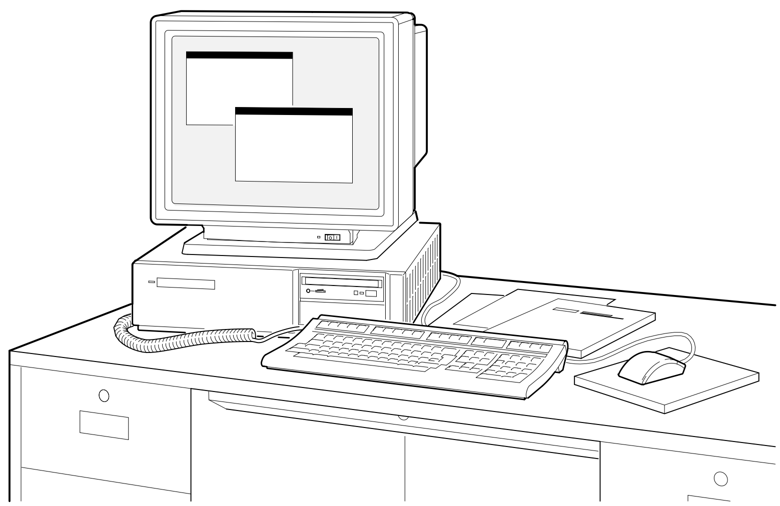
DEC 3000 Model 400/400S AXP System Service Information

EK-SNDPR-SV. A01



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Digital Equipment Corporation

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The postpaid Reader's Comment Card included in this document requests the user's critical evaluation to assist in preparing future documentation.

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Preface

About This Document

Purpose

This document provides information for servicing the DEC 3000 Model 400/400S AXP system. This document provides a variety of diagnostic and troubleshooting aids, along with procedures to remove and replace failed or damaged field replaceable units (FRUs).

Intended Audience

This manual is a support and reference document for Digital Services personnel who perform maintenance work on the DEC 3000 Model 400/400S AXP system. It is also intended for Digital customers who have a self-maintenance agreement with Digital.

Organization

This document is comprised of seven chapters and three appendices:

- Chapter 1 provides an overview of the DEC 3000 Model 400/400S AXP components and features. It also provides a front view and rear view of the DEC 3000 Model 400/400S AXP system.
- Chapter 2 provides configuration information and console security information.
- Chapter 3 describes system console commands and uses of alternate consoles.
- Chapter 4 provides information on diagnostic testing.
- Chapter 5 provides information on diagnostic utilities.
- Chapter 6 contains troubleshooting information.
- Chapter 7 describes how to remove and replace field replaceable units (FRUs).

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- Appendix A describes how to upgrade firmware, create a bootable disk, and also provides monitor alignment patterns.
- Appendix B contains error codes and error status information.
- Appendix C contains a listing of FRU part numbers.

Conventions Used in this Document

This document uses the following conventions:

Convention	Meaning
Note	Provides general information.
Caution	Provides information that prevents damage to equipment and software.
Warning	Provides information to prevent personal injury.
Key	A terminal key used in text and examples. For example, Return indicates that you press the Return key on your terminal.
[ ]	Optional. The information contained within these brackets is optional.
{ }	Required. The information contained within these delimiters is required.
BOLD	User input. Bolded text indicates that the user must supply this information.
❶	A number in a circle corresponds to that number in an illustration.

Continued on next page

Related Documentation

The following documents provide additional information about the DEC 3000 Model 400/400S AXP system.

Table 1 DEC 3000 Model 400/400S AXP System Reference Documentation

Document	Order Number
DEC 3000 Model 400/400S AXP System Owner's Guide	EK-SNDPR-SV-OG
DEC 3000 Model 400/400S AXP Setting Up Your Workstation (Quick Card)	EK-SNDPR-QC
DEC 3000 Model 400/400S AXP Setting Up Your Server (Quick Card)	EK-SNDSV-QC
DEC 3000 Model 400/400S AXP Technical Summary	EK-SNDPR-TM
DEC 3000 Model 400/400S AXP Options Guide	EK-SNDPR-OP
OpenVMS Factory Installed Software User Card	EK-A0377-UG
Guide to Installing DEC OSF/1	AA-PS2DA-TE
DEC 3000 Model 400/400S AXP Floor Stand Installation Card	EK-SNDPR-QC
TURBOchannel Expander Box Owner's Guide	EK-TRBXT-IN

Digital Support Centers

Digital Support Centers

Digital Services representatives are available at Digital Support Centers for on-site warranty and service contract customers. If you are not currently eligible to receive this support but would like to be eligible, please contact either a Digital Support Center listed in Table 2 or your local Digital office.

Digital Support Center Contact Numbers

Table 2 lists the telephone numbers for a Digital Services representative at your Digital Support Center.

If your Digital Services number is not listed below, please contact your local Digital office for assistance.

Table 2 Telephone Numbers of Digital Support Centers

Country	Telephone Number
United States	1-800-354-9000
Canada	1-800-267-5251
Canada (Quebec)	1-800-267-2603
United Kingdom	[44]256 59200
France	[33]92955111
Germany	[49]-(89)-95913218

Chapter 1
System Overview

Overview

Chapter Overview

This chapter contains the following topics:

- Components and features of the DEC 3000 Model 400/400S AXP system
- Front view of the DEC 3000 Model 400/400S AXP system
- Rear view of the DEC 3000 Model 400/400S AXP system

Introduction

The DEC 3000 Model 400/400S AXP can be used as either a workstation or a server. The DEC 3000 Model 400/400S AXP system uses the DECchip 21064 implementation of the Alpha AXP architecture.

The DEC 3000 Model 400 AXP workstation is a high-performance desktop workstation that may be mounted in a BA47X-AA vertical floor stand or placed on a desktop.

The DEC 3000 Model 400S AXP server is a high-performance desktop server that may also be mounted in a BA47X-AA vertical floor stand or placed on a desktop.

The DEC 3000 Model 400/400S AXP system is based on Digital's Alpha AXP architecture, providing all the advantages of a 64-bit computing environment, and the choice of several different operating systems.

Components and Features

System Components

Workstation

The DEC 3000 Model 400 AXP workstation system consists of the following components:

- System unit, which includes:
  - System module
  - I/O module
  - Memory Mother Boards (MMB)
  - Memory SIMMs
  - Mass storage shelf
  - Power supply
- Graphic card
- Monitor
- Keyboard
- Mouse

Server

The DEC 3000 Model 400S AXP server system includes a system unit, which consists of:

- System module
- I/O module
- Memory Mother Boards (MMB)
- Memory SIMMs
- Mass storage shelf
- Power supply

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System Module

The system module (Syscard shown in Figure 1–1) consists of:

- DECchip 21064 processor chip
- DECchip 21064 B-cache
- B-cache and main memory control
- TURBOchannel interface

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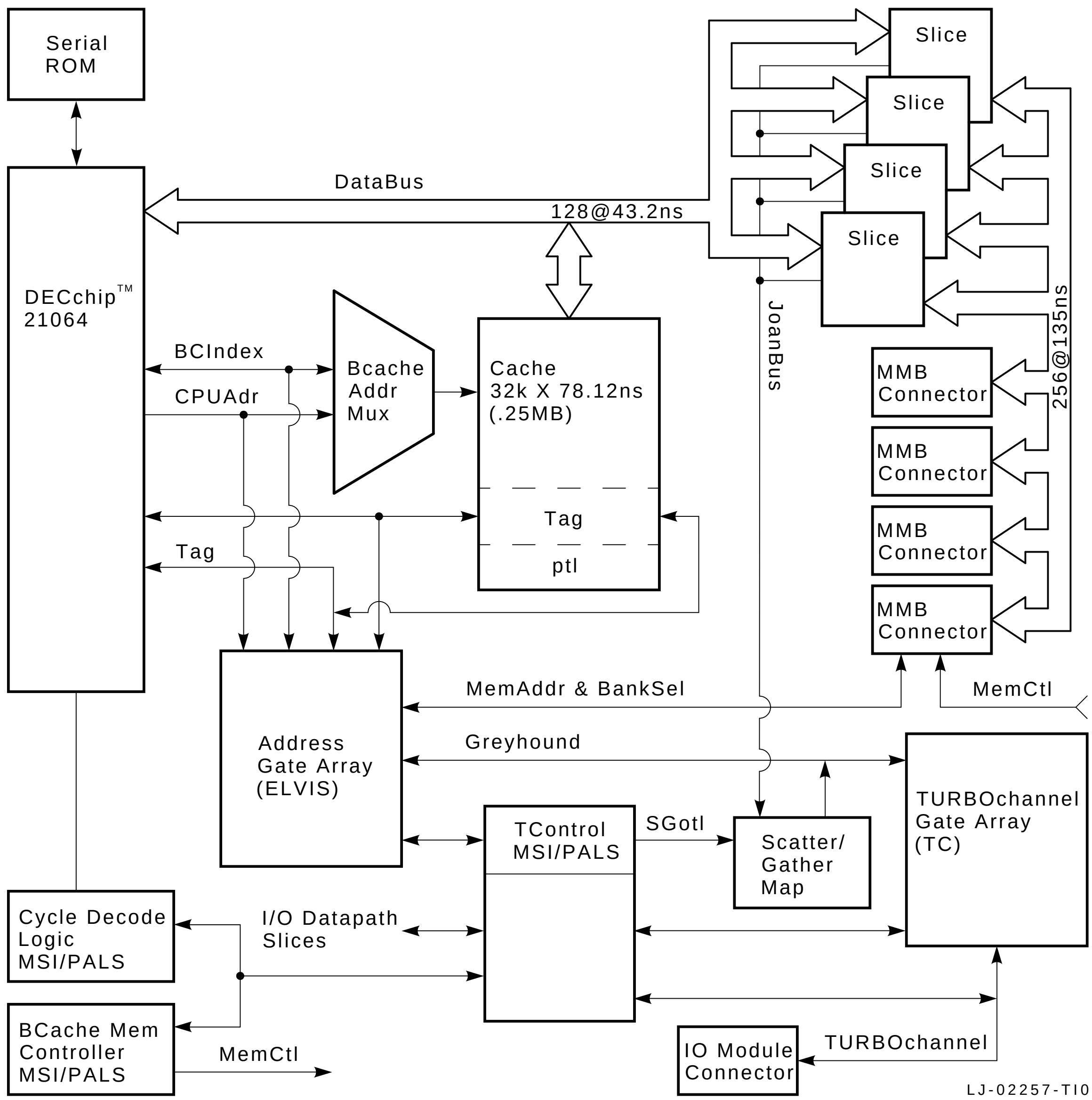
Figure 1–1 DEC 3000 Model 400/400S AXP system Module Block Diagram



