

Model A4268A FWD SCSI Adapter Installation and Service Guide



Embedded Systems Operation
Part No. A4268-90601
Edition E1097

© Hewlett-Packard Co. 1995, 1997

First Printing: April 1995

Last Printing: October 1997

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

NOTICE

The information contained in this document is subject to change without notice.

HEWLETT-PACKARD MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material.

Hewlett-Packard assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Hewlett-Packard.

This document contains proprietary information which is protected by copyright. All rights reserved. No part of this document may be photocopied, reproduced or translated to another language without the prior written consent of Hewlett-Packard Company.

RESTRICTED RIGHTS LEGEND. Use, duplication, or disclosure by government is subject to restrictions as set forth in subdivision (c) (1) (ii) of the Rights in Technical Data and Computer Software Clause at DFARS 252.227.7013. Hewlett-Packard Co., 3000 Hanover St., Palo Alto, CA 94304

10 9 8 7 6 5 4 3 2 1

Contents

Preface

Chapter 1 Preparing for the Installation

Product Description	1-2
Features	1-2
Physical and Environmental Specifications	1-2
Check That You Have the Necessary Equipment	1-3
System Prerequisites	1-4
Hardware Prerequisites	1-4
Firmware Prerequisites	1-4
Software Prerequisites	1-4
Record Adapter Information	1-5
Check the Switch Settings	1-6

Chapter 2 Installing the FWD SCSI Adapter

Remove SBC from the Card Cage.	2-2
Remove blank plate from front panel.	2-4
For Model 743 only, install new Boot ROM if required.	2-5
Install FWD SCSI Adapter card.	2-6
Replace the SBC in the Card Cage.	2-8
Connect the disk drives.	2-9
Verify the operation of the FWD SCSI adapter.	2-10

Chapter 3 Troubleshooting

Diagnostic Information	3-2
Term Power LED	3-2
Off-Line Diagnostics	3-3
MAPPER	3-3
IOTEST	3-3
Field Replaceable Units	3-4
Removing and Replacing the Term Power Fuse	3-4



Preface

This guide describes how to install and configure the Fast–Wide–Differential (FWD) SCSI adapter on your Model 743 or 744 Single Board Computer or Model 748 Industrial System.

We've organized this guide as follows:

- Chapter 1** This chapter describes how to prepare your computer for the installation. It lists the contents of the kit, and system prerequisites.
- Chapter 2** This chapter describes the step–by–step procedure for installing the FWD SCSI adapter.
- Chapter 3** This chapter tells you what to do if you experience problems after installing the new adapter.

Audience

This guide is intended for use by anyone familiar with the Model 743 or 744 Single Board Computer or Model 748 Industrial System who wants to install a FWD SCSI adapter.

Installation Notice

Products designated in the applicable Hewlett-Packard price list as customer installable can be installed by computer-knowledgeable customers who carefully read and follow the instructions provided. Customers who elect to have the product installed by our field personnel are charged the applicable field installation charge, as covered under the standard terms and conditions. For more information, please contact your local sales representative.

Related Manuals

For more information, refer to the following documents:

- *Model 744 Owner's Guide* (A4511-90602)
- *Model 743 Owner's Guide* (A2636-90606)
- *Model 748 Owner's Guide* (A4511-90604)
- *HP-RT Operating System 3.01 Release Notes* (B5487-90013)
- *HP-RT System Administration Tasks* (B5487-90002)

Revision History

The revision history for each edition of the manual is listed below:

Edition	Revision History
E0495	First edition.
E1097	Second edition, revised to include information relating to the Model 744.

Problems, Questions, and Suggestions

If you have any questions or problems with our hardware, software, or documentation, please contact your designated service representative.

Documentation Conventions

Unless otherwise noted in the text, this guide uses the following symbolic conventions:

literal values

Bold words or characters in formats and command descriptions represent commands that you must use literally. Pathnames are also in bold.

user-supplied values

Italic words or characters in formats and command descriptions represent values that you must supply. Italics are also used in text for emphasis.

screen display

Information that the system displays appears in this typeface.



