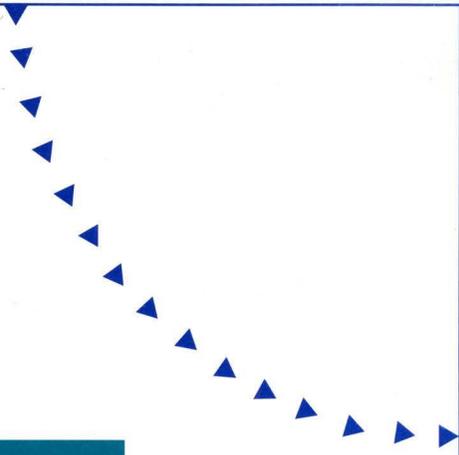


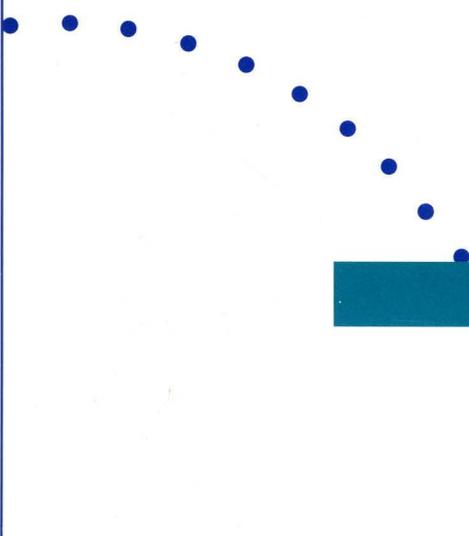
**adaptec**



**AHA-1520/1522**

***PC AT-to-SCSI***

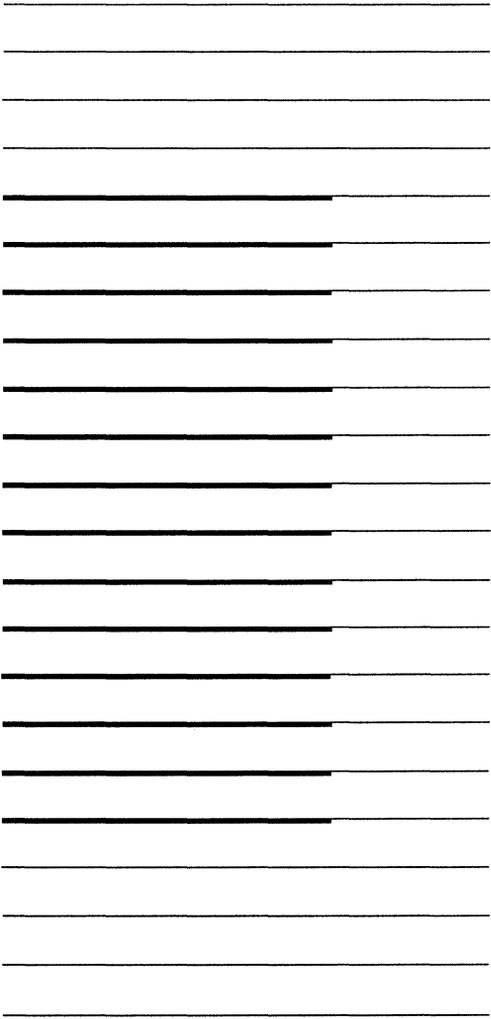
***Host Adapter***



**User's Manual**

AHA-1520/1522  
SCSI Host Adapter

*User Manual*



## **COPYRIGHT**

Copyright 1991 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**

ASPI and SCSI Direction Kit are trademarks of Adaptec.

Netware, Netware 286, Netware 386, and Novell are registered trademarks of Novell, Inc.

SCO UNIX is a registered trademark of The Santa Cruz Operation.

## **CHANGES**

The material in this manual is subject to change without notice.

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

Additional information may be obtained from

**adaptec**

Literature Department-MS/40  
691 South Milpitas Blvd.  
Milpitas, CA 95035

Adaptec Technical Support Bulletin Board  
(408) 945-7727

## FCC COMPLIANCE

This equipment generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications of Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in residential installations. 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 using the equipment, try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits

If necessary, consult your dealer or an experienced radio/television technician for additional suggestions. You may find *How to Identify and Solve Radio-TV Interference Problems* helpful. This booklet was prepared by the Federal Communications Commission and is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

**Caution:** This equipment has been certified to comply with the limits for Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, and so on) certified to comply with Class B limits may be attached to your computer. Operation with noncertified peripherals is likely to result in interference to radio and TV reception. This equipment must be used with shielded power cables and shielded input/output cables.

Finally, if you make any changes or modifications to the equipment that are not expressly approved by the grantee or manufacturer you could void your authority to operate the equipment.



# Table of Contents

<b>Preface</b> .....	<b>xi</b>
<b>1 Introduction</b> .....	<b>1-1</b>
The SCSI Direction Kit .....	1-1
Should You Use ASPI Software? .....	1-2
<b>2 Installing the Host Adapter</b> .....	<b>2-1</b>
Which SCSI Devices Should Be Terminated? .....	2-1
Should You Change the Default Settings? .....	2-1
Preparing and Installing a Host Adapter .....	2-2
What You Need to Get Started .....	2-2
Preparing the Computer and Host Adapter .....	2-2
Installing the Host Adapter .....	2-5
Installing Two Host Adapters .....	2-6
<b>3 Changing Jumper Settings</b> .....	<b>3-1</b>
How to Determine if you Need to Change Settings .....	3-1
The I/O Port Address Range .....	3-2
The IRQ Channel .....	3-2
The AHA-1520/1522 BIOS .....	3-3
The Floppy Drive Controller .....	3-3
How to Change Settings with Jumpers .....	3-3
Installing and Removing Jumpers .....	3-4
Changing the I/O Port Address Range .....	3-6
Changing the IRQ Channel .....	3-6
Disabling the AHA-1520/1522 BIOS .....	3-8
Disabling the Floppy Drive Controller .....	3-8
<b>4 Software for DOS</b> .....	<b>4-1</b>
Software Overview .....	4-1
The DOS Manager .....	4-1
The Hard Disk Driver .....	4-2
The Disk Partitioning Utility .....	4-2

Installing the Software .....	4-3
Copying the ASW-1210 Files to the Hard Disk .....	4-3
Loading ASPI2DOS for a Single Host Adapter .....	4-3
Loading ASPI2DOS for Two Host Adapters .....	4-4
Configuration Options for ASPI2DOS .....	4-5
Loading ASPIDISK .....	4-7
ASPIDISK Configuration Options .....	4-8
Using Removable Media Drives with ASPIDISK and ASPI2DOS .....	4-9
Using AFDISK .....	4-10
Before Using AFDISK .....	4-10
General Information About AFDISK .....	4-10
Using AFDISK to Partition a Disk .....	4-11
AFDISK and the Host Adapter BIOS .....	4-14
Screen Legibility While Using AFDISK .....	4-15
Understanding and Resolving Errors .....	4-15
Error Messages for ASPI2DOS .....	4-15
Error Messages for ASPIDISK .....	4-16
<b>5 Software for NetWare 286 .....</b>	<b>5-1</b>
Hardware Considerations .....	5-1
ASW-1240 Files for NetWare 286 2.15 .....	5-2
Information about Using NETGEN .....	5-2
Before Using NETGEN with a Hard Disk .....	5-3
Basic NetWare Installation .....	5-3
To Select and Configure Drivers .....	5-4
To Link and Configure the Operating System .....	5-11
Multiple Disk Drive Configurations .....	5-14
Disk Mirroring .....	5-15
Disk Duplexing .....	5-19
Multiple Channels per Host Adapter for Multitasking .....	5-30
Error Messages .....	5-39
Host Adapter Options .....	5-40
<b>6 Software for NetWare 386 .....</b>	<b>6-1</b>
Hardware Considerations .....	6-1
Before Installing .....	6-2
Installing the ASW-1240 Software .....	6-2
Command Line Options .....	6-4

Fault Tolerant Disk Drive Configurations .....	6-5
Disk Mirroring .....	6-6
Disk Duplexing .....	6-12
Booting NetWare from a SCSI Disk .....	6-15
To Modify the DOS Boot Process .....	6-15
To Modify NetWare .....	6-16
Removable Media Disk Drives .....	6-17
Formatting Disk Drives .....	6-18
Error Messages .....	6-19
<b>7 Software for SCO UNIX .....</b>	<b>7-1</b>
ASW-1250 Features and Restrictions .....	7-1
How to Determine Your Configuration .....	7-2
Choosing the AHA-1540/1542 Driver IRQ Channel .....	7-2
Choosing the ASW-1250 and AHA-1520/1522 IRQ Channel .....	7-3
Choosing the Port Address Range .....	7-3
Disabling the AHA-1520/1522 BIOS .....	7-3
Configuration Choices .....	7-4
Configuration Choices Form .....	7-5
If You Need to Change Settings .....	7-5
Preparation for Installing the Software .....	7-5
Logging On as Superuser .....	7-6
Making a Copy of the UNIX Kernel .....	7-6
Installing the Extended Utilities Packages .....	7-7
Using Custom to Install the ASW-1250 Software .....	7-7
Using Custom to Configure the ASW-1250 Software .....	7-12
SCO UNIX 3.2v0 Requirements .....	7-13
Changing the ASW-1250 Default IRQ Channel .....	7-13
Changing the ASW-1250 Port Address .....	7-14
Resolving Conflicts Between the ASW-1250 Software and ad .....	7-15
ASW-1250 and the Non-SCSI Tape Driver .....	7-17
Removing the Tape Driver .....	7-18
Recording the Host Adapter Prefix .....	7-20
Quitting Custom .....	7-20
Using mkdev to Attach Devices to the AHA-1520/1522 .....	7-21
Using mkdev with SCO UNIX 3.2v0 and ODT v1.0 .....	7-22
Using mkdev .....	7-22
Troubleshooting .....	7-23
Error Messages .....	7-23

<b>A Host Adapter Message Classes .....</b>	<b>A-1</b>
Class 0—Header Display (Default) .....	A-1
Class 1—Jumper Configuration Information .....	A-1
Class 2—SCSI Drive Information .....	A-1
Class 3—Boot Progress Report .....	A-2
Class 4—Error Messages (Default) .....	A-3
<b>B Jumper Block Reference .....</b>	<b>B-1</b>
Jumper Block J5 (Data) .....	B-1
Jumper Block J6 (Channel Selection and SCSI ID) .....	B-3
Jumper Block J7 (Floppy Drive Options).....	B-6
Jumper Block J8 (DMA Channel) .....	B-8
Jumper Block J9 (IRQ Channel, Port Address, and BIOS) .....	B-9
<b>C Internal Connector Pins .....</b>	<b>C-1</b>
<b>D External Connector Pins .....</b>	<b>D-1</b>
<b>E Low-Level Formatting .....</b>	<b>E-1</b>
<b>Index .....</b>	<b>I-1</b>

# List of Figures and Tables

## 2 Installing the Host Adapter

Figure 2-1. The AHA-1520 host adapter .....	2-4
Figure 2-2. The AHA-1522 host adapter .....	2-5

## 3 Changing Jumper Settings

Figure 3-1. The AHA-1520 jumper blocks .....	3-4
Figure 3-2. The AHA-1522 jumper blocks .....	3-5

## 5 Software for NetWare 286

Figure 5-1. Configuration for disk mirroring .....	5-15
Figure 5-2. Configuration for disk duplexing .....	5-19
Figure 5-3. Configuration for multitasking .....	5-30
Table 5-1. Port Address 340h Options .....	5-41
Table 5-2. Port Address 140h Options .....	5-42

## 6 Software for NetWare 386

Figure 6-1. Configuration for disk mirroring .....	6-6
Figure 6-2. Configuration for disk duplexing .....	6-12



This manual tells you how to install and use the Adaptec AHA-1520 and AHA-1522 Small Computer System Interface (SCSI) host adapters on IBM PC/AT and compatible computers. It also tells you how to install and configure the Adaptec software that you can use with these host adapters.

The manual comprises seven chapters and five appendixes.

- Chapter 1 gives you a brief overview of the host adapters and the software you can use with them.
- Chapter 2 tells you how to install your host adapter.
- Chapter 3 tells you how to reconfigure the host adapter using jumpers.
- Chapter 4 tells you how to install and configure the ASW-1210 software for the DOS operating system.
- Chapter 5 tells you how to install and configure the ASW-1240 software for the Novell NetWare 286 operating system.
- Chapter 6 tells you how to install and configure the ASW-1240 software for the Novell NetWare 386 operating system.
- Chapter 7 tells you how to install and configure the ASW-1250 software for the SCO UNIX operating system.
- Appendix A tells you about the various messages that you might see when you use the host adapter.
- Appendix B lists all the jumper settings and functions of the host adapter.
- Appendix C lists the SCSI internal connector pin assignments.
- Appendix D lists the SCSI external connector pin assignments.
- Appendix E tells you how to low-level format a hard disk.

If you are going to install the host adapter now, read Chapters 1 through 3 to learn how. If you have already installed the host adapter and want to install software to use with it, read Chapter 1 and then turn to the chapter for your operating system.



The Adaptec AHA-1520 and AHA-1522 host adapters allow you to connect your IBM PC/AT or compatible computer to Small Computer System Interface (SCSI) peripherals like hard disks, tape drives, and CD-ROM drives. The host adapters' high data transfer rates and multitasking capabilities significantly enhance the input/output (I/O) performance of your AT-class computer.

The AHA-1520 and AHA-1522 are identical except that the AHA-1522 is equipped with a floppy disk controller. Both host adapters are referred to as the AHA-1520/1522 in this document. System (on-screen) messages sometimes refer to the host adapters as the AHA-152x.

This manual applies to the AHA-1520S11 and AHA-1522S11 versions as well as to the standard models. The S11 models differ from the standard host adapters only in their default I/O port address range settings. Throughout this manual, all information applies to these models unless the S11 is singled out.

## THE SCSI DIRECTION KIT

The AHA-1522 is available as part of Adaptec's SCSI Direction Kit. If you purchased The SCSI Direction, check to make sure that it contains the following items:

- AHA-1522 SCSI host adapter board with floppy controller
- *Adaptec AHA-1520/1522 SCSI Host Adapter User Manual* (this book)
- SCSI ribbon cable
- Alternate bracket
- Software for major operating systems
- Registration card
- ASPI software information card

**SHOULD YOU USE ASPI SOFTWARE?**

You can use Adaptec's ASPI (Advanced SCSI Programming Interface) software to enhance the performance of your AHA-1520/1522 host adapter. ASPI software allows you to use different kinds of SCSI devices (disk drives, tape drives, CD-ROM drives, and so on) with the host adapter. ASPI software packages currently support DOS, SCO UNIX, and Novell NetWare. ASPI software for OS/2 will be available soon.

It is possible to use the AHA-1520/1522 host adapter without installing ASPI software. You can use the host adapter without this software under the following circumstances:

- You do not plan to use an operating system other than DOS.
- You do not plan to use a SCSI device other than a hard disk.
- The total number of disk drives installed on your system (standard and SCSI) does not exceed two.

Under all other circumstances you must install the appropriate software for your operating system: ASW-1210 for DOS, ASW-1240 for Novell NetWare 386 and 286, or ASW-1250 for SCO UNIX.

See Chapters 4 through 7 in this manual for information about installing each of these software packages.

If you are going to use the host adapter without ASPI software, you must set the SCSI IDs of your disk drives to 0 or 1. If you want to boot from a SCSI drive, its SCSI ID must be 0. If you already have a non-SCSI drive installed on your system, set the SCSI ID of the SCSI disk you want to add to 0.

The Adaptec AHA-1520/1522 is easy to install into IBM PC/AT and compatible computers. This chapter gives you the information you need to install one or two host adapters in your system. The chapter covers three major topics:

- how to terminate your SCSI bus
- how to decide whether you need to change the default settings of the host adapter
- how to install the host adapter or adapters

### WHICH SCSI DEVICES SHOULD BE TERMINATED?

For your system to operate properly, you must *terminate* your SCSI bus correctly. The SCSI devices at the physical beginning and end of the SCSI bus must have terminators installed. All other SCSI devices on the SCSI bus must have their terminators removed.

The AHA-1520/1522 is a SCSI device. If you are using only one of its connectors, the host adapter is at one end of the SCSI bus. Its terminators should remain installed. If you connect devices to both the external and internal connectors on the host adapter, the host adapter is not at the end of the SCSI bus and its terminators should be removed. Terminators should be installed on the SCSI devices on both ends of the SCSI bus.

On the AHA-1520/1522 host adapters, terminators are single inline package (SIP) resistors mounted on the board. Terminators on SCSI devices can take several forms. They can be SIP resistors or they can be dual inline package (DIP) resistors. Terminators on SCSI devices can also be set with switches. Consult the documentation that came with your SCSI device to find out how to set its terminators.

### SHOULD YOU CHANGE THE DEFAULT SETTINGS?

The AHA-1520/1522 is set up at the factory to operate properly under most circumstances. You need to make changes to the default settings of the board if either of the following is true:

- You plan to use more than one AHA-1520/1522 host adapter in your system.

- You plan to use other products, such as video adapter cards or other host adapters, that use the same default settings as the AHA-1520/1522.

**2** If you think you might need to change any default settings on the AHA-1520/1522, see Chapter 3 before proceeding. Chapter 3 gives you information about the settings that you can change, why you might need to change them, and how to make the changes.

### PREPARING AND INSTALLING A HOST ADAPTER

The following sections tell you how to prepare and install your host adapter. Be sure that the adapter's settings are appropriate for your system before you proceed.

#### What You Need to Get Started

In addition to the AHA-1520/1522 host adapter, you need some or all of the following items in order to complete the installation:

- a 50-pin SCSI cable to connect an internal device to the host adapter (if applicable)
- a 50-pin SCSI cable with a D connector to connect an external device to the host adapter (if applicable)
- a 34-pin cable to connect a floppy disk drive to the AHA-1522 host adapter (AHA-1522 only)
- a medium-size, flat-blade screwdriver
- a medium-size, Phillips screwdriver

#### Preparing the Computer and Host Adapter

Before you can install the AHA-1520/1522 board, you must first prepare your computer by opening its cover and finding an unused expansion slot. You must also prepare the host adapter for installation.

### *To Prepare the Computer*

1. Turn off the power to your computer and its external equipment. Unplug the computer and its external equipment.
2. Remove the top cover from your computer to expose the expansion slots.

On most AT-compatible computers, you can use a medium-size, flat-blade screwdriver to remove the screws that secure the cover.

3. Locate an unused AT expansion slot in your system. Remove the slot cover from the back of the computer. Set aside the screw that you remove.

Some systems have both AT and XT-style slots on the mother-board. An AT slot has receptacles for a 62-pin edge connector and a 36-pin edge connector directly in line with each other.

Next, you need to prepare the host adapter for installation.

### *To prepare the AHA-1520/1522*

1. Remove the AHA-1520/1522 from its antistatic bag.

**CAUTION:** *Like all electronic components, the AHA-1520/1522 is sensitive to static electricity. To avoid possible damage to the host adapter, you should discharge any static electricity before handling the board. You can do this by touching a metal table edge or the frame of your computer.*

2. If you plan to use an internal SCSI device, attach a 50-pin ribbon cable to the internal pin connector on the board.

Line up pin 1 on the cable connector, usually marked with a red stripe, with pin 1 on the board, located on the left side of the connector. See Figure 2-1 or 2-2 to locate the internal connector.

3. If you are installing an AHA-1522 host adapter and want to use a floppy drive, attach the 34-pin ribbon cable to the floppy drive connector on the board.

Line up pin 1 on the cable connector, usually marked with a red stripe, with pin 1 on the board, located on the left side of the connector. See Figure 2-2 to locate the floppy connector.

2

- 4. If you plan to use both an external and an internal SCSI device, remove the terminators from the AHA-1520/1522. Otherwise, leave the terminators in place. To remove a terminator, gently pull it up from the board. To install a terminator, gently push it into place on the board. See Figure 2-1 or 2-2 to locate the terminators. When installing, line up pin 1 of the terminator with pin 1 of the terminator socket, located on the left side of the connector. Pin 1 of the terminator is indicated by a dark color dot or stripe near the end of the terminator.

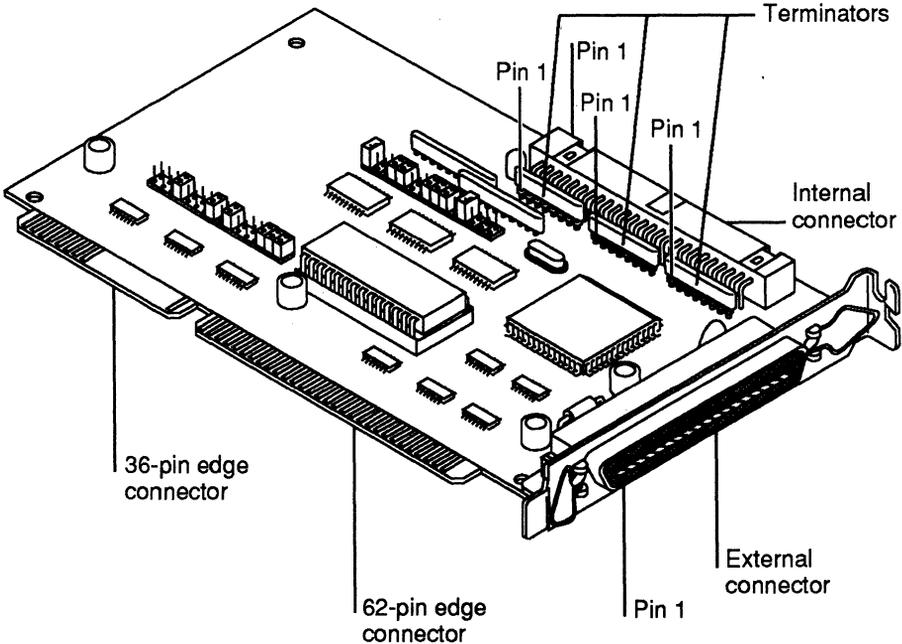


Figure 2-1. The AHA-1520 host adapter

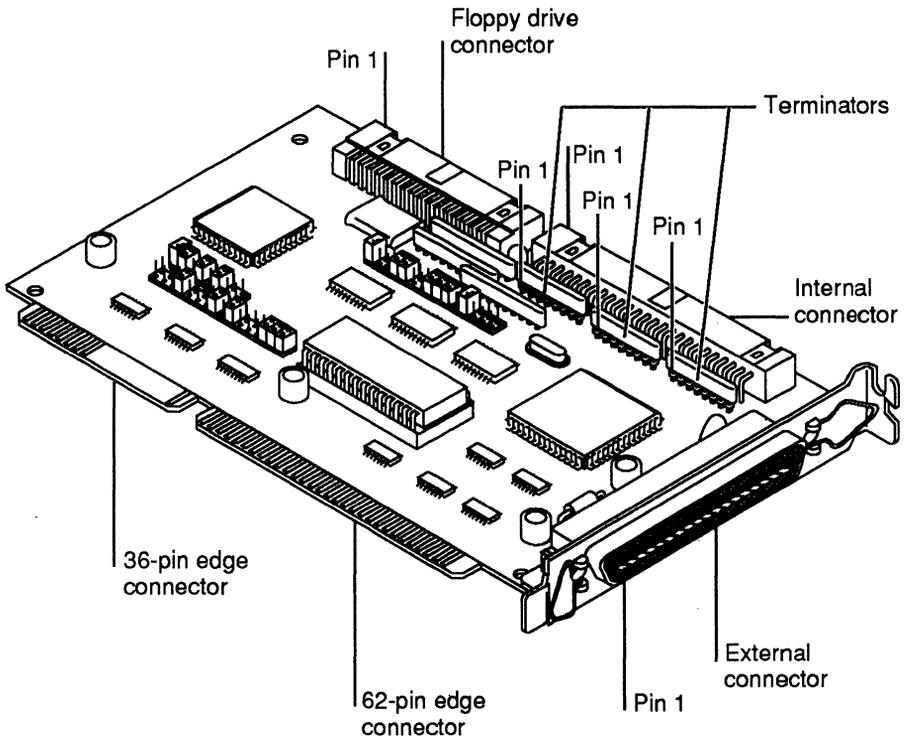


Figure 2-2. The AHA-1522 host adapter

### Installing the Host Adapter

Now that you have prepared both the board and the computer, you can install the AHA-1520/1522 into your computer.

1. Slide the external connector of the AHA-1520/1522 through the hole in the back of the computer that corresponds to the unused expansion slot.
2. Press the edge connectors of the AHA-1520/1522 into the expansion slot.

It is easier to fit the edge connectors into the slot if you insert one corner first and then press the entire edge into place.

If the bracket does not fit properly, and you purchased the AHA-1522 in a SCSI Direction Kit, you can use the alternative bracket supplied with the kit.

3. Secure the AHA-1520/1522's external connector to the computer frame. Use the screw that you removed with the expansion slot cover.
4. If you are going to use an internal SCSI device, verify cable (pin 1) orientation and attach the free end of the 50-pin ribbon cable to the device.
5. If you are installing an AHA-1522 host adapter and want to use it with a floppy disk drive, connect the free end of the 34-pin ribbon cable to the floppy drive.
6. Replace the computer's cover.

Make sure that the internal drive and floppy drive cables fit comfortably inside the computer's case when you replace the cover. Rearrange the cables if necessary.

7. If you are going to use an external device, connect it to the host adapter using a 50-pin SCSI cable. Plug the cable connector into the external connector of the host adapter and secure it with the bail clips on the external connector.
8. Turn on the power to your computer and its peripherals.

The host adapter can cause the system to display a variety of startup messages. These messages are explained in Chapter 3 and Appendix A.

### INSTALLING TWO HOST ADAPTERS

You can install as many as two AHA-1520/1522 host adapters in your AT-class system. Installing two host adapters allows you to use more SCSI devices. If you do install two host adapters, you must use the ASPI software appropriate for your operating system.

The installation of each host adapter is the same as the installation of a single host adapter. Follow the instructions in "Preparing and Installing a Host Adapter" to install each host adapter.

If you install two host adapters, each must be configured so that it does not conflict with the other. You need to change some of the default settings of one or both host adapters.

The following is a short overview of the hardware issues you need to consider when you use two host adapters:

- Each host adapter must use a different interrupt request (IRQ) channel.
- Only one host adapter can have its BIOS enabled. The BIOS on the other host adapter must be disabled.
- Only one host adapter can use the direct memory access (DMA) data transfer mode.
- Each host adapter must use a different port address range.
- If you use two AHA-1522 host adapters, only one can have its floppy drive controller enabled. The floppy drive controller on the other host adapter must be disabled.

If you plan to install two host adapters, see Chapter 3 to learn how to make the necessary changes. You should make all these changes before you install the host adapters.



The AHA-1520/1522 host adapters are designed to operate properly at their default settings under most circumstances. In certain cases, however, you need to change these default settings to ensure proper operation. This chapter tells you how make these changes. The chapter covers two major topics:

- how to determine whether you need to change any default settings
- how to make any necessary changes

If you use ASPI software with your host adapter and change any settings on the board, you may need to change software settings as well.

### HOW TO DETERMINE IF YOU NEED TO CHANGE SETTINGS

You might need to change the default settings of the AHA-1520/1522 if

- you plan to use more than one AHA-1520/1522 host adapter in your system
- you plan to use other products that use the same default settings as the AHA-1520/1522

Examples of products that might conflict with the AHA-1520/1522 include

- video adapter cards
- LAN cards
- host adapters other than the AHA-1520/1522 (such as the Adaptec AHA-1540/1542)

There are four potential areas of conflict:

- the I/O port address range
- the interrupt request (IRQ) channel
- the host adapter BIOS
- the floppy drive controller (AHA-1522 only)

The possible problems are discussed in the following sections. If you do need to change settings, refer to the sections under "Changing Settings with Jumpers" later in this chapter for instructions. Be aware that if you change any settings, you must use the ASPI software appropriate for your operating system.

### The I/O Port Address Range

**3** The port address ranges used by some products, such as video and tape-drive adapters, overlap the primary port address range of AHA-1520/1522—340h–35Eh. (The *h* indicates that these are hexadecimal numbers.)

If you plan to use a product that must use the same port address range as the host adapter and its software, you need to change the AHA-1520/1522 to its secondary range of 140h–15Eh. If you have installed a second AHA-1520/1522, you must change the port address range of one of the adapters.

If you are using the AHA-1520S11 or AHA-1522S11, you don't need to change the port address range. The default port address range of the S11 models is 140h–15Eh, so no conflict exists. Note that if you are using ASPI software with an S11 model, you need to set the software to its secondary range of 140h–15Eh.

The host adapter BIOS operates only if the host adapter uses its primary port address range. If you change to the secondary port address range, you must also disable the host adapter BIOS.

### The IRQ Channel

By default, the AHA-1520/1522 board uses IRQ channel 11. You need to change this if your system has other products that must use channel 11.

If you must change the IRQ channel, choose channel 9, 10, or 12. Select a channel that is not used by another product. Consult the documentation for each product to determine which IRQ channel it uses. Adaptec does not recommend using channel 9 with Windows or OS/2.

### The AHA-1520/1522 BIOS

If you are using two AHA-1520/1522 host adapters, only one can use its BIOS. You must disable the BIOS of the other. If you use the AHA-1520/1522 in combination with a different host adapter (such as the Adaptec AHA-1540/1542), you also need to disable the AHA-1520/1522 BIOS. In both cases, you need to use ASPI software to access the SCSI devices connected to the AHA-1520/1522.

You must disable the host adapter BIOS if you change the host adapter from its primary port address range. See "The I/O Port Address Range" earlier in this chapter for more information.

### The Floppy Drive Controller

If you are using two AHA-1522 host adapters, only one can use its floppy disk controller. You must disable the floppy controller of the other.

### HOW TO CHANGE SETTINGS WITH JUMPERS

The following sections tell you how to change the AHA-1520/1522 jumpers to make changes to the host adapter's settings. You will learn which jumper settings you need to change to avoid the conflicts discussed previously.

Appendix B, "Jumper Block Reference," lists all the jumper settings you can change.

Installing and Removing Jumpers

You can make changes to all the jumper blocks on the AHA-1520/1522. Both the AHA-1520 and the AHA-1522 have jumper blocks J5, J6, J8, and J9. Only the AHA-1522 has jumper block J7. See Figures 3-1 and 3-2 to locate these jumper blocks.