Interconnection: The system card (Syscard) provides connectors to interface to the DEC 3000 Model 400/400S AXP system I/O

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module (SPIOMOD) and to the SIMM memory mother board (MMB) modules.

SLICE Chips: The primary data paths on the Syscard are contained within the SLICE chips. The SLICE chips interface the 128 bit DECchip 21064 bus to a main memory bus that is 256 bits wide and to the I/O bus that is 32 bits wide.

ELVIS Chip: The addresses for main memory, I/O, and the B-cache is controlled by the ELVIS chip.

I/O Module

The DEC 3000 Model 400/400S AXP system I/O module (SPIOMOD displayed in Figure 1–2) contains all of the internal and external I/O connectors along with three TURBOchannel options connectors.

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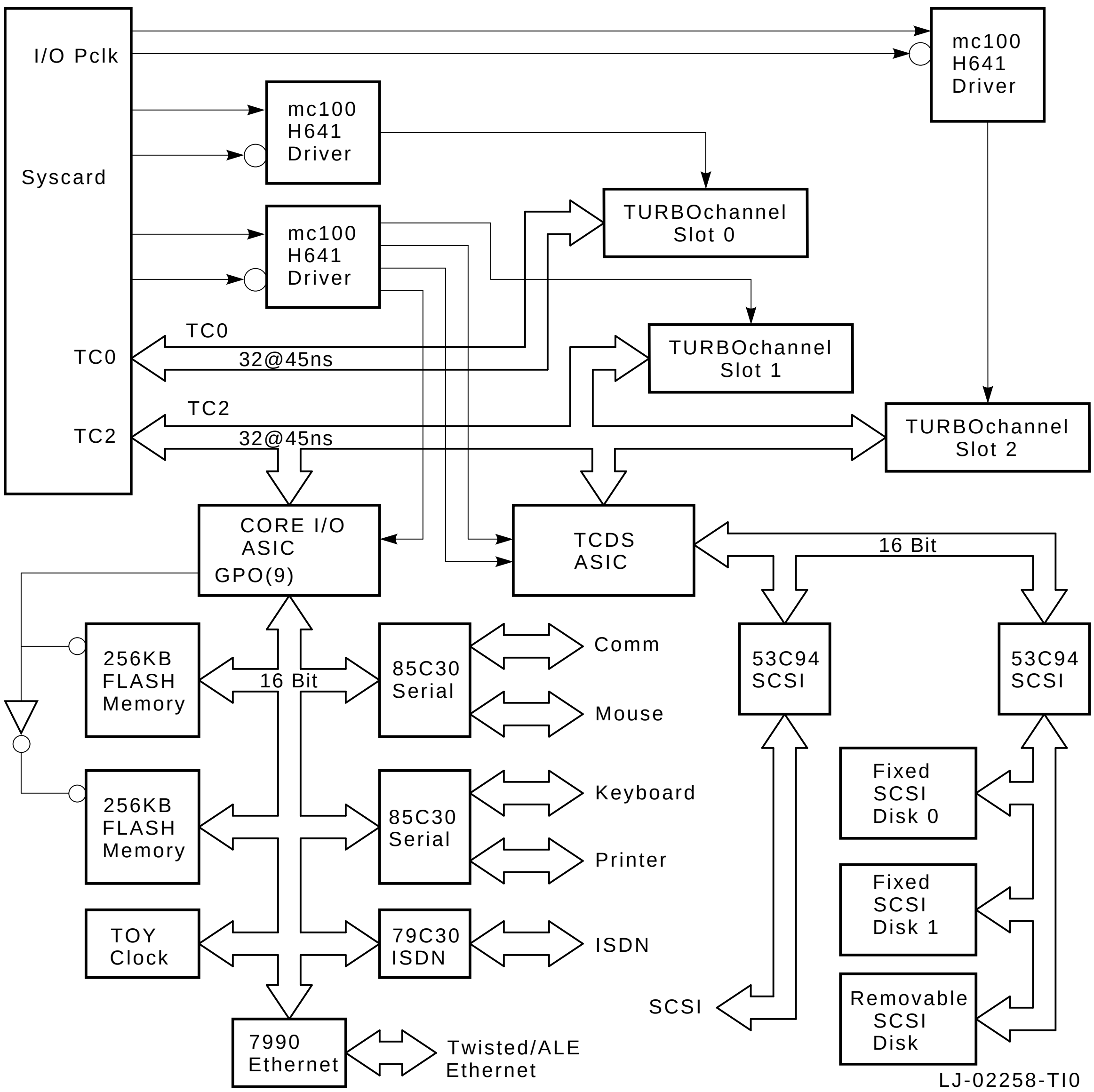
Figure 1–2 DEC 3000 Model 400/400S System I/O Subsystem Block Diagram



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I/O Module (continued)

The I/O module has the following features:

- Dual SCSI interface chip
- Interface that interfaces to the TURBOchannel
- Ethernet, ISDN, printer, and communication ports that have DMA
- 32K-entry scatter/gather map for virtual DMA

The I/O module contains the following hardware jumpers:

- Serial ROM jumper–Determines the way in which the system is booted. There is only one configuration in which this jumper should be installed. Refer to Chapter 2 for configuration information.
- ROM Update jumper–Enables/disables the writeable feature of the FEPROMs.
- Secure System jumper–When placed in the enabled position, this jumper will require the operator to enter a password before executing any privileged command.

Memory Mother Board (MMB)

The DEC 3000 Model 400/400S AXP system consists of four memory mother boards. To improve memory latency and bandwidth, the memory system is sliced among four memory mother boards. To have an operational system, all four MMBs must be present.

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System Features

The DEC 3000 Model 400/400S AXP system provides the following features:

Feature	Benefit
Alpha AXP 64-bit computing using the DECchip 21064 microprocessor chip, which contains 8 kbytes of instructions and 8 kbytes of internal cache	Double the industry-standard 32-bit data path. Internal instructions and cache improve performance.
Expandable from 16 to 128 MB of memory, with future expansion of up to 512 MB of memory	Memory expands using either 2, 4, or 8 MB DRAM SIMM modules.
A 512-kbytes secondary cache	Improves speed and performance.
Internal and external options	Increases storage, graphics, communications, and other capabilities to the workstation. Local I/O with two SCSI ports. External storage supports up to seven SCSI devices.
AUI Thickwire Ethernet port	Connects directly to an AUI Ethernet DECnet network.
A 10Base-T network port	Connects directly to a twisted pair network.
ISDN network capabilities (not supported initially)	Connects directly to an ISDN network (not presently accessible for use).
Three TURBOchannel I/O adapter slots	Allows for high-performance module interconnection that makes available a variety of options.
Password security	Additional security for privileged commands in console mode.

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Feature	Benefit
Audio technology	Built-in audio for voice grade output capabilities.
Choice of operating systems	Choice of OpenVMS Alpha AXP, DEC OSF/1 Alpha AXP, and possibly more choices in the future.
Access to an integrated computing environment	The best features of both timesharing and local or distributed applications.
DECwindows Motif software	Industry-standard windows-style user interface to allow concurrent applications.