A rectangle with rounded corners and a key label denotes a key on your keyboard. (In this manual we refer to the **Enter** key. On your keyboard the key may be labeled either **Enter** or **Return**.)



This symbol indicates the end of a chapter or part of this guide.



Chapter 1

Preparing for the Installation

This chapter describes how to prepare your system for a FWD SCSI adapter installation. Before installing your new adapter, you need to complete the following tasks:

- Check that you have the necessary equipment.
- Make sure that your system meets the prerequisites.
- Record adapter information.
- Check switch settings.

Product Description

The followings describes the features, physical and environmental specifications and parts included with the installation kit.

Features

The HP A4268A FWD SCSI Adapter complies with ANSI X3T9.2 SCSI specifications and has the following features:

- NCR 53C720 SCSI I/O processor chip.
- Differential control and data lines.
- Internal removable terminators allowing for installation anywhere on the SCSI bus.
- 4 position DIP switch to set SCSI ID for the adapter.

Physical and Environmental Specifications

The HP A4268A FWD SCSI Adapter's physical and environmental specifications are:

- Temperature
 - Operating: 0 to 55 degrees C (ramp rate 10 degrees C).
 - Storage: – 40 to 70 degrees C.
- Humidity: 95% relative humidity at 40 degrees C.
- Mechanical shock: compliant with IEC 654-3 and IEC-68-2 methods.
- Mechanical vibration: compliant with IEC 654-3 Class VH3 levels or better.

1. Check That You Have the Necessary Equipment

Verify that you have kit A4268A FWD SCSI adapter). Ensure that the kit contains the following parts.

- HP A4268A FWD SCSI adapter card
- Screws (2)
- Boot ROM, upgrade (for use with Model 743 only)
- IC removal tool (for use with Model 743 only)
- Disposable anti-static wrist strap

Verify that you have the following tools to perform the installation:

- Small flat blade screwdriver
- #1 Pozidriv screwdriver

2. System Prerequisites

Your system must meet some hardware and software prerequisites to support the FWD SCSI adapter. These prerequisites are described in the following sections.

Hardware Prerequisites

The required hardware is as follows:

- GSC Expansion Adapter (A4262A or A4219A) or HCRX/VME Graphics Board (A4315A or A4316A)
- A minimum of 32-MB RAM if running HP-UX version 10.20, or a minimum of 16-MB RAM if running HP-UX version 9.x, or a minimum of 24-MB RAM if running HP-RT

Firmware Prerequisites

The required firmware is as follows:


- A Model 743 Single Board Computer (SBC) may require a firmware upgrade if the Boot ROM included in this kit is a later version than the one in use on your SBC. To determine if the Boot ROM of your SBC needs to be replaced, you need to determine the revision number, which can be done in one of two ways: use the Boot Console Handler (BCH) interface as described in the *Model 743 Owner's Guide*, or you can examine the label on the Boot ROM – a revision number is printed on the label. If the revision number on the Boot ROM installed on the Model 743 is a lower number than the one included in this kit, you should replace the Boot ROM with the one included in this kit. If the revision number on the Boot ROM installed on the Model 743 is equal to or greater than the one included in this kit, **DO NOT** replace the Boot ROM on the Model 743.
- A Model 744 Single Board Computer does not require a firmware upgrade

Software Prerequisites

The required software is as follows:

- For Model 743 SBC with HP-UX, software release 9.05 or later version.
- For Model 744 SBC with HP-UX, software release 10.20 or later version.

To identify which revision of HP-UX your workstation is running, enter the following command:

```
uname -r 
```

A line similar to the following is displayed:

```
A.09.05
```

If a number less than 09.05 is displayed it means that you need to update your software before installing your HCRX/VME graphics upgrade.