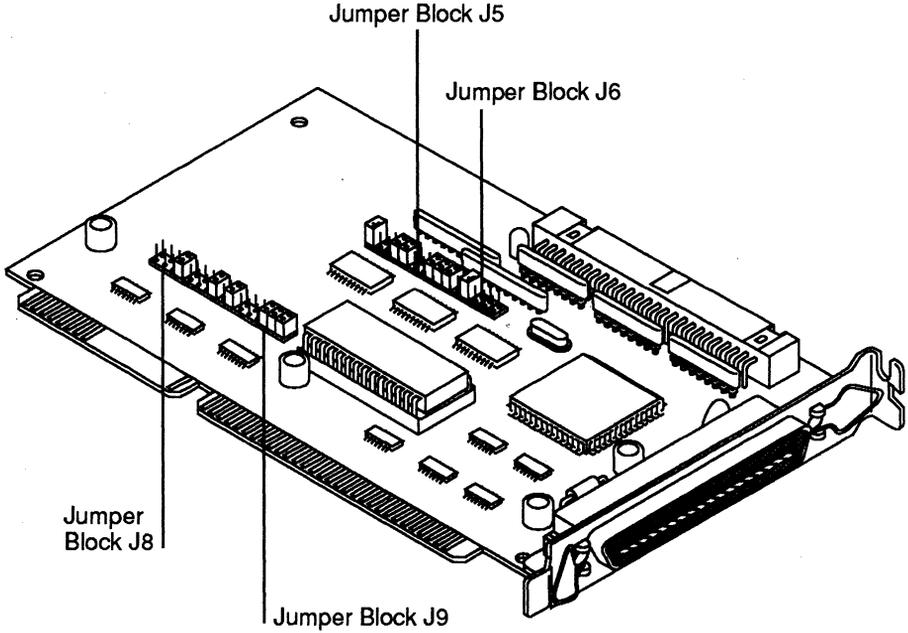


Figure 3-1. The AHA-1520 jumper blocks

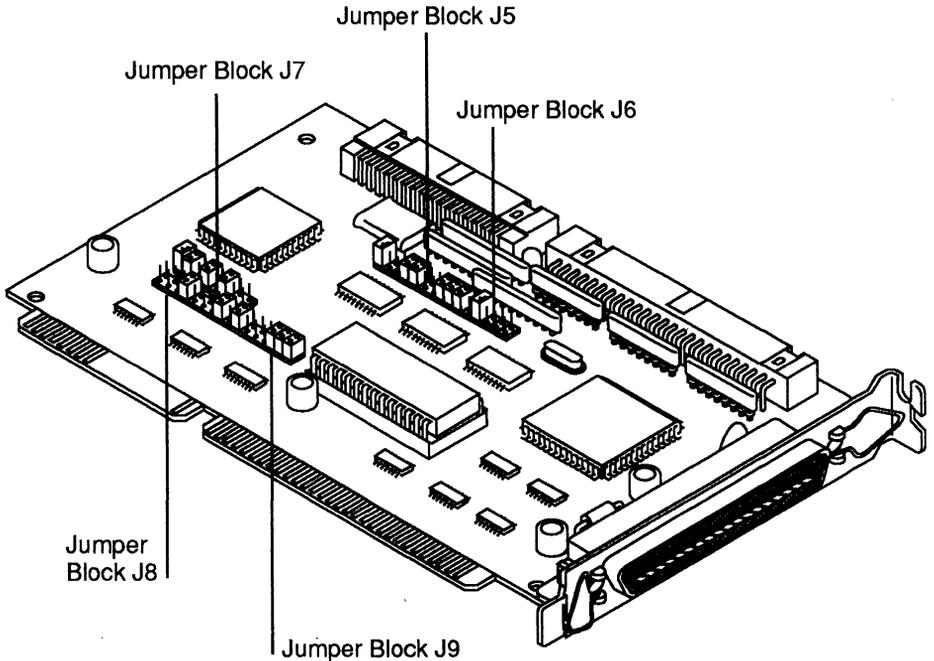


Figure 3-2. The AHA-1522 jumper blocks

Jumpers are small, rectangular devices made of plastic and metal. Each jumper has two holes in it to fit over the pins in the jumper block.

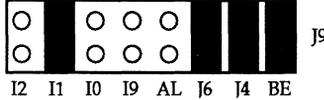
Before you remove or install a jumper, locate the proper pin pair using the information provided in this chapter. The name of each jumper block (J5, J6, and so on) appears on the host adapter next to the jumper block. A two-character abbreviation for the function of each pin pair also appears on the board. These abbreviations are used to identify pin pairs in the following sections and in Appendix B. When shown in figures, these abbreviations appear below the jumper blocks (rather than in their true positions) to make them easier to read.

To remove a jumper pin, gently pull it up from the jumper block. To install a jumper, gently push the jumper over the pins until it is securely seated.

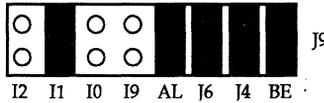
## Changing the I/O Port Address Range

To change the I/O port address from its primary range to its secondary range, place a jumper on pin pair AL in jumper block J9.

The following figure shows the jumper setting for the primary port address range (340h–35Eh for the AHA-1520/1522, the default for the AHA-1520/1522):



The following figure shows the jumper setting for the secondary port address range (140h–15Eh for the AHA-1520/1522, the default for the AHA-1520/1522S11):

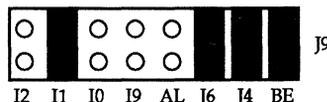
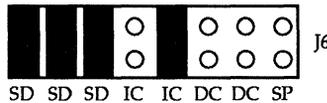


The BIOS only operates if the host adapter is set to the port address that the BIOS expects (340-35Eh for the AHA-1520/1522; 140h–15Eh for the AHA-1520/1522S11). If you change the setting to the secondary port address range, you should also disable the BIOS.

## Changing the IRQ Channel

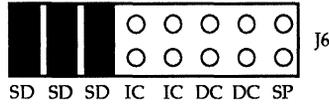
The IRQ channel setting is determined by the pin pairs marked IC in jumper block J6 and pin pairs I0, I1, I2, and I9 in jumper block J9.

The following figure shows the jumper settings for IRQ channel 11 (the default):

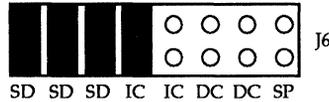


To change the AHA-1520/1522 IRQ channel, choose a new channel (9, 10, or 12) and then reset the jumpers according to the appropriate illustration.

The following figure shows the jumper settings for IRQ channel 9. IRQ channel 9 is not recommended when running Windows or OS/2.



The following figure shows the jumper settings for IRQ channel 10:



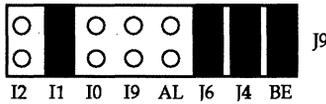
The following figure shows the jumper settings for IRQ channel 12:



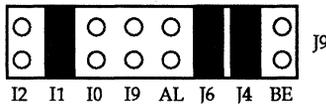
**Disabling the AHA-1520/1522 BIOS**

To disable the AHA-1520/1522 BIOS, remove the jumper on pin pair BE on jumper block J9.

The following figure shows the jumper setting that enables the BIOS (the default):



The following figure shows the jumper setting that disables the BIOS:



**Disabling the Floppy Drive Controller**

To disable the AHA-1522 floppy drive controller, remove the jumper pin on pin pair FE in jumper block J7.

The following figure shows the jumper setting that enables the floppy controller (the default):



The following figure shows the jumper setting that disables the floppy controller:



If you have questions concerning jumper settings, refer to Appendix B.

This chapter tells you how to install Adaptec's ASW-1210 ASPI software for the DOS operating system and the AHA-1520/1522 host adapter. The software comprises a DOS manager, a hard disk driver, and a disk partitioning utility.

This chapter covers these major topics:

- an overview of the software
- how to configure and load the DOS manager
- how to configure and load the hard disk driver
- how to use the disk partitioning utility
- understanding and resolving errors

## SOFTWARE OVERVIEW

The components of the ASW-1210 software are:

- ASPI2DOS (DOS manager)
- ASPIDISK (hard disk driver)
- AFDISK (partitioning utility)

Each of these programs is discussed separately in the following sections.

### The DOS Manager

ASPI2DOS is a program that DOS can load at startup time and then use automatically to communicate with the AHA-1520/1522 and to access SCSI devices connected to the host adapter. You need to have DOS load ASPI2DOS in the following situations:

- You change any default host adapter jumper settings.
- More than two hard disks are installed in your system.
- You have a SCSI drive with a SCSI ID other than 0 or 1.

- You use SCSI devices other than a fixed hard disk (removable media drive, CD-ROM drive, tape drive, printer, plotter, and so on).
- You install more than one host adapter.

You can use ASPI2DOS to improve your system's performance even if none of these conditions apply. Using ASPI2DOS results in faster I/O operations.

### The Hard Disk Driver

ASPIDISK is a program that DOS can load at startup time and then use automatically to control hard disks. In order to use ASPIDISK, your system must be running DOS 3.30 or later.

4

You need to have DOS use ASPIDISK under any of the following circumstances:

- The host adapter BIOS is disabled.
- You have more than two hard disks.
- You have a SCSI drive with a SCSI ID other than 0 or 1.
- You have a disk partitioned with AFDISK or FDISK.

ASPIDISK allocates logical drive names to the SCSI hard disks and partitions installed on your system. If you have non-SCSI disks installed, ASPIDISK allocates logical drive names that follow those of the non-SCSI drives. For instance, if you have two non-SCSI drives (C and D), ASPIDISK begins with drive E.

### The Disk Partitioning Utility

Before you can use a hard disk, you must partition it. AFDISK is an Adaptec partitioning utility that you use to partition SCSI disks. You can use AFDISK to create or delete DOS partitions, and to delete non-DOS partitions.

You should partition your SCSI disks with AFDISK if you have a total of three or more disks (SCSI and non-SCSI). If you have a total of one or two disks, you can partition your SCSI disks with the DOS FDISK utility. If you later add more SCSI disks, you will not have to repartition any SCSI disks that you originally partitioned with FDISK.

If your system tries to load ASPIDISK before you have partitioned a disk that should be partitioned with AFDISK, ASPIDISK will not be loaded successfully.

### INSTALLING THE SOFTWARE

There are two phases to the installation of the ASW-1210 software:

- copying the ASW-1210 files to your hard disk
- editing the file CONFIG.SYS so that ASPI2DOS and ASPIDISK are loaded when your system starts up

#### Copying the ASW-1210 Files to the Hard Disk

Before you begin installing the ASW-1210 software, copy the files ASPI2DOS.SYS and ASPIDISK.SYS and the directory AFDISK from the ASW-1210 program diskette to drive C using the DOS COPY or XCOPY command. Put the AFDISK files in a separate directory.

#### Loading ASPI2DOS for a Single Host Adapter

In order to have DOS load ASPI2DOS when your computer is turned on, you must put an instruction in the file CONFIG.SYS. This file should be in the root directory and you can use almost any word processor or editor to add the instruction. If you don't have a CONFIG.SYS file, create one using your editing program or DOS. Be sure it's in the root directory.

Add the following command to the beginning of CONFIG.SYS:

```
DEVICE= \ASPI2DOS.SYS
```

When this command exists in the CONFIG.SYS file, DOS will now load ASPI2DOS each time you boot your system. To work properly, this must be the first command in CONFIG.SYS.

ASPI2DOS is loaded the same way even if you already have non-SCSI disks installed on your system.

If you rejumped the host adapter to change from the default port address range, you must add a *switch* to the DEVICE command. You can also specify other settings with switches. See "Configuration Options for ASPI2DOS," later in this chapter, for more information.

If you do not plan to add any switches, you should save CONFIG.SYS now or add a DEVICE command for ASPIDISK, as explained in "Loading APSIDISK," in this chapter.

### Loading ASPI2DOS for Two Host Adapters

If you install two AHA-1520/1522 host adapters, you need to edit the CONFIG.SYS file so that two copies of ASPI2DOS are loaded when you boot your system. You can use almost any word processor or editor to edit CONFIG.SYS. If you don't have a CONFIG.SYS file, create one using your editing program or DOS. Be sure it's in the root directory.

The two copies of ASPI2DOS must use separate port address ranges. One copy of ASPI2DOS must use its default port address range of 340h–35Eh. The other copy must be set to the secondary port address range of 140h–15Eh.

If one of the host adapters has its BIOS enabled, the first copy of ASPI2DOS loaded must use its default port address range. If neither of the host adapters has its BIOS enabled, the order in which you list the copies of ASPI2DOS is unimportant.

To cause DOS to load ASPI2DOS correctly, you must put two commands at the beginning of CONFIG.SYS. If you do not have the S11 models of the host adapter, the two commands should look like the following:

```
DEVICE = ASPI2DOS.SYS
```

```
DEVICE = ASPI2DOS.SYS /P140
```

If you do have the S11 host adapters, you should reverse the order of these commands. The /P140 tells one copy of ASPI2DOS to use the port address range 140h–15Eh.

The two copies of ASPI2DOS are loaded the same way even if you already have non-SCSI disks installed on your system.

You can use the AHA-1520/1522 with other host adapters, including the Adaptec AHA-1540/1542 bus master host adapter. If you change the port address range of the AHA-1520/1522 to avoid conflict with another host adapter, be sure to change the port address range of ASPI2DOS as well. (See the next section for more information about changing the port address range.) ASPI2DOS can coexist with the Adaptec DOS manager for the AHA-1540/1542.

### Configuration Options for ASPI2DOS

There are two groups of options you can specify for ASPI2DOS:

- Group One options can be specified either with ASPI2DOS or with jumpers on the host adapter. Settings you specify with ASPI2DOS override jumper settings, except for /Qx, the Interrupt Channel selection. If you do not specify these options with ASPI2DOS, the settings are taken from the jumpers on the host adapter.
- Group Two options can only be specified with ASPI2DOS. If you do not specify these options, the default values are used. If you use jumpers to change the port address range of the host adapter, you must also specify that change with ASPI2DOS.

You specify options with ASPI2DOS by appending one or more *switches* to the commands that you add to CONFIG.SYS. The format is as follows:

```
DEVICE= \ASPI2DOS.SYS /options
```

The switches that you can use are listed below:

#### Group One

Switch	Function
--------	----------

/C, /C-	The /C switch (the default) prevents SCSI targets from disconnecting during command execution. The /C- switch allows SCSI targets to disconnect during command execution.
---------	---

/TD	Sets the data transfer mode to 8-bit second-party DMA. If you specify this option, you cannot also specify /TP.
-----	---

- 4**
- /TP** Sets the data transfer mode to PIO, the default. If you specify this option, you cannot also specify /TD.
  - /Y, /Y-** The /Y switch (the default) disables the checking of SCSI bus parity by the host adapter. The /Y- switch enables the checking of SCSI bus parity by the host adapter.
  - /U, /U-** The /U switch (the default) enables negotiation for synchronous data transfer between the host adapter and the target. The /U- switch disables negotiation for synchronous data transfer.
  - /Hx** Specifies the host adapter SCSI ID. A number from 0-7 replaces *x*. The default ID is 7. If you specify an invalid number, the default value is used.
  - /Qx** Specifies the host adapter interrupt request (IRQ) channel. A channel number (9, 10, 11, or 12) replaces *x*. If you specify an invalid channel number, the channel specified by the host adapter jumper settings is used. The host adapter jumper block *must* also be jumpered accordingly.
  - /Z** Sets all Group 1 options to their default values. If you want to leave some options at their defaults and change others, you can include the options you want to change along with /Z.

### Group Two

Switch	Function
<b>/L</b>	Causes all LUNs to be addressed when the software determines which logical units are present on the SCSI bus. You should use this option if you are using a bridge controller with SCSI disks. If /L is not specified (the default), only LUN=0 is addressed for each SCSI target.
<b>/P340</b>	Sets the port address to the primary range of 340h–35Eh. The port address specified by the host adapter jumper setting must match the setting you specify with this switch.
<b>/P140</b>	Sets the port address to the secondary range of 140h–15Eh. The port address specified by the host adapter jumper setting must match the setting you specify with this switch.

- /Nx** Sets the AT bus-on time in microseconds. The maximum value of *x* is 15 microseconds (the default). If you specify a value greater than 15, the default value of 15 microseconds is used. This option is used only in DMA mode.
- /Fx** Sets the AT bus-off time in microseconds. The maximum value of *x* is 15 microseconds. If you specify a time greater than 15 microseconds, the default value of 1 microsecond is used. This option is used only in DMA mode.
- /I** Disables the loading of the interrupt 13 driver. This option is used only for debugging.
- /D** Causes the system to display debugging information during initialization.

### Loading ASPIDISK

To have DOS load ASPIDISK each time you boot your system, add the following command to your CONFIG.SYS file:

```
DEVICE = \ASPIDISK.SYS
```

You can use almost any word processor or editor to add this command to CONFIG.SYS. This command must come after the command that loads ASPI2DOS. You only need to load one copy of ASPIDISK, even if you use two host adapters and two copies of ASPI2DOS.

After you have added commands to load ASPI2DOS and ASPIDISK to CONFIG.SYS, you should see the following message when you boot your system (assuming that you did not use the /D switch):

```
ASW 1210: ASPI Manager for DOS (AHA-1520)
Version 2.1
Copyright 1990 Adaptec, Inc.
HA initialization complete; installation successful.
Int 13H routed through ASPI manager
ASPI2DOS.SYS Installation Successful
```

```
ASPI Disk Driver for DOS
Version 2.1
Copyright 1990 Adaptec, Inc.
```

```
2 SCSI disk drive(s) handled by ASPIDISK
5 Logical drive(s) installed
ASPIDISK.SYS Installation Successful
```

ASPIDISK only recognizes SCSI disks that are not controlled by the host adapter BIOS and that have been partitioned with AFDISK or FDISK. If ASPIDISK doesn't find any hard disks that meet these criteria, it will not be loaded. Your system will display the following message when you boot it:

```
Failed to find any SCSI logical drives to support
ASPIDISK.SYS not installed
```

**4** This does not necessarily indicate that there is a problem—all of your SCSI disks may be controlled by the host adapter BIOS, in which case you don't need ASPIDISK and can remove it from CONFIG.SYS. The system will also display this message if you have not yet used AFDISK to partition any appropriate disks. If this occurs, partition the disks with AFDISK before rebooting.

You should note that ASPI2DOS will load normally even if ASPIDISK doesn't load.

### ASPIDISK Configuration Options

You make changes to ASPIDISK by appending one or two switches to the appropriate command in CONFIG.SYS. The format is as follows:

```
DEVICE= \ASPIDISK.SYS /option /option
```

The switches you can use are listed below:

Switch	Function
/Rx	Determines the number of logical drives reserved for removable "hard" disks. Replace <i>x</i> with the number of logical drives to reserve. Specify the largest number of logical drives on any of your cartridges so you can access all of your logical drives. If you do not specify this option, one logical drive is reserved. (Valid values are 1 through 24). This option is ignored if no removable "hard" disk drives are installed.

/D Causes the system to display debugging information during initialization. If you specify the /D option, the system will display a message similar to the following when you boot it:

```
ASW 1210: ASPI Manager for DOS (AHA-1520)
Version 2.1
Copyright 1990 Adaptec, Inc.
HA initialization complete; installation successful.
Int 13H routed through ASPI manager
ASPI2DOS.SYS Installation Successful
```

```
ASPI Disk Driver for DOS
Version 2.1
Copyright 1990 Adaptec, Inc.
```

```
HA #0 - SCSI ID 0: Handled by host adapter BIOS
HA #0 - SCSI ID 1: Handled by host adapter BIOS
HA #0 - SCSI ID 2: Removable media - 2 logical drives
                    E: to F: reserved
HA #0 - SCSI ID 4: Fixed Disk - 3 logical drives
                    G: to I:
```

```
Host Adapter BIOS: 64 head translation
DOS Version: 3.30
```

```
2 SCSI disk drive(s) handled by ASPIDISK
5 logical drive(s) installed
ASPIDISK.SYS Installation Successful.
```

The number of SCSI drives and logical drives listed in this message depends on the number of drives and partitions you have installed on your system.

### Using Removable Media Drives with ASPIDISK and ASPI2DOS

You can use removable media drives with ASPI2DOS and ASPIDISK. Install the drives the same way you would any other. Do not assign the drives SCSI ID 0 or 1—you cannot boot from these drives. Use the /R switch with ASPIDISK to specify the maximum number of logical drives installed on any of your removable media. This ensures that you have access to all of the logical drives on all of your removable media.

You might need to low-level format your media. You can get a removable media format utility from Adaptec Technical Support.

## USING AFDISK

Before you can use your SCSI disks, they must be partitioned (and high-level formatted). You can use the Adaptec disk partitioning utility AFDISK to partition your SCSI disks if the SCSI disk is not installed by the host adapter BIOS at a drive ID other than 1 or 0. In this case you can also install ASPI2DOS and ASPIDISK. You can use the DOS partitioning utility FDISK to partition your SCSI drives if your drive ID is 1 or 0.

After you partition your disks (regardless of which utility you use) you must format them using a utility such as DOS FORMAT. However, it is not required.

### Before Using AFDISK

Before you use AFDISK, make sure that you have copied all its files into the same directory on the hard disk. The files and their functions are listed below:

File	Function
PROGHLP.HLP	AFDISK Help file
SY\$ERR.DTA	AFDISK error message file
SY\$HELP.DTA	AFDISK help message file
SY\$MESSG.DTA	AFDISK system disk file
AFDISK.EXE	SCSI disk partitioning utility

### General Information About AFDISK

If you originally partitioned a disk with FDISK while running DOS 3.21 or later, you do not have to repartition the disk if you subsequently place it under the control of ASPIDISK.

AFDISK partition size limitations are the same as DOS limitations. If you use DOS 3.3, the maximum partition size is 32 megabytes. If you use DOS 4.0 or later (or 3.21), the maximum partition size is one gigabyte.

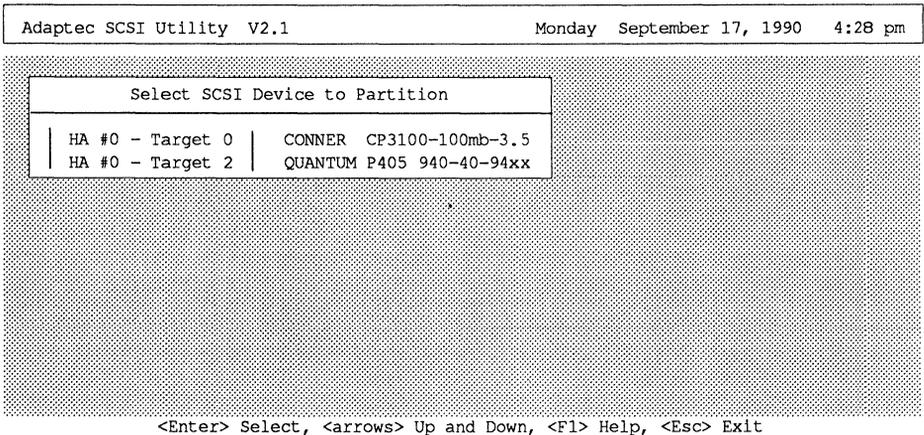
AFDISK indicates partition size in terms of *cylinders*. The host adapter defines the cylinder size as one megabyte (regardless of how many platters you have). A partition that begins with cylinder 0 and ends with cylinder 31 is therefore a 32-megabyte partition.

You can get online help while using AFDISK by pressing F1.

## Using AFDISK to Partition a Disk

1. To invoke AFDISK, type **AFDISK** at the DOS prompt and press Enter.

The system displays the Select SCSI Device to Partition window, which lists SCSI disk drives connected to each host adapter on your systems:



The drives and host adapters listed depend upon what is installed on your system.

2. To create or delete partitions on a disk, use the arrow keys to highlight the desired disk. Press Enter.

The system displays logical drive information in the lower left corner of the screen and information about existing partitions in the upper right. In this example, no partitions currently exist on the disk:

Adaptec SCSI Utility V2.1 Monday September 17, 1990 4:29 pm

	Type	Start	End	Megs
Select SCSI Device to Partition				
HA #0 - Target 0   CONNER CP3100-1				
HA #0 - Target 2   QUANTUM P405 940				

Logical Drive Info

64 heads  
 32 sectors/track  
 40 cylinders  
 512 bytes/sector

40 megabytes  
 1406Ch blocks

<Ins> Create, <Del> Delete, <F1> Help, <Esc> Exit

4

3. To delete an existing partition, you would highlight it in the box in the upper right and press Del. You would then answer yes to the next prompt.
4. To create a partition, press Ins.

The system displays the Create a DOS Partition window. The Start Cylinder and End Cylinder fields default to the maximum allowed under the version of DOS you are using and for which there is space. In this example, a 32-megabyte partition is the default:

Adaptec SCSI Utility V2.1 Monday September 18, 1990 4:32 pm

	Type	Start	End	Megs
Select SCSI Device to Partition				
HA #0 - Target 0   CONNER CP3100-1				
HA #0 - Target 2   QUANTUM P405 940				

Logical Drive Info

64 heads  
 32 sectors/track  
 40 cylinders  
 512 bytes/sector

40 megabytes  
 1406Ch blocks

Create a DOS Partition

Start Cylinder: 0  
 End Cylinder: 31

<F1> Help, <Esc> Save and Exit

- To change the default values in the Start and End Cylinder fields, highlight the field you want to change and type the number you want. AFDISK will not let you enter an invalid number.
- When you are ready to create the partition, press Esc. When the system asks if you want to create the partition, answer yes:

Adaptec SCSI Utility V2.1 Monday September 18, 1990 4:33 pm

Select SCSI Device to Partition	Type	Start	End	Megs
HA #0 - Target 0   CONNER CP3100-1				
HA #0 - Target 2   QUANTUM P405 940				

Logical Drive Info

- 64 heads
- 32 sectors/track
- 40 cylinders
- 512 bytes/sector
- 40 megabytes
- 1406Ch blocks

Create Partition? - <F1> Help

No

Yes

Create a DOS Partition

Start Cylinder: 0

End Cylinder: 31



- If you want to create additional partitions, repeat steps 4-6 for each partition. The list of partitions in the upper right corner of the screen displays the size of each partition. In this example, two partitions have been installed:

Adaptec SCSI Utility V2.1 Tuesday September 18, 1990 12:08 pm

Select SCSI Device to Partition	Type	Start	End	Megs
HA #0 - Target 0   CONNER CP3100-1	DOS	0	31	32
HA #0 - Target 2   QUANTUM P405 940	DOS	32	39	8

Logical Drive Info

- 64 heads
- 32 sectors/track
- 40 cylinders
- 512 bytes/sector
- 40 megabytes
- 1406Ch blocks

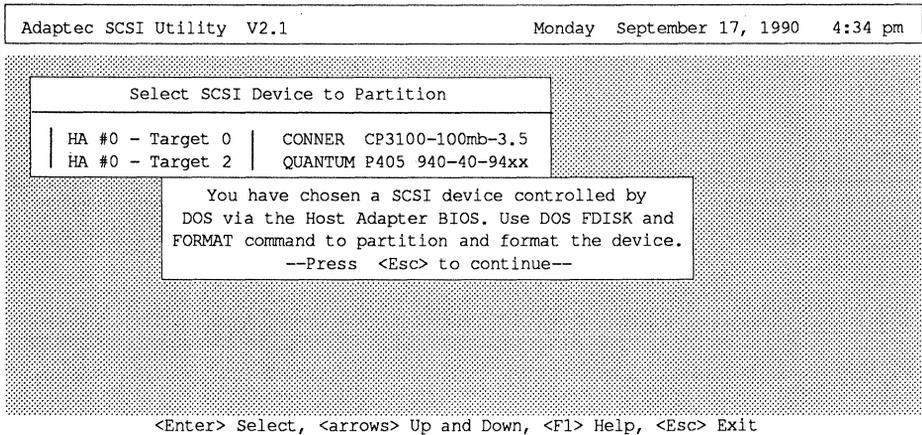
<Ins> Create, <Del> Delete, <F1> Help, <Esc> Exit

- 8. When you have finished partitioning the disk, press Esc to return to the Select SCSI Device to Partition window.
- 9. If you want to partition more disks, repeat steps 2-8 for each disk you want to partition.
- 10. When you have finished partitioning disks, press Esc to exit AFDISK.

**AFDISK and the Host Adapter BIOS**

You cannot use AFDISK to partition disks controlled by the host adapter BIOS. If you try to use AFDISK to partition a disk controlled by the host adapter BIOS, you will see the following screen:

4



## Screen Legibility While Using AFDISK

Occasionally, especially if you use a laptop computer or monochrome VGA, you may find it difficult to read the text on the screen when you run AFDISK. You can fix this problem by putting your computer into monochrome mode. To do so, use the following DOS command:

```
MODE BW80
```

If you want to return to color mode, use the following DOS command:

```
MODE CO80
```

## UNDERSTANDING AND RESOLVING ERRORS

This section lists and explains the error messages that your system can display when you boot it after adding the ASPI2DOS and ASPIDISK commands to the CONFIG.SYS file.

### Error Messages for ASPI2DOS

Message	Meaning
Illegal or no hex digit found in Command Line /P Option	You used an invalid number with /P. Only /P140 and /P340 are valid.
Failed to initialize HA, installation failed.	The driver failed to initialize the host adapter. Make sure there are no hardware conflicts with other equipment, the host adapter's jumpers are correctly set, and the host adapter is properly installed.

## Error Messages for ASPIDISK

### Message

### Meaning

Unable to open ASPI manager!

The system failed to access the ASPI2DOS software. The software may not be loaded. Check CONFIG.SYS to make sure that ASPIDISK will be loaded after ASPI2DOS and reboot.

Command line argument is incorrect

DOS cannot understand an argument in the CONFIG.SYS command that loads ASPIDISK. Make sure that the command and all its arguments are valid.

4

ASPI "Host Adapter Inquiry" failed.

ASPIDISK failed to issue the ASPI host adapter inquiry command to get information from installed host adapters. Make sure that all SCSI cables are installed correctly and the SCSI bus is terminated correctly.

No Host Adapter exists

ASPIDISK cannot find a host adapter on the system. Make sure that there are no port address conflicts and that the host adapter is correctly installed.

ASPI "Get Device Type" failed.