Front View

Front View

See Figure 1–3 and Table 1–1 for information pertaining to the front of the DEC 3000 Model 400/400S AXP system.

Figure 1–3 Front View

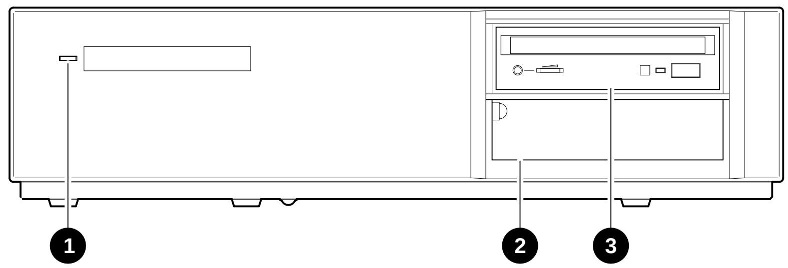

Table 1–1 DEC 3000 Model 400/400S AXP System (Front)

Feature	Function
❶ Power OK indicator light	When lit, indicates that the system unit is on.
❷ Lower hatch	Pulldown door that covers the serial number and system model number.
❸ Compact disc or floppy disk (optional)	Removable storage media.

Rear View

See Figure 1–4 and Table 1–2 for information pertaining to the rear of the DEC 3000 Model 400/400S AXP system.

Figure 1–4 Rear View

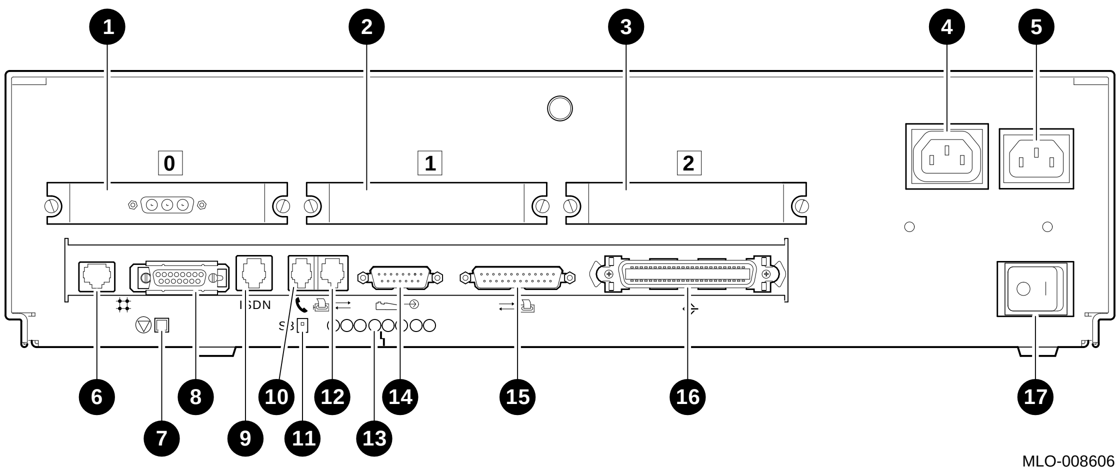

Table 1–2 DEC 3000 Model 400/400S AXP System (Rear)

Feature	Function
❶ TURBOchannel slot 0[1]	Used to connect a TURBOchannel option. In Figure 1–4, slot 0 contains a graphics option.
❷ TURBOchannel slot 1[2]	Used to connect a TURBOchannel option.
❸ TURBOchannel slot 2	Used to connect a TURBOchannel option.

[1]Dual width TURBOchannel options must be installed in slots 0 and 1

[2]Dual width TURBOchannel options *cannot* be installed in slots 1 and 2.

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Table 1–2 (Continued) DEC 3000 Model 400/400S AXP System (Rear)

Feature	Function
❹ Monitor power socket	Used to connect the monitor power cord.
❺ System power socket	Used to connect the system power cord.
❻ 10Base-T port	Used to connect a 10Base-T twisted pair Ethernet network cable.
❼ Halt button	Used to place the system in console mode.
❽ AUI Ethernet network port	Used to connect an AUI Thickwire Ethernet network cable.
❾ ISDN port (Not presently accessible for use.)	Used to connect an ISDN network cable.
❿ Audio port	Used to connect a voice grade audio output cable.
⓫Alternate console switch	A toggle switch used to switch to either a graphic or an alternate console connected to the MMJ port ⓬. With the switch in the up position, you are in graphic mode, with the switch in the down position, you are in alternate console mode.
⓬ Printer/alternate console port	Used to connect either a printer or an alternate console using an MMJ connector.
⓭ Eight amber diagnostic display LEDs	Used to decode diagnostic error codes.
⓮ Keyboard/mouse port	Used to connect the keyboard/mouse cable.

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Table 1–2 (Continued) DEC 3000 Model 400/400S AXP System (Rear)

Feature	Function
⓯ Synch/Asynch full modem communications port	Used to connect to a communications device such as a printer, plotter, modem, or console terminal.
⓰ External SCSI port	Used to connect Small Computer System Interface (SCSI) peripheral devices.
⓱ Power ON/OFF switch	Used to turn the system unit power on (|) and off (0).

Chapter 2
Configuration

Overview

Chapter Overview

This chapter contains the following topics:

- Serial ROM jumpers
- Console security
- ROM update
- Storage devices
- Memory configuration

General Rules

When removing, upgrading, or replacing either storage devices or memory, check the present conditions before making any changes. Check the conditions again after the removal, replacement, or upgrade is complete to ensure the change has been done correctly.

Commands

Use the following commands to check for both the compliance of the general rules and the outcome of the procedures:

- SHOW CONFIGURATION
- SHOW MEMORY
- SHOW DEVICE

Serial ROM Jumpers

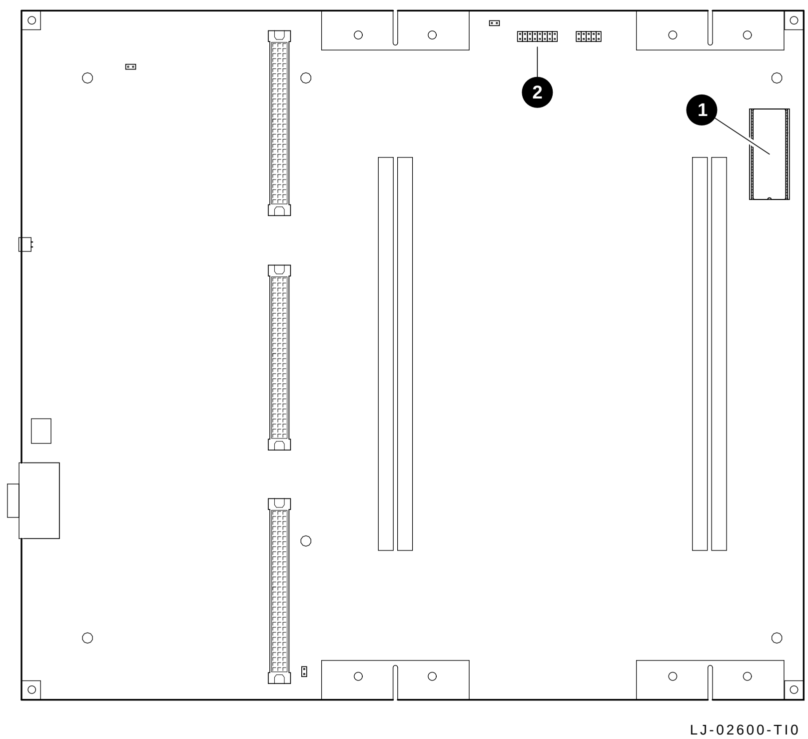
Serial ROM Jumpers

Figure 2–1 shows the serial ROM ❶ and the serial ROM jumpers ❷. The jumper location 0 should be installed and all other jumpers should be removed.

NOTE

Installing any jumper other than jumper 0 can cause permanent damage to the system module.