- For Model 743 and 744 SBCs with HP-RT, the operating system software revision of the host system must be HP-UX 10.10 or later, and the HP-RT target system must have at least HP-RT 3.01. For more information, refer to the *HP-RT 3.01 Release Notes*.

Contact your designated service representative for information on receiving an upgrade to the correct version of the operating system.

3. Record Adapter Information

Record the serial number of the adapter for future reference. If your adapter needs service in the future, the serial number will be needed by HP service personnel. This information is provided on the bar code sticker affixed to the adapter. See the following example.



401105H009

4. Check the Switch Settings

Ensure the SCSI address switches are set to SCSI address 7 unless your storage subsystem allows multiple controllers (refer to your storage subsystem documentation). The SCSI adapter address switches are shown set to SCSI address 7 in Figure 1–1.

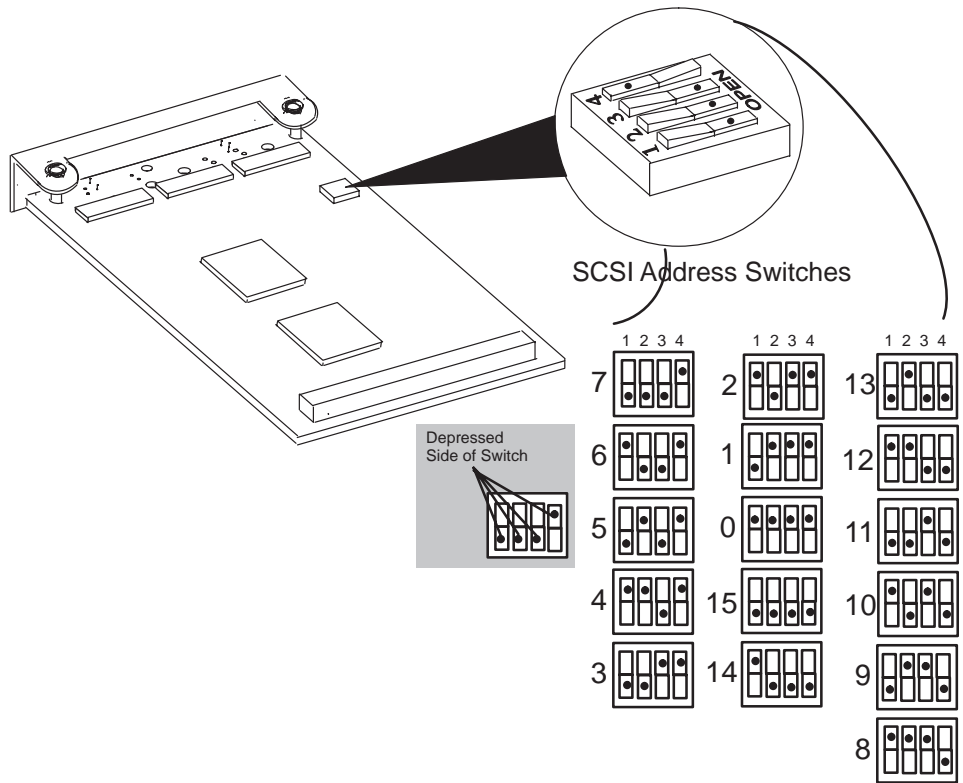


Figure 1–1. The SCSI Adapter Address Switches



Chapter 2

Installing the FWD SCSI Adapter

This chapter describes how to install the FWD SCSI adapter. Before beginning the hardware installation, you must complete the tasks in Chapter 1. The tasks for installing the FWD SCSI adapter are as follows:

- Remove the single board computer (SBC).
- For a Model 743 SBC, install new Boot ROM, if required.
- Remove a blank cover.
- Install FWD SCSI card.
- Replace the single board computer.
- Connect the disk drive(s).