ASPIDISK failed to issue the ASPI Get Device Type command. Make sure that all SCSI cables are properly installed and that the SCSI bus is properly terminated.

Failed to access ASPI device parameter. SCSI drive either not formatted or bad.

ASPIDISK failed to read the BIOS parameter block of the first SCSI drive that is controlled by the driver. The drive is either unformatted or bad.

Get DOS version failed.

ASPIDISK failed to determine the DOS version.

Invalid DOS version. DOS must be version 3.21 and above.

The current DOS version is older than 3.21. Upgrade to DOS 3.21 or later.

SCSI ID XX - Read Capacity failed

The driver failed to issue the SCSI Read Capacity command on the specified drive. Make sure that all SCSI cables are properly installed and that the SCSI bus is properly terminated.

Failed to read master boot record

ASPIDISK failed to read the information from the master boot record on the boot drive. The drive is either bad or unpartitioned.

Failed to read boot record

ASPIDISK failed to read the disk parameters. The SCSI drive may be unformatted.

Error issuing SCSI Inquiry command

ASPIDISK failed to issue the SCSI Inquiry command to check the removable media.

No SCSI drives attached

ASPIDISK cannot find any SCSI drive attached on the system. Make sure your drives are correctly installed.

Failed to find any SCSI logical drives to support

ASPIDISK cannot find any logical drives. Any drives not controlled by the host adapter BIOS may not have been partitioned.

WARNING: Maximum number of logical drives reached. Driver can only support up to 26 logical drives.

There are too many logical drives on the attached SCSI drives. The maximum number allowable under DOS is 26. The data on the uninstalled logical drives is not lost. The data will be available when sufficient logical drives are present.

ASPIDISK.SYS is not installed

This message will be shown with the error messages listed above to indicate that the loading of the driver has failed.



This chapter tells you how to install Adaptec's ASW-1240 ASPI software for Novell NetWare 286 2.15 and the AHA-1520/1522 host adapter. The ASW-1240 software supports both NetWare 286 2.15 SFT and NetWare 286 2.15 Advanced. The software contains an operating system manager and other files that allow you to use SCSI devices with the NetWare file server.

You use the Novell NetWare NETGEN.EXE program to install the file server operating system and reconfigure it to reflect the presence of the ASW-1240 software and the AHA-1520/1522 host adapter.

The chapter covers these major topics:

- hardware considerations
- ASW-1240 files for NetWare 286 2.15
- information on using NETGEN
- basic NetWare installation
- multiple disk drive configurations
- understanding and resolving errors
- host adapter options

## HARDWARE CONSIDERATIONS

Before you begin the software installation, make sure that the host adapter is properly installed and configured. See Chapter 3, "Changing Jumper Settings," for information about configuration choices and using jumpers. Make sure you know how the host adapter is jumpered so you can select the correct configuration options for the software.

Make sure that a LAN card is installed in your system.

If you are planning to install multiple disk drives on the NetWare system, consult "Multiple Disk Drive Configurations" later in this chapter. There are specific hardware considerations for each multiple disk drive configuration. You should make any necessary changes to the jumper settings on the host adapter or adapters before proceeding with the software installation.

**ASW-1240 FILES FOR NETWARE 286 2.15**

Adaptec's ASW-1240 software supports NetWare 386v3.1 (see Chapter 6, "Software for NetWare 386") and NetWare 286 2.15 and later. The files for NetWare 286 2.15 are found in the \NET286 directory on the ASW-1240 diskette. This directory contains the following files:

<b>File</b>	<b>Purpose</b>
PRI1520.DSK PRI1520.OBJ	These files contain the driver for an AHA-1520/1522 host adapter jumpered to primary port address range (340h-35Eh).
ALT1520.DSK ALT1520.OBJ	These files contain the driver for an AHA-1520/1522 host adapter jumpered to secondary port address range (140h-15Eh).
README.TXT	This is an ASCII file containing information about the other files.

**INFORMATION ABOUT USING NETGEN**

NETGEN.EXE is a Novell program that installs and configures the file server operating system. The ASW-1240 software installation requires NETGEN. This section provides basic information about NETGEN. For more detailed information, consult the NetWare documentation.

NETGEN can be used in four different hardware configurations:

- standard (floppy diskettes)
- RAM disk
- network drive
- hard disk

NETGEN functions similarly in all configurations, except that it reads the NetWare and ASW-1240 files from different sources. In the standard configuration, NETGEN reads files directly from floppy diskettes. In the other configurations, first you copy the NetWare and ASW-1240 files from the diskettes onto the appropriate drives. Then NETGEN reads the files from the drives.

This chapter documents the hard disk configuration. To use the other configurations, consult the NetWare documentation.

### Before Using NETGEN with a Hard Disk

Make copies of all NetWare and ASW-1240 diskettes before you begin, and work with the copies.

Using the working copies of the NetWare diskettes, copy all the NetWare files onto your hard disk. Make a separate directory for each diskette and give it the same name. Copy the contents of each diskette into the appropriate directory.

After you have copied the NetWare files onto your hard disk, copy the appropriate ASW-1240 files into a new directory on the hard disk. Create a new directory called `\DSK_DRV_.209`. Note the letter of the logical drive that contains this directory. Copy the files in the `\NET286.215` directory on the working copy of the ASW-1240 diskette into this directory.

### BASIC NETWARE INSTALLATION

The procedures in this section describe a typical installation of NetWare and the ASW-1240 software. These procedures also form the basis for installing multiple disk drive configurations. If you are planning to use a multiple disk drive configuration, first familiarize yourself with the basic installation.

The procedures that follow describe the installation of a file server operating system on a system that does not run NetWare. If your system is already running NetWare and you are adding the AHA-1520/1522 host adapter and the ASW-1240 software, you can use a simpler procedure. Begin by typing `NETGEN` rather than `NETGEN -N`. Thereafter the installation is basically the same except that you only enter information about the host adapter, its software, and the new disk drives. The rest of the configuration information can be carried over from the existing operating system.

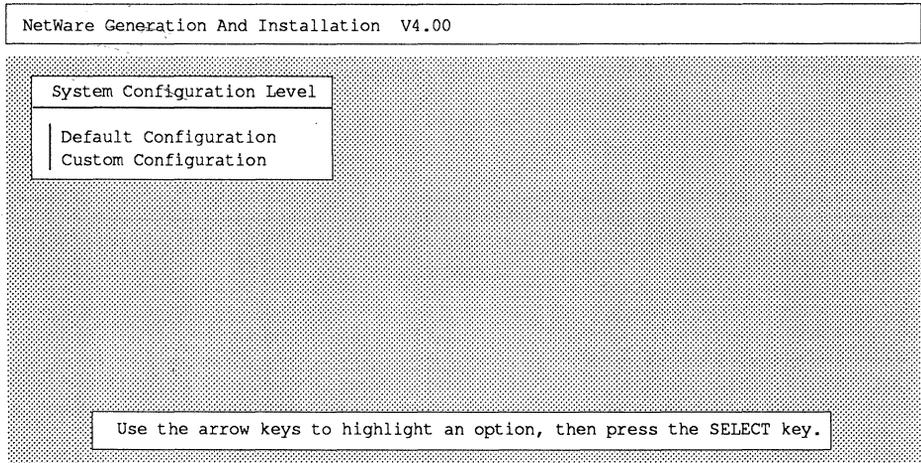
If at any time during the NetWare installation you need to verify you have correctly completed a previous step, press the Esc key. The Esc key moves back to the previous menu.

Once you have copied all the necessary NetWare and ASW-1240 files, you can begin using NETGEN to install the software. The software installation is divided into two phases. In the first phase, you select and configure drivers (including the host adapter driver and the driver for the LAN card). In the second phase, you link and configure the operating system to reflect the configurations of the drivers you have selected.

## To Select and Configure Drivers

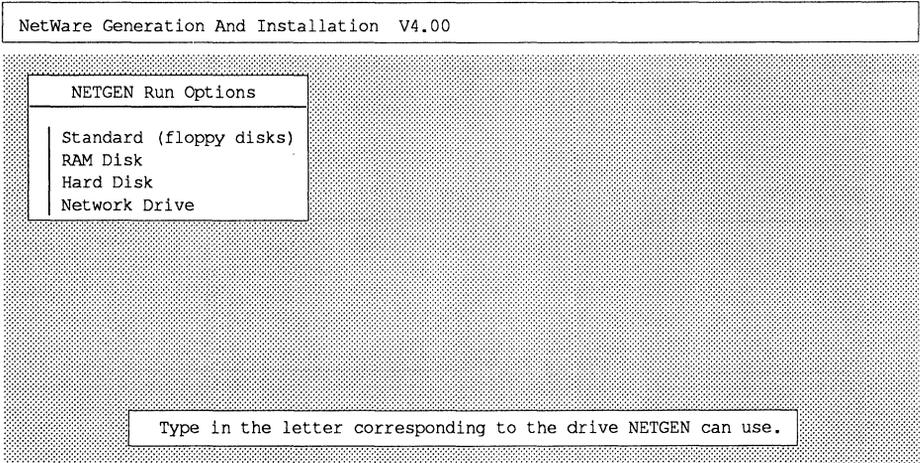
1. Type NETGEN -N at the DOS prompt and press Enter.

The system displays the following screen:



2. Use the arrow keys to highlight Custom Configuration and press Enter.

The system displays the NETGEN Run Options menu:

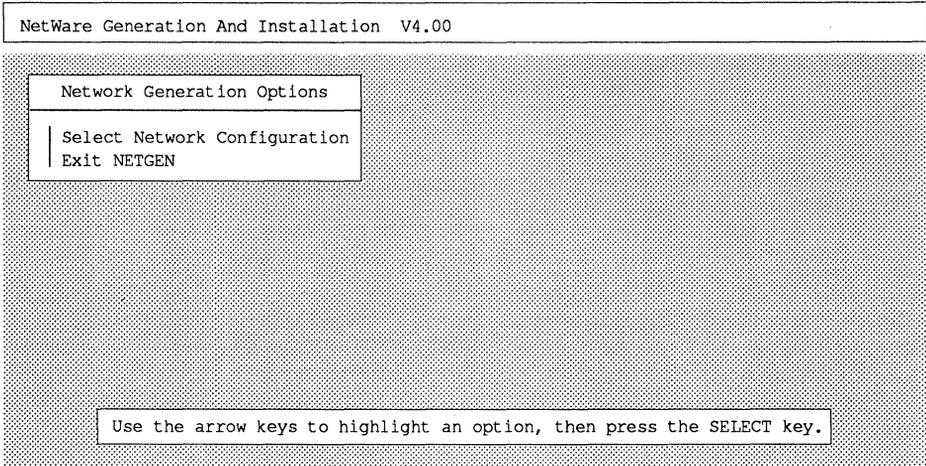


3. Use the arrow keys to highlight Hard Disk and press Enter.

The system prompts you for the letter of the logical drive that contains the NetWare subdirectories previously created, including the DSK\_DRV\_.209 subdirectory with the NetWare 286 drivers for the AHA-1520/22

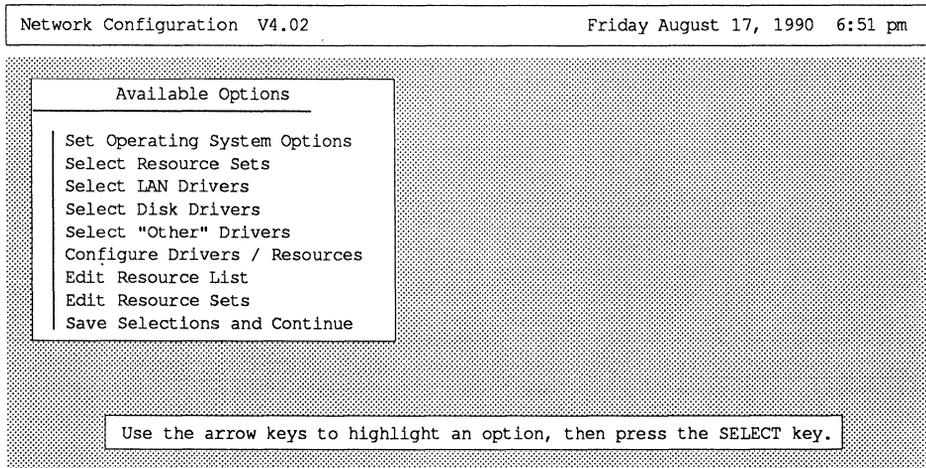
- Enter the letter of the logical drive that contains the \DSK\_DRV\_.209 directory and press Enter.

The system displays the Network Generations Options menu:



- Use the arrow keys to highlight Select Network Configuration and press Enter.

The system takes a moment to load files and then displays the Available Options menu:



- 6. Use the arrow keys to highlight Select Disk Drivers and press Enter.

The system displays the Disk Driver Options menu:

Network Configuration V4.02 Friday August 17, 1990 1:57 pm

Selected Disk Drivers	
Se	0
Se	1
Se	2
Se	3
Se	4
Co	

Edit Resource List  
 Edit Resource Sets  
 Save Selections and Con

Disk Driver Options  
 Select Loaded Item  
 Load and Select Item

Use the arrow keys to highlight an option, then press the SELECT (Enter) key. Press ESCAPE to save selections and continue.

- 7. Use the arrow keys to highlight Load and Select Item and press Enter.

NETGEN reads the ASW-1240 files from the DSK\_DRV\_.209 directory that you created.

The system informs you that it has read the first host adapter file:

Network Configuration V4.02 Friday August 17, 1990 1:58 pm

Se	0
Se	1
Se	2
Se	3
Se	4

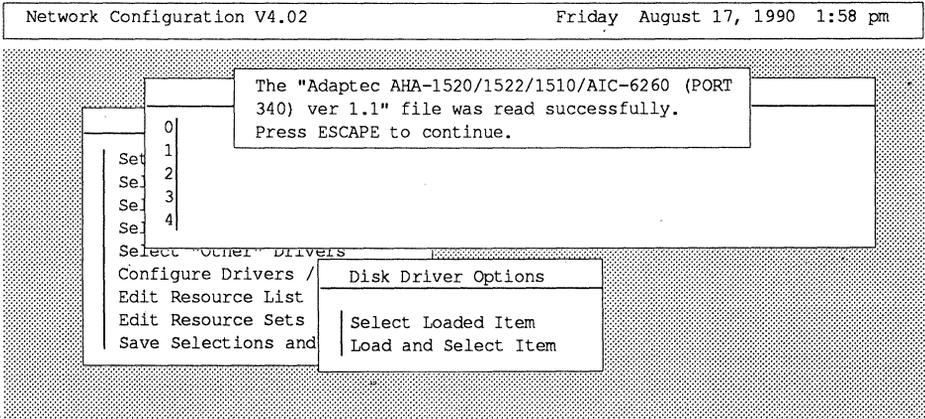
The "Adaptec AHA-1520/1522/1510/AIC-6260 (PORT 140) ver 1.1" file was read successfully.  
 Press ESCAPE to continue.

Select "Other" Drivers  
 Configure Drivers /  
 Edit Resource List  
 Edit Resource Sets  
 Save Selections and

Disk Driver Options  
 Select Loaded Item  
 Load and Select Item

8. Press Esc.

The system informs you that it has read the second host adapter file:

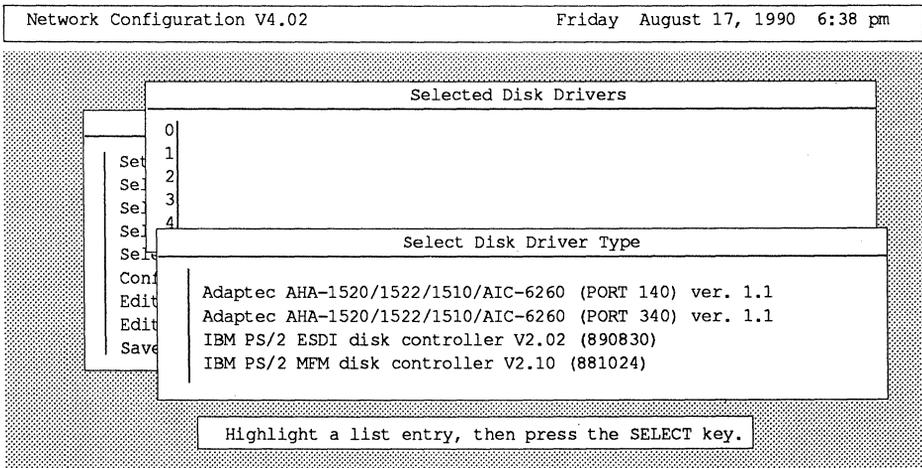


5

9. Press Esc.

10. The system prompts you for a channel number. Valid numbers are 0 through 4. Use channel 0 if you plan to boot from the disk. Enter the channel number you want to configure and press Enter.

The system displays the Select Disk Driver Type menu:

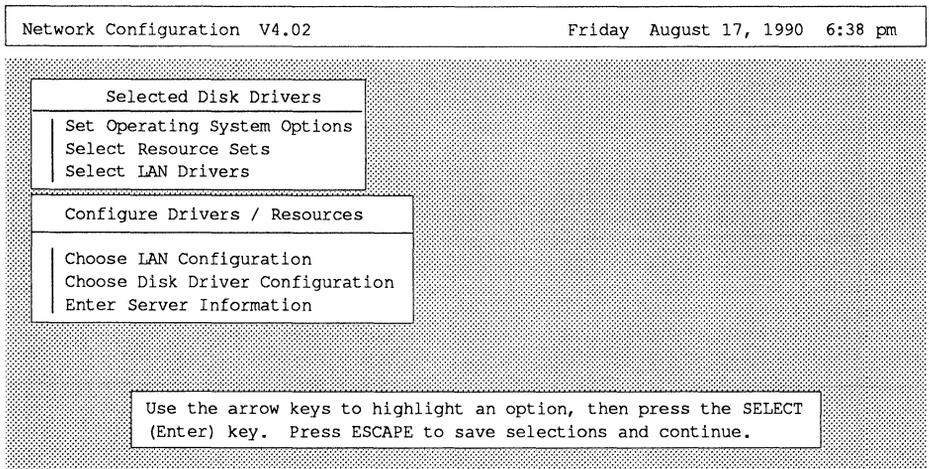


11. Use the arrow keys to highlight the option that reflects the port address range on your host adapter. Press Enter.

The system redisplay the Disk Driver Options menu.

12. Press Esc to return to the Available Options menu.
13. Use the arrow keys to highlight Select LAN Drivers and press Enter. Choose the driver for the LAN card installed in your system.
14. Press Esc to return to the Available Options menu.
15. Use the arrow keys to highlight Configure Drivers/Resources and press Enter.

The system displays the Configure Drivers/Resources menu:



16. Use the arrow keys to highlight Choose Disk Driver Configuration and press Enter.

The system displays the Unconfigured Disk Drivers menu and lists the disk driver that you selected:

Network Configuration V4.02

Friday August 17, 1990 6:38 pm

## Unconfigured Disk Drivers

0: AHA-1520/1522: I/O Port=340h, IRQ=11

Highlight a list entry, then press the SELECT key.

Use the arrow keys to highlight the driver and press Enter.

The system displays a list of available configurations:

Network Configuration V4.02

Friday August 17, 1990 2:21 pm

## Unconfigured Disk Drivers

0:	Available Disk Configurations		
0:	0: AHA-1520/1522:	I/O port = 340h,	IRQ = 11
1:	1: AHA-1520/1522:	I/O port = 340h,	IRQ = 9
2:	2: AHA-1520/1522:	I/O port = 340h,	IRQ = 10
3:	3: AHA-1520/1522:	I/O port = 340h,	IRQ = 12
4:	4: AHA-1510/AIC-6260:	I/O port = 340h,	IRQ = 11
5:	5: AHA-1510/AIC-6260:	I/O port = 340h,	IRQ = 9
6:	6: AHA-1510/AIC-6260:	I/O port = 340h,	IRQ = 10
7:	7: AHA-1510/AIC-6260:	I/O port = 340h,	IRQ = 12

Highlight a list entry, then press the SELECT key.

18. Use the arrow keys to scroll through the list to find the option that corresponds to the configuration of the AHA-1520/1522 host adapter installed in your system. See "Host Adapter Options" later in this chapter for a complete list of the available options. When the proper option is highlighted, press Enter.

The system redisplay the Configure Drivers/Resources menu.

19. Use the arrow keys to highlight Choose LAN Configuration and press Enter.
20. Choose the LAN configuration that corresponds to your LAN driver from the list and press Enter.

The system redisplay the Configure Drivers/Resources menu.

21. Use the arrow keys to highlight Enter Server Information and press Enter.

The system prompts you for information about your system.

22. Type the requested information and press Enter.

The system redisplay the Configure Drivers/Resources menu.

23. Press Esc to return to the Available Options menu.
24. Use the arrow keys to highlight Save Selections and Continue on the Available Options menu and press Enter.
25. The system asks if you want to save the driver configurations and continue the network generation process. Use the arrow keys to highlight the Yes option and press Enter.

The system displays the Network Generations Options menu.

This completes the first phase of software installation, selecting and configuring drivers.

### To Link and Configure the Operating System

Now you begin the second phase of software installation. You have selected and configured all necessary drivers. You need to link and configure the operating system to reflect these selections.

1. Use the arrow keys to highlight Link/Configure NetWare Operating System and press Enter.

The system takes a few moments, displays a message telling you that it is linking and configuring the operating system, and then redisplay the Network Generation Options menu.

- 2. Use the arrow keys to highlight Link/Configure File Server Utilities and press Enter.

The system takes a few moments, displays a message telling you that it is linking and configuring the file server utilities, and then redisplay the Network Generation Options menu.

- 3. Use the arrow keys to highlight NetWare Installation and press Enter.

The system displays a message telling you that it is inspecting the disk drives. If it finds a drive that has not been tested with COMPSURF, a disk analysis program, you must stop the NetWare installation and analyze the surface of the disk using that program. To invoke COMPSURF, choose Analyze Disk Surface on the Network Generation Options menu. Consult the NetWare documentation for information on COMPSURF.

- 4. If the disk drive has been analyzed with COMPSURF (or after you have analyzed it), use the arrow keys to highlight NetWare Installation on the Network Generations Options menu and press Enter.

The system displays information about the hard drives connected to your system:

SFT Netware + TTS Install V4.00 Monday August 20, 1990 5:29 pm  
 Press F1 For Help

Drive Name	Channel	Controller	Drive	Status
CONNER CP3100-100mb	0	0	0	

Verify that the drives and information displayed are correct. If necessary use the arrow keys to view all drives. Then press the ESCAPE key to continue.

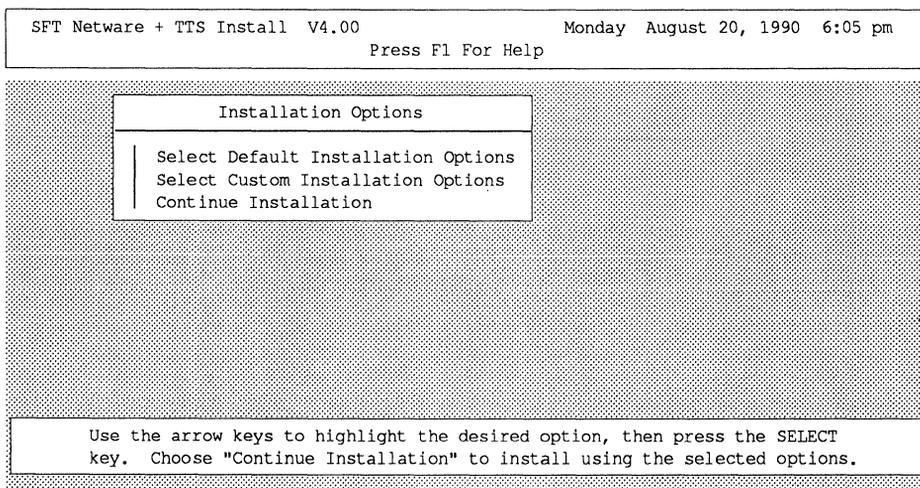
5

5. Verify that the information about each disk drive is correct. "Channel" lists the NetWare channel to which the drive is assigned; "Controller" lists the SCSI ID of the drive; "Drive" lists the logical unit number of the drive, which is almost always zero. Press Esc when you are sure the information is correct.

The system asks you to confirm the information.

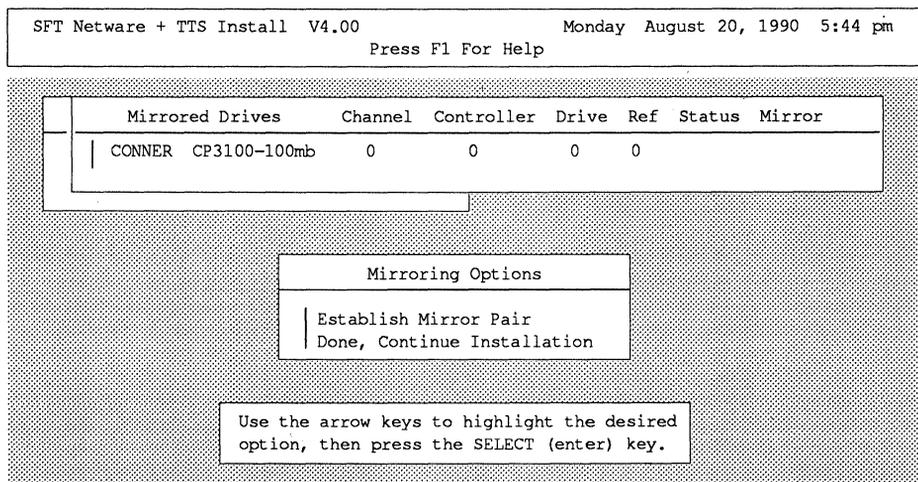
6. Use the arrow keys to highlight Drive List Is Correct and press Enter.

The system displays the Installation Options menu:



7. Use the arrow keys to highlight Select Default Installation Options and press Enter.

The system displays the Mirroring Options menu:



- 5
- Use the arrow keys to highlight Done, Continue Installation on the Mirroring Options menu and press Enter.
  - The system provides instructions on naming the file server and installing files. Follow these instructions to complete the NetWare installation.

## MULTIPLE DISK DRIVE CONFIGURATIONS

The ASW-1240 software allows you to use multiple SCSI hard disk drives for fault tolerance and multitasking when running on SFT versions of NetWare. There are three multiple disk drive configurations:

- disk mirroring for fault tolerance
- disk duplexing for fault tolerance
- multiple channels per host adapter for multitasking

The following sections provide information on how to install the ASW-1240 and NetWare software for each of these configurations.

### Disk Mirroring

Disk mirroring occurs when the software configuration allows two hard disks connected to a single host adapter to contain the same data. If one disk fails, the other continues to function and preserves the data. Figure 5-1 illustrates the configuration for disk mirroring.

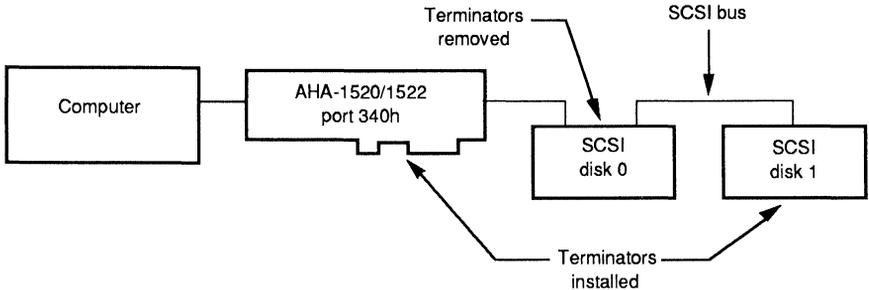


Figure 5-1. Configuration for disk mirroring

### Hardware Considerations

Make sure that your host adapter and disk drives are properly prepared before configuring the system for disk mirroring. You should keep in mind the following list of important hardware considerations:

- The two disk drives must have almost the same capacity. NetWare does not allow drives that vary greatly in capacity to be mirrored. Consult the NetWare documentation for limitations.
- The drives must be connected on the same SCSI bus to the same AHA-1520/1522 host adapter.
- Both drives must be assigned to the same interrupt request channel.
- The SCSI IDs of the the two drives must be different. If you want to boot from one of the drives, its SCSI ID must be 0.
- The SCSI devices at the beginning and end of the SCSI bus must have terminators. All other SCSI devices on the SCSI bus must have their terminators removed. The AHA-1520/1522 is a SCSI device. Its terminators should be installed unless you use both the external and internal connectors.

*Setting Up Mirrored Disk Drives*

Software installation for mirrored disk drives is similar to the basic installation. It differs only in the second phase of the installation. To complete the first phase of the installation, follow the procedure in "Selecting and Configuring Drivers" in the Basic NetWare Installation section.

To complete the second phase of the software installation for mirrored disk drives, use the following procedure.

1. Use the arrow keys to highlight Save Selections and Continue on the Available Options menu and press Enter.
2. The system asks if you want to save the driver configurations and continue the network generation process. Use the arrow keys to highlight the Yes option and press Enter.

The system displays the Network Generations Options menu:

3. Use the arrow keys to highlight Link/Configure NetWare Operating System and press Enter.

The system takes a few moments, displays a message telling you that it is linking and configuring the operating system, and then redisplay the Network Generation Options menu.

4. Use the arrow keys to highlight Link/Configure File Server Utilities and press Enter.

The system takes a few moments, displays a message telling you that it is linking and configuring the file server utilities, and then redisplay the Network Generation Options menu.

5. Use the arrow keys to highlight NetWare Installation and press Enter.

The system displays a message telling you that it is inspecting the disk drives. If it finds a drive that has not been tested with COMPSURF, you must stop the NetWare installation and analyze the surface of the disk using that program. To invoke COMPSURF, choose Analyze Disk Surface on the Network Generation Options menu. Consult the NetWare documentation for information on COMPSURF.



- Use the arrow keys to highlight Drive List is Correct and press Enter.

The system displays the Installation Options menu:

SFT Netware + TTS Install V4.00 Monday August 20, 1990 6:05 pm  
 Press F1 For Help

Installation Options

| Select Default Installation Options  
 | Select Custom Installation Options  
 | Continue Installation

Use the arrow keys to highlight the desired option, then press the SELECT key. Choose "Continue Installation" to install using the selected options.

5

- Use the arrow keys to highlight Select Default Installation Options and press Enter.