Figure 2–1 Serial ROM Jumpers

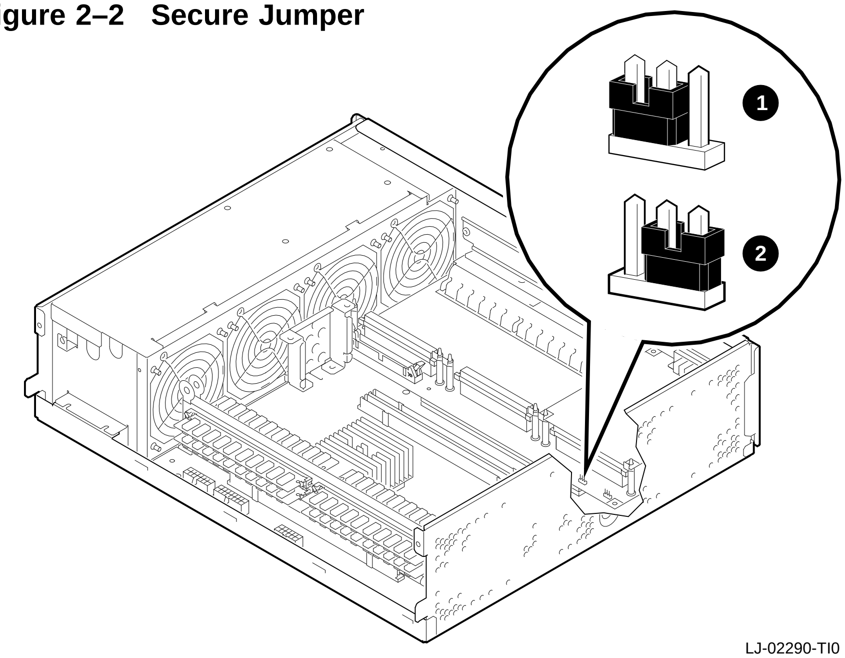


Console Security

Secure Jumper

Figure 2–2 shows the secure jumper in the off position ❶ and on position ❷.

Figure 2–2 Secure Jumper



If the secure jumper is set to the on ❷ position, then the privileged commands require that you use the 16-character password to execute the commands.

The privileged commands are as follows:

- BOOT (with parameters)
- DEPOSIT
- EXAMINE
- FIND
- HALT
- INITIALIZE
- REPEAT

Continued on next page

- SET
- SHOW
- START
- TEST

Securing the Password

To restrict users from entering the secure console mode, do the following:

1. Set the jumper to the secure position. Refer to the section Secure Jumper.
2. Set the password (if not already set).

   >>> **SET PASSWORD** Return

3. Enter SET SECURE ON at the console prompt:

   >>> **SET SECURE ON** Return

4. Log in to access the privileged functions.

Enabling the Password

Once you have entered and confirmed your password, then enable the password.

Enter SHOW SECURE at the console prompt:

>>> **SHOW SECURE** Return

If the screen displays, SECURE=OFF, then the password feature has not been enabled.

If the screen displays, SECURE=ON, then the password feature has been enabled.

To enable the password feature, enter SET SECURE ON at the console prompt.

>>> **SET SECURE ON** Return

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Setting the Password

To set the password:

1. Access the console mode.
2. Enter SET PASSWORD at the console prompt:

   ```
   >>> SET PASSWORD [Return]
   ```

3. Enter the old password at the PSWD0> console prompt. The password should be exactly 16 hexadecimal characters (0 through F):

   ```
   >>> ENTER_OLD_PASSWORD [Return]
   ```

4. Enter the new password at the PSWD1>>> console prompt:

   ```
   >>> ENTER_NEW_PASSWORD [Return]
   ```

5. Enter the same password at the PSWD2>>> console prompt. This verifies that you entered the password correctly:

   ```
   >>> ENTER_NEW_PASSWORD [Return]
   ```

6. If the two passwords match, then they are stored in nonvolatile memory.

Entering the Privileged State

To enter the privileged state on a secured console, enter LOGIN at the console prompt.

```
>>> LOGIN [Return]
```

Exiting the Privileged State

The following commands allow you to exit the privileged state:

- BOOT
- CONTINUE
- HALT

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Disabling Console Security

To disable console security:

1. In console mode, set SECURE to zero (SET SECURE 0 or SET SECURE OFF).
2. Remove the secure jumper on the I/O module.

Restoring Console Password

If you forget the console password and you need a new password to gain access to the privileged state, then perform the following:

1. While in console mode, enter the following DEPOSIT command:

   `>>> DEP -U -Q -N:1 1E0200088 0` Return

2. Enter the new password:

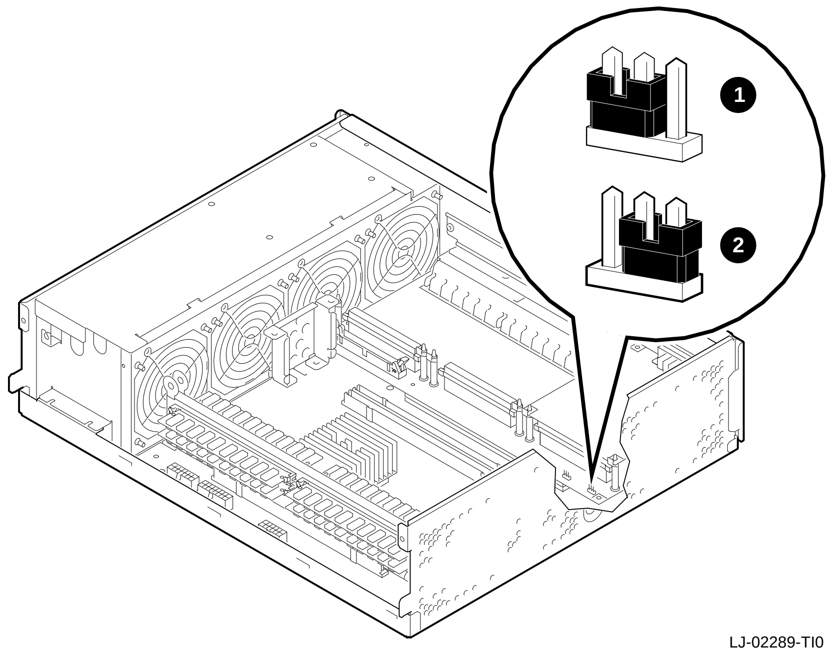
   `>>> ENTER_NEW_PASSWORD` Return

ROM Update

ROM Update Jumper

Figure 2–3 shows the ROM update jumper in the disabled position ❶ and enabled position ❷. The factory default setting is in the disabled position.

Figure 2–3 ROM Update Jumper



In the enabled position, the ROM can be rewritten when new versions of the firmware are distributed.

Storage Devices

Configuring SCSI Drives

When replacing storage devices:

1. At the console prompt, enter SHOW DEVICE for device information:

   ```
   >>> SHOW DEVICE  Return
   ```

2. Go to Chapter 7 for procedures to remove the device.
3. Set all jumpers/switches on the replacement drives according to the removed device.
4. Replace the device.
5. At the console, enter SHOW DEVICE to verify that the replacement was performed correctly.

   ```
   >>> SHOW DEVICE Return
   ```

6. Go to Chapter 5 and run the disk verifier diagnostic.

When adding storage devices:

1. At the console prompt, enter SHOW DEVICE for existing device information:

   ```
   >>> SHOW DEVICE Return
   ```

2. Set the SCSI address. See Table 2–1 for the recommended SCSI jumper/switch settings.
3. Mount the device. See Figure 7–3 for the system power cable routing, Figure 7–4 for the disk SCSI cable routing and placement of drives within the DEC 3000 Model 400/400S AXP system, and Figure 7–5 for the disk power cable routing.
4. Install the device.
5. At the console prompt, enter SHOW DEVICE to verify that the replacement was performed correctly:

   ```
   >>> SHOW DEVICE Return
   ```

6. Go to Chapter 5 and run the disk verifier diagnostic.

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Table 2–1 lists the recommended SCSI jumper settings.

Table 2–1 Recommended SCSI Jumper Settings

Drive	SCSI Address	0	1	2
RZ24L/RZ25/RZ26	0	Out	Out	Out
RZ24L/RZ25/RZ26	1	In	Out	Out
RZ24L/RZ25/RZ26	2	Out	In	Out
Factory-installed RZ24L/RZ25 /RZ26	3	In	In	Out
RRD42	4	Out	Out	In
SCSI controller	6	Out	In	In
(High-priority drive)	7	In	In	In

In = Attached
Out= Removed

Table 2–2 lists the recommended SCSI switch settings.

Table 2–2 Recommended SCSI Switch Settings

Drive	SCSI Address	1	2	3	4
RX26/TLZ06	5	Down	Up	Down	—
TZK10		In	Out	In	—
TZ30		Left	Left	Right	Left

NOTE
SCSI ID 6 is normally reserved for the SCSI controller.

