -  
SCSI ID: 10 - No Device      -  
SCSI ID: 11 - No Device      -  
SCSI ID: 12 - No Device      -  
SCSI ID: 13 - No Device      -  
SCSI ID: 14 - No Device      -  
SCSI ID: 15 - No Device      -  
  
{<Space> to select device  <Enter> to accept device  <Esc> to exit}  
Select Target: [SCSI ID:  0-No Device  ]
```

Figure 3-4. SCSI Disk Utilities Target Selection Screen

2 Use the keys listed in the table below for the SCSI Disk Utilities target selection screen as follows. Alternate keys, where possible, are provided for terminal emulators that do not support certain keyboard inputs:

Key	Function
↑ or ↓ Alternate: Space	Scrolls through the list of SCSI IDs.
Enter	Accepts the setting for the selected device.
Esc	Returns to the <i>SCSISelect</i> Options screen, returns to the Target Selection screen, or aborts an operation.
?	For some fields, displays a Help screen.

3 To select a device

- Press ↑, ↓, or **Space** to scroll through the list of devices.
- When the device you want appears at the **Select Target** prompt, press **Enter**.

If you select an invalid entry, a message appears advising you of the problem.

- Press **Esc** to return to the *SCSISelect* Options screen
- or
- Press any other key to return to the SCSI Disk Utilities Target Selection screen

Once a valid device is selected and accepted, *SCSISelect* displays the selection and asks if you want to format or verify the device, as in Figure 3-5.

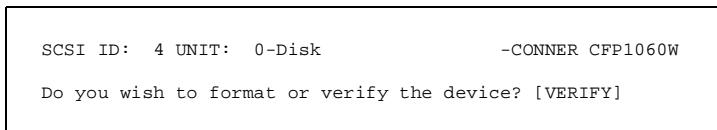


Figure 3-5. Format or Verify Device Screen

4 Select Verify or Format.

These options are explained in the following sections.

Using the Verify SCSI Disk Media Utility

To use the Verify [SCSI disk media] utility

1 Select Verify.

A safety prompt appears to verify the selection (Figure 3-6).

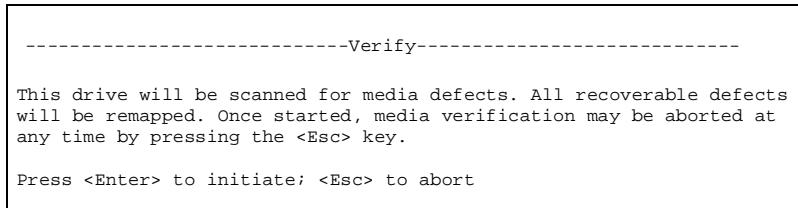


Figure 3-6. Verify Message Screen—Executing the Utility

2 To execute the utility, press **Enter; to discontinue, press **Esc**.**

The Verify utility sequentially scans the selected device's media for defects. A screen similar to the one in Figure 3-7 appears.

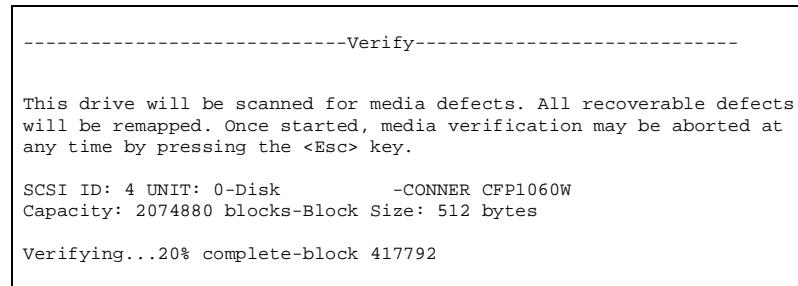


Figure 3-7. Verify Message Screen—Defect Scanning in Progress

If the Verify utility finds a Recovered Error or a Medium Error on the device, a message similar to the following appears:

Verifying...ERROR-sector 417792 has a defect-REASSIGN BLOCK?

- Press **Y** to reassign the defective sector and continue media verification
- or
- Press **N** to ignore the defective block and continue media verification with the next sector
- or
- Press **Esc** to abort the operation

Using the Format SCSI Disk Utility

Fixed data media must be low-level formatted before an operating system's partitioning and file preparation utilities can be used. (Most SCSI disk drives are low-level formatted at the factory.)

Adaptec's Format utility is compatible with most SCSI disk drives. Use the Format utility to format hard disk drives or removable-media drives that were previously used with non-Adaptec host adapters.



Caution: *Low-level formatting destroys all the data on a disk drive.* Be sure to back up any data you want to keep before you low-level format your drive. Once started, a low-level disk format *cannot* be aborted.

To use the Format [SCSI disk] utility

- 1 Select the **Format** option from the Format or Verify Device screen (see Figure 3-5 on page 3-11).

A safety prompt that verifies the selection appears (Figure 3-8).