The system displays the Mirroring Options menu:

SFT Netware + TTS Install V4.00 Monday August 20, 1990 5:44 pm  
 Press F1 For Help

Mirrored Drives	Channel	Controller	Drive	Ref	Status	Mirror
CONNER CP3100-100mb	0	0	0	0	P	1
QUANTUM P105S 910-10	1	0	0	1	S	0

Mirroring Options

| Establish Mirror Pair  
 | Done, Continue Installation

Use the arrow keys to highlight the desired option, then press the SELECT (enter) key.

10. Use the arrow keys to highlight Establish Mirror Pair and press Enter.

The system redisplay the Mirroring Options menu.

11. Use the arrow keys to highlight Done, Continue Installation and press Enter.

12. The system provides instructions about naming the file server and installing files. Follow these instructions to complete the NetWare installation.

### Disk Duplexing

Disk duplexing occurs when two host adapters installed in the file server are connected to separate disk drives. Each of the disk drives contains the same data. If one disk fails, the other continues to function, preserving the data. Figure 5-2 illustrates the configuration for disk duplexing.

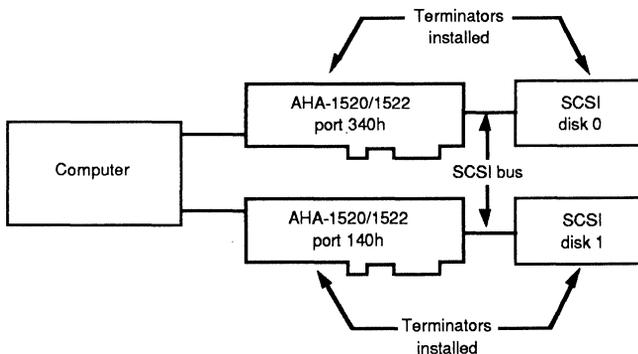


Figure 5-2. Configuration for disk duplexing

### Hardware Considerations

Make sure that the host adapter and disk drives are properly prepared before configuring the system for disk duplexing. You should keep in mind the following list of important hardware considerations:

- The two disk drives must have almost the same capacity. NetWare does not allow drives that vary greatly in capacity to be duplexed. Consult the NetWare documentation for limitations.

- Each drive must be connected to a separate AHA-1520/1522 host adapter on a separate SCSI cable.
- If you use two AHA-1522 host adapters, only one can have its floppy controller enabled. The other floppy controller must be disabled. See Chapter 3, “Changing Jumper Settings” for information on disabling the floppy controller.
- Each AHA-1520/1522 must use a different interrupt request (IRQ) channel. See Chapter 3 for information on changing IRQ channel settings.
- Each AHA-1520/1522 must use a different DMA channel. See Chapter 3 for information on changing DMA channel settings.
- The BIOS on at least one of the AHA-1520/1522 host adapters must be disabled. See Chapter 3 for information on disabling the host adapter BIOS. Do not disable the BIOS of the host adapter connected to the SCSI disk from which you want to boot.
- Each host adapter must use a different port address range. If one of the host adapters has its BIOS enabled, it must operate at primary port address 340h. (If the host adapter with its BIOS enabled is an S11 version, it must operate at port address 140h.) The other host adapter should operate at secondary port address (140h for the standard host adapter and 340h for the S11 version). See Chapter 3 for information on changing the port address range.
- The SCSI device at the beginning and end of each SCSI bus must have terminators. All other SCSI devices on the SCSI bus must have their terminators removed. The AHA-1520/1522 is a SCSI device. Its terminators should be installed unless you use both the external and internal connectors.

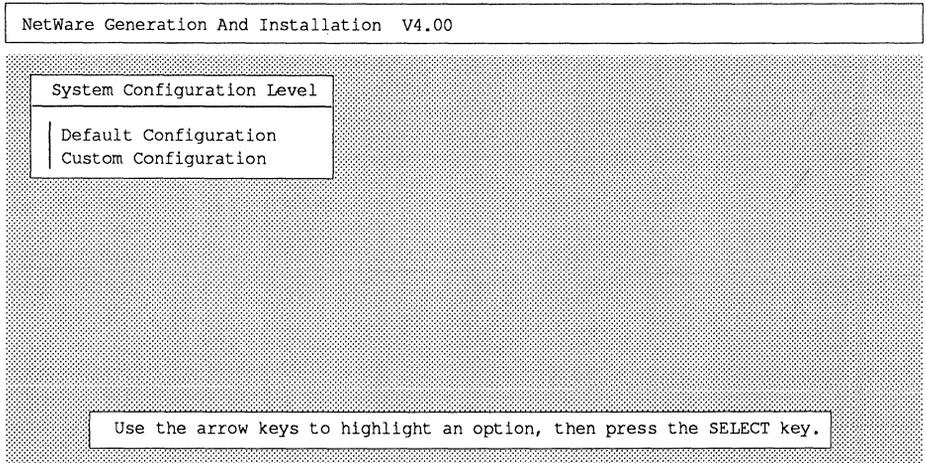
### *Setting Up Duplexed Disk Drives*

Software installation for duplexed disk drives is similar to the mirrored disk drives installation. It differs only in the first phase, selecting and configuring drivers. If you are using duplexed drives, you need to install two disk drivers, one for each host adapter. Install one driver at primary port address 340h and the other at secondary port address 140h.

To complete the first phase of the software installation for duplexed disk drives, use the following procedure.

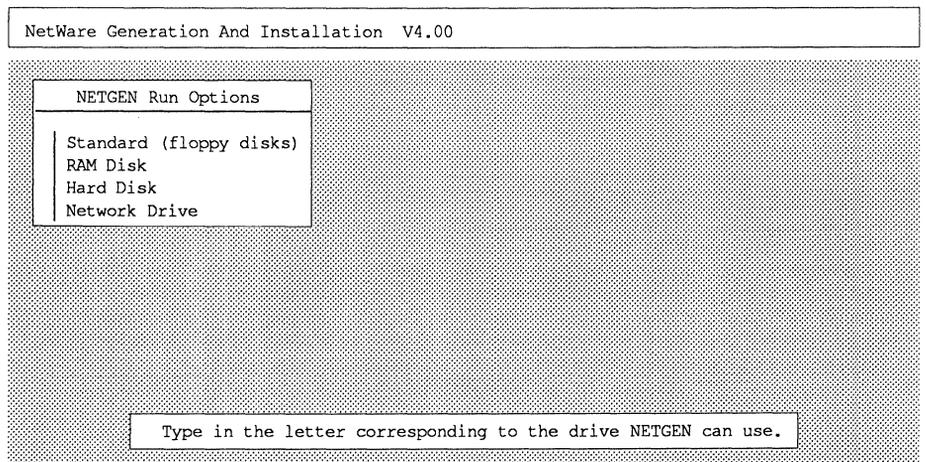
1. Type NETGEN -N at the DOS prompt and press Enter.

The system displays the following screen:



2. Use the arrow keys to highlight Custom Configuration and press Enter.

The system displays the NETGEN Run Options menu:

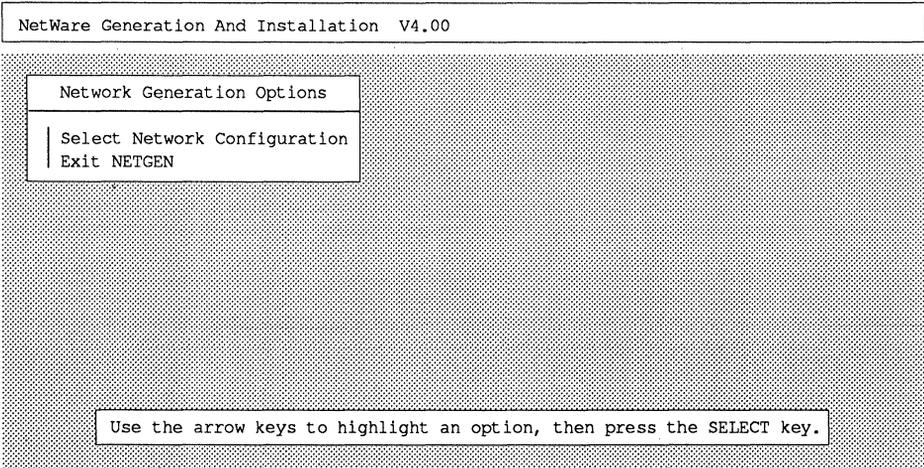


3. Use the arrow keys to highlight Hard Disk and press Enter.

The system prompts you for the letter of the logical drive that contains the directory for the ASW-1240 files (DSK\_DRV\_.209).

4. Enter the letter of the logical drive that contains this directory and press Enter.

They system displays the Network Generations Options menu:



5. Use the arrow keys to highlight Select Network Configuration and press Enter.

The system takes a moment to load files and then displays the Available Options menu:

Network Configuration V4.02 Friday August 17, 1990 6:51 pm

Available Options

- Set Operating System Options
- Select Resource Sets
- Select LAN Drivers
- Select Disk Drivers
- Select "Other" Drivers
- Configure Drivers / Resources
- Edit Resource List
- Edit Resource Sets
- Save Selections and Continue

Use the arrow keys to highlight an option, then press the SELECT key.

- Use the arrow keys to highlight Select Disk Drivers and press Enter.

The system displays the Disk Driver Options menu:

Network Configuration V4.02 Friday August 17, 1990 1:57 pm

Selected Disk Drivers

Se	0	
Se	1	
Se	2	
Se	3	
Se	4	
Co		

<ul style="list-style-type: none"> <li>Edit Resource List</li> <li>Edit Resource Sets</li> <li>Save Selections and Con</li> </ul>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Disk Driver Options</p> <ul style="list-style-type: none"> <li>Select Loaded Item</li> <li>Load and Select Item</li> </ul> </div>
---	---

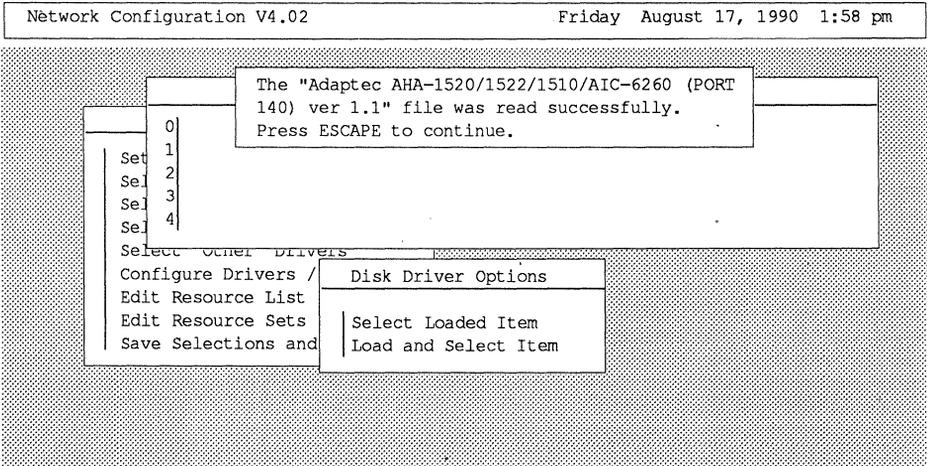
Use the arrow keys to highlight an option, then press the SELECT (Enter) key. Press ESCAPE to save selections and continue.

- Use the arrow keys to highlight Load and Select Item and press Enter.



NETGEN reads the ASW-1240 files from the DSK\_DRV\_209 directory that you created.

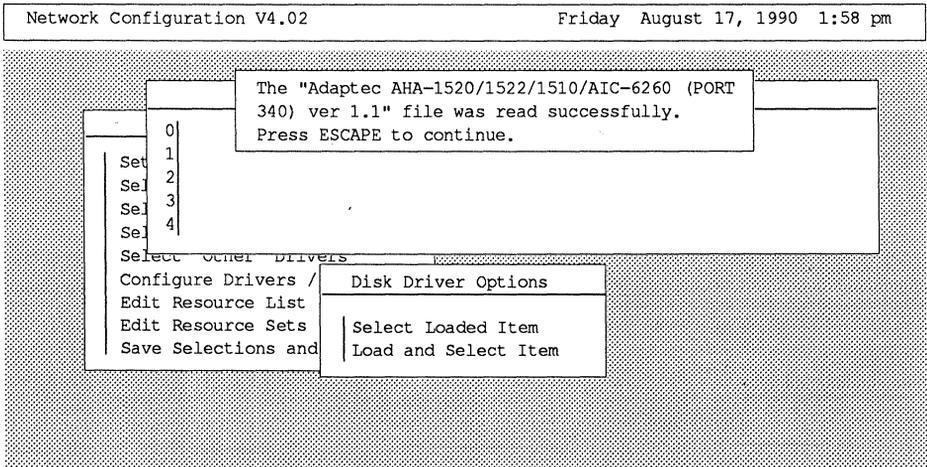
The system informs you that it has read the first host adapter file:



5

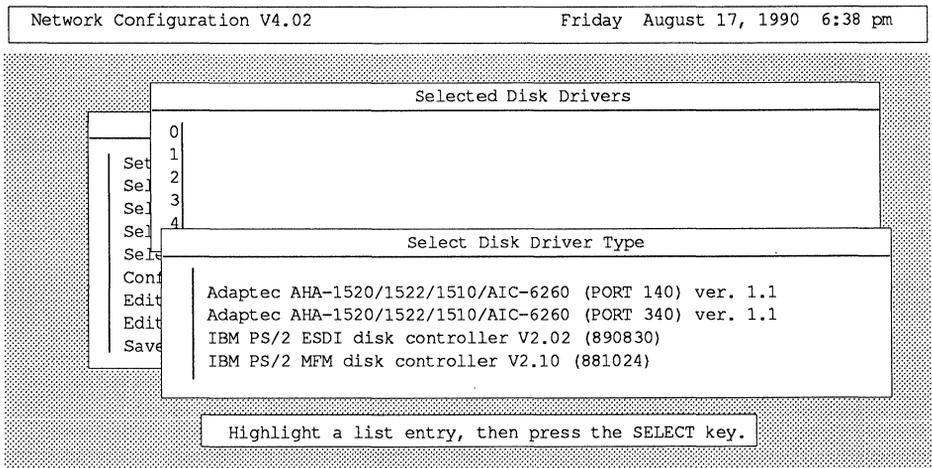
8. Press Esc.

The system informs you that it has read the second host adapter file:



- 9. Press Esc.
- 10. The system prompts you for a channel number. Type 0 and press Enter.

The system displays the Disk Driver Type menu:

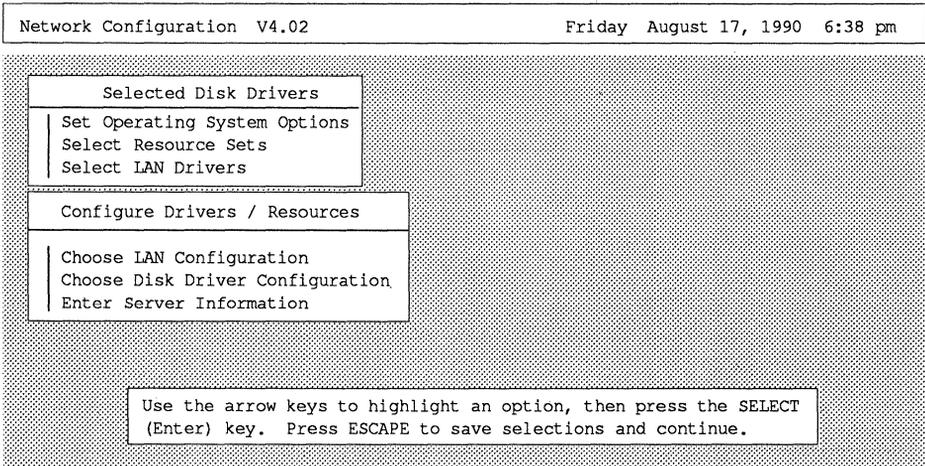


- 11. Use the arrow keys to highlight the driver at port address 340h if you are using a standard AHA-1520/1522 host adapter with the SCSI disk from which you will boot. If you are using the S11 version of the host adapter, highlight the driver at port address 140h. Press Enter.

The system redisplayes the Disk Driver Options menu.

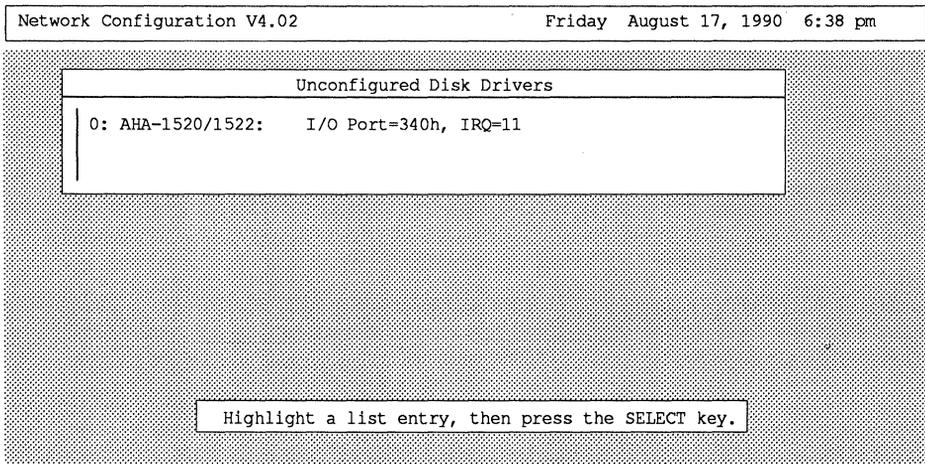
- 12. Press Esc to return to the Available Options menu.
- 13. Use the arrow keys to highlight Configure Drivers/Resources and press Enter.

The system displays the Configure Drivers/Resources menu:



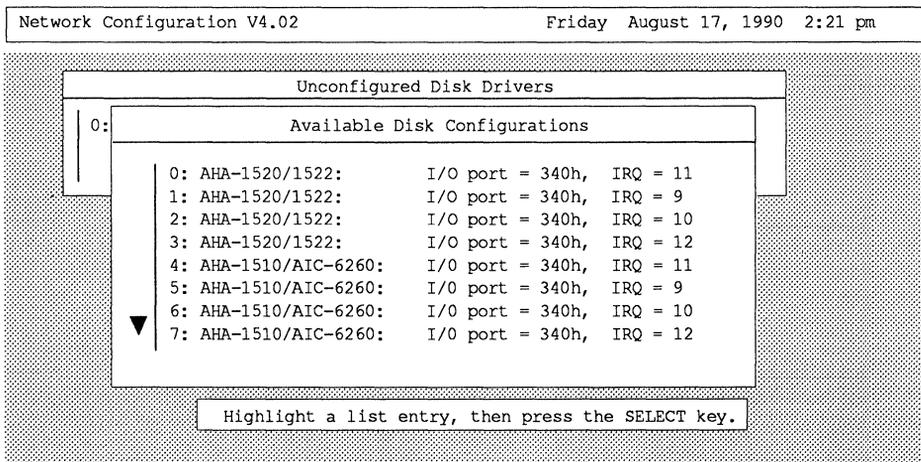
- 5 14. Use the arrow keys to highlight Choose Disk Driver Configuration and press Enter.

The system displays the Unconfigured Disk Drivers menu and lists the disk driver you selected in Step 11:



15. Use the arrow keys to highlight the driver and press Enter.

The system displays a list of available configurations:



16. Use the arrow keys to scroll through the list to find the option that corresponds to the configuration of the host adapter at Channel 0. See "Host Adapter Options" later in this chapter for a complete list of the available options. When the proper option is highlighted, press Enter.

The system redisplay the Configure Drivers/Resources menu.

17. Press Esc to return to the Available Options menu.
18. Use the arrow keys to highlight Select Disk Drivers and press Enter.

The system displays the Disk Driver Options menu.

19. Use the arrow keys to highlight Select Loaded Item and press Enter.
20. The system prompts you for a channel number. Type 1 and press Enter.

The system displays the Select Disk Driver Type menu.

21. Use the arrow keys to highlight the driver that you have not yet installed and press Enter.

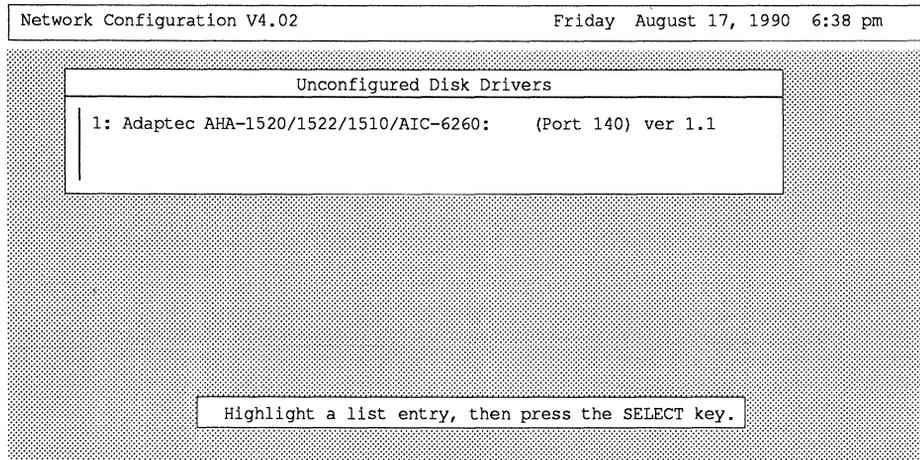
The system displays the Available Options menu.

22. Use the arrow keys to highlight Select LAN Drivers and press Enter. Choose the driver for the LAN card installed in your system.
23. Press Esc to return to the Available Options menu.
24. Use the arrow keys to highlight Configure Drivers/Resources and press Enter.

The system displays the Configure Drivers/Resources menu.

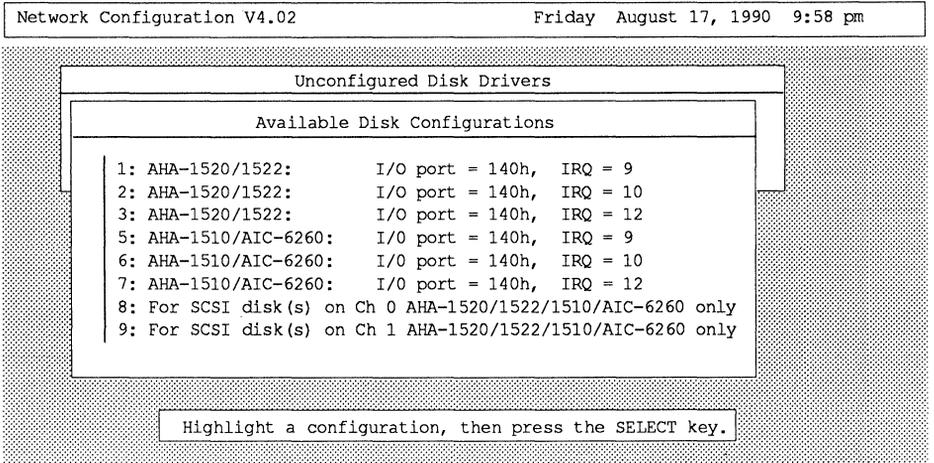
25. Use the arrow keys to highlight Choose Disk Driver Configuration and press Enter.

The system displays the Unconfigured Disk Drivers menu and lists the disk driver you selected in Step 21:



26. Use the arrow keys to highlight the driver and press Enter.

The system displays a list of available configurations. It does not list any configuration that conflicts with the configuration of the driver you have already installed:



27. Use the arrow keys to highlight the option that corresponds to the configuration of the host adapter at channel 1. Press Enter.

The system redisplay the Configure Drivers/Resources menu.

28. Use the arrow keys to highlight Choose LAN Configuration and press Enter.

29. Use the arrow keys to highlight the LAN configuration that corresponds to your LAN driver from the list and press Enter.

The system redisplay the Configure Drivers/Resources menu.

30. Use the arrow keys to highlight Enter Server Information and press Enter.

The system prompts you for information about your system.

31. Type the requested information and press Enter.

The system redisplay the Configure Drivers/Resources menu.

32. Press Esc to return to the Available Options menu.

This completes the first phase of software installation, selecting and configuring drivers, for duplexed disk drives.

The second phase of software installation, linking and configuring the operating system, for duplexed drives is the same as for mirrored drives. Follow the procedure in "Setting Up Mirrored Disk Drives" earlier in this chapter to complete the installation.

### Multiple Channels per Host Adapter for Multitasking

If you plan to add data storage capacity by using two or more disk drives with an AHA-1520/1522 host adapter, you can achieve higher performance by assigning each disk drive a separate NetWare channel. This allows multitasking on the SCSI bus. Figure 5-3 illustrates the configuration for multitasking.

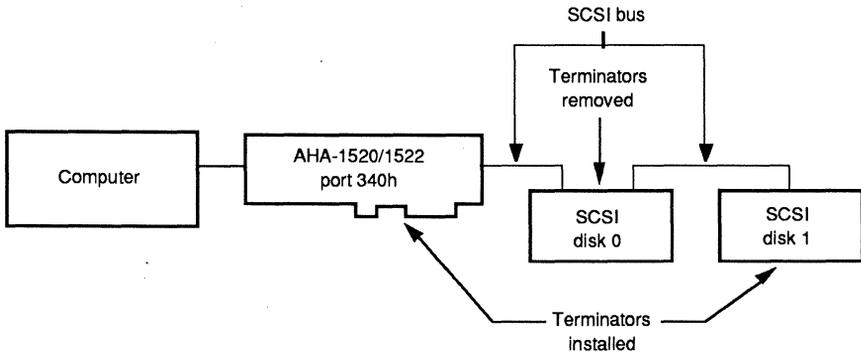


Figure 5-3. Configuration for multitasking

### Hardware Considerations

Make sure that the host adapter and disk drives are properly prepared before configuring the system for multitasking. You should keep in mind the following list of important hardware considerations:

- The disk drives must be connected to the same host adapter on the same SCSI bus.
- Each drive must be assigned to a different interrupt request channel.
- Each drive must have a different SCSI ID. The drive from which you want to boot must have a SCSI ID of 0.

- The SCSI devices at the beginning and end of the SCSI bus must have terminators. All other SCSI devices on the SCSI bus must have their terminators removed. The AHA-1520/1522 is a SCSI device. Its terminators should be installed unless you use both the external and internal connectors.

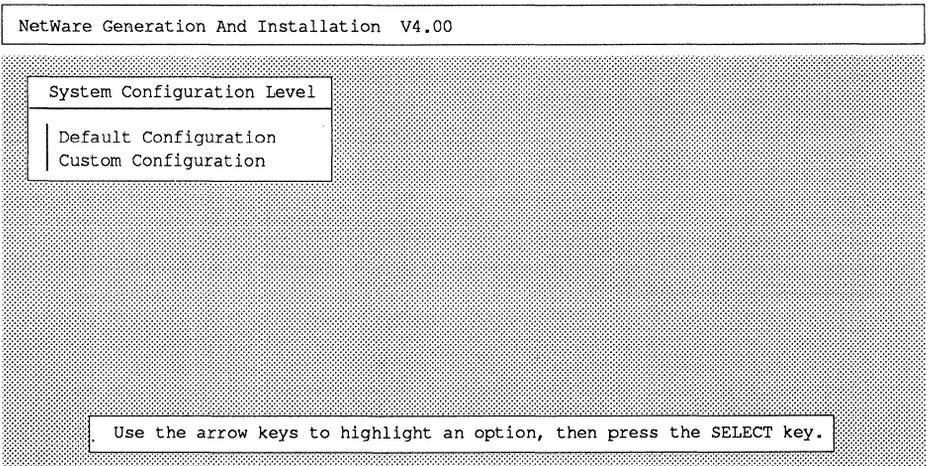
### *Setting Up Multiple Disk Drives for Multitasking*

The installation procedure for assigning multiple channels per host adapter is similar to the basic installation. The only difference is that in the first phase you must load and configure a copy of the disk driver for each hard disk connected to the host adapter.

To complete the first phase of software installation for multiple channels, use the following procedure:

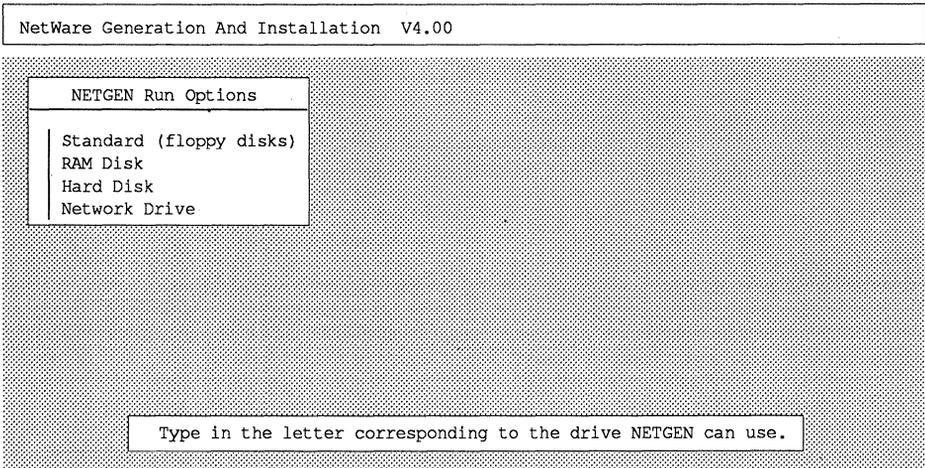
1. Type NETGEN -N at the DOS prompt and press Enter.

The system displays the following screen:



2. Use the arrow keys to highlight Custom Configuration and press Enter.

The system displays the NETGEN Run Options menu:

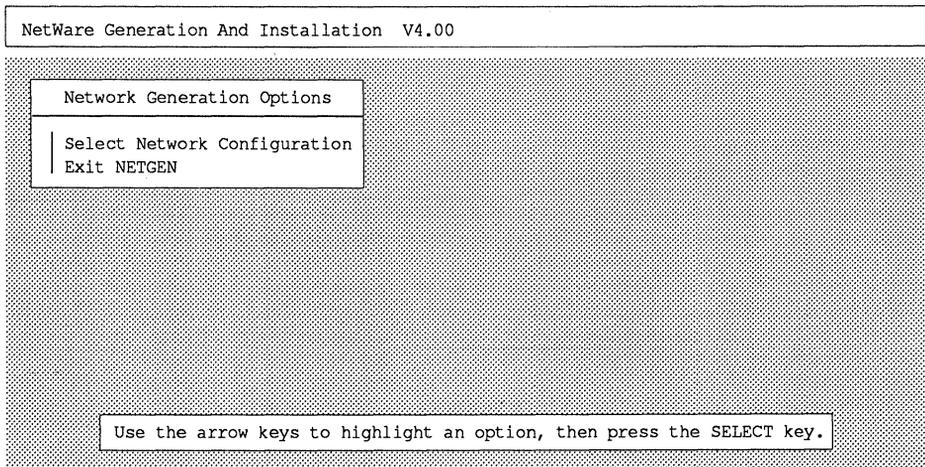


- 5
- Use the arrow keys to highlight Hard Disk and press Enter.