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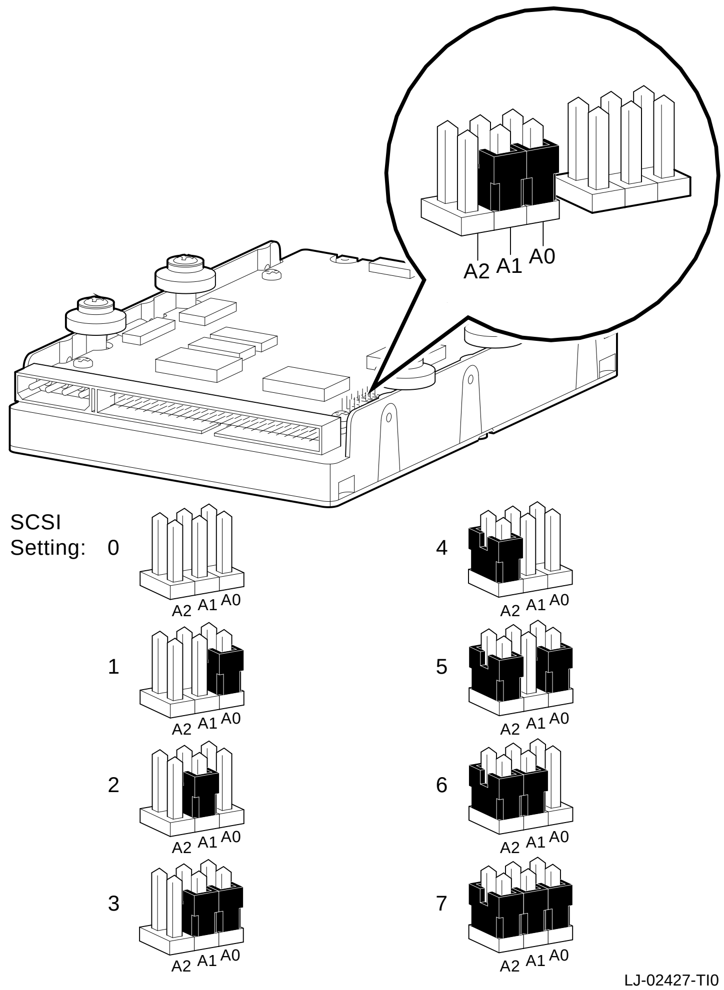
RZ24L Jumper Settings

Figure 2–4 shows the RZ24L jumper settings. SCSI address 3 is the default setting for the RZ24L drive. When setting the jumper settings, check for conflicts with the RZ25 or RZ26 disk drives in Table 2–1.

Figure 2–4 RZ24L Jumper Settings



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RZ25 Jumper Settings

When setting SCSI ID addresses for the RZ25 drive:

1. Use location J5 only.
2. Remove all jumpers from location J7 *except jumper 4*.

If these procedures are not followed, it could cause dual SCSI address problems. Figure 2–5 shows the RZ25 jumper settings. SCSI address 3 is the default setting for the RZ25 drive. When setting the jumper settings, check for conflicts with the RZ24L or RZ26 drives in Table 2–1.

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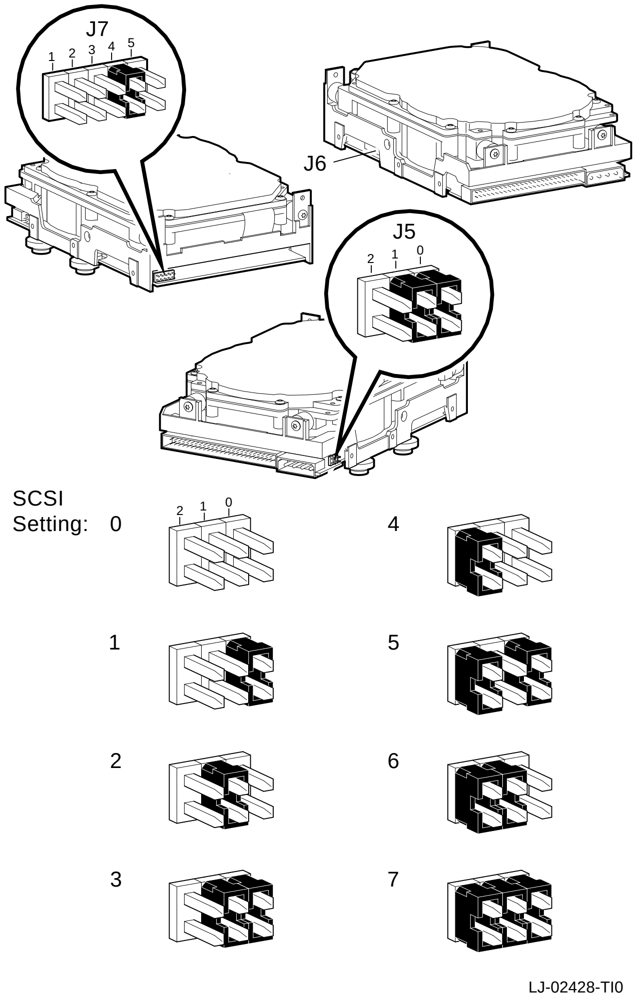
Figure 2–5 RZ25 Jumper Settings



See Table 2–3 for pin descriptions of J6 and Table 2–4 for pin descriptions of J7.

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Table 2–3 RZ25 J6 Jumper Description

Jumper Position	Description
1	Factory use only.
2	In = Enables motor start option. Out = Drive operation depends if jumper is installed in position 3.
3	In = Enables motor start option (if position 2 is out). Motor start delay is 16 times the drive ID number in seconds.
4	In = Entire drive is write protected.
5	In = Parity checking by drive is enabled.
6	Reserved for future use.
7	In = Supplies drive power to SCSI bus, pin 26.
8	In = Supplies power only to drive terminators.

NOTE

If J6 pins 7 and 8 are positioned horizontally (lower part), then the drive takes power from the SCSI bus, pin 26. Jumpers on both pins 7 and 8 can be in at the same time.

Table 2–4 describes the J7 jumper positions.

Continued on next page

Table 2–4 RZ25 J7 Jumper Description

Jumper Position	Description
1	SCSI ID (use J5 ID setting)
2	SCSI ID (use J5 ID setting)
3	SCSI ID (use J5 ID setting)
4	Jumper must be installed if no cable is connected.
5	Used for connection to a remotely located LED indicator.

RZ26 Jumper Settings

Figure 2–6 shows the RZ26 jumper settings. SCSI address 3 is the default setting for the RZ26 drive. When setting the jumper settings, check for conflicts with the RZ24L and RZ25 drives in Table 2–1.

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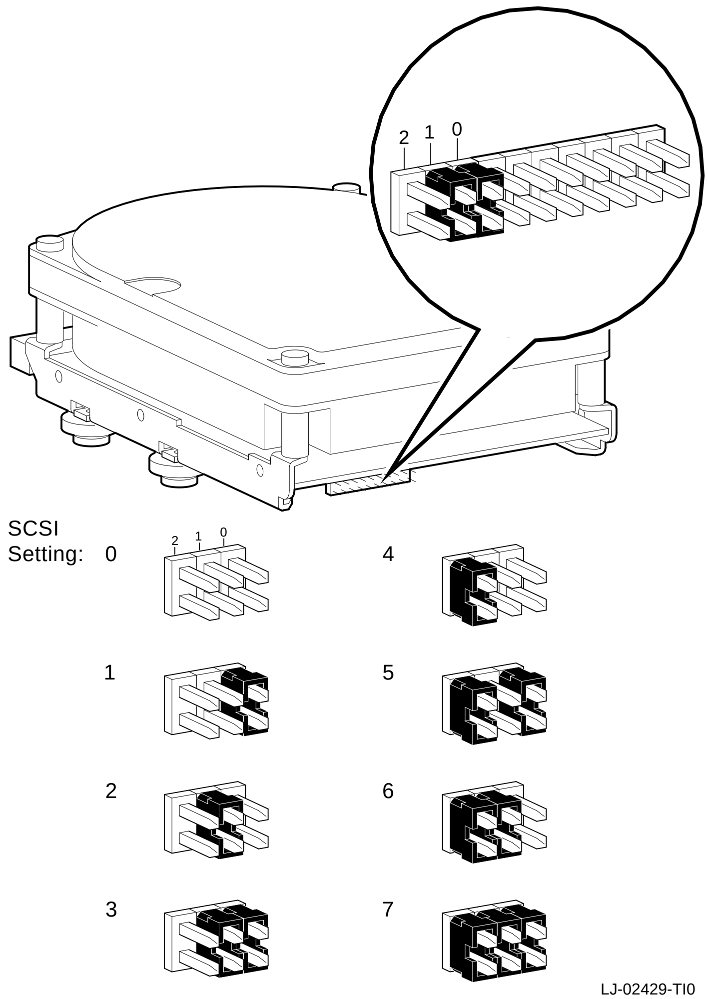
Figure 2–6 RZ26 Jumper Settings



RRD42 Jumper Settings

Figure 2–7 shows the RRD42 jumper settings. SCSI address 4 is the default setting for the RRD42 drive.