CAUTION: The FWD SCSI adapter is susceptible to electrostatic shock. When handling your graphics option board, always wear the static-grounding wrist strap that came in the kit. Always handle printed circuit boards carefully.

1. Remove SBC from the Card Cage.

- a.** Power down your card cage.
- b.** Disconnect the power cord(s) from the wall outlet and the card cage.
- c.** Power off any external peripherals attached to your computer, and unplug their power cables from the wall outlet.
- d.** Attach the anti-static grounding wrist strap to your wrist and an exposed piece of metal on your computer, as described on the wrist strap's packaging.

- e. Loosen the SBC's two captive screws with a small flat blade screwdriver. Depending on your configuration, you could have four captive screws – two on the SBC, and two on the expansion slot. If you have these four captive screws, you will need to remove all four. See Figure 2-1.

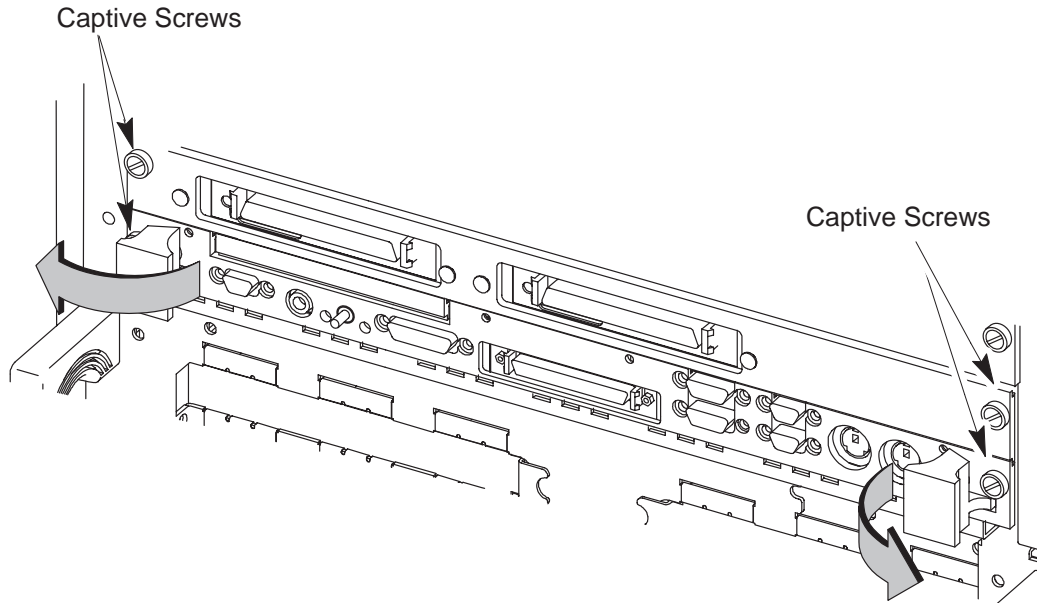


Figure 2-1. Removing the Single Board Computer

- f. Push the ejector handles to the outside of the board and remove the SBC from the card cage, as shown in Figure 2-1.

2. Remove blank plate from front panel.

Remove the blank plate from the opening of the front panel expansion plate at the site where you will install the FWD SCSI adapter. Save the screws for use later. See Figure 2-2.