The system prompts you for the letter of the logical drive that contains the directory for the ASW-1240 files (DSK\_DRV\_.209).

- Enter the letter of the logical drive that contains the DSK\_DRV\_.209 directory and press Enter.

The system displays the Network Generations Options menu:



- 5. Use the arrow keys to highlight Select Network Configuration and press Enter.

The system takes a moment to load files, then displays the Available Options menu:

Network Configuration V4.02 Friday August 17, 1990 6:51 pm

Available Options

- Set Operating System Options
- Select Resource Sets
- Select LAN Drivers
- Select Disk Drivers
- Select "Other" Drivers
- Configure Drivers / Resources
- Edit Resource List
- Edit Resource Sets
- Save Selections and Continue

Use the arrow keys to highlight an option, then press the SELECT key.

- 6. Use the arrow keys to highlight Select Disk Drivers and press Enter.

The system displays the Disk Driver Options menu:

Network Configuration V4.02 Friday August 17, 1990 1:57 pm

Selected Disk Drivers	
Se 0	
Se 1	
Se 2	
Se 3	
Se 4	
Co	

- Edit Resource List
- Edit Resource Sets
- Save Selections and Continue

Disk Driver Options

- Select Loaded Item
- Load and Select Item

Use the arrow keys to highlight an option, then press the SELECT (Enter) key. Press ESCAPE to save selections and continue.

7. Use the arrow keys to highlight Load and Select Item and press Enter.

NETGEN reads the ASW-1240 files from the DSK\_DRV\_.209 directory that you created.

The system informs you that it has read the first host adapter file:

Network Configuration V4.02 Friday August 17, 1990 1:58 pm

The "Adaptec AHA-1520/1522/1510/AIC-6260 (PORT 140) ver 1.1" file was read successfully.  
Press ESCAPE to continue.

```
0 |
1 |
2 |
3 |
4 |
Select "Other" Drivers
Configure Drivers /   Disk Driver Options
Edit Resource List
Edit Resource Sets   Select Loaded Item
Save Selections and  Load and Select Item
```

5

8. Press Esc.

The system informs you that it has read the second host adapter file:

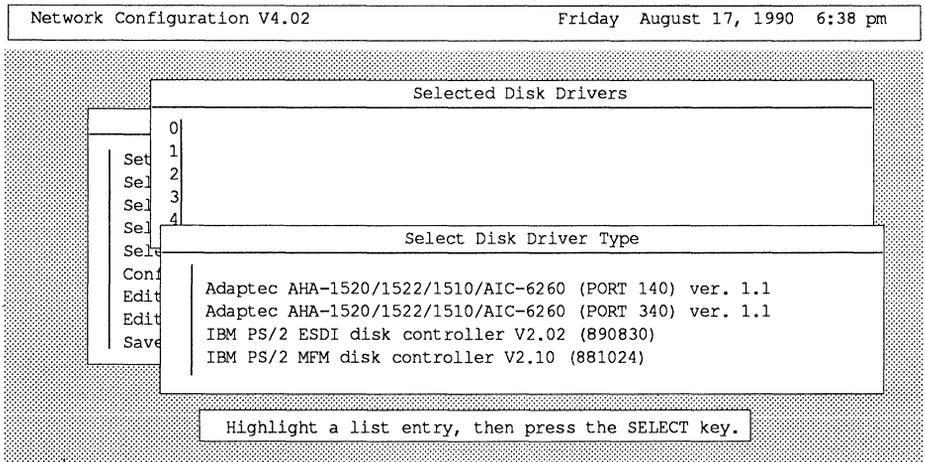
Network Configuration V4.02 Friday August 17, 1990 1:58 pm

The "Adaptec AHA-1520/1522/1510/AIC-6260 (PORT 340) ver 1.1" file was read successfully.  
Press ESCAPE to continue.

```
0 |
1 |
2 |
3 |
4 |
Select "Other" Drivers
Configure Drivers /   Disk Driver Options
Edit Resource List
Edit Resource Sets   Select Loaded Item
Save Selections and  Load and Select Item
```

9. Press Esc.
10. The system prompts you for a channel number. Type 0 and press Enter.

The system displays the Select Disk Driver Type menu:



11. Use the arrow keys to highlight the option that reflects the port address range of your host adapter. Press Enter.

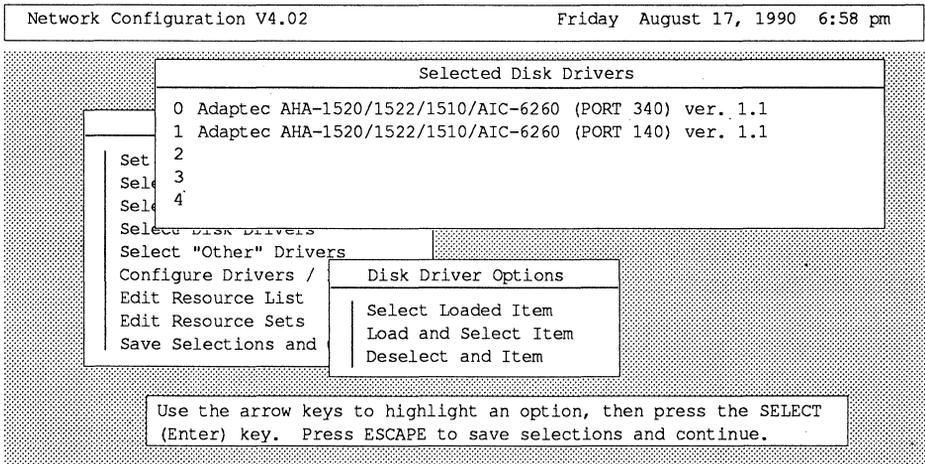
The system redisplay the Disk Driver Options menu.

12. Use the arrow keys to highlight Select Loaded Item and press Enter.
13. The system prompts you for a channel number. Type 1 and press Enter.

The system redisplay the Select Disk Driver Type menu.

14. Use the arrow keys to highlight the same option that you did in Step 11. Press Enter.

The system redisplay the Disk Driver Options menu:



5

15. Repeat Steps 12-14 for each disk drive, assigning each a different channel. You can use up to five channels.
16. When you have finished assigning disk drives to channels, press Esc to return to the Available Options menu.
17. Use the arrow keys to highlight Select LAN Drivers and press Enter. Choose the driver for the LAN card installed on your system.
18. Press Esc to return to the Available Options menu.
19. Use the arrow keys to highlight Configure Drivers/Resources and press Enter.

The system displays the Configure Drivers/Resources menu:

Network Configuration V4.02 Friday August 17, 1990 6:38 pm

```

Selected Disk Drivers
| Set Operating System Options
| Select Resource Sets
| Select LAN Drivers

Configure Drivers / Resources
| Choose LAN Configuration
| Choose Disk Driver Configuration
| Enter Server Information
  
```

Use the arrow keys to highlight an option, then press the SELECT (Enter) key. Press ESCAPE to save selections and continue.

- 20. Use the arrow keys to highlight Choose Disk Driver Configuration and press Enter.

The system displays the Unconfigured Disk Drivers menu and lists all the disk drives that you assigned to NetWare channels.

- 21. Use the arrow keys to highlight the driver at channel 0 and press Enter.

The system displays a list of available configurations:

Network Configuration V4.02 Friday August 17, 1990 2:21 pm

```

Unconfigured Disk Drivers
| 0: Available Disk Configurations
| 0: AHA-1520/1522: I/O port = 340h, IRQ = 11
| 1: AHA-1520/1522: I/O port = 340h, IRQ = 9
| 2: AHA-1520/1522: I/O port = 340h, IRQ = 10
| 3: AHA-1520/1522: I/O port = 340h, IRQ = 12
| 4: AHA-1510/AIC-6260: I/O port = 340h, IRQ = 11
| 5: AHA-1510/AIC-6260: I/O port = 340h, IRQ = 9
| 6: AHA-1510/AIC-6260: I/O port = 340h, IRQ = 10
| 7: AHA-1510/AIC-6260: I/O port = 340h, IRQ = 12
  
```

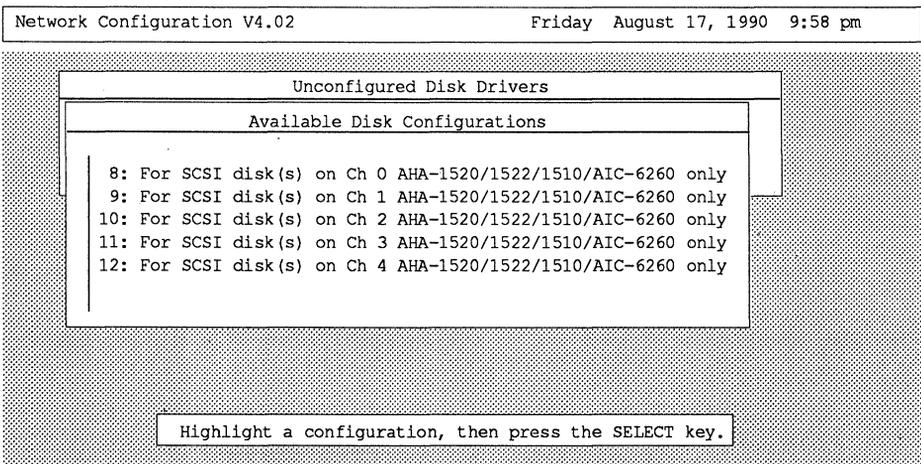
Highlight a list entry, then press the SELECT key.

22. Use the arrow keys to scroll through the list to find the option that corresponds to the configuration of the host adapter installed on your system. See "Host Adapter Options" later in this chapter for a complete list of available options. When the proper option is highlighted, press Enter.

The system updates the Unconfigured Drivers menu.

23. Use the arrow keys to highlight the driver at channel 1 and press Enter.

The system displays a list of available configurations:



24. Use the arrow keys to highlight option 17 and press Enter.

The system updates the Unconfigured Disk Drivers menu.

25. Repeat Steps 23-24 for the driver at each channel, using the appropriate option configuration.

26. When you have configured all the drivers, press Esc to return to the Configure Drivers/Resources menu.

27. Use the arrow keys to highlight Choose LAN Configuration and press Enter.

- 28. Use the arrow keys to highlight the LAN configuration that corresponds to your LAN driver from the list and press Enter.

The system redisplay the Configure Drivers/Resources menu.

- 29. Use the arrow keys to highlight Enter Server Information and press Enter.

The system prompts you for information about your system.

- 30. Type the requested information and press Enter.

The system redisplay the Configure Drivers/Resources menu.

- 31. Press Esc to return to the Available Options menu.

This completes the first phase of the software installation for multitasking.

Follow the procedure in "Linking and Configuring the Operating System" in the Basic NetWare Installation section earlier in this chapter to complete the installation.

**ERROR MESSAGES**

Under NetWare, the ASW-1240 displays error messages only when a fatal error occurs during installation. There are only a few ASW-1240 error messages. All of these errors cause the installation to fail.

<b>Message</b>	<b>Meaning</b>
AHA 152x Host Adapter NOT Configured to Proper IO Port Address	The ASW-1240 software is unable to find the host adapter at the port address specified in the software installation. Make sure that the port address specified in the software matches the port address specified by jumper settings on the AHA-1520/1522 host adapter. Verify that the host adapter is properly installed and properly terminated.

AHA 152x Host Adapter NOT Configured To Proper Interrupt Channel.

The IRQ channel specified in the software installation does not match the IRQ channel specified by the jumper settings on the AHA-1520/1522 host adapter. Change the host adapter or software IRQ channel setting.

AHA 152x Host Adapter NOT Configured to Proper DMA Channel.

The DMA channel specified in the software installation does not match the DMA channel specified by the jumper settings on the AHA-1520/1522 host adapter. Change either the board or software DMA channel setting.

AHA 152x INQUIRY Command Completed With Error Or Time Out

The ASW-1240 detects a time-out or error when issuing the inquiry, test unit ready, or read capacity SCSI commands. Make sure that the host adapter is properly installed, its jumpers are set correctly, and it is properly terminated.

AHA 152x TEST UNIT READY Command Completed With Error Or Time Out

AHA 152x READ CAPACITY Command Completed With Error Or Time Out

5

## HOST ADAPTER OPTIONS

Tables 5-1 and 5-2 list the configuration options available for the AHA-1520/1522 host adapter and the ASW-1240 software. These are the options available when you configure the software during the NetWare installation.

Options 16-20 let you assign a NetWare channel to a disk. This permits multiple channels for a host adapter and makes multitasking possible on the SCSI bus. See "Multiple Channels per Host Adapter for Multitasking" earlier in this chapter for detailed information.

If you run the AHA-1520/1522 in second-party DMA mode, only DMA channel 0 is currently supported. In general, you can achieve higher performance by running the AHA-1520/1522 in PIO mode.

Table 5-1. Port Address 340h Options

Option #	Product	I/O Port	IRQ
0	AHA-1520/1522	340h	11
1	AHA-1520/1522	340h	9
2	AHA-1520/1522	340h	10
3	AHA-1520/1522	340h	12
4	AHA-1510/AIC-6260	340h	11
5	AHA-1510/AIC-6260	340h	9
6	AHA-1510/AIC-6260	340h	10
7	AHA-1510/AIC-6260	340h	12
8	For SCSI disk(s) on CH 0 AHA-1520/1522/1510/AIC-6260 only		
9	For SCSI disk(s) on CH 1 AHA-1520/1522/1510/AIC-6260 only		
10	For SCSI disk(s) on CH 2 AHA-1520/1522/1510/AIC-6260 only		
11	For SCSI disk(s) on CH 3 AHA-1520/1522/1510/AIC-6260 only		
12	For SCSI disk(s) on CH 4 AHA-1520/1522/1510/AIC-6260 only		

Table 5-2. Port Address 140h Options

Option #	Product	I/O Port	IRQ
0	AHA-1520/1522	140h	11
1	AHA-1520/1522	140h	9
2	AHA-1520/1522	140h	10
3	AHA-1520/1522	140h	12
4	AHA-1510/AIC-6260	140h	11
5	AHA-1510/AIC-6260	140h	9
6	AHA-1510/AIC-6260	140h	10
7	AHA-1510/AIC-6260	140h	12
8	For SCSI disk(s) on CH 0 AHA-1520/1522/1510/AIC-6260 only		
9	For SCSI disk(s) on CH 1 AHA-1520/1522/1510/AIC-6260 only		
10	For SCSI disk(s) on CH 2 AHA-1520/1522/1510/AIC-6260 only		
11	For SCSI disk(s) on CH 3 AHA-1520/1522/1510/AIC-6260 only		
12	For SCSI disk(s) on CH 4 AHA-1520/1522/1510/AIC-6260 only		

This chapter tells you how to install Adaptec's ASW-1240 ASPI software for Novell NetWare 386 v3.1 and the AHA-1520/1522 host adapter. The ASW-1240 software contains an operating system manager and other files that allow you to use SCSI devices with the NetWare file server.

This chapter covers these major topics:

- hardware considerations
- before installing
- installing the ASW-1240 software
- fault tolerant disk drive configurations
- booting NetWare from a SCSI disk
- removable media disk drives
- formatting disk drives
- error messages

## HARDWARE CONSIDERATIONS

Before you begin software installation, make sure that the host adapter is properly installed and configured. See Chapter 3, "Changing Jumper Settings," for information about configuration choices and using jumpers. Make sure you know how the host adapter is jumpered so you can select the correct configuration options for the software.

Make sure that a LAN card is installed in your system.

You can use NetWare Ready SCSI drives as well as standard SCSI drives with the AHA-1520/1522 host adapter and the ASW-1240 software. You can tell which drives are NetWare Ready by looking at the drive descriptions in the MONITOR.NLM module. Consult the NetWare documentation for information on using MONITOR.NLM.

You can use multiple SCSI disk drives with the AHA-1520/1522 host adapter and the NetWare file server. There are several ways you can do this. If you want to add storage capacity to your system, you can simply connect additional drives to

the host adapter on the SCSI bus and then partition them with the NetWare INSTALL.NLM module. You can also have a NetWare volume span more than one disk drive. Consult the NetWare documentation for information about this possibility. Finally, you can configure software, host adapter, and disk drives for fault tolerance. See "Fault Tolerant Disk Drive Configurations" later in this chapter for information.

## BEFORE INSTALLING

Adaptec's ASW-1240 software supports NetWare 386v3.1 and NetWare 286 2.15 (See Chapter 5, "Software for NetWare 286"). The files for NetWare 386 v3.1 are found in the \NET386.31 directory on the ASW-1240 diskette. This directory contains the following files: AHA1520.DSK, ASPITRAN.DSK, and README.TXT. AHA1520.DSK and ASPITRAN.DSK contain the ASPI software for NetWare 386 v3.1. README.TXT is a file that gives information about the ASW-1240 software.

Before beginning software installation, make copies of all Novell and Adaptec diskettes. Use the copies as your working diskettes. When you copy the ASW-1240 files, make sure that ASPITRAN.DSK and AHA1520.DSK remain in the same directory.

## INSTALLING THE ASW-1240 SOFTWARE

**6** To install the ASW-1240 software, load the AHA1520.DSK and ASPITRAN.DSK files from the the working copy of the ASW-1240 diskette onto the NetWare operating system.

If NetWare 386 v.3.1 has not already been installed on your system, complete all steps in the following procedure. If NetWare has already been installed, start with step 5.

1. Boot your system to DOS.
2. Insert the working copy of the NetWare System 1 disk in the floppy disk drive and make it the current drive.
3. Type **Server** at the DOS prompt and press Enter.

The system displays a series of messages and prompts you for a file server name and an IPX internal network number. Consult the NetWare documentation if you are unsure which IPX number to use.

4. Type the file server name and IPX number and press Enter.

The system displays a colon, which is the NetWare prompt.

5. Remove the NetWare diskette from the drive and replace it with the working copy of the ASW-1240 diskette.
6. Type the following command to load the ASW-1240 files:

```
load a:\net386.31\aha1520
```

7. The system displays a series of messages letting you know that it is loading the software. It then prompts you for the port address you want to use for the host adapter and software:

```
Loading module AHA1520.DSK
```

```
Auto-loading Module ASPITRAN.DSK
```

```
AHA-1520/1522/1510/AIC-6260 ASPI Manager & SCSI Disk Module for  
NetWare 386 Version 1.1
```

```
Copyright 1990 Adaptec, Inc.
```

```
(Note: Load ASPITRAN.DSK before AHA1520.DSK in your STARTUP.NCF)
```

```
Supported I/O port values are 340, 140
```

```
I/O port:    340
```

8. Press Enter to select the default 340 I/O port address. Type 140 if you need the alternate port address.

The system redisplay the NetWare prompt. The ASW-1240 software is now loaded.

9. To complete the installation of the file server operating system, follow NetWare instructions to load LAN drives, partition your disks, add NetWare volumes, and copy the remaining NetWare files to your hard disk. Consult the NetWare documentation for information about these tasks.

## Command Line Options

The ASW-1240 software reads most of the options for the AHA-1520/1522 host adapter directly from the jumper settings on the board. In most cases, you do not specify these options in the software.

If you use jumpers to change the port address range of the host adapter, however, you must specify that change in the software. In addition, there are several options that you can specify only through the software. The syntax for a command with options is as follows:

```
load a:\net386.31\aha1520 options
```

You can enter the options in upper- or lowercase letters. You can use spaces or commas to separate the options if you want.

The following is a list of options available with Novell NetWare 386 v3.1 and the AHA-1520/1522 host adapter:

Option	Possible	Function
port=	340	Selects the port address range that the software uses. Enter the number that corresponds to the jumpered port address of the host adapter. If you specify this option, the system does not prompt for a port address when you load the software.
	140	
removable =	off	Disables support for removable media. By default, removable media devices are supported. To load your own ASPI Removable Disk Module, you should disable removable media support.
fixed_disk =	off	Disables support for fixed disk drives. By default, fixed disk drives are supported. To load your own ASPI Fixed Disk Module, you should disable fixed disk support.

sel_to =	0 32 64 128	Sets the selection timeout value in milliseconds. The default value is zero. Use this option with caution; if the value is too low, some targets may not appear to the driver.
verbose =	y	Displays host adapter configuration information when you load the software.

If you specify the verbose = y option, the information the system displays depends on the number and type of installed SCSI devices and on the configuration of the host adapter. The screen display when you specify the verbose = y and port = 340 options is similar to the following text.

```

Loading module AHA1520.DSK
Auto-loading Module ASPITRAN.DSK

```

```

AHA-1520/1522/1510/AIC-6260 ASPI Manager & SCSI Disk Module for
NetWare 386 Version 1.1

```

```

Copyright 1990 Adaptec, Inc.

```

(Note: Load ASPITRAN.DSK before AHA1520.DSK in your STARTUP.NCF)

Registered Device(s)

---

```

SCSI ID 0 - LUN 0:      NetWare Ready P40S 940-40-94xx
SCSI ID 1 - LUN 0:      SONY      SM0-C501-00
SCSI ID 2 - LUN 0:      IMPRIMIS 94601-15

I/O Port Address:      340-363
Interrupt Level:       11
Host Adapter SCSI ID:  7

Initiate Sync Mode:    Enabled
Parity Checking:       Enabled
SCSI Disconnection:    Enabled

```

**FAULT TOLERANT DISK DRIVE CONFIGURATIONS**

NetWare 386 v3.1 and the ASW-1240 software allow two disk drive configurations, disk mirroring and disk duplexing, which automatically place the same data on two or more disk drives. This duplication can prevent loss of data if one of your disk drives crashes.



Disk mirroring and disk duplexing are similar, except that disk duplexing requires the use of two host adapters. Each configuration is discussed in the following sections.

**Disk Mirroring**

Disk mirroring occurs when the software configuration allows two or more hard disks connected to a single host adapter to contain the same data. If one disk fails, the other continues to function and preserves the data. Figure 6-1 illustrates the configuration for disk mirroring.

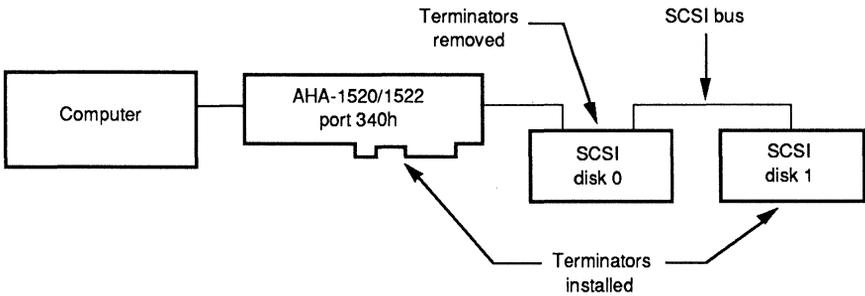


Figure 6-1. Configuration for disk mirroring

**6**

**Hardware Considerations**

Make sure that your host adapter and disk drives are properly prepared before configuring the system for disk mirroring. You should keep in mind the following list of important hardware considerations:

- The two disk drives must have almost the same capacity. NetWare does not allow drives that vary greatly in capacity to be mirrored. Consult the NetWare documentation for limitations.
- The drives must be connected on the same SCSI bus to the same AHA-1520/1522 host adapter.
- The SCSI IDs of the the drives must be different. If you want to boot from one of the drives, its SCSI ID must be 0.
- The SCSI devices at the beginning and end of the SCSI bus must have terminators. All other SCSI devices on the SCSI bus must have their

terminators removed. The AHA-1520/1522 is a SCSI device. Its terminators should be installed unless you use both the external and internal connectors.

### *Setting Up Mirrored Disk Drives*

Configuring the software for mirrored disk drives requires two phases. In the first phase, you load the ASW-1240 software just as in a normal software installation. To complete the first phase of the installation, follow the procedure in "Installing the ASW-1240 Software" earlier in this chapter. (You can skip this phase if the ASW-1240 software has already been installed.)

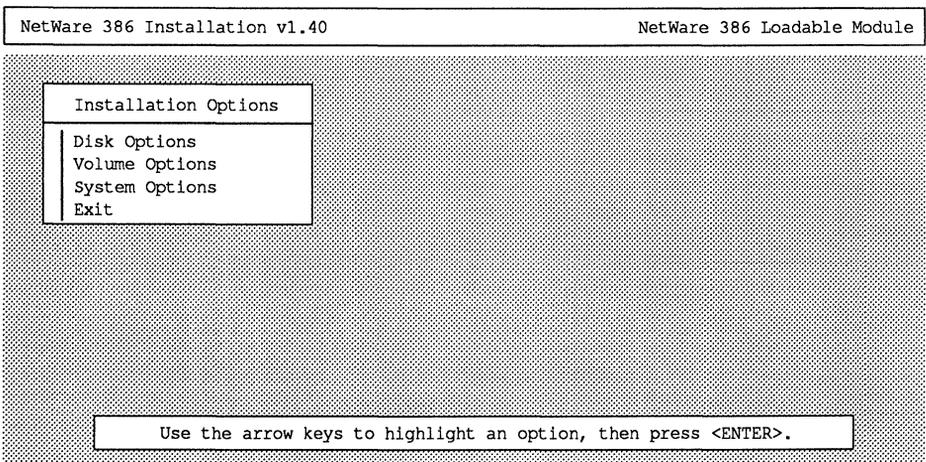
In the second phase, you load and use the NetWare INSTALL module to set up the disk drives for mirroring. While you are using INSTALL, you can return to the NetWare prompt by pressing the Alt and Esc keys at the same time. You can move to the previous menu by pressing the Esc key.

To complete the second phase of software installation for mirrored disk drives, use the following procedure.

1. Type the following command to load the INSTALL.NLM module:

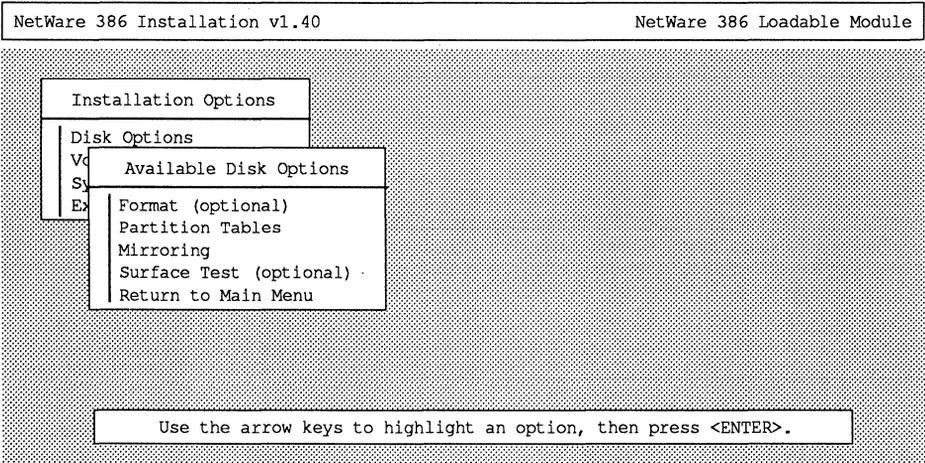
```
load install.nlm
```

The system displays the Installation Options menu:



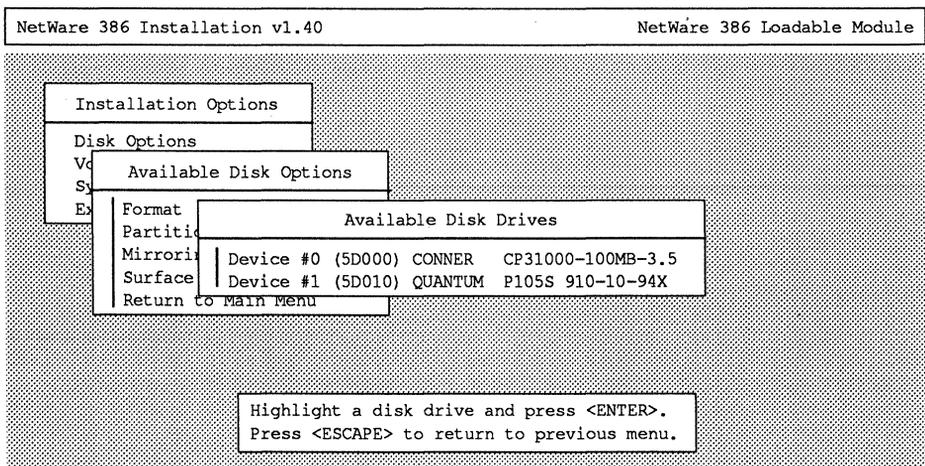
2. Use the arrow keys to highlight Disk Options and press Enter.

The system displays the Available Disk Options menu:



3. Use the arrow keys to highlight Partition Tables.

The system displays the Available Disk Drives menu:



6

4. Use the arrow keys to highlight the first disk drive you want to partition and press Enter.

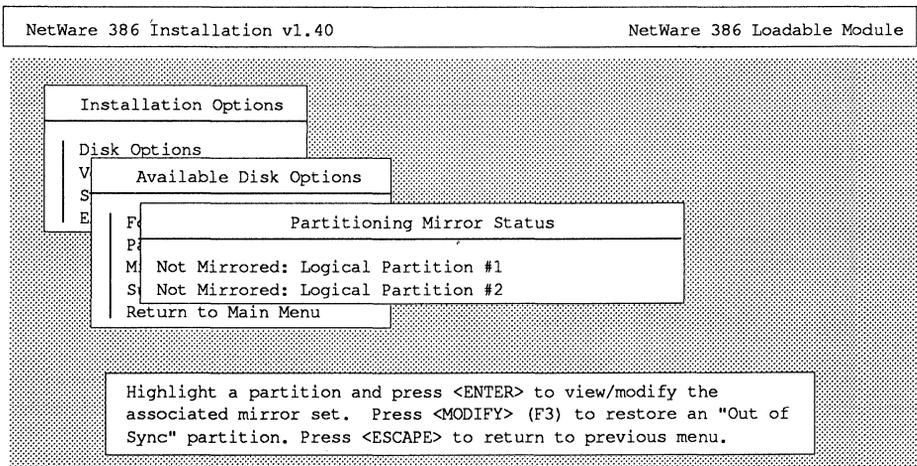
The system displays the Partitioning Options menu.