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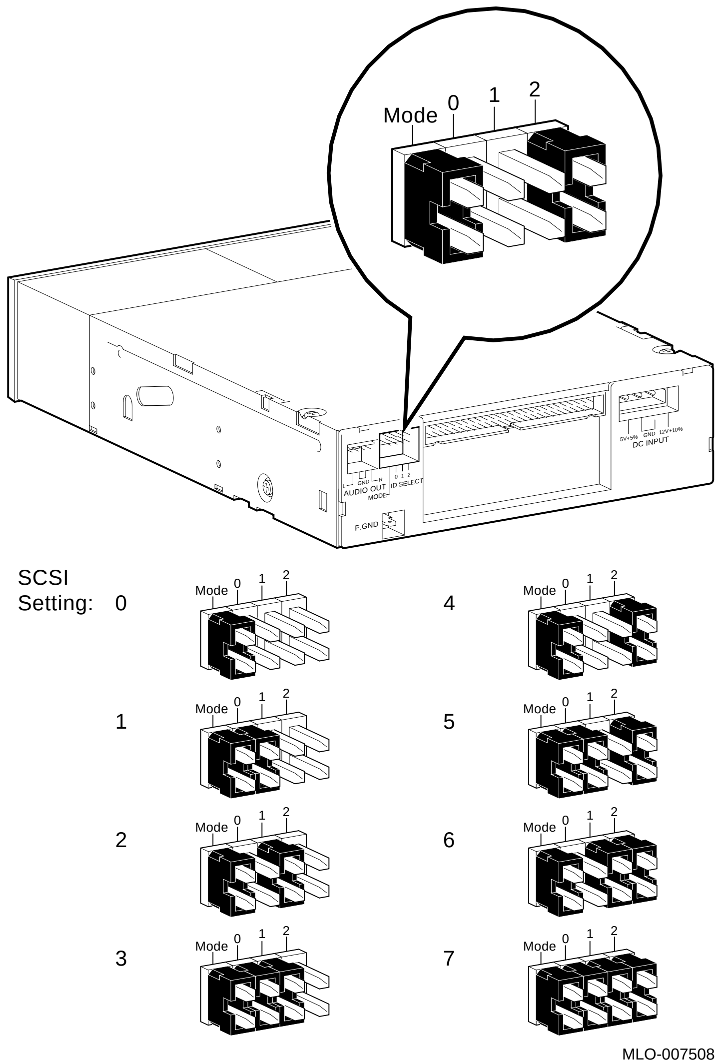
Figure 2–7 RRD42 Jumper Settings



NOTE

Figure 2–7 shows that the mode jumper is installed in all the SCSI settings.

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RRD42 Jumper Settings (continued)

Mode Select Jumper

The mode select jumper shown in Figure 2–7 is a user-selectable feature. If you do not select the correct mode, then the drive will not operate properly.

The mode select jumper has two modes:

- Mode 0 - default mode

When the drive is shipped from the factory, the jumper is **not** installed. The drive operates in the default mode with a block size of 2 kbytes. Use mode 0 while running MS–DOS and SCO UNIX operating systems.

- Mode 1 - standard mode

When the jumper is installed, the drive operates in standard mode with a block size of 512 bytes. Use mode 1 while running VMS and ULTRIX operating systems.

The mode select jumper does not effect other operations.

RX26 Switch Settings

Figure 2–8 shows the switch settings for the RX26 drive. SCSI address 5 is the default setting for the RX26 drive. When setting the switch settings, check for conflicts with the TZK10 and TLZ06 drives in Table 2–2.

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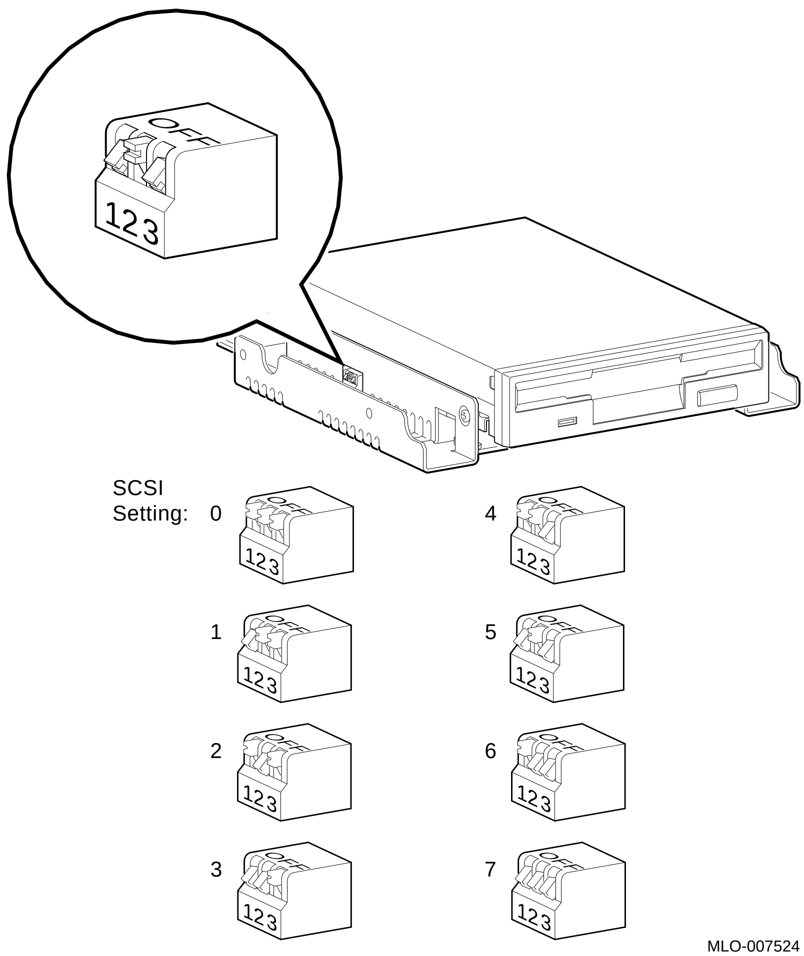
Figure 2–8 RX26 Switch Settings



TZK10 Tape Drive Jumper Settings

Figure 2–9 shows the jumper settings for the TZK10 drive. SCSI address 5 is the default setting for the TZK10 drive.

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Figure 2–9 TZK10 Jumper Settings

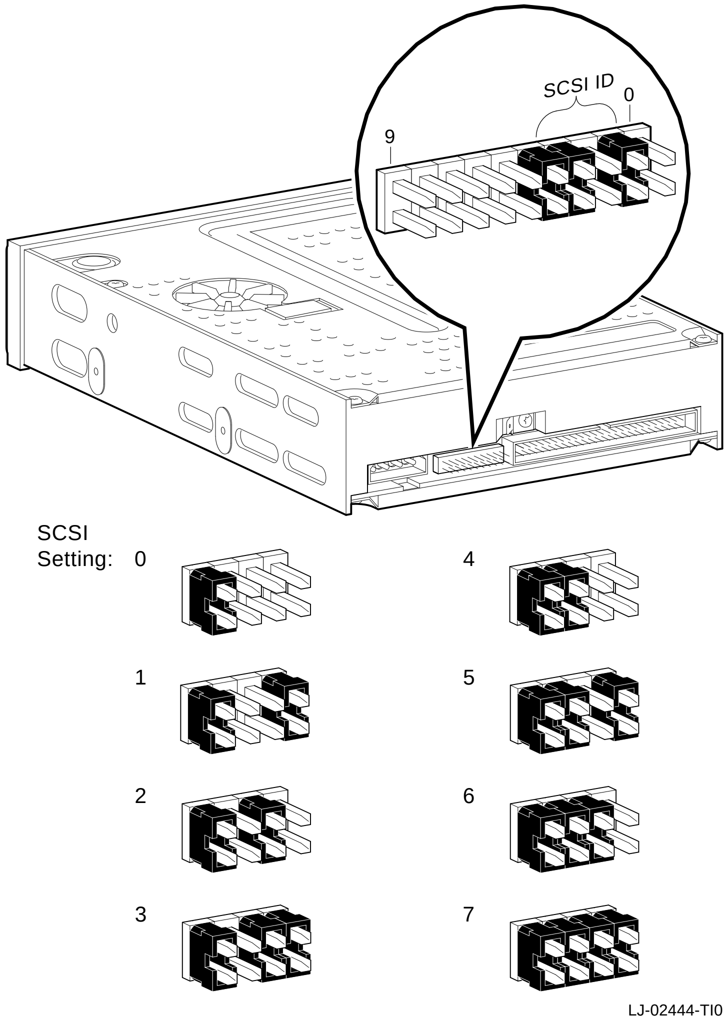

Table 2–5 describes the TZK10 pins.

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Table 2–5 TZK10 Pin Description

Pin Location	Description
0	Terminator power. When the jumper is installed, then power for the terminator is provided by the drive.
1	SCSI ID setting
2	SCSI ID setting
3	SCSI ID setting
4	Disable Auto Density (DADs). When the jumper is installed, automatic density selection is disabled.
5	Manufacturing use only
6	Manufacturing use only
7	Manufacturing use only
8	Manufacturing use only
9	Manufacturing use only

TLZ06 Switch Settings

Figure 2–10 shows the TLZ06 switch settings. SCSI address 5 is the default setting for the TLZ06 drive. When setting the switches, check for conflicts with the RX26 and TLZ06 in Table 2–2.