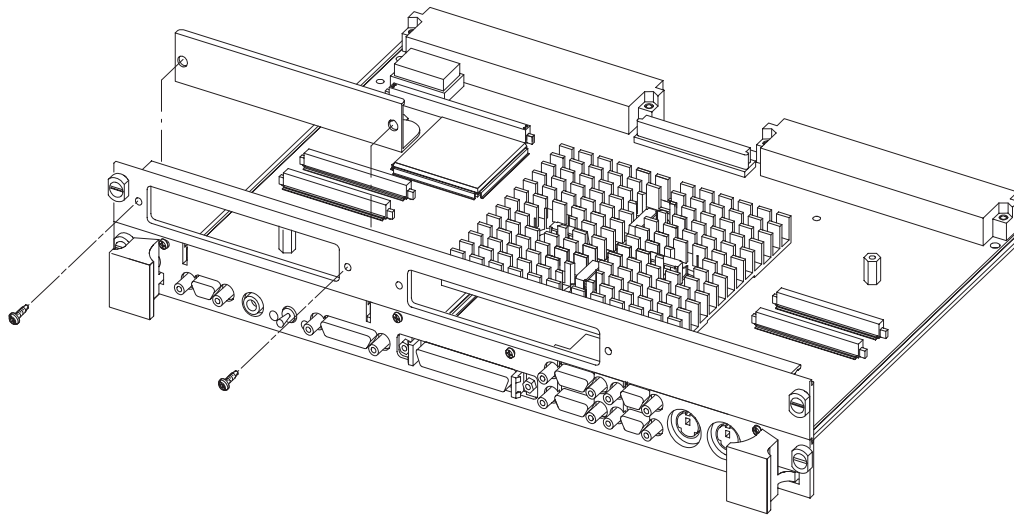


Figure 2-2. Removing a Blank Plate

3. For Model 743 only, install new Boot ROM if required.

If after reading the prerequisites for firmware in Chapter 1 you must replace the Boot ROM, use the following procedure.

- a. Remove the Boot ROM from its socket on the Model 743, at location U54, using the IC removal tool as shown in Figure 2-3.
- b. Align the new Boot ROM in its socket, at location U54, with the keyed corner matching the sockets keyed corner. Carefully press the new Boot ROM into its socket. See Figure 2-3.

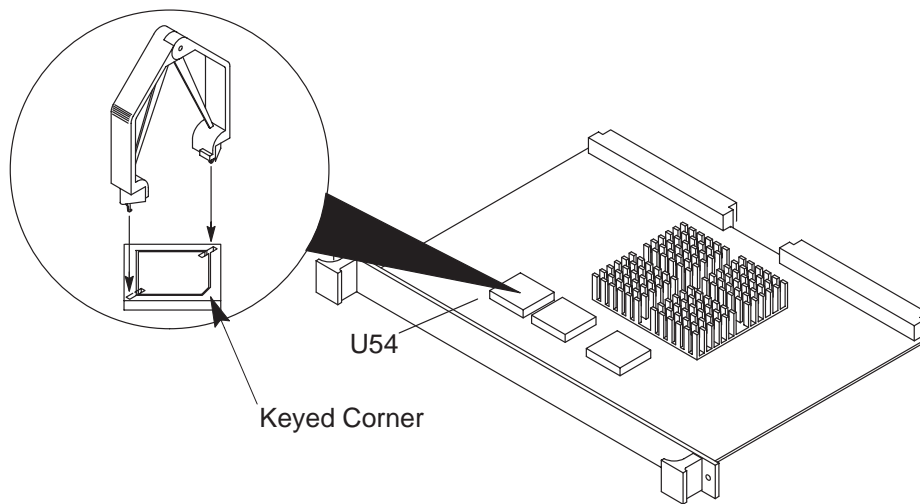


Figure 2-3. Removing and Replacing the Boot ROM

4. Install FWD SCSI Adapter card.

- a.** Align the connector on the FWD SCSI adapter with the cutout on the front extension plate. See Figure 2–4.