5. Use the arrow keys to highlight Create NetWare Partition and press Enter.

The system displays information about partition size. Press Esc to accept NetWare's suggested size, or type in the appropriate values and press Esc to create a partition of a different size.

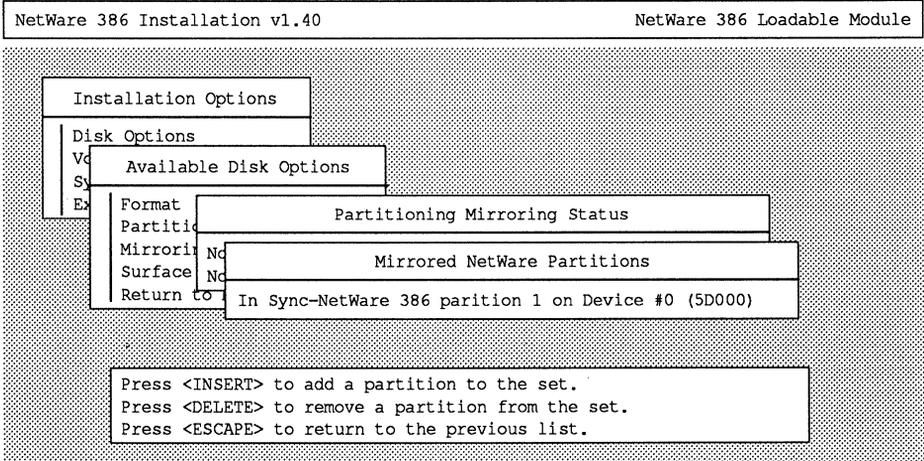
6. Repeat steps 4 and 5 for each partition you want to create.
7. When you finish creating partitions on the first disk drive, press Esc to return to the Available Disk Drives menu.
8. Repeat steps 4 through 7 for your other disk drive.
9. From the Available Disk Drives menu, press Esc to return to the Available Disk Options menu.
10. Use the arrow keys to highlight Mirroring and press Enter.

The system displays the Partitioning Mirroring Status menu:



- 11. Use the arrow keys to highlight Not Mirrored: Logical Partition #1.

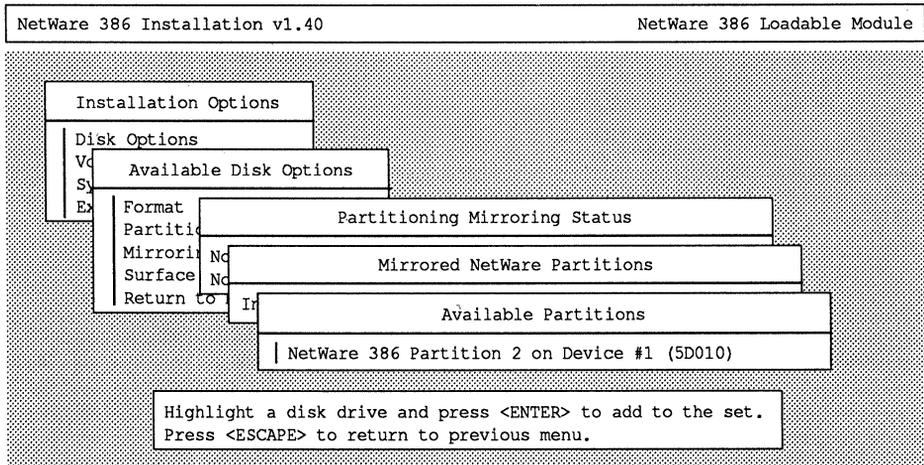
The system displays the Mirrored NetWare Partitions window:



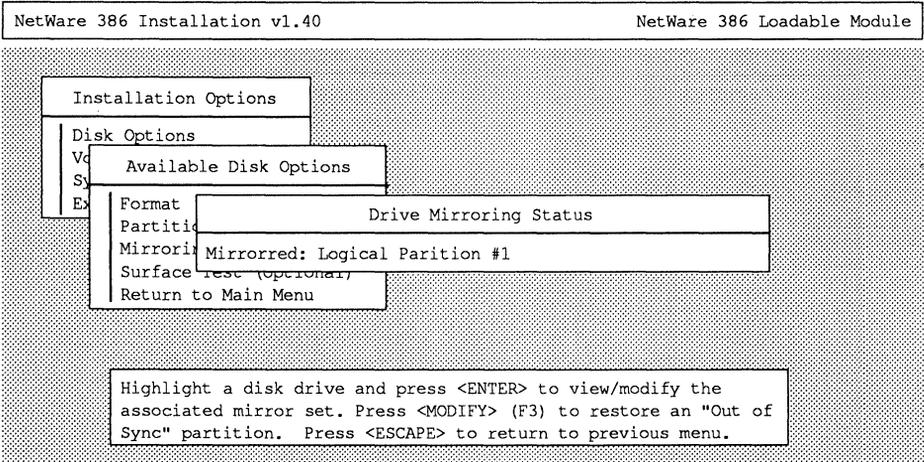
- 12. Press Ins.

The system displays the Available Partitions window:

6



- 13. Press Enter to add the displayed disk to the mirrored set.
- 14. Press Esc to view the Drive Mirroring Status window:



- 15. The drives are now mirrored. Press Esc to return to the Available Disk Options menu.
- 16. Press Esc to return to the Installation Options menu.
- 17. Use the arrow keys to highlight Exit; press Enter and confirm that you want to exit INSTALL.

The system displays the NetWare prompt.

- 18. To complete the installation of the file server operating system, follow NetWare instructions to load LAN drives, add NetWare volumes, and copy the remaining NetWare files to your hard disk. Consult the NetWare documentation for information about these tasks.

## Disk Duplexing

Disk duplexing occurs when two host adapters installed on the file server are connected to separate disk drives. Each of the disk drives contains the same data. If one disk fails, the other continues to function, preserving the data. Figure 6-2 shows the configuration for disk duplexing.

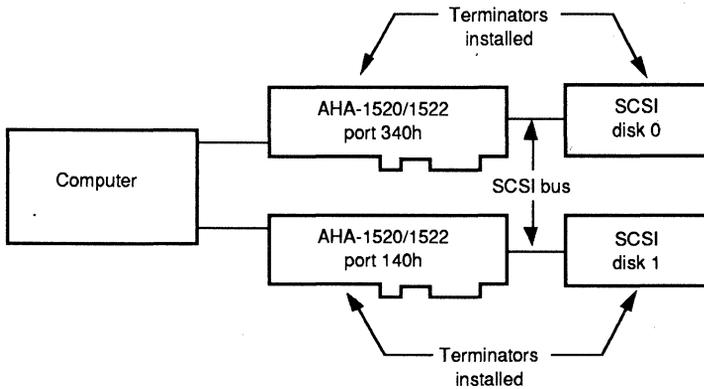


Figure 6-2. Configuration for disk duplexing

## Hardware Considerations

6 Make sure that the host adapter and disk drives are properly prepared before configuring the system for disk duplexing. You should keep in mind the following list of important hardware considerations:

- The disk drives must have almost the same capacity. NetWare does not allow drives that vary greatly in capacity to be duplexed. Consult the NetWare documentation for limitations.
- Each drive must be connected to a separate AHA-1520/1522 host adapter on a separate SCSI cable.
- If you use two AHA-1522 host adapters, only one can have its floppy controller enabled. The other floppy controller must be disabled. See Chapter 3, "Changing Jumper Settings" for information on disabling the floppy controller.

- Each AHA-1520/1522 must use a different interrupt request (IRQ) channel. See Chapter 3 for information on changing IRQ channel settings.
- Each AHA-1520/1522 must use a different DMA channel. See Chapter 3 for information on changing DMA channel settings.
- The BIOS on at least one of the AHA-1520/1522 host adapters must be disabled. See Chapter 3 for information on disabling the host adapter BIOS. Do not disable the BIOS of a host adapter connected to the SCSI disk from which you want to boot.
- Each host adapter must use a different port address range. If one of the host adapters has its BIOS enabled, it must operate at primary port address 340h. (If the host adapter with its BIOS enabled is an S11 version, it must be set to operate at port address 140h.) The other host adapter should operate at the secondary port address (140h for the standard host adapter and 340h for the S11 version). See Chapter 3 for information on changing the port address range.
- The SCSI device at the beginning and end of each SCSI bus must have terminators. All other SCSI devices on the SCSI bus must have their terminators removed. The AHA-1520/1522 is a SCSI device. Its terminators should be installed unless you use both the external and internal connectors.

### *Setting Up Duplexed Disk Drives*

Configuring the software for duplexed disk drives requires two phases. Software installation for duplexed disk drives is similar to the mirrored disk drives installation. It differs only in the first phase of the installation, loading the ASW-1240 software. Because you use two host adapters in a duplexed drives configuration, you must load the ASW-1240 software twice. The first time the software must be configured at the default port address range of the host adapter, and the second time it must be configured at the secondary port address range of the host adapter (140h–15Eh for the standard AHA-1520/1522 and 340h–35Eh for the S11 version).

To complete the first phase of software installation for duplexed disk drives, use the following procedure. If NetWare 386 v.3.1 has not been installed on your system, complete all steps (see “Before Installing,” earlier in this chapter); if NetWare has already been installed, start with step 5.

1. Boot your system to DOS.
2. Insert the working copy of the NetWare System 1 disk in the floppy disk drive and make it the current drive.
3. Type **Server** at the DOS prompt and press Enter.

The system displays a series of messages and prompts you for a file server name and an IPX internal network number. Consult the NetWare documentation if you are unsure which IPX number to use.

4. Type the file server name and IPX number and press Enter.

The system displays a colon, which is the NetWare prompt.

5. Remove the NetWare diskette from the drive and replace it with the working copy of the ASW-1240 diskette.
6. Type the following command to load the ASW-1240 software and configure it to the default port address range:

```
load a:\net386.31\aha1520 port = 340
```

7. The system displays a series of messages letting you know that it is loading the software:

```
Loading module AHA1520.DSK
```

```
Auto-loading Module ASPITRAN.DSK
```

```
AHA-1520/1522/1510/AIC-6260 ASPI Manager & SCSI Disk Module for  
NetWare 386 Version 1.1
```

```
Copyright 1990 Adaptec, Inc.
```

```
(Note: Load ASPITRAN.DSK before AHA1520.DSK in your STARTUP.NCF)
```

8. Type the following command to load the the ASW-1240 software and configure it at the secondary port address range:

```
load a:\net386.31\aha1520 port = 140
```

The system displays the same messages it did when you loaded the software the first time.

9. The system redisplay the NetWare prompt. The ASW-1240 software is now loaded.

This completes the first phase of software installation.

The second phase of software installation for duplexed drives is the same as for mirrored drives. Follow the procedure in "Setting Up Mirrored Disk Drives," earlier in this chapter to complete the installation.

### BOOTING NETWARE FROM A SCSI DISK

You can set up your system so that it boots NetWare and automatically loads the ASW-1240 software. Before you can do this, the hardware must be properly configured. Make sure your system is configured as follows:

- an AHA-1520/1522 host adapter is jumpered to port address 340h and with its BIOS enabled
- a SCSI disk drive with SCSI ID 0

The procedure to set up NetWare to boot automatically has two phases. The first phase modifies the DOS boot process to automatically load the NetWare operating system every time the system starts up. The second phase modifies the NetWare INSTALL module to set up NetWare to load files (including the ASW-1240 software) and automatically mount volumes.

#### To Modify the DOS Boot Process

1. Boot your system to DOS.
2. Create a 6 megabyte partition on your SCSI disk using the DOS FDISK command.
3. Format the disk using the DOS FORMAT command.
4. Insert the working copy of the NetWare System 1 diskette into the floppy drive.

5. Copy the SERVER.EXE and INSTALL.NLM files from the NetWare System 1 diskette onto the new partition.
6. Remove the NetWare System 1 diskette and replace it with the working copy of the ASW-1240 diskette.
7. Copy the AHA1520.DSK and ASPITRAN.DSK files from the ASW-1240 diskette onto the new partition.
8. Type **SERVER.EXE** at the end of the DOS AUTOEXEC.BAT file.
9. Reboot your system. NetWare boots up automatically.
10. Follow the instructions in "Installing the ASW-1240 Software" earlier in this chapter to install the NetWare operating system and the ASW-1240 software.

### To Modify NetWare

1. At the NetWare prompt, type

```
load install.nlm
```

The system displays the Installation Options menu.

2. Use the arrow keys to highlight System Options and press Enter.

The system displays the Available System Options menu.

3. Use the arrow keys to highlight Edit AUTOEXEC.NCF and press Enter.

The system displays the file server AUTOEXEC.NCF file.

4. Add the following lines to the AUTOEXEC.NCF file:

```
file server name MYFILESERVER
```

```
ipx internal net X
```

```
mount all
```

Replace MYFILESERVER with the name of your file server and X with its IPX internal net number.

5. Press Esc to return to the Available System Options menu.
6. Use the arrow keys to highlight Edit STARTUP.NCF and press Enter.

The system displays the file server STARTUP.NCF file.

7. Add the following lines in the same order to the STARTUP.NCF file:

```
load aspitran
load aha1520 port=340
```

8. Press Esc to return to the Available Systems Options menu.
9. Press Esc to return to the Installation Options menu.
10. Use the arrow keys to highlight Exit, press Enter, and confirm to exit INSTALL.
11. The system displays the NetWare prompt.

12. Reboot your system. NetWare and the ASW-1240 software load automatically.

### REMOVABLE MEDIA DISK DRIVES

You can use removable media SCSI disk drives, including magneto-optical drives, with NetWare 386 v3.1 and the ASW-1240 software. Use only removable media drives that have 512 bytes per sector.

To mount and dismount removable media drives, use the NetWare MONITOR.NLM program. Before you can eject a cartridge, you must first dismount the drive using MONITOR.NLM. Use the following procedure to dismount the drive:

1. At the NetWare prompt type

```
load monitor.nlm
```

2. Use the arrow keys to highlight Disk Information on the Monitor menu and press Enter.

The system displays a list of all disk drives.

3. Use the arrow keys to highlight the removable media device.

The system displays a list of information about the drive.

4. Use the arrow keys to highlight option 5, Removable Drive Mount Status, and press Enter.

5. The removable media drive is now dismounted. Eject the cartridge using the button on the drive.

After you insert a new cartridge in the removable media drive, return to the MONITOR.NLM program and remount the drive by following the same procedure.

**6** NetWare also lets you lock the removable media drive. If your drive supports the lock/unlock feature, you can lock and unlock it by selecting option 6 on the Monitor menu, which you use to mount and dismount the drive. When the drive is locked, you cannot eject the cartridge even if you press the eject button.

## FORMATTING DISK DRIVES

SCSI drives do not normally require low-level formatting. NetWare gives you the option of formatting disks. You might want to format the disk to erase data or to change the drive's interleave value.

The formatting option is accessible through the Disk Options menu in the INSTALL.NLM module. When you format the disk, NetWare prompts you for an interleave value from one to nine. You can also enter an interleave value of zero, which is the optimal interleave for SCSI drives.

**ERROR MESSAGES**

If an error occurs while you are trying to boot NetWare or load the ASW-1240 software, the boot attempt will be aborted. You will see an error code followed by a brief description of the error.

The following is a list of possible errors and their codes. Errors numbered between 000 and 099 are not specific to the AHA-1520/1522 host adapter or the ASW-1240 software. Errors numbered between 300 and 399 are specific to the host adapter and its software.

<b>Code</b>	<b>Message</b>
000	<p>Failed ParseDriverParameters call</p> <p>The NetWare call to the Parse Driver Parameters routine failed. The command line may contain an error or you may have pressed the Esc key at the port or slot prompt.</p>
001	<p>Unable to reserve hardware, possible conflict</p> <p>The driver cannot reserve the host adapter's hardware settings (DMA and IRQ settings, etc.). There may be another card in your system that conflicts with the host adapter.</p>
002	<p>NetWare rejected card - Failed AddDiskSystem call</p> <p>The driver could not register the host adapter with NetWare 386. There may not be enough memory in the system.</p>
003	<p>Invalid command line option entered -&gt; <i>option</i></p> <p>You entered an invalid option on the command line. The <i>option</i> field displays the invalid option that you entered.</p>
004	<p>Invalid command line, please enter correctly</p> <p>The driver cannot understand the command line options that you entered. Reenter them correctly.</p>

- 005           Unable to load driver - not enough memory?  
  
              The driver cannot be loaded. The system probably does not have enough memory.
  
- 300           Host adapter not found at given port location.  
  
              The driver cannot find a host adapter at the specified port address. Make sure that you enter the same port address specified by the jumper settings on the host adapter.
  
- 301           Invalid 'verbose' setting, use 'y'  
  
              You entered something other than y with the verbose option.
  
- 307           Invalid 'fixed\_disk' setting, use 'off'  
  
              You entered something other than off with the fixed\_disk option.

6

This chapter tells you how to install Adaptec's ASW-1250 software for SCO UNIX and the AHA-1520/1522 host adapter.

The chapter covers these major topics:

- ASW-1250 features and restrictions
- how to determine your software configuration
- installing the software, which comprises two phases:
  - using the SCO UNIX utility Custom to install and configure the ASW-1250 software
  - using the SCO UNIX mkdev command to enable device drivers for the SCSI devices attached to the AHA-1520/1522
- understanding and resolving errors

## ASW-1250 FEATURES AND RESTRICTIONS

The ASW-1250 software and the AHA-1520/1522 host adapter allow you to use SCSI devices, including hard disks and tape drives with SCO UNIX and your IBM PC/AT or compatible computer.

The ASW-1250 software supports SCO UNIX versions 3.2v0, ODT v1.0, and 3.2v2.

You should be aware of the following restrictions of SCO UNIX and the ASW-1250 software:

- SCO UNIX limits your system to a maximum of four disk drives.
- The software supports a single AHA-1520/1522 host adapter.
- You cannot boot from a SCSI disk connected to the AHA-1520/1522 host adapter and controlled by the ASW-1250 software. The disk you boot from has to be connected to a controller or host adapter for which SCO provides embedded support.

## HOW TO DETERMINE YOUR CONFIGURATION

For your system to operate properly, the configurations of the AHA-1520/1522 hardware and the ASW-1250 software must match. In addition, the configurations of the AHA-1520/1522 and the ASW-1250 must not conflict with other hardware or software installed on your system.

This section tells you about the choices you need to make to avoid these conflicts. Some of these configuration choices have already been discussed in Chapter 3. However, the structure of SCO UNIX and the ASW-1250 software can alter your choices. Read this section even if you have already changed jumper settings. You need to make four choices:

- Which IRQ channel will the SCO UNIX adapter driver (called *ad*) for the Adaptec AHA-1540/1542 host adapter use? You must choose an IRQ channel even if the AHA-1540/1542 host adapter is not installed on your computer; *ad* is an embedded part of SCO UNIX.
- Which interrupt request (IRQ) channel will the ASW-1250 software and the AHA-1520/1522 host adapter use?
- Will the AHA-1520/1522 use the primary or secondary input/output (I/O) port address range?
- Will the AHA-1520/1522 BIOS be enabled or disabled?

Each of these choices is discussed in the following sections.

**Choosing the AHA-1540/1542 Driver IRQ Channel**

**7** The driver for the Adaptec AHA-1540/1542 host adapter, *ad*, is an embedded part of SCO UNIX. You cannot remove it even if the AHA-1540/1542 is not installed on your computer. This driver uses the same default IRQ channel as the ASW-1250 software. You can resolve this conflict in two ways:

- If an AHA-1540/1542 host adapter is installed on your system, leave the *ad* IRQ channel at its default of channel 11 and change the AHA-1520/1522 IRQ channel to 9, 10, or 12.
- If an AHA-1540/1542 host adapter *is not* installed on your system, change the *ad* IRQ channel. You can choose channel 9, 10, 12, 14, or 15.

Record the IRQ channel you select in Table 7-2, later in this chapter.

## Choosing the ASW-1250 and AHA-1520/1522 IRQ Channel

By default, the AHA-1520/1522 board and ASW-1250 software use IRQ channel 11. You need to change this if your system has other products that must use channel 11. The AHA-1520/1522 and ASW-1250 should not use channel 11 if your system has an Adaptec AHA-1540/1542 host adapter installed.

If you must change the ASW-1250 and AHA-1520/1522 IRQ channel, choose channel 9, 10, or 12. Select a channel that is not used by another product. Consult the documentation for each product to determine which IRQ channel it uses.

Record the IRQ channel you select in Table 7-2.

## Choosing the Port Address Range

Some products, such as video and tape drive adapters, use port address ranges that overlap the primary port address range (340h–35Eh) of the AHA-1520/1522 host adapter and the ASW-1250 software. The non-SCSI tape driver embedded in SCO UNIX is an example of such a product. A port address range conflict will cause your system to malfunction.

If no port address conflict exists, use the primary range (340h–35Eh).

If you plan to use the non-SCSI tape driver or another product that has the same port address range, you need to change the AHA-1520/1522 host adapter and the ASW-1250 software from their primary port address range of 340h–35Eh to their secondary port address range of 140h–15Eh.

If you are using the AHA-1520S11 or AHA-1522S11 with the non-SCSI tape driver or a similar product, you do not need to rejump the board. The primary port address range of the S11 variants is 140h–15Eh, so no conflict exists, however, you still must configure the ASW-1250 to its secondary range of 140h–15Eh.

Record the port address range you select in Table 7-2.

## Disabling the AHA-1520/1522 BIOS

If you have only the AHA-1520/1522 host adapter installed, you should leave its BIOS enabled. If you have both an AHA-1520/1522 host adapter and an AHA-1540/1542 host adapter installed, you need to disable the AHA-1520/1522 BIOS.

Record whether the BIOS is enabled or disabled in Table 7-2.

## Configuration Choices

Table 7-1 presents the various configuration choices available. You must determine the appropriate choices for your configuration before you install the ASW-1250 software.

*Table 7-1. Configuration Choices Summary*

Installed Hardware	AHA-1520/ 1522 and ASW-1250 IRQ channel	AHA-1540/ 1542 and ad IRQ channel	AHA-1520/ 1522 and ASW-1250 I/O port address range	AHA-1520/ 1522 BIOS
AHA-1520/1522 only	11	9, 10, 12, 14, 15	340h-35Eh	enabled
AHA-1520S11/ AHA-1522S11 only	11	9, 10, 12, 14, 15	140h-15Eh	enabled
AHA-1520/1522 and AHA-1540/1542	9, 10, 12	11	340h-35Eh	disabled
AHA-1520/1522 and non-SCSI cartridge tape drive	11	9, 10, 12, 14, 15	140h-15Eh	enabled
AHA-1520S11/ AHA-1522S11 and non-SCSI cartridge tape drive	11	9, 10, 12, 14, 15	140h-15Eh	enabled
AHA-1520/1522, AHA-1540/1542, and non-SCSI cartridge tape drive	9, 10, 12	11	140h-15Eh	disabled

**Configuration Choices Form**

Use the following form to record the configuration choices you make. You need to know this information when you install the ASW-1250 software.

---

*Table 7-2. Configuration Choices Form*

---

ad and AHA-1540/1542 IRQ channel:	_____
ASW-1250 and AHA-1520/1522 IRQ channel:	_____
ASW-1250 and AHA-1520/22 port address range:	_____
AHA-1520/1522 BIOS:	_____

---

**If You Need to Change Settings**

After you have chosen the appropriate ASW-1250 software and the AHA-1520/1522 host adapter configuration, you might need to change the jumper settings on the board to reflect your choices. If you think you need to change the jumper settings, see Chapter 3, "Changing Jumper Settings," for information.

**PREPARATION FOR INSTALLING THE SOFTWARE**

When you are sure that the jumpers on the host adapter are set properly, you can install the ASW-1250 software. Installing the software reconfigures the SCO UNIX operating system to reflect the presence of the host adapter. The SCO Extended Utilities package and (for SCO UNIX 3.2v0 only) the SCO UFA Maintenance Supplement must be installed in your operating system.

Installing the software is fast and simple. There are two major steps to the software installation:

1. Using Custom, an SCO UNIX utility, to install and configure the ASW-1250 software

2. Using the `mkdev` command to enable UNIX to recognize and control the SCSI devices you connect to the AHA-1520/1522

Before you begin to install the software, you need to complete several tasks.

- Logging On as Superuser
- Making a Copy of the UNIX Kernel
- Installing the Extended Utilities Package

These tasks are discussed in the following sections:

## Logging On as Superuser

To use Custom, you must be logged onto your system as a superuser in system maintenance mode. To do this, look for the following prompt when you boot your system :

```
Type CONTROL-D to proceed with normal setup (or give root
password for system maintenance):
```

When you see this prompt, enter the root password. Your root password is supplied with the SCO UNIX software package.

## Making a Copy of the UNIX Kernel

It is important that you make a copy of your current working kernel (the file `/unix`) before using Custom. This provides a backup copy in case there is a problem (such as a power failure) while you reconfigure the kernel.

Copy your current kernel to a new file called `/unix.pre1250` by entering the following command at the UNIX prompt:

```
cp /unix /unix.pre1250
```

If you need to reboot your system with this copy of the kernel, enter the following at the boot prompt:

```
/unix.pre1250
```

### Installing the Extended Utilities Packages

Make sure that the Link Kit package contained in the SCO Extended Utilities is installed in your operating system before you install the ASW-1250 software. You cannot successfully install and configure the ASW-1250 software without the Link Kit package. If this portion of the Extended Utilities package is not in your operating system, consult the SCO documentation for information on installing it.

**Note:** *Users of SCO UNIX 3.2v0 must also make sure that the UFA Maintenance supplement is installed. The entire Extended Utilities package must be installed before you can install the UFA Maintenance supplement. Custom reminds you of this requirement when you begin installing the software.*

### USING CUSTOM TO INSTALL THE ASW-1250 SOFTWARE

Custom is an SCO UNIX utility that you use to install the ASW-1250 software. Custom interacts with you, asking questions about the software and hardware configuration of your system. See the SCO UNIX system administration documentation for more information about Custom.

To install the ASW-1250 software, follow the instructions below.

1. Start Custom by typing `custom` at the UNIX prompt. Press Enter. The system displays the following screen:

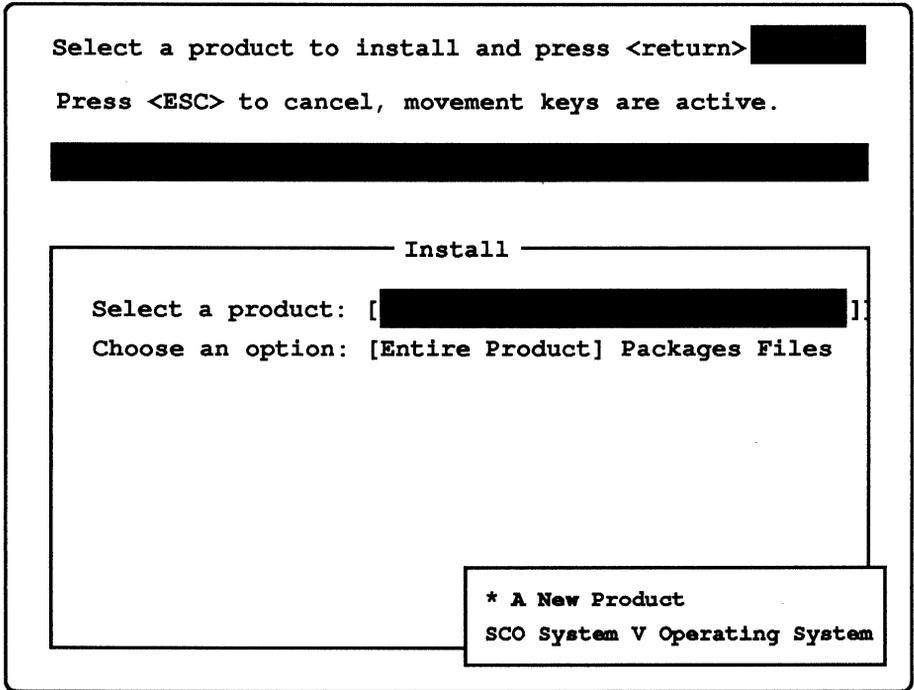
```
Install Remove List Quit Custom
Install Software_
/ Thursday September 27, 1990 9:48

----- Products Currently Installed -----
SCO System V Operating System
```

2. The Install option in the upper left corner of the screen should be highlighted. If it isn't, use the arrow keys to move the highlighted box to Install.

3. Press Enter.

The system displays the following screen:



4. Use the arrow keys to select A New Product from the menu at the lower right corner of the screen. Press Enter.

The system displays the following screen:

```
Install the entire product_          Install

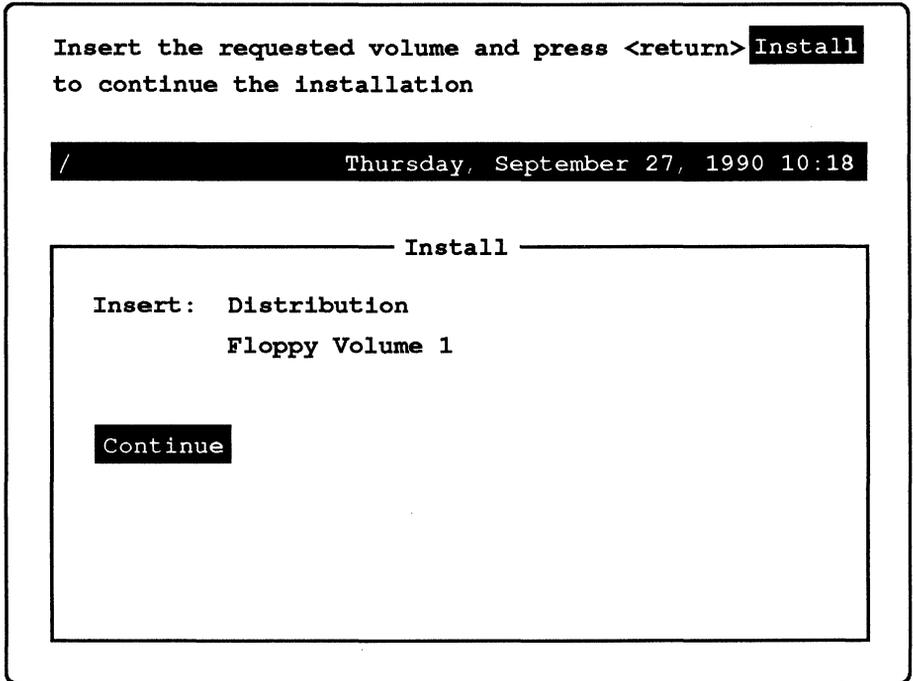
/                                     Thursday, September 27, 1990 9:57

----- Install -----
Select a product: [ A New Product    ]
Choose an option: Entire Product Packages Files
```

7

- 5. The Entire Product option in the middle of the screen should be highlighted. If it isn't, use the arrow keys to highlight it. Press Enter.