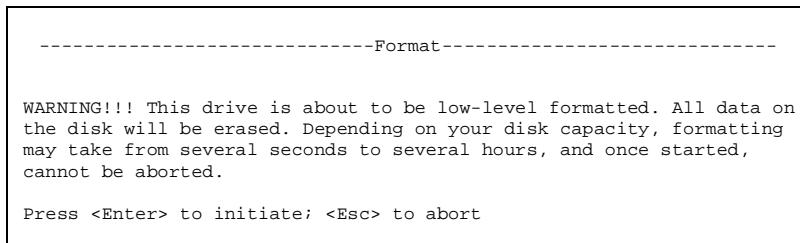


Figure 3-8. Format Utility Message Screen—Executing the Utility

2 To begin formatting, press **Enter**; to discontinue, press **Esc**.

The Format utility begins to low-level format the hard disk drive. A screen similar to the one in Figure 3-9 appears.

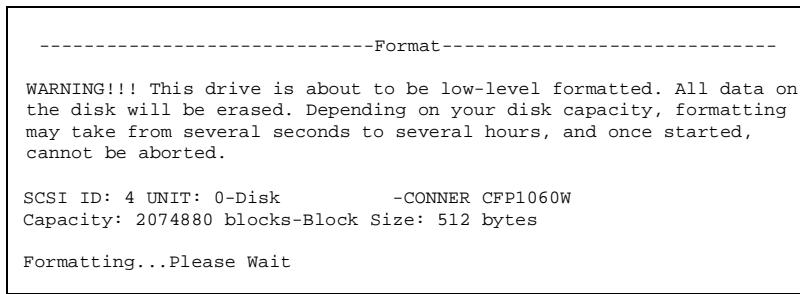


Figure 3-9. Format Utility Message Screen—Formatting in Progress

When formatting is complete, all intermediate keyboard inputs are discarded and a message similar to the following appears in the Format utility message screen:

Formatting...COMPLETE-Elapsed Time: 1 Hrs 6 Mins 53 Secs



Default Device Configuration Data Settings

Initial Program Load Data File (ipldata.fc)

1802	1802	1802	1802	1802	1802	1802	1802
3802	3802	3802	3802	3802	3802	3802	3802
B618	5C00	0728	0800	00FF	FFFF	FFFF	FFFF
FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FF00	9763

Initial Program Load Data Settings



Note: Fields in shaded rows are configurable via *SCSISelect*.

SCSI ID Configuration Flags

Offset	Bits	Title	Setting	Value
0-15	0-2	Transfer Rate	10 MHz	000
0-15	3	Synchronous Negotiation	Enabled	1
0-15	4	SCSI Disconnection	Enabled	1
0-7	5	Initiate Wide SCSI Negotiation	Disabled	0
8-15	5	Initiate Wide SCSI Negotiation	Enabled	1
0-15	6	<i>Ultra</i> SCSI Mode	Disabled	0

Offset	Bits	Title	Setting	Value
0-15	8	Send Start Unit SCSI Command	Disabled	0
0-15	9	Include In BIOS Scan	Disabled	1
0-15	10	Report Even If Not Found	No	0
0-15	11	Multiple LUN Support	Disabled	0

BIOS Control

Offset	Bits	Title	Setting	Value
16	0	Support All Removable Drives	Disabled	0
16	1	Support Removable Drive for Boot Only	Enabled	1
16	2	BIOS Enable	Enabled	1
16	4	Support More Than Two Drives	Enabled	1
16	5	Display <Ctrl-A> Message During Boot	Enabled	1
16	6	Virtual DMA Services	Disabled	0
16	7	Support >1 GByte Drive Translation	Enabled	1
16	8	SCAM	Disabled	0
16	11	Bootable CD-ROM Support	Enabled	1
16	12	INT13 Extensions	Enabled	1

Host Adapter Control

Offset	Bits	Title	Setting	Value
17	0	Automatic Cable Sensing Termination	Disabled	0
17	1	<i>Ultra</i> SCSI Mode	Disabled	0
17	2–3	SCSI Termination	Enabled	11
17	4	SCSI Parity	Enabled	1
17	5	Multiple LUN Support	Disabled	0
17	6	Reset SCSI Bus at Initialization	Enabled	1
17	7	Automatic Current Sensing Termination	Disabled	0

Host Adapter SCSI ID

Offset	Bits	Title	Setting	Value
18	0–3	Host Adapter SCSI ID	7	0111

Bus Release Time

Offset	Bits	Title	Setting	Value
18	8–15	Bus Release Time After Preempt	40	00101000

Maximum # of Devices

Offset	Bits	Title	Setting	Value
19	0–7	Maximum # of Devices	8	00001000

Reset Initialization Default Data Adjustments

SCSI ID Configuration Flags

Wide

Bit 5 Initiate Wide SCSI Negotiation

- 0 This bit is cleared (DISABLED) for SCSI IDs 0 through 7 when it has been sensed that the WIDEPS# input has been deasserted.
- 1 This bit is set (ENABLED) for all SCSI IDs when it has been sensed that the WIDEPS# input has been asserted.

Host Adapter Control

Fast-20

Bit 1 UltraSCSI Mode

- 0 This bit is cleared (DISABLED) when the GND/REXT pin is sensed as being tied to ground.