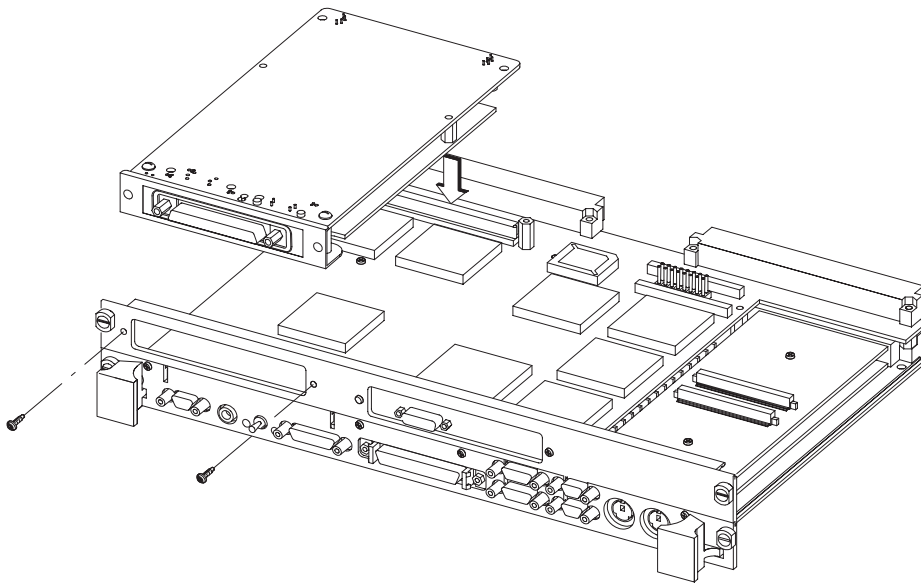


Figure 2–4. Installing the FWD SCSI Adapter

- b.** Align the connector on the bottom of the adapter with the connector on the GSC expansion adapter. See Figure 2–4.
- c.** Gently press down on the adapter until the connectors are fully seated.
- d.** Insert the the two screws provided in the kit through the top of the adapter into the two standoffs on the GSC expansion adapter. See Figure 2–4.

- e.** Use a #1 Pozidriv screwdriver to tighten the two screws.

- f.** Install the two screws removed during Step 2 through the front panel extension plate on either side of the SCSI connector to secure the connector plate. See Figure 2-4.

- g.** Use a #1 Pozidriv screwdriver to tighten the two screws.

5. Replace the SBC in the Card Cage.

- a. Replace the SBC in the VME card cage.
- b. Push on the SBC's ejector handles until it is fully seated in the card cage, as shown in Figure 2-5.

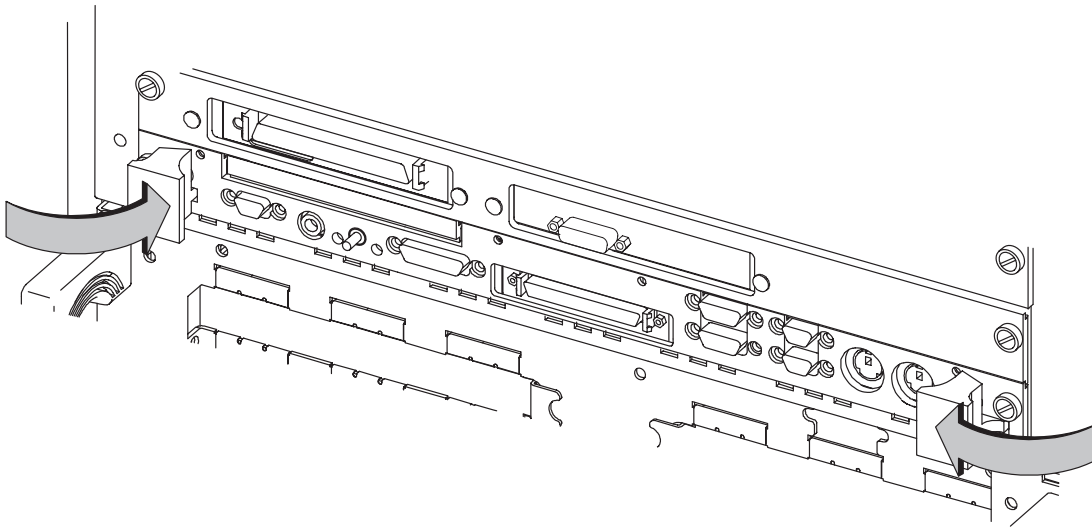


Figure 2-5. Replacing the Single Board Computer

- c. Use a small flat blade screwdriver to tighten the two captive screws on the SBC and the two captive screws on the expansion slot.