The system displays the following screen:



6. Custom asks you to insert the Distribution diskette. Insert the ASW-1250 diskette and press Enter.

The system displays the following screen:

```
Insert the requested volume and press <return> Install
to continue the installation

/ Thursday, September 27, 1990 10:18

----- Install -----
Insert: ASW-1250
        Floppy Volume 1

Continue
```

7. You have already inserted the ASW-1250 diskette. When the Continue message appears, press Enter.

Custom now reads the contents of the ASW-1250 diskette and begins to display a series of prompts that ask you about the configuration of the hardware and software.

## USING CUSTOM TO CONFIGURE THE ASW-1250 SOFTWARE

Below are step-by-step instructions for using Custom to configure the software. While you are using Custom you will

- change ASW-1250 default settings for the IRQ channel and port address range (if necessary)
- resolve any conflicts between the ASW-1250 and the AHA-1540/1542 driver (ad)
- resolve any conflicts between the ASW-1250 and the non-SCSI cartridge tape driver
- record the host adapter prefix

### SCO UNIX 3.2v0 Requirements

If you are using SCO UNIX 3.2v0, Custom displays a message to remind you that the Extended Utilities and UFA Maintenance Supplement packages must be installed before you can complete the ASW-1250 installation. If the Extended Utilities package and the UFA Maintenance Supplement are already installed in your operating system, type **y** and press Enter. Continue with the installation. If either of these packages is not installed, type **n** and press Enter. This ends Custom and displays the UNIX shell prompt. Install the Extended Utilities package (contained in a series of diskettes labeled X1) and the UFA Maintenance Supplement (contained in diskettes labeled UFA1). Consult the SCO UNIX documentation if you need information on how to do this. When you have installed these utilities, reinstall the ASW-1250 software.

### Changing the ASW-1250 Default IRQ Channel

Custom now asks you if you want to override the default IRQ channel (channel 11) and port address (340h) used by the ASW-1250 software.

```
Executing ASW-1250 Init Script.
```

```
Checking for presence of the Link Kit...
```

```
By default the ASW-1250 is configured at IRQ 11 and base I/O port 340H. You may override this configuration.
```

```
Do you wish to change the IRQ?
```

Check your list of configuration choices (Table 7-2) to recall the appropriate IRQ channel the ASW-1250 should use. If you don't need to change the IRQ channel from its default of channel 11, type **n** and press Enter.

To change the IRQ channel from its default of channel 11, use the following procedure:

1. Type **y** and press Enter.

Custom asks you to specify the IRQ channel that you want to use.

Which IRQ do you wish the ASW-1250 to use (9,10,11,12)?

2. Enter the channel number you decided on earlier and press Enter.

### Changing the ASW-1250 Port Address

After you have specified an IRQ channel or accepted the default, Custom asks you if you want to change the port address to the secondary range (140h-15Eh).

Do you wish to configure the ASW-1250 at its secondary address range (140H-15Eh)?

Check your list of configuration choices (Table 7-2) to recall if you need to change the ASW-1250 port address. If you don't need to change the port address, type **n** and press Enter. If you need to change the ASW-1250 port address to its secondary range, type **y** and press Enter.

If you changed either the IRQ channel or the port address range, Custom reminds you to re jumper the AHA-1520/1522 board to reflect the changes.

You must REJUMPER the AHA-152x to reflect the new configuration. Refer to the AHA-1520/1522 User's Guide for jumper locations.

You should have already made the necessary changes to the AHA-1520/1522 jumper settings. If you haven't, see Chapter 3, "Changing Jumper Settings" for information on how to change the jumper settings.

Custom will prompt you to change the IRQ channel and port address range if it detects a conflict. Custom can only detect conflicts between the ASW-1250 and two products: the AHA-1540/1542 host adapter and the non-SCSI cartridge tape driver imbedded in SCO UNIX.

### **Resolving Conflicts between the ASW-1250 Software and ad**

When Custom installs the ASW-1250 software, it informs you that ad, the SCO UNIX adapter driver for the Adaptec AHA-1540/1542 host adapter, is present. Custom then asks you if an Adaptec AHA-1540/1542 board has been installed on your computer. (Since ad is an embedded part of SCO UNIX, it cannot be removed even if the AHA-1540/1542 is not installed.)

```
Installing ASW-1250 driver, please wait...
```

```
ASW-1250 driver installed.
```

```
The default SCO adapter driver (ad) is configured into  
the kernel.
```

```
Is there actually an Adaptec AHA-1540/1542 board in the  
system?
```

Enter **y** or **n** depending on whether or not the AHA-1540/1542 is installed on your system. If you enter **y**, skip the following section. If you enter **n**, continue with the following section.

### ***If the AHA-1540/1542 Is Not Installed***

If the AHA-1540/1542 is not installed on your system, Custom asks you to change the IRQ channel for ad so that it does not conflict with the default IRQ of the AHA-1520/1522.

```
By default, both the Adaptec AHA-1540/1542 and 152x use  
IRQ 11. The default SCO SCSI driver for the AHA-1540/  
1542 is a required driver and must remain in the system.  
Please reconfigure this driver to use a different IRQ so  
it will not conflict.
```

```
Which IRQ do you wish the SCO AHA-1540/1542 driver to use  
(9,10,12,14,15)?
```

1. Select an IRQ channel that is not used by the AHA-1520/1522 board. Look at your configuration choices form (Table 7-2) to recall which channel you can use.
2. Type the appropriate channel number and press Enter.

Custom displays a message confirming that it is reconfiguring the AHA-1540/1542 driver.

```
Reconfiguring the default SCO adapter driver to use
IRQ XX
```

### *If Both the AHA-1540/1542 and the AHA-1520/1522 Are Installed*

If you have already changed the AHA-1520/1522 and ASW-1250 IRQ channel from the default setting of channel 11, Custom reminds you to disable the AHA-1520/1522 BIOS by rejumping the board.

By default, both the Adaptec AHA-1540/1542 and AHA-152x host adapters have on-board bioses enabled at address DC00H. You must REJUMPER the AHA-152x to disable its BIOS. Refer to the AHA-1520/1522 User's Guide for jumper locations.

If you have not already changed the AHA-1520/1522 IRQ channel, Custom displays a reminder that you need to disable its BIOS and change its IRQ channel.

By default, both the Adaptec AHA-1540/1542 and AHA-152x host adapters use IRQ 11 and have on-board bioses enabled at address DC00H. You must:

- 1) REJUMPER the AHA-152x to use a different IRQ
- 2) REJUMPER the AHA-152x to disable its BIOS

Which IRQ do you wish the ASW-1250 to use (9,10,11,12)?

1. Using your configuration choices form (Table 7-2), determine which channels are free.

2. Type the number of a free channel and press Enter.

Custom informs you that it is reconfiguring the software to the new IRQ channel.

Refer to the AHA-1520/1522 User's Guide for jumper locations. Reconfiguring the Adaptec AHA-152x driver to use IRQ XX...

### ASW-1250 and the Non-SCSI Tape Driver

Custom now checks for the presence of the SCO UNIX non-SCSI cartridge tape driver. The ASW-1250 software and the cartridge tape driver have overlapping port address ranges.

If Custom does not find the non-SCSI cartridge tape driver, it displays a message concerning the host adapter prefix. If you see the message about the host adapter prefix, skip the following section and go directly to "Recording the Host Adapter Prefix" later in this chapter.

If Custom finds that the tape driver is enabled, it displays the following message:

```
The non-scsi cartridge tape driver is configured into the
kernel. Its I/O port address range conflicts with that
of the AHA-152x driver. If you are using a cartridge
tape drive or think you may use one in the future,
reconfigure the AHA-152x at its secondary address range.
If you never intend to use a cartridge tape, you may
remove the cartridge tape driver from the system configura-
tion files to avoid rejumping the AHA-152x.
```

1. Remove Cartridge Tape Driver

2. Configure 152x at secondary I/O address range (140h-15Eh)

Select an option:

Enter 1 or 2, depending on which way you intend to solve the port address conflict. Note that Custom asks you if you want to change the port address range even if you changed it earlier in the installation.

If you enter 1, proceed to the following section, "Removing the Tape Driver."

If you enter 2, Custom reminds you that you also need to reconfigure the AHA-1520/1522 board by changing jumper settings.

```
Configuring ASW-1250 driver for secondary I/O address
range...
```

```
Configuration complete. Refer to the AHA-1520/1522
User's Guide for instructions on rejumping for second-
ary I/O address range.
```

Skip the following section and proceed to "Recording the Host Adapter Prefix" later in this chapter.

## Removing the Tape Driver

Custom informs you that it is not necessary to rebuild the UNIX kernel immediately after removing the cartridge tape driver.

```
After the removal of the Cartridge Tape driver, you will
be prompted to relink the kernel to reflect the changes
made to the driver. You should choose NOT to relink the
kernel at this time as you will be prompted to do so
again at the end of the ASW-1250 installation to reflect
the addition of the ASW-1250 driver. Press any key to
continue...
```

1. Press any key.

You see the Tape Drive Configuration menu:

```
Tape Drive Configuration Program
```

1. Install a Tape Drive
2. Remove a Tape Drive
3. Change default Tape Drive

```
Select an option or enter q to quit.
```

2. Type **2** and press Enter. You see the Tape Drive Removal menu:

Tape Drive Removal Menu

1. Remove Cartridge Tape Drive
2. Remove Mini-Cartridge Tape Drive
3. Remove Qic-40 Tape Drive
4. Remove SCSI Tape Drive

Select an option or enter **q** to return to the main menu.

3. Type **1** and press Enter. The system informs you that the cartridge tape driver has been removed.

Updating system files to effect removal of driver...

System files have been updated.

Cartridge Tape Driver and associated devices have been removed.

You see the Tape Drive Configuration menu again:

Tape Drive Configuration Program

1. Install a Tape Drive
2. Remove a Tape Drive
3. Change default Tape Drive

Select an option or enter **q** to quit.

4. Type **q** and press Enter. The system asks you if you want to create a new UNIX kernel now.

You must create a new kernel to effect the driver change you specified.

Do you wish to create a new kernel now? (y/n)

5. You do not need to create a new kernel at this time since you will do so later. Type **n** and press Enter.

## Recording the Host Adapter Prefix

Custom now tells you the host adapter prefix, which you need when you use the `mkdev` command to connect SCSI devices to your system.

You will be using the SCO UNIX command `mkdev` to attach hard disks and tapes to the AHA-152x (`mkdev hd` and `mkdev tape`). You should refer to chapters on "Adding Hard Disks" and "Using Floppy Disks and Tape Drives" in the SCO UNIX Operating System System Administrator's Guide.

NOTE!!! `mkdev` will prompt you for Host Adapter prefix at various points.

The Host Adapter prefix associated with an AHA-152x is `spad`.

Record this prefix and press <Return> when you have done so...

Make note of the prefix `spad` and press Enter.

## Quitting Custom

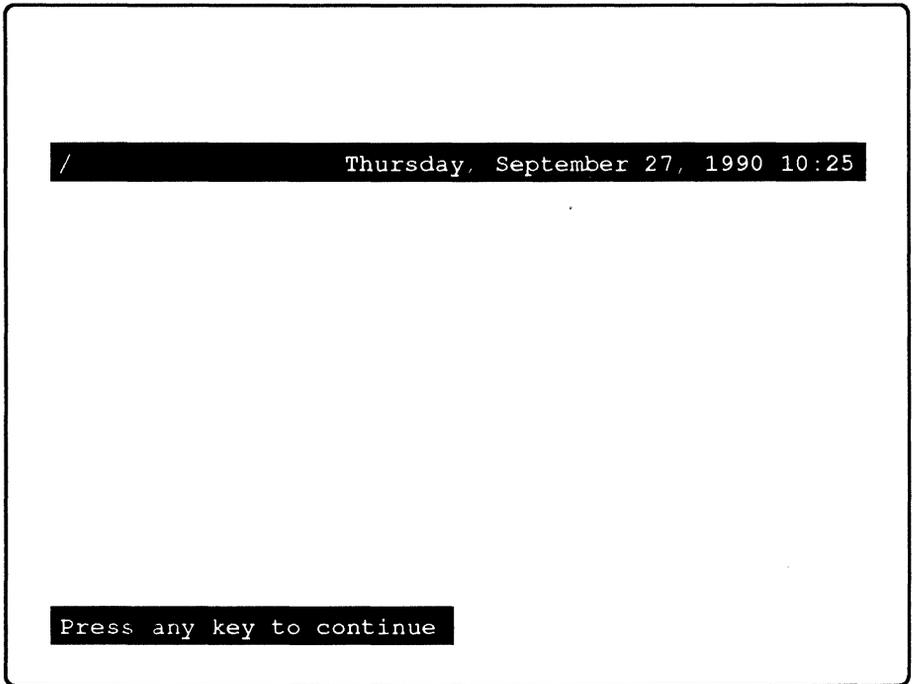
Custom gives you the option of building a new kernel immediately or waiting until you use `mkdev` to add SCSI devices to your system. Waiting until you run `mkdev` saves time.

If you don't plan to use `mkdev` immediately, you should rebuild the kernel.

A new kernel must be built to reflect the changes to the driver configurations. You will be asked to do this again when you run `mkdev` so if you are planning on running it next, you can wait. Do you want to do this now?

Type **y** or **n** and press Enter.

If you enter **n**, you see the following Custom screen:



Press any key to return to the UNIX shell. The installation and configuration of the ASW-1250 software is now complete.

### USING `mkdev` TO ATTACH DEVICES TO THE AHA-1520/1522

You use the SCO UNIX commands `mkdev hd` and `mkdev tape` to attach hard disks and tape drives to the AHA-1520/1522. Consult the SCO UNIX documentation for information about these commands.

You should be aware that Custom installs a new version of `mkdev` when you install the ASW-1250 software. This new version is slightly different from the version discussed in the SCO UNIX *System Administrator's Guide* and *System Administrator's Reference*. The most important differences in the new version are listed below:

- The new version requires the use of a host adapter prefix. This requirement is discussed in "Recording the Host Adapter Prefix."
- You can specify only a single host adapter (number 0) when using `mkdev` with the ASW-1250 software installed. This is discussed in "Using `mkdev`."

### Using `mkdev` with SCO UNIX 3.2v0 and ODT v1.0

If you are using SCO UNIX 3.2v0 or ODT v1.0, you have to change configuration parameters if you want to use more than two hard disks (including non-SCSI hard disks that were installed before you installed the host adapter). You need to complete the procedure described below before using `mkdev hd` to install your hard disks.

#### *To Change Configuration Parameters*

1. At the UNIX prompt, type `cd /etc/conf/cf.d` and press Enter.
2. Type `.configure NDISK=6` and press Enter.

This changes the maximum number of hard disks that SCO UNIX 3.2v0 and ODT v1.0 recognize to six (two non-SCSI disks plus four SCSI disks).

#### Using `mkdev`

7 When you invoke `mkdev`, it asks to which host adapter the SCSI device you are installing should be connected. Unlike some software drivers (such as `ad`), the ASW-1250 software supports only a single AHA-1520/1522 host adapter. Therefore you can only specify the AHA-1520/1522 and assign it the number 0.

You must invoke `mkdev` two times for each SCSI device you attach to the AHA-1520/1522. When you invoke `mkdev` the first time for each device, it asks if you want to rebuild the UNIX kernel. You must rebuild the kernel to attach the devices correctly. When you rebuild the kernel, you see the following message:

```
Warning: no dma channel specified for scsi device :
prefix spad.
```

You should ignore this message. The AHA-1520/1522 does not use a DMA channel.

After the kernel has been rebuilt, the system prompts you to reboot with the new kernel and invoke `mkdev` a second time to complete the installation of the new device. You must repeat this entire process for each device you add.

## TROUBLESHOOTING

If you cannot successfully reboot the system after you install the ASW-1250 software or if your screen looks strange the first time you boot after installation, there is probably a port address range conflict. Check the documentation for all the adapter cards you have installed on your system. If any of them use the same port address as the AHA-1520/1522, you need to resolve the conflict.

If necessary, remove the AHA-1520/1522 from the system, reboot the original kernel (`/unix.pre1250`), and reconfigure the AHA-1520/1522. Then reinstall the ASW-1250 software.

### Error Messages

While you are initializing your system, you may see error messages that let you know that there are problems with the new setup.

The following messages indicate that the AHA-1520/1522 board has not been successfully installed:

```
spad_init: Adapter 0 configuration failure, base port  
0x340
```

```
spad_init: Adapter initialization failure, base port  
0x340
```

Both of these messages mean that the ASW-1250 software and the AHA-1520/1522 host adapter are unable to communicate. SCO UNIX does not recognize any devices that you have attached to the board. If you receive either of these messages, check to see that the AHA-1520/1522 is inserted properly into the computer. Make sure that the software and board configurations match.

The following messages indicate problems on the SCSI bus:

```
spad: Adapter 0 ERROR: Selection timeout  
spad: Adapter 0 ERROR: Data overrun/underrun  
spad: Adapter 0 ERROR: Unexpected Bus Free Occurred  
spad: Adapter 0 ERROR: Invalid Bus Phase Detected
```

The first message indicates that you have specified a hard disk in the software that is not physically installed on the SCSI bus. The other three error messages indicate serious problems on the SCSI bus. Contact Adaptec Customer Service if you receive any of these messages and do not know what to do.

The following message can indicate a serious malfunction of the AHA-1520/1522 board:

```
spad: spurious interrupt
```

Check to make sure that the AHA-1520/1522 board has been properly installed and that all configurations are correct. Contact Adaptec Customer Service if you receive this error message and cannot resolve the problem.

Your system can display a number of different messages when you boot it with the host adapter installed. The messages are divided into different classes. You can select which class or classes of messages you want displayed by changing the host adapter jumper settings. See Chapter 3, "Changing Jumper Settings" and Appendix B "Jumper Block Reference" for information. This appendix lists the different message classes that are available.

## CLASS 0—HEADER DISPLAY (DEFAULT)

```
Adaptec AHA-1520 BIOS (or Adaptec AHA-1522 BIOS)
Version 1.1
Copyright 1990 Adaptec, Inc.
All Rights Reserved
```

## CLASS 1—JUMPER CONFIGURATION INFORMATION

These messages tell you which host adapter options you have specified with jumpers. The possible values are listed.

```
SCSI ID=0, 1, 2, 3, 4, 5, 6, 7
Interrupt Channel=9, 10, 11, 12
DMA Channel=0, 5, 6, 7
SCSI parity=enabled/disabled
transfer mode=DMA/PIO
boot=enabled/disabled
displayed Message Classes=#0, #1, #2, #3, #4
initiate sync negotiation=enabled/disabled
target disconnection=enabled/disabled
```

## CLASS 2—SCSI DRIVE INFORMATION

```
Target 0: Lists disk drive vendor, product identification,
and revision level.
Target 0: disk drive ready, but Inquiry failed
Target 0: Device identification not available
```

## CLASS 3—BOOT PROGRESS REPORT

Reset SCSI bus.

Diagnostics completed without error.

Host adapter interrupt channel initialized.

Delay for targets to recover from reset.

No SCSI targets were set up.

Checking SCSI Target 0:

Executing SCSI Inquiry command

Target is connected. Wait for target ready.

Target is ready.

Executing "Get Disk Type" command.

Target check completed

SCSI Target 0 set up as Drive C:

Checking SCSI Target 1:

Executing SCSI Inquiry command

Target is connected. Wait for target ready.

Target is ready. Recall target.

Executing "Get Disk Type" command.

Target check completed.

SCSI Target 1 set up as Drive D:

Attempting to boot from floppy.

Attempting to boot from hard disk.

## CLASS 4—ERROR MESSAGES (DEFAULT)

Boot from floppy failed.

Boot from hard disk failed.

Target 0: target not connected

Target 0: target connected, but has a fault

Target 0: target connected, but is not a disk drive

Target 0: disk drive connected but not ready

Target 0: disk format not 512 bytes/block

HOST ADAPTER SELF DIAGNOSTIC FAILURE

SCSI TARGET 0 NOT FOUND

UNABLE TO INITIALIZE TARGET



The following sections describe the functions of each of the jumper pins on each of the jumper blocks on the host adapter board. In each section, a diagram of the default jumper settings is followed by a description of the function of each pin pair. The pin pairs are referred to by the two-character codes printed next to them on the host adapter board.

## JUMPER BLOCK J5 (DATA)

Jumper block J5 controls a number of different options on the host adapter. The following diagram shows the default settings of jumper block J5:



Pin Pair	Description
Pin Pair DT	You use this pin pair to choose whether data transfer will be performed in PIO or DMA mode. If no jumper is installed (the default), data transfer is performed in the PIO mode. If a jumper is installed, data transfer is performed using second-party DMA.
Pin Pair BT	You use this pin pair to choose whether the host adapter BIOS intercepts the INT19 call and performs the boot operation. If a jumper is installed (the default) the BIOS intercepts INT19 and performs the boot operation. If no jumper is installed, the BIOS does not intercept the INT19 call.
Pin Pairs M0, M1	You use these pin pairs to select which types of messages you want the AHA-1520/1522 to display when you boot your computer. The AHA-1520/1522 can display five different classes of message: <ul style="list-style-type: none"> <li>0-Adaptec header display</li> <li>1-Jumper configuration information</li> <li>2-SCSI device information</li> <li>3-Boot progress report</li> <li>4-Error messages</li> </ul>

Refer to Appendix A for more information about these message classes.

To display message classes 0 and 4 (the default), position the jumpers according to the following diagram:



To display message classes 0, 3, and 4, position the jumpers according to the following diagram:



To display message classes 0, 1, 2, 3, and 4, position the jumpers according to the following diagram:



To display message class 4, position the jumpers according to the following diagram:



### Pin Pair SN

You use this pin pair to enable and disable synchronous negotiation on the host adapter. When a jumper is installed (the default), the AHA-1520/1522 initiates synchronous negotiation. If a jumper is not installed, the board responds to negotiation, but only if the target starts the process.

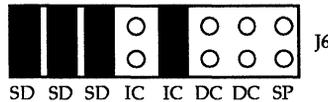
**Pin Pair DN** You use this pin pair to enable and disable disconnection by the target SCSI device. When a jumper is installed (the default), the AHA-1520/1522 allows disconnection by the target device. If disconnection occurs, the AHA-1520/1522 BIOS issues INT15 (busy, wait for disk device) to allow the host CPU to multitask. When a jumper is not installed, the AHA-1520/1522 does not allow disconnection and does not issue any INT15 calls.

**Pin Pair R-** Not used.

**Pin Pair R-** Not used.

## JUMPER BLOCK J6 (CHANNEL SELECTION AND SCSI ID)

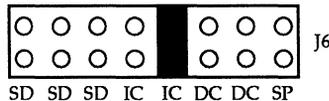
Jumper block J6 controls the SCSI ID, the DMA channel, and the IRQ channel that the host adapter uses. Note that the IRQ channel and the DMA channel are also controlled by other jumper blocks (jumper block J9 for the IRQ channel and jumper block J8 for the DMA channel). The following diagram shows the default settings of jumper block J6:



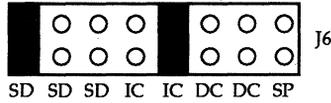
Pin Pair	Description
----------	-------------

Pin Pairs SD	You use the three pin pairs marked SD to determine the SCSI ID of the host adapter..
--------------	--

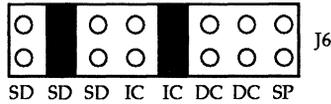
To set the host adapter to SCSI ID 0, position the jumpers according to the following diagram:



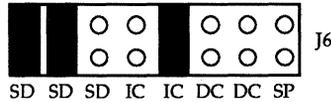
To set the host adapter to SCSI ID 1, position the jumpers according to the following diagram:



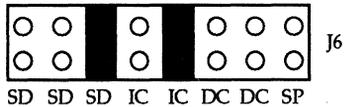
To set the host adapter to SCSI ID 2, position the jumpers according to the following diagram:



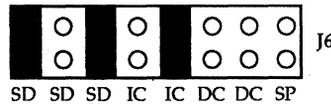
To set the host adapter to SCSI ID 3, position the jumpers according to the following diagram:



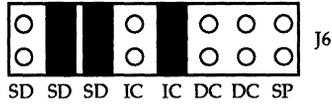
To set the host adapter to SCSI ID 4, position the jumpers according to the following diagram:



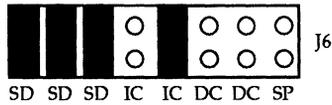
To set the host adapter to SCSI ID 5, position the jumpers according to the following diagram:



To set the host adapter to SCSI ID 6, position the jumpers according to the following diagram:



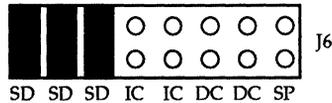
To set the host adapter to SCSI ID 7 (the default), position the jumpers according to the following diagram:



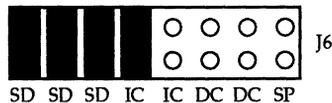
Pin Pairs IC

You use the two pin pairs marked IC to select the host adapter IRQ channel. You must also use pin pairs I0, I1, I2, and I9 on jumper block J9 to select the IRQ channel.

To select IRQ channel 9, position the jumpers according to the following diagram:



To select IRQ channel 10, position the jumpers according to the following diagram:



To select IRQ channel 11 (the default), position the jumpers according to the following diagram:

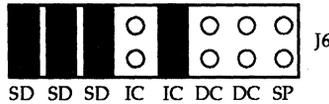


To select IRQ channel 12, position the jumpers according to the following diagram:



**Pin Pairs DC** You use the two pin pairs marked DC to select the host adapter DMA channel. You must also use jumper block J8 to select the DMA channel. Only channel 0 is valid.

To select DMA channel 0, position the jumpers according to the following diagram:



**Pin Pair SP** You use this pin pair to determine whether parity checking is enabled or disabled on the SCSI bus. If no jumper is installed (the default), parity checking is enabled. If a jumper is installed, parity checking is disabled.

**JUMPER BLOCK J7 (FLOPPY DRIVE OPTIONS)**

Jumper block J7, which exists only on the AHA-1522 host adapter, controls floppy drives options. The following diagram shows the default settings of jumper block J7:



**Pin Pair**                      **Description**

**Pin Pair FE**                      You use this pin pair to determine whether the floppy controller on the host adapter is enabled or disabled. If a jumper is installed (the default), the floppy controller is enabled. If no jumper is installed, the floppy controller is disabled.

**Pin Pairs DR**                      You use the two pin pairs marked DR to set the floppy DMA request channel. You must also use the two pin pairs marked DA to set the DMA acknowledge channel to the same value.

To set the DMA request channel to 2 (the default), position the jumpers according to the following diagram:



To set the DMA request channel to 3, position the jumpers according to the following diagram:



**Pin Pairs DA**                      You use the two pin pairs marked DA to set the floppy DMA acknowledge channel. You must also use the two pin pairs marked DR to set the DMA request channel to the same value.

To set the DMA acknowledge channel to 2 (the default), position the jumpers according to the following diagram:





**Pin Pair**                      **Description**

Pin Pairs DR, D6, D5, D0      You use these four pin pairs to select the DMA request channel. You must choose the matching DMA acknowledge channel using pin pairs DA, D6, D5, and D0. In addition, you must choose the same DMA channel using the DC pin pairs on jumper block J6. Only channel 0 is valid.

To select DMA request channel 0, position the jumpers according to the following diagram:



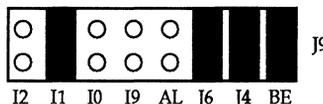
Pin Pairs DA, D6, D5, D0      You use these four pin pairs to select the DMA acknowledge channel. You must choose the matching DMA request channel using pin pairs DR, D6, D5, and D0. In addition, you must choose the same DMA channel using the DC pin pairs on jumper block J6. Only channel 0 is valid.

To select DMA acknowledge channel 0, position the jumpers according to the following diagram:



**JUMPER BLOCK J9 (IRQ CHANNEL, PORT ADDRESS, AND BIOS)**

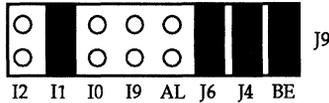
Jumper block J9 controls the host adapter IRQ channel, its port address, its BIOS address, and whether the BIOS is enabled. The following diagram shows the default settings of jumper block J9:



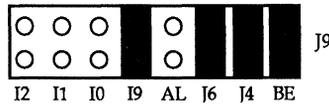
**Pin Pair**                      **Description**

Pin Pairs I2, I1, I0, I9                      You use these four pin pairs to select the IRQ channel. You must also select the corresponding interrupt channel with the IC pin pairs on jumper block J6.

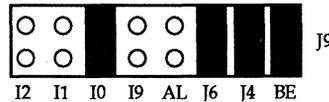
To select IRQ channel 11 (the default), position the jumpers according to the following diagram:



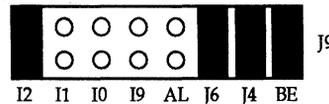
The following diagram shows the jumper positions for selecting IRQ channel 9. Use of IRQ channel 9 is not recommended when running Windows or OS/2.



To select IRQ channel 10, position the jumpers according to the following diagram:



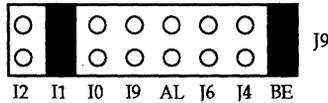
To select IRQ channel 12, position the jumpers according to the following diagram:



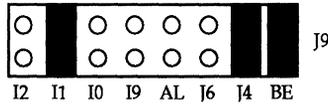
**Pin Pair AL** You use this pin pair to select the host adapter port address range. If no jumper is installed (the default), the board uses the primary port address range, 340H–35Eh. If a jumper is installed, the board uses the secondary address range, 140H–15Eh. Note that the primary and secondary port address ranges of the AHA-1520/1522S11 model are the reverse of those on the standard host adapter.