- 1 This bit is set (ENABLED) when the GND/REXT pin is sensed as having an external precision resistor present.

Autotermination

Bit 0 Automatic Cable-Sensing Termination

- 0 This bit is cleared (DISABLED) for products that do not support automatic cable-sensing termination.
- 1 This bit is set (ENABLED) for products that support automatic cable-sensing termination.

Bit 7 Automatic Current-Sensing Termination

- 0 This bit is always cleared (DISABLED).

Maximum # of Devices

Bits 0–7 Maximum # of Devices

- 8 This value, 8, is set when it has been sensed that the WIDEPS# input has been deasserted.
- 10 This value, 16, is set when it has been sensed that the WIDEPS# input has been asserted.

Adjusted Default Data Settings

AHA-2940UW

■ Initial Program Load Data File—IPL7881.FC

3802	3802	3802	3802	3802	3802	3802	3802
3802	3802	3802	3802	3802	3802	3802	3802
B618	5F00	0728	1000	00FF	FFFF	FFFF	FFFF
FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FF00	A264

AHA-294XUW

■ Initial Program Load Data File—IPL7884.FC

3802	3802	3802	3802	3802	3802	3802	3802
3802	3802	3802	3802	3802	3802	3802	3802
B618	5F00	0728	1000	00FF	FFFF	FFFF	FFFF
FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FF00	A264



▼▼▼▼ Index

A

Advanced configuration 3-9
AHA-2940UW/OF and
AHA-2944UW/OF
illustrated 2-2
Autotermination settings A-4

B

BIOS control settings A-2
Bus release time settings A-3

C

Caution notice, explanation of 1-3
Command
 properties 3-2
 pwd 3-2
 select 3-1
 show-devs 3-1
Configuration
 advanced 3-9
 SCSI channel interface 3-6
Configuring SCSI devices 2-11
Conventions 1-2
Copyright information for
 device 3-2

D

Default settings
 initial program load data A-1
 initial program load data file
 (ipldata.fc) A-1
 reset initialization default data
 adjustments A-4

Device configuration 3-8
 screen illustration 3-4

Device Driver
 installation 2-9

E

Enable disconnection option 3-9

F

Fast-20 settings A-4
Format disk utility
 low-level format destroys data
 and cannot be aborted 3-13
Format SCSI disk utility 3-13
Forth evaluator, *See* OK prompt
Forth prompt, *See* OK prompt

G

gnd/rext pin A-4

H

Host adapter
 autotermination A-4
 control settings A-3, A-4
 Fast-20 A-4
 SCSI ID 3-6
 SCSI ID settings A-3
 SCSI termination 3-7
 single-chip with the P1275 user
 interface 3-1

I

Initial program load data
 ipldata.fc A-1
Initial program load data
 settings A-1, A-3
 BIOS control A-2
 bus release time A-3
 host adapter SCSI ID A-3
 maximum # of devices A-3
 SCSI ID configuration flags A-1
Initiate sync negotiation 3-8
Initiate wide negotiation 3-9
Installation
 device driver (v.2.0) 2-9
 external SCSI devices 2-8
 host adapter 2-3
 internal SCSI devices 2-5
 troubleshooting 2-12

M

Maximum # of devices A-3
 settings A-5
Maximum sync transfer rate
 option 3-8

N

note, explanation of 1-3

P

P1275 user interface 3-1
Pin
 gnd/rext A-4
 wideps# A-4
Power connection
 to SCSI devices 2-7
Properties command 3-2
pwd command 3-2

R

Release information for device 3-2
Reset initialization
 default data adjustments A-4
 host adapter control A-4
 SCSI ID configuration flags A-4
Reset SCSI bus at host adapter
 initialization option 3-9
ROM monitor, *See* OK prompt

S

SCSI channel interface,
 configuring 3-6
SCSI device configuration 3-8
SCSI disk utilities 3-10
 format SCSI disk utility 3-13
 target selection screen,
 illustrated 3-10
 verify SCSI disk media
 utility 3-12
SCSI ID configuration flags A-1, A-4
 wide setting A-4
SCSI parity checking option 3-6
SCSISelect
 configure/view host adapter
 settings 3-3
 enable disconnection 3-9
 executing 3-2
 host adapter SCSI ID 3-6
 host adapter SCSI
 termination 3-7
 illustrated options 3-2
 initiate sync negotiation 3-8
 initiate wide negotiation 3-9
 maximum sync transfer rate 3-8
 reset SCSI bus at host adapter
 initialization 3-9
 SCSI disk utilities 3-10
 SCSI parity checking 3-6
 See also individual options by
 name

Select

- command 3-1
- purpose of the word 3-1
- Selecting a single-chip host adapter to configure
 - with the P1275 user interface 3-1
- Show-devs command 3-1

T

Troubleshooting

- problems with installing host adapter 2-12

Typographic conventions 1-2

V

- Verify SCSI disk media utility 3-12
- View host adapter settings 3-3
- View host adapter settings screen, illustrated 3-3

W

- Warning notice, explanation of 1-3
- Wide setting A-4
- wideps# pin A-4

□