6. Connect the disk drives.

- a.** Connect the FWD SCSI cable to the connector on the FWD SCSI adapter, as shown in Figure 2–6. Be sure to firmly tighten the screws on the connector.

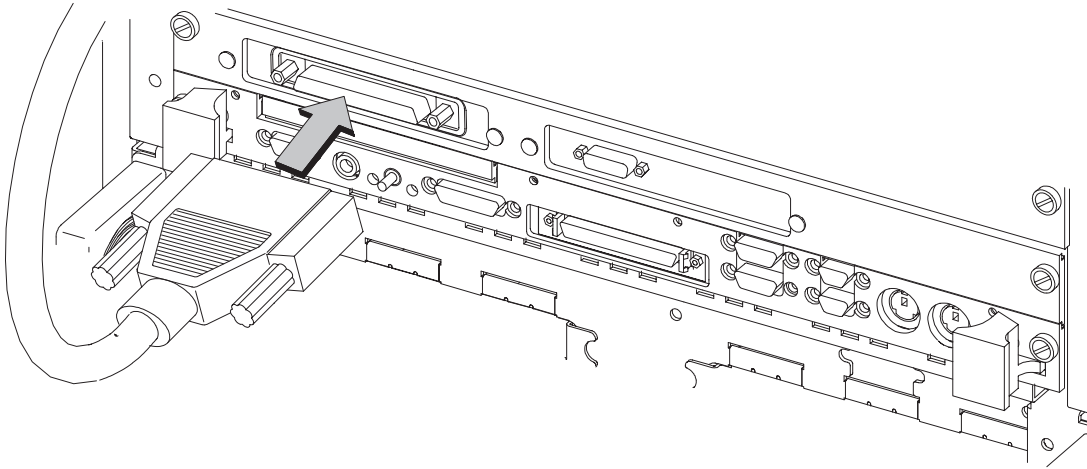


Figure 2–6. Connecting the SCSI Cable

- b.** Connect the other end of the FWD SCSI cable to the peripheral box.
- c.** Be sure to terminate the last device in the FWD SCSI bus, or use an external terminator.

7. Verify the operation of the FWD SCSI adapter.

To verify that your system recognizes the FWD SCSI adapter, follow these steps:

- a. Turn on and boot the system, and log in as **root** or **superuser**.
- b. In a terminal window, enter the following command:

```
/etc/ioscan -C scsi  (for HP-UX 9.x)
```

```
/usr/sbin/ioscan -C ext_bus  (for HP-UX 10.x)
```

After a few moments the ioscan utility lists all of the bus interfaces it could find. The list appears similar to the following:

For HP-UX 9.x:

```
H/W Path Description Status
=====
2.0.1    scsi          ok(0x7071)
2.0.7    scsi          ok(0x707c)
```

For HP-UX 10.x:

```
H/W Path  Class           Description
=====
8/8       ext_bus         GSC add-on Fast/Wide SCSI Interface
8/12/0    ext_bus         Built-in Parallel Interface
8/12/5    ext_bus         Built-in SCSI
```

If ioscan does not find your FWD SCSI adapter, go to Chapter 3, “Troubleshooting”.



Chapter 3

Troubleshooting

This chapter describes how to solve installation problems with the following information:

- Diagnostic Information
- Field Replaceable Units

Diagnostic Information

There are two diagnostic tools available to identify faulty adapters. They are

- TERM POWER LED
- Off-Line Diagnostics

Term Power LED

If the TERM POWER LED, located on the adapter bulkhead, is green, it indicates the adapter is supplying termination power to the SCSI bus. During proper operation the LED is on.

If the TERM POWER LED is off, this adapter is not supplying termination power to the SCSI bus.