**Pin Pair J6, J4** You use these two pin pairs to select the host adapter BIOS address location.

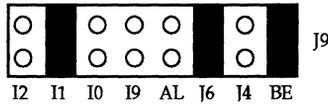
To select BIOS address C8000, position the jumpers according to the following diagram:



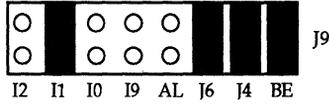
To select BIOS address CC000, position the jumpers according to the following diagram:



To select BIOS address D8000, position the jumpers according to the following diagram:



To select BIOS address DC000, position the jumpers according to the following diagram:



## Pin Pair BE

You use this pin pair to determine whether the host adapter BIOS is enabled or disabled. If a jumper is installed (the default), the BIOS is enabled. If no jumper is installed, the BIOS is disabled.

The following is a list of the pin assignments for each of the 50 pins on the host adapter's internal SCSI connector:

Signal Name	Pin	Pin	Signal Name
Ground	1	2	-DB(0)
Ground	3	4	-DB(1)
Ground	5	6	-DB(2)
Ground	7	8	-DB(3)
Ground	9	10	-DB(4)
Ground	11	12	-DB(5)
Ground	13	14	-DB(6)
Ground	15	16	-DB(7)
Ground	17	18	-DB(P)
Ground	19	20	Ground
Ground	21	22	Ground
Ground	23	24	Ground
Open	25	26	Term Power (Fused)
Ground	27	28	Ground
Ground	29	30	Ground

## Appendix C

## Internal Connector Pins

Ground	31	32	-ATN
Ground	33	34	Ground
Ground	35	36	-BSY
Ground	37	38	-ACK
Ground	39	40	-RST
Ground	41	42	-MSG
Ground	43	44	-SEL
Ground	45	46	-C/D
Ground	47	48	-REQ
Ground	49	50	-I/O

The following is a list of the pin assignments for each of the 50 pins on the host adapter's external SCSI connector:

Signal Name	Pin	Pin	Signal Name
Ground	1	26	-DB(0)
Ground	2	27	-DB(1)
Ground	3	28	-DB(2)
Ground	4	29	-DB(3)
Ground	5	30	-DB(4)
Ground	6	31	-DB(5)
Ground	7	32	-DB(6)
Ground	8	33	-DB(7)
Ground	9	34	-DB(P)
Ground	10	35	Ground
Ground	11	36	Ground
Ground	12	37	Ground
Open	13	38	Term Power (Fused)
Ground	14	39	Ground
Ground	15	40	Ground

## Appendix D

## External Connector Pins

Ground	16	41	-ATN
Ground	17	42	Ground
Ground	18	43	-BSY
Ground	19	44	-ACK
Ground	20	45	-RST
Ground	21	46	-MSG
Ground	22	47	-SEL
Ground	23	48	-C/D
Ground	24	49	-REQ
Ground	25	50	-I/O

Hard disks and removable media cartridges must be low-level formatted before they can be partitioned and high-level formatted. If your dealer has not performed the low-level formatting, you need to do so.

You can use a low-level formatting utility provided by the AHA-1520/1522 BIOS. Type **DEBUG** at the DOS prompt to invoke this utility. When you see a hyphen, type **G=DC00:6**. DC00 is the default host adapter BIOS address. If you have changed the BIOS address, use the new address instead.

The system will display a short menu that gives you choices for displaying, selecting, and formatting disks.

When you low-level format a disk, you will be asked for an interleave value. Entering **0** or **1** results in a 1:1 interleave. This is the optimum value for many 286 and 386 systems. Optimum values depend, however, on the processing speed of the system. There are a number of programs that can help you determine the optimum value for your system.

Reboot your system after you finish low-level formatting. If you are low-level formatting removable cartridges, you don't need to reboot after each cartridge. Low level format all the cartridges, then reboot.



# Index

---

## A

- ACK signal name, C-2, D-2
- acknowledge channel, *See* DMA and floppy disk drive/controller ad, *See* SCO UNIX
- adapter driver, *See* SCO UNIX
- AddDiskSystem call, 6-19
- address, port, *See* port address range
- Advanced version of NetWare 286 2.15, 5-1 to 5-42
- AFDISK, 4-3, 4-8, 4-10 to 4-15
- AHA-152x, 1-1, 6-2, 6-16
- AHA-1540/1542 host adapter, 3-1, 3-3, 4-5, 7-2, 7-4, 7-15
- Alt/Esc key combination, 6-7
- analyzing the disk surface, *See* COMPSURF
- ASCII file with README text, 5-2
- ASPI (Advanced SCSI Programming Interface), 1-2, 3-1 to 3-3
  - ASW-1210 software, 1-2, 4-1 to 4-17
  - ASW-1240 software, 1-2, 5-1 to 5-42, 6-1 to 6-20
  - ASW-1250 software, 1-2, 7-1 to 7-24
  - Fixed Disk Module, 6-4
- ASPI2DOS program/files, 4-1 to 4-7, 4-10
- ASPIDISK program/files/options, 4-2, 4-3, 4-7 to 4-10, 4-17
- ASPITRAN.DSK file, 6-2, 6-16
- assigning disk drives to channels, *See* channel numbers
- ASW-12xx software/files, *See* ASPI
- AT bus-on/off times, 4-7
- ATN signal name, C-2, D-2
- attaching devices, 7-21 to 7-23
- AUTOEXEC.NCF file, 6-16
- automatic bootup, *See* boot

## Available

- configurations, *See* list of
- Disk Drives menu, 6-8
- Disk Options menu, 6-8
- Options menu, 5-6, 5-9 to 5-11, 5-22 to 5-29, 5-33
- Partitions menu, 6-10
- System Options menu, 6-16

## B

- backup copies, *See* copying
- basic Netware installation, 5-3 to 5-11
- BIOS address, 4-8, 4-16, 4-17
  - disabling, 3-2, 3-6, 3-8, 4-2, 5-20, 6-13
  - enabling, 4-4
  - jumper block, B-11 to B-12
  - setting for both types of host adapters, 7-3
  - versus AFDISK, 4-14
  - with two host adapters, 2-7, 3-2
- blocks, jumper, *See* jumper blocks
- boot
  - NetWare from SCSI disk, 6-15 to 6-17
  - process, 4-14
  - progress report, A-2
  - messages, 4-7, 4-9, 4-17
- bridge controller, 4-5
- BSY signal name, C-2, D-2
- building kernel, *See* SCO UNIX kernels
- bus, *See* SCSI bus
- bus on/off times, 4-7
- busy INT15 call, B-3

## C

- /C switch, 4-5
- cables, 2-2 to 2-5, 4-16, 4-17, 5-20, 6-12
- capacity
  - data storage, 5-30, 6-1

# Index

- disk drive, 5-15, 5-19, 6-6, 6-12
  - cartridge, *See* tape driver and removable media
  - C/D signal name, C-2, D-2
  - CD-ROM drives, 1-1 to 1-2, 4-2
  - changing
    - configuration parameters, 7-22
    - default IRQ channel, *See* IRQ
    - default jumper settings, *See* jumper settings
    - interleave value for disk, 6-18
    - IRQ channel, *See* IRQ
    - port address range, *See* port address range
    - settings, 7-5
  - channel
    - numbers, 5-8, 5-25, 5-27, 5-35, 5-40 to 5-42, 7-17
    - selection, *See* J6
    - See also* IRQ and DMA
  - classes of host adapter messages, A-1 to A-3
  - color mode, 4-10, 4-15
  - command line
    - argument is incorrect (message), 4-16
    - options, 6-4 to 6-5
  - COMPSURF disk analysis program, 5-12, 5-16
  - CONFIG.SYS file, 4-3, 4-4, 4-7, 4-8
  - Configure Drivers/Resources menu, 5-27, 5-29, 5-36, 5-39
  - configuring
    - ASW-12xx software, *See* ASPI
    - choices form, 7-5
    - drivers, 5-4, 5-9, 5-11, 5-25, 5-26, 6-2
    - errors in, 5-39 to 5-40
    - file server utilities, 5-12, 5-16
    - for ASPI2DOS, 4-5
    - for NetWare, 5-1
    - host adapters, 2-6, 6-2
    - jumpers, *See* jumper settings
    - operating system, 5-11 to 5-14, 5-16
    - options for, 4-5, 4-7, 4-8 to 4-9, 5-40 to 5-42, 6-4 to 6-5
    - parameters, 7-22
    - software, 6-2
    - with NETGEN, 5-2
  - Confirm Attached Drives menu, 5-17
  - conflicts
    - between ASW-1250 and ad, 7-15
    - error message, 6-19
    - port address, 4-16, 7-23
    - with other products, 3-1, 7-2
    - with two host adapters, 2-6
  - connectors, 2-1 to 2-5
    - See also* cables, external, 2-3 to 2-4, 5-15, 5-20, 5-31, 6-13, D-1 to D-2
    - See also* cables, internal, 2-3, 5-15, 5-20, 5-31, 6-13, C-1 to C-2
  - copying
    - diskettes, 5-3, 6-2
    - files to hard disk, 4-3, 4-4, 4-10, 5-3
    - UNIX Kernel, 7-6 to 7-7
  - Custom utility, 7-5 to 7-22
  - cylinder
    - end field, 4-12
    - size, 4-11
    - start field, 4-12
- ## D
- D connector, 2-2
  - /D switch, 4-7, 4-9
  - data
    - jumper block, *See* J5
    - overrun/underrun, 7-24
    - transfer modes, *See* PIO and DMA
  - DB(x) signal names, C-1, D-1
  - debugging, 4-7, 4-9, E-1
  - default
    - jumper settings, *See* jumper settings
    - port address range, 1-1
  - deleting partitions, *See* partitioning
  - DEVICE= command, 4-3, 4-4, 4-5, 4-7, 4-8

# Index

devices, 4-16

external, 2-2 to 2-5

internal, 2-2 to 2-5

*See also* peripherals

DIP (dual inline package) resistors, 2-1

direct memory access, *See* DMA

direction kit, *See* SCSI Direction Kit

disabling

BIOS, *See* BIOS address

disconnection by target SCSI device,  
B-3

floppy drive controller, *See* floppy  
disk drive/controller

interrupt 13h driver loading, 4-7

parity checking, *See* parity checking

support for fixed disk drives, 6-4

support for removable media, 6-4

synchronous negotiation on host  
adapter, B-2

discharging static electricity, 2-3

disconnection by target SCSI device, B-3

disk

analysis, *See* COMPSURF

driver options menu, 5-7 to 5-9,  
5-23 to 5-27, 5-33 to 5-36

driver type menu, 5-25

drives, 1-2, 5-12, 5-16, 7-1

duplexing, 5-19 to 5-30, 6-12 to 6-15

fixed, *See* fixed disk

formatting, *See* formatting

hard, *See* hard disk

mirroring, 5-15 to 5-19, 6-6 to 6-11

parameters, 4-17

partitioned, *See* partitioning

RAM, 5-2

surface, *See* COMPSURF

*See also* floppy disk drive

diskettes

floppy; *See* floppy disk drive/  
controller

working copies of, *See* copying

dismounting removable media drives,  
6-17

DMA (direct memory access) channel,  
2-7, 3-3, 7-23, B-1

acknowledge channel, B-9

error message, 5-40, 6-19

floppy acknowledge channel, B-8

floppy request channel, B-7

jumper block, B-3, B-8 to B-9

request channel, B-9

DOS

boot process, *See* boot

FDISK utility, *See* FDISK utility

FORMAT, *See* formatting

manager, 4-1 to 4-2, 4-5

operating system, 1-2, 4-1 to 4-17

version, 4-2, 4-10 to 4-11, 4-16  
to 4-17

driver

adapter, *See* SCO UNIX

AHA-1520/1522, 5-2

host adapter, 5-4

interrupt, *See* interrupt driver

LAN card, *See* LAN card

loading, *See* loading

parse, *See* parse

selecting, 5-4

drives

CD-ROM, *See* CD-ROM

disk, *See* disk

floppy, *See* floppy disk drive

logical, *See* logical drives

magneto-optical, 6-17

Mirroring Status window, 6-10

NetWare Ready SCSI, *See* SCSI

network, 5-2

non-SCSI, 1-2, 4-2, 7-3, 7-4, 7-17,  
7-22

removable media, *See* removable  
media drive

SCSI, *See* SCSI

tape, *See* tape drives

dual-speed spindle, B-8

duplexing, *See* disk duplexing

# Index

## E

- edge connectors, 2-3 to 2-5
- editing
  - CONFIG.SYS file, *See* CONFIG.SYS file
- electricity, static, *See* static electricity
- enabling
  - BIOS, *See* BIOS address
  - disconnection by target SCSI device, B-3
  - DMA data transfers, *See* DMA
  - floppy drive controller, *See* floppy disk drive/controller
  - parity checking, *See* parity checking
  - synchronous negotiation on host adapter, B-2
- End Cylinder field, 4-12
- erasing data on disk, *See* formatting
- error messages, 4-10, 4-15 to 4-17, 5-39 to 5-40, A-3
  - with ASW-1240, 6-19 to 6-20
  - with ASW-1250, 7-23 to 7-24
- Esc key, 4-14, 5-3, 5-9, 5-17, 5-24, 6-7
- exiting, 6-11, 7-20
  - See also* Esc key
- expansion slots, 2-2 to 2-3, 2-5
- extended utilities package, *See* SCO UNIX

## F

- /F switch, 4-6
- F1 key, *See* help
- failure
  - in call to AddDiskSystem, 6-19
  - in call to ParseDriverParameters routine, 6-19
  - in host adapter inquiry, 4-16
  - power, *See* power failure
  - to access ASPI device parameter, 4-16
  - to access ASPI2DOS, 4-16

- to find any logical drives, 4-17
- to get device type, 4-16
- to get DOS version, 4-16
- to initialize host adapter, 4-15
- to issue SCSI Inquiry command, 4-17
- to issue SCSI Read Capacity command, 4-17
- to read boot record, 4-17
- to read master boot record, 4-17
- fault tolerance, 5-14, 6-2, 6-5 to 6-15
- FDISK utility, 4-2, 4-10, 6-15
- file server
  - configuring, *See* configuring
  - installing, *See* installing
  - linking, *See* linking
  - name, 5-14, 5-19, 6-3, 6-14
  - operating system, 5-1, 6-1, 6-11
  - utilities, 5-12
- fixed disk, 6-4, 6-20
  - See also* hard disk
- floppy disk drive/controller, 1-1, 2-2, 2-3, 2-5, 5-2, 6-12
  - disabling, 2-7, 3-3, 3-10, 5-20
  - DMA acknowledge channel, B-8
  - enabling, 2-7, 5-20
  - IRQ channel, B-8
  - options, *See* J7
- formatting
  - disks, 4-8, 4-14, 6-15, 6-18
  - high-level, 4-8, 4-10
  - logical, 4-14
  - low-level, 4-9, 6-18, E-1
  - SCSI drive, 4-16
- fused term power (signal name), C-1, D-1

## G

- Get Device Type failed (message), 4-16
- Get DOS version failed (message), 4-16
- ground (signal name), C-1 to C-2, D-1 to D-2

# Index

## H

- /H switch, 4-6
- hard disk, 5-2, 7-1, 7-21 to 7-22
  - copying ASW-1210 files to, 4-3
  - driver, 4-2
  - low-level formatting, E-1
  - multiple, *See* multiple
  - only (no other SCSI device), 1-2
  - removable, *See* removable
- hardware considerations
  - with disk duplexing, 5-19, 6-12 to 6-13
  - with disk mirroring, 5-15, 6-6 to 6-7
  - with multitasking, 5-30 to 5-31
  - with NetWare 286, 5-1
  - with NetWare 386, 6-1 to 6-2
  - with two host adapters, 2-7
- header display messages, A-1
- help
  - file (AFDISK), 4-10
  - message file (AFDISK), 4-10
  - online, 4-11
- hex digit in Command Line /P Option
  - illegal or missing, 4-15
- high-level formatting, *See* formatting
- host adapter
  - adding, 5-3
  - inquiry failed (message), 4-16
  - installing, 2-1 to 2-7
  - options, 5-40 to 5-42
  - prefix, 7-20
  - unable to find at port address, 5-39

## I

- /I switch, 4-7
- ID, *See* SCSI
- illegal hex digit in Command Line /P Option (message), 4-15
- improper
  - DMA Channel (message), 5-40
  - Interrupt Channel (message), 5-40
  - IO Port Address (message), 5-39

- initialization, 4-15, 7-23
  - See also* boot
- inquiry command
  - completed with error or time out (message), 5-40
  - not issued (message), 4-17
- inspecting disk drives, 5-12, 5-16
- INSTALL (.NLM) module, 6-2, 6-7, 6-16
- installing
  - drives, 4-17
  - extended utilities packages, 7-7
  - failure in, 4-15
  - files, 5-14, 5-19
  - file server operating system, 5-1, 5-3, 6-11
  - NetWare software, 5-3 to 5-11
  - options menu, 5-13, 5-18, 6-7, 6-16
  - two host adapters, 2-6 to 2-7
- INT15 calls, B-3
- interleave value for disk, 6-18, E-1
- interrupt
  - driver (13h), 4-6
  - request channel, *See* IRQ channel
  - spurious, 7-24
- invalid
  - bus phase detected, 7-24
  - command line option entered, 6-19
  - DOS version (message), 4-17
  - fixed disk setting, 6-20
  - verbose setting, 6-20
- invoking
  - AFDISK, 4-11
  - COMPSURF, *See* COMPSURF
  - mkdev, *See* mkdev command
- I/O (input/output)
  - parallel data transfer mode, *See* PIO
  - performance, *See* performance
  - port address range, *See* port address range
  - signal name, C-2, D-2
- IPX internal network number, 6-3, 6-14, 6-17

# Index

- IRQ channel, 2-7, 3-2
  - changing, 3-6 to 3-7
  - error message, 5-40, 6-19
  - floppy, *See* floppy disk drive/controller
  - for AHA-1540/1542 driver, 7-2
  - for ASW-1250 software, 7-3, 7-13
  - jumper block, B-9
  - with disk duplexing, 5-20, 6-13
  - with disk mirroring, 5-15
  - with multitasking, 5-30
  - with SCO UNIX adapter driver, 7-2

## J

- J5 (data) jumper block, B-1 to B-3
- J6 (channel selection/SCSI ID) jumper block, B-3 to B-7
- J7 (floppy drive options) jumper block, B-7 to B-8
- J8 (DMA channel) jumper block, B-8 to B-9
- J9 (IRQ channel/port address/BIOS) jumper block, B-9 to B-12
- jumper
  - block reference, B-1 to B-13
  - configuration information, A-1
  - installing, 3-4 to 3-5
  - pins, B-1 to B-12
  - removing, 3-5
  - settings, 2-1 to 2-2, 3-1 to 3-10, 6-4, 7-5, B-1 to B-12

## K

kernel, UNIX, *See* SCO UNIX

## L

- /L switch, 4-6
- LAN, 3-1, 5-1, 5-9, 5-28 to 5-29, 5-36, 6-1
- laptop computer, 4-15
- legibility of screen, 4-15

- link kit, *See* SCO UNIX extended utilities package
- linking
  - file server utilities, 5-12, 5-16
  - SCO UNIX kernel, 7-18
  - to the operating system, 5-11 to 5-14, 5-16

## listing

- available configurations, 5-10, 5-26, 5-28, 5-37 to 5-38
- disk drivers, 4-11, 5-9, 5-26 to 5-28, 5-37, 6-18

## loading

- ASPI2DOS, 4-3, 4-4, 4-16
- ASPIDISK, 4-7, 4-16
- driver, 4-17, 6-20
- files, 5-6, 5-33, 6-2
- software, 6-14

locking removable media drives, 6-18

logging on as a superuser, 7-6

## logical

- drives, 4-2, 4-8, 4-12, 4-17, 5-22, 5-32
- drives, too many, 4-17
- units, 4-5

low-level formatting, *See* formatting

LUN addressing, 4-5

## M

magneto-optical drives, 6-17

maintenance

mode, 7-6

supplement, *See* SCO UNIX

Maximum number of logical drives

reached (message), 4-17

memory in system, 6-19, 6-20

messages

boot, *See* boot

error, *See* error messages

help, *See* help

host adapter (classes), A-1 to A-3

# Index

## Mirroring

- disk, *See* disk mirroring
- NetWare Partitions window, 6-10
- Options menu, 5-14, 5-18

mkdev command, 7-6, 7-22 to 7-23

Monitor menu, 6-18

MONITOR.NLM module, 6-1, 6-17

monochrome mode, 4-10, 4-15

mounting removable media drives, 6-17

-MSG signal name, C-2, D-2

multiple

- channels per host adapter, *See* multitasking
- disk drives on NetWare, 5-1, 5-3, 5-14 to 5-39
- hard disks, 4-1, 4-2, 4-10, 7-22
- host adapters, 2-1, 2-6 to 2-7, 3-1 to 3-3, 4-2, 4-4, 7-16

multitasking, 5-14, 5-30 to 5-42, B-3

## N

/N switch, 4-7

naming file servers, 5-14, 5-19

negotiation, synchronous, *See* synchronous negotiation

NETGEN

- .EXE program, 5-2 to 5-3
- N command, 5-31
- Run Options menu, 5-5, 5-21, 5-32

NetWare, *See* Novell NetWare

network

- drive, *See* drive
- Generations Options menu, 5-6, 5-12, 5-16 to 5-17, 5-22, 5-32
- number, *See* IPX

No hex digit found in Command

Line /P Option (message), 4-15

No host adapter exists (message), 4-16

No SCSI drives attached (message), 4-17

Novell NetWare, 1-2, 5-1 to 5-42, 6-1 to 6-20

## O

ODT version of SCO UNIX, 7-1, 7-22

open (signal name), D-1

opening ASPI manager, 4-16

operating system

- configuring, *See* configuring
- file server, *See* file server
- linking, *See* linking
- manager, 5-1, 6-1
- types supported, 1-2
- See also* DOS, SCO UNIX, Novell NetWare, and OS/2

OS/2 support, 1-2

overlay files, 4-10

overrun message, 7-24

## P

/P140 switch, 4-6, 4-15

/P340 switch, 4-6, 4-15

parallel input/output, *See* PIO

parity checking, B-7

ParseDriverParameters call failure, 6-19

partitioning

- disks, 4-2 to 4-3, 4-8, 4-10 to 4-15, 4-17, 6-2
- Mirroring Status menu, 6-9
- options menu, 6-9
- size, 4-11, 6-9

password, root, *See* root password

performance, 1-1, 4-2, 5-30, 5-40

peripherals, 1-1 to 1-2, 2-1, 4-2, 4-16

pin

- assignments, C-1 to C-2, D-1 to D-2
- pairs, B-1 to B-12

PIO (parallel input/output) data transfer mode, 3-3, 5-40, B-1

plotter, 4-2

# Index

port address range, 3-2  
  changing, 3-6, 4-5  
  command line option, 6-4  
  error message, 5-39, 6-20  
  for ASW-1240 software, 5-2  
  for ASW-1250 software, 7-3, 7-13  
  jumper block, B-12  
  options, 5-41 to 5-42  
  with disk duplexing, 5-20, 6-13  
  with two host adapters, 2-7, 4-4

power failure, 7-6

prefix, host adapter, 7-20

preparing

  AHA-1520/1522 host adapter,  
  2-3 to 2-4  
  computer, 2-3

previous menu/screen, *See* Esc key

printer, 4-2

## Q

/Q switch, 4-6

quitting, *See* exiting

## R

/R switch, 4-8, 4-9

RAM disk, *See* disk

Read

  ASW-1240 files, 5-7, 5-34  
  Boot Record failed, 4-17  
  Capacity command completed  
  with error/time out, 5-40  
  Capacity failed, 4-17  
  disk parameters, 4-17  
  host adapter files, 5-24, 5-34

README.TEXT file, 5-2, 6-2

rebooting, *See* boot

red stripe, 2-3 to 2-4

rejumping, *See* jumper settings

removable

  "hard" disks, 4-8  
  media, 4-2, 4-9, 4-17, 6-4, 6-17, E-1

repartitioning, *See* partitioning

-REQ signal name, D-2

request channel, *See* DMA and floppy  
  disk drive/controller

reserving

  hardware settings, 6-19

  logical drives, 4-8

resetting jumpers, *See* jumper settings

resistors, *See* SIP and DIP

returning

  to NetWare prompt, 6-7

  to previous screens/menus,  
  *See* Esc key

  to previous step in installation  
  process, 5-3

ribbon cable, *See* cables

root password, 7-6

-RST signal name, C-2, D-2

## S

S11 models, 1-1, 3-2, 4-4, 6-13, 7-4

saving driver configuration selections,  
  5-11, 5-16

SCO UNIX, 1-2, 7-1 to 7-24

  adapter driver (ad), 7-2, 7-15  
  extended utilities package, 7-5, 7-7  
  kernel, 7-6 to 7-7, 7-18, 7-22  
  UFA maintenance supplement,  
  7-5, 7-7

screen legibility, 4-15

screwdrivers, 2-2, 2-3

SCSI (Small Computer System Interface)

  bus, 2-1, 4-5, 4-16 to 4-17, 6-6, 7-24  
  cables, *See* cables  
  devices, adding, 7-20  
  direction kit, 1-1  
  drive/disks, 1-2, 4-1 to 4-11, 4-17,  
  6-1, 6-15, A-1  
  drive, bad, 4-16, 4-17  
  IDs, 1-2, 4-17, 5-15, 5-30, 6-6, B-3  
  peripherals, *See* peripherals

# Index

second-party DMA mode, *See* DMA  
-SEL signal name, C-2, D-2  
Select Disk Driver Type menu, 5-8,  
5-27, 5-35  
Select SCSI Device to Partition window,  
4-11  
selecting  
    channels, *See* J6  
    drivers, 5-4  
selection timeout, 6-5, 7-24  
SERVER.EXE file, 6-16  
settings  
    default, *See* jumper settings  
    jumper, *See* jumper settings  
    software, 3-1, 4-5, 6-4 to 6-5  
SFT version of NetWare 286 2.15, 5-1  
    to 5-42  
signal names and pin assignments, C-1  
    to C-2  
SIP (single inline package) resistors, 2-1  
slots, *See* expansion slots  
software  
    for DOS, 4-1 to 4-17  
    for NetWare 286, 5-1 to 5-42  
    for NetWare 386, 6-1 to 6-20  
    for SCO UNIX, 7-1 to 7-24  
    settings, *See* settings  
spad, *See* prefix, host adapter  
spurious interrupt, 7-24  
Start Cylinder field, 4-12  
STARTUP.NCF file, 6-17  
static electricity, 2-3  
storage capacity, *See* capacity  
stripe, red, *See* red stripe  
superuser, 7-6  
surface analysis, *See* COMPSURF  
switches, 4-5, 4-8  
synchronous negotiation, B-2  
system  
    disk file, 4-10  
    maintenance mode, 7-6

## T

/TD switch, 4-5  
/TP switch, 4-6  
tape drives, 1-1 to 1-2, 3-2, 4-2, 7-1,  
7-3, 7-17  
    attaching, 7-21 to 7-23  
    configuration menu, 7-18, 7-19  
    removal menu, 7-19  
term power, fused (signal name),  
C-1, D-1  
terminators, 2-1  
    installing, 2-4, 5-15, 5-20, 5-31,  
6-6, 6-13  
    removing, 2-4, 5-15, 5-20, 5-31,  
6-6, 6-13  
    SCSI bus, 4-16  
test unit ready command completed with  
    error/time out, 5-40  
time out, 5-40, 6-5, 7-24  
troubleshooting, 7-23

## U

/U switch, 4-6  
UFA Maintenance Supplement, *See* SCO  
UNIX  
Unable  
    to open ASPI manager! (message),  
4-16  
    to reserve hardware (message), 6-19  
Unconfigured Disk Drivers menu, 5-9,  
5-26, 5-37 to 5-38  
underrun message, 7-24  
unexpected bus free occurred, 7-24  
UNIX, *See* SCO UNIX

## V

verbose option, 6-5, 6-20  
verifying previous steps in installation  
    process, 5-3  
video adapter, 2-2, 3-1, 3-2, 7-3

# Index

## W

- waiting for disk device INT15 call, B-3
- warning messages, 4-17
- working copies of diskettes, 5-3, 6-2

## X

- X1 diskettes, *See* SCO UNIX extended utilities package

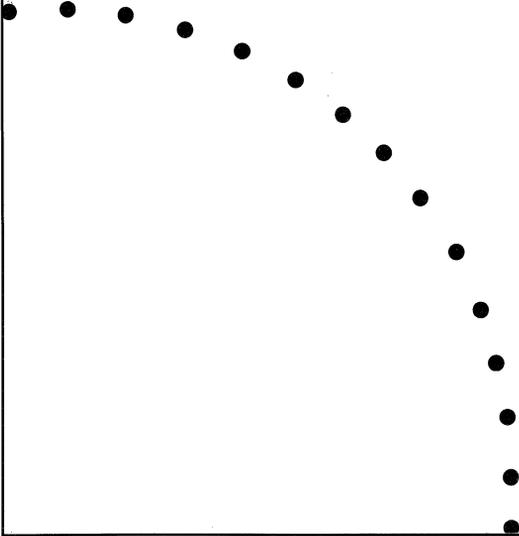
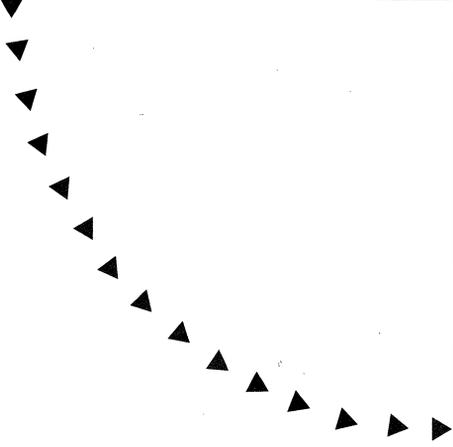
## Y

- /Y switch, 4-6

## Z

- /Z switch, 4-6





**adaptec**

**691 south milpitas blvd.  
milpitas, ca 95035**

PN 510171-00 Rev. A 6/91  
Printed in Singapore