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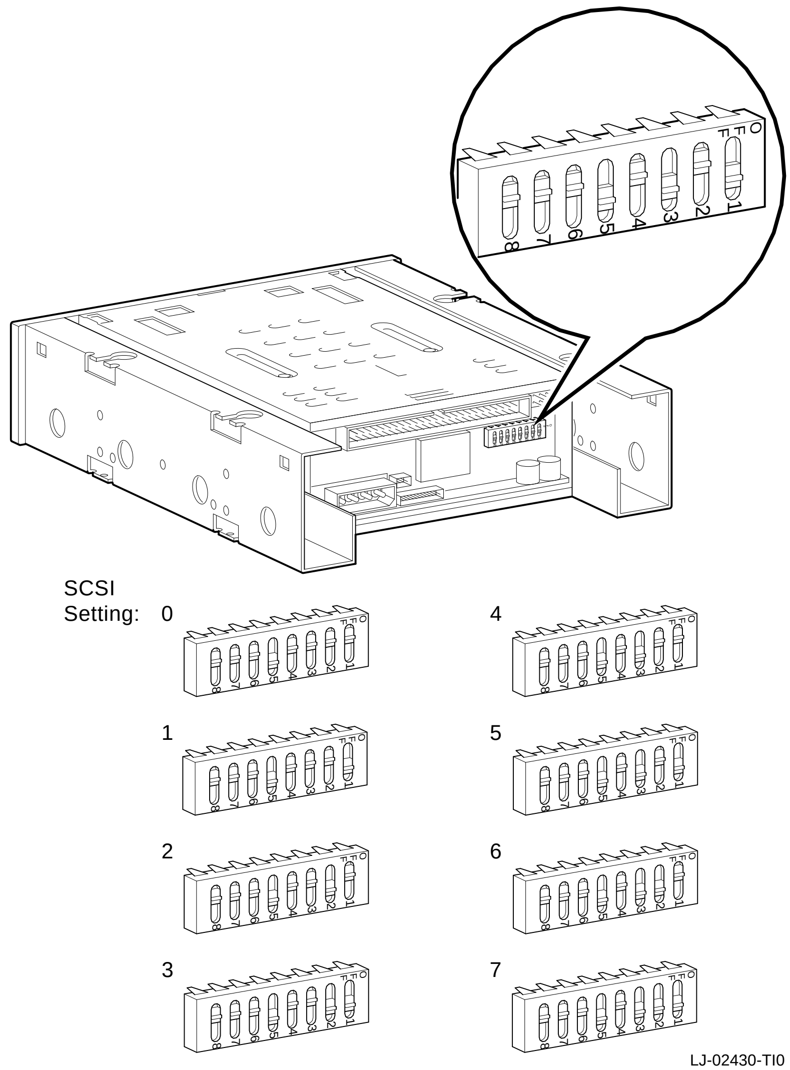
Figure 2–10 TLZ06 Switch Settings



TZ30 Switch Settings

Figure 2–11 shows the TZ30 switch settings. SCSI address 5 is the default setting for the TZ30 drive. When setting the switches, check for conflicts with the RX26, TZK10, and TLZ06 in Table 2–2.

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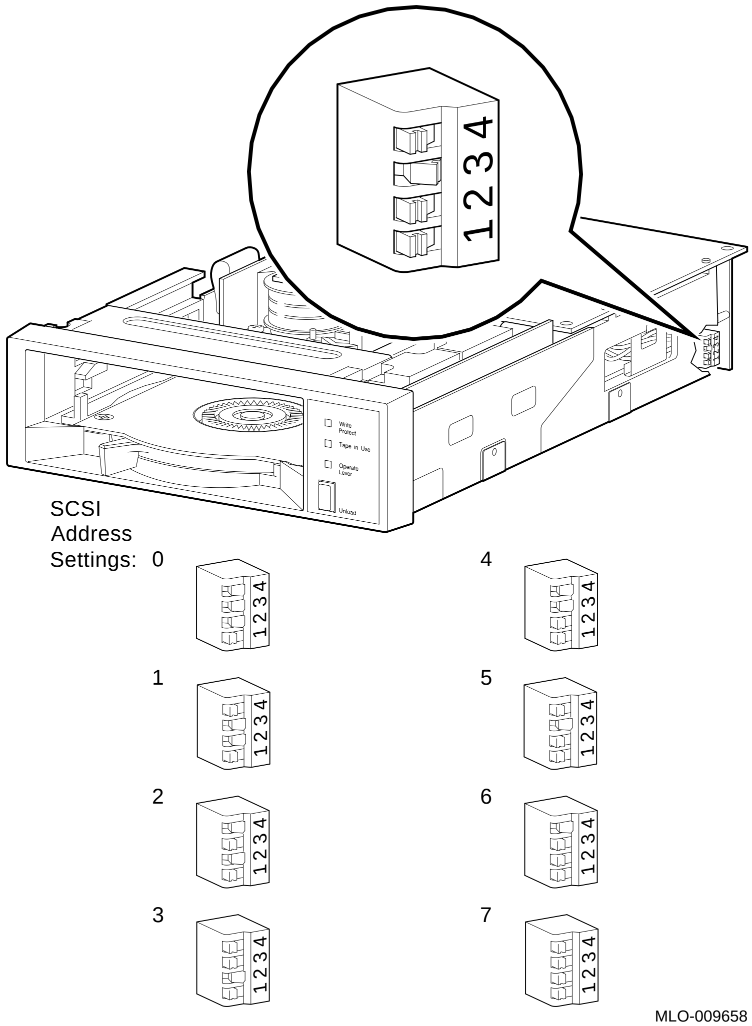
Figure 2–11 TZ30 Switch Settings



Memory Configuration

Banks and Slots

A bank represents the eight memory arrays (SIMMs 0 through 7) as shown in Figure 2–12. A slot consists of two banks because every memory array can be populated on both sides as shown in Figure 2–12.

Example

The following example shows a sample memory mother board configuration and the relationship between banks, SIMM memory size, and slots. For the DEC 3000 Model 400 AXP system, the banks are numbered 0 through 3.

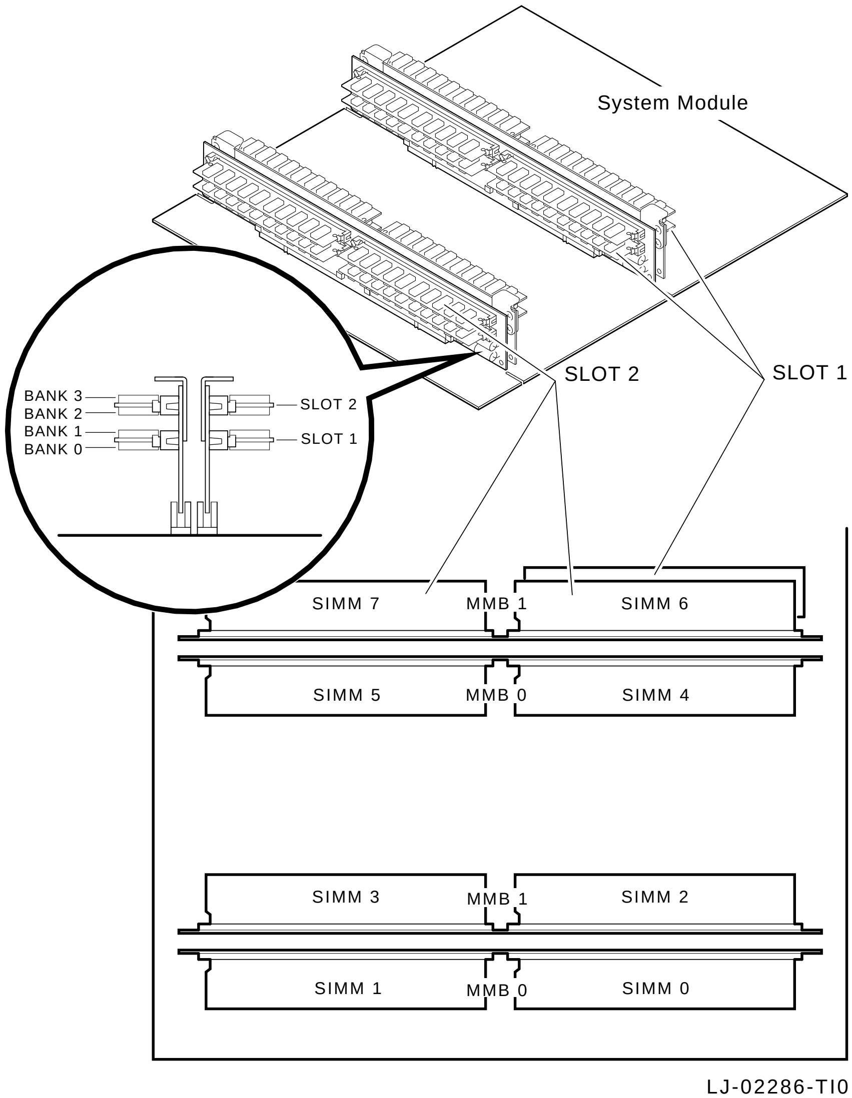
```
DEC 3000 - M400 Memory: 96 Mbytes
------------------------------------------
BANK #      MEMORY_SIZE
------      -----------
0            032 Mbytes
1            032 Mbytes
2            032 Mbytes
3            000 Mbytes
 >>>
```

Banks	Meaning
0 and 1	Occupy slot 1. Banks 0 and 1 are two-sided SIMMs that consist of 64 Mbytes.
2 and 3	Occupy slot 2. Banks 2 and 3 are single-sided SIMMs that consist of 32 Mbytes.