Possible faults include:

- Blown fuse
- Faulty HP A4268A FWD SCSI Adapter
- Faulty SCSI device
- Faulty cable connection, (bent pins or improper seating of the cable connector)

Off-Line Diagnostics

The Off-Line Diagnostic Environment (ODE) is used to test to the I/O card level in the computer system. IOTEST and MAPPER are modules of the ODE that check the functionality of the I/O modules in the computer system. ODE is run from the Initial System Loader (ISL) on the system console. Please refer to your system's *Owner's Guide* for more information on running ISL.

MAPPER

```
ISL>ODE
ODE>mapper
MAPPER>run
```

The MAPPER utility provides the following hardware information

- Path #
- Type ID (Architecture Module)
- Hardware Version
- Hardware and Firmware Versions
- SCSI bus address of the host adapter
- Names and addresses of devices on the SCSI bus

MAPPER automatically resets the SCSI bus.

IOTEST

```
ISL>ODE
ODE>iotest
IOTEST>run
```

The IOTEST's strategy is to systematically check the basic functionality of the I/O modules in the system. This is accomplished by either making a PDC_IODC call to invoke selftest, or by running a test within the diagnostic. IOTEST doesn't test the functionality of devices.

IOTEST is currently divided into 23 sections. Each section performs basic tests on a particular module.

For the HP SCSI adapter, Section 006 tests the basic functionality of the the interface chip from the NCR controller chip to the HP (GSC+) backplane. First, there is a register test

which writes and reads patterns to and from the interface chip registers. Then the interface chip is tested by implemented DMA transactions. Last, error handling is tested by invoking errors and checking the interface chip's status. This section also runs the IODC selftest on the interface chip.

NOTICE: No on-line diagnostics are available for the HP A4268A Fast Wide Differential SCSI adapter.

Field Replaceable Units

The following components are authorized for field replacement.

Description	Part Number
Adapter board	A4268-60003
125V, 2A, LF Fuse	2110-0517
Terminating Resistor Pack(3)	1810-1418

NOTICE: In the event of replacing a a Model 743 SBC that has the HP A4268A Fast Wide Differential SCSI Adapter installed, you must ensure the revision of the Boot ROM on the SBC is 304.2 (Rev. E) or later. If you must replace the Boot ROM, this tool is required.

IC removal tool	S2413-40001
-----------------	-------------

Removing and Replacing the Term Power Fuse

To remove and replace the termpower fuse (F3) do the following:

1. Remove the SBC.
2. Remove the SCSI adapter board from the SBC.
3. Inspect and if necessary replace fuse F3 as shown in Figure 3–1. The fuse has no polarity, so fuse can be oriented in either position in the socket.

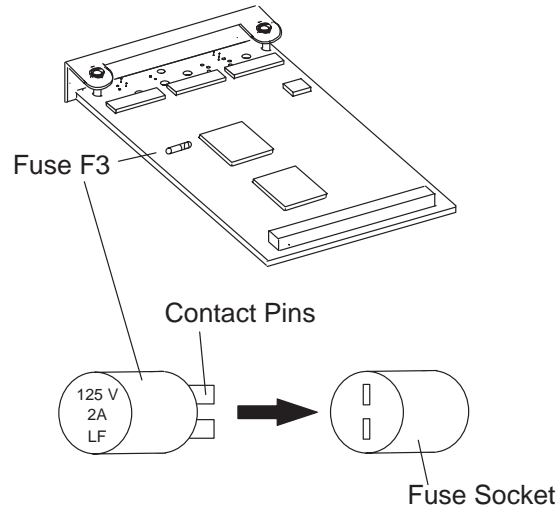


Figure 3–1. Replacing Fuse F3

4. Replace the SCSI adapter.
5. Replace the SBC.

If you verify that you correctly installed and configured your FWD SCSI adapter and you still have a problem, contact your designated service representative.