Two banks occupy one memory slot. Each memory card (SIMM) can be populated on both sides, which totals 64 Mbytes per SIMM card maximum (32 Mbyte on each side).

Continued on next page

Figure 2–12 An Example of a Memory Bank



Continued on next page

Memory Configuration, Continued

Memory Configuration Rules

When installing memory, the following configuration rules must be followed:

- Each memory slot with the same number must be filled with sets of eight SIMMs.
- The eight memory SIMMs in a slot with the same number must be of equal size and of the same type (single- or double-sided).

NOTE

If memory rules are violated, then the memory size displayed will be that of the smallest size SIMM installed.

Identifying the SIMM Modules

The following table lists the part numbers for 2, 4, and 8 MB memory SIMMs.

Part Number	Description
54-21139-BA	2 MB Memory SIMM
54-21139-CA	4 MB Memory SIMM
54-21139-DA	8 MB Memory SIMM

Chapter 3
Using the Console

Overview

Chapter Overview

This chapter contains the following topics:

- Console command list (general)
- Commands:
  - BOOT
  - BOOT command parameter/qualifiers
  - CONTINUE
  - DEPOSIT
  - EXAMINE
  - HELP
  - INITIALIZE
  - LOGIN
  - REPEAT
  - SET
  - SET command parameters/qualifiers
  - SHOW
  - SHOW command parameters

Continued on next page

Chapter Overview (continued)

- – START
- – TEST
- Alternate consoles

Console Commands List

This chapter describes the system console commands and alternate console commands.

The following table lists the console commands and their function.

Each console command described in this chapter will also contain a brief description of the command, along with its associated parameters and qualifiers.

Console Commands	Function
BOOT	Initiates the bootstrap process
CONTINUE	Returns operating system from console to program mode
DEPOSIT	Writes to memory, I/O, and register locations
EXAMINE	Displays specific memory, I/O, and register locations
HALT	Halts the current program and places the system from program mode to console mode
HELP	Displays basic help file
INITIALIZE	Resets console, devices, and CPU
LOGIN	Secures the system
REPEAT	Repeats commands
SET	Sets an environment variable
SHOW	Shows an environment variable
START	Starts CPU at a given address
TEST	Runs diagnostics

BOOT

Description

The BOOT command bootstraps the operating system.

Issuing the boot command with the -fl, -fi flag or boot device option overrides the current default value for the current boot request, but does not change the stored default value.

Overview

The information in this section will provide the environment variables required when the BOOT command is used. All parameter names are listed in the far left margin in alphabetical order and qualifiers will be listed within that particular parameter.

Format

To execute the BOOT command, enter the following:

```
>>> B[OOT] [device_name] [qualifier] Return
```

BOOT Command Parameters/Qualifiers

device_name

A device from which the firmware attempts to boot.

NOTE

A default boot devices may be specified by using the SET BOOTDEF_DEV command.

Device Name Identifiers: The following names are supported device identifiers:

VMS Device Identifiers	OSF Device Identifiers	Device Type
DK	RZ	Fixed or removable disk
MK	TZ	Tape
ES	–	Ethernet, MOP protocol
–	EZ	Ethernet, BOOTP protocol

VMS Device Naming Convention:

The device naming convention for the VMS operating system is: `ddiunn`. The device naming convention for the OSF operating system is `ddiu`. See Table 3–1 for a description of the VMS and OSF device naming conventions.

Table 3–1 VMS and OSF Device Naming Conventions

VMS Convention	OSF Convention	Description
dd	*dd*	Device name identifier
i	*i*	Designates SCSI controller (A/B)
u	*u*	Designates SCSI ID number
nn		Logical unit number is always 00, LUN must be two digits.

Continued on next page

For example, a disk device on SCSI controller A with a SCSI ID of 4 and an LUN of 0 would have the following OSF device naming convention:

```
DKA400
```

NOTE

BOOT commands can either be in VMS or OSF format when the system is operating under either VMS or OSF. Two command syntaxes are available so as to match the current VMS and OSF syntaxes.

Qualifier

-fl <value>

ASCII string up to 23 characters.

-fi <filename>

Used when booting across a network device to specify the name of a file to load into the operating system. The filename is limited to 23 characters.

Qualifier	Description
-fl <value>	FLAGS, ASCII string of up to 23 characters
-fi <filename>	Used when booting across a network device to specify the name of a file to load into the system

Continued on next page

Examples

This example uses the default boot specification.

```
>>> BOOT [Return]
```

This example boots from a disk device on SCSI controller A with a SCSI ID of 4 and an LUN of 0 and using the default flag values.

```
>>>  BOOT DKA400 [Return]
```

This example performs a MOP boot to device ESA0 with the flags equal to 0,0.

```
>>> BOOT -FL 0,0 ESA0 [Return]
```

This example perform a MOP boot to device ESA0 from filename E_BOOT.CMD.

```
>>> BOOT -FI E_BOOT.CMD ESA0 [Return]
```

CONTINUE

Description

The CONTINUE command returns the operating system from the console mode to program mode.

The processor begins instruction execution at the address contained in the program counter.

Processor initialization is not performed.

Ctrl P/CONTINUE is *not* supported on MIPS Emulated graphics consoles; this function only works on alternate console.

Format

To execute the CONTINUE command, enter the following:

```
>>> C[ONTINUE]  Return
```

Example

This example returns the operating system from the console mode to the program mode.

```
>>> CONTINUE Return
```

Result:

```
?06 HLT INST
  PC=00000000.2000000C  PSL=00000000.00001F00
```

DEPOSIT

Description

The DEPOSIT command is used to write to memory locations from the console.

Format

To execute the DEPOSIT command, enter the following:

```
>>> DEPOSIT [qualifier_list]{address}{data}[{data}] Return
```

The address specifies the address (or first address) to be written. Data values must be in hexadecimal.

Qualifier_list

The following qualifiers specify data size:

Data Size (option)	Description
-B	byte (8 bits)
-W	word (16 bits)
-L	longword (32 bits) (default)
-Q	quadword (64 bits)

The following qualifiers specify address type options:

Address Type (option)	Description
-VM	Virtual address
-PM	Physical address
PS*	Processor status register (PS). The data size is always quadword.
-R	General purpose register set, R0 through R31. The data size is always quadword.

*These options should *not* be typed with (-), otherwise the command will not work.

Continued on next page

Address Type (option)	Description
-FR	Floating point register set, F0 through F31. The data size is always quadword.
-U	Access to console private memory is allowed.
PC*	Program Counter. The data size is always quadword.
SP*	Stack Pointer. The data size is always quadword.

*These options should *not* be typed with (-), otherwise the command will not work.

The following qualifiers specify the miscellaneous options:

Miscellaneous Options	Description
-N:{count}	Specifies the number of locations to be written with the value specified by data.
-S	Address increment size. Default is data size.

Address

Address is a longword address that specifies the first location into which data is deposited.

Data

Data is the data to be deposited. If the specified data is larger than the deposit data size, then the console ignores the command and issues an error response. If the specified data is smaller than the deposit data size, then it is extended on the left with 0s.

Continued on next page

Examples

This example deposits 01234567 into location 00400000 and five subsequent locations:

```
>>> D -PM -N:5 00400000 01234567 [Return]
```

To verify that the deposit worked properly, enter the following:

```
>>> E -PM -N:5 00400000 [Return]
```

Result:

```
  PMEM: 00000000.00400000 01234567
  PMEM: 00000000.00400004 01234567
  PMEM: 00000000.00400008 01234567
  PMEM: 00000000.0040000C 01234567
  PMEM: 00000000.00400010 01234567
  PMEM: 00000000.00400014 01234567
>>>
```

This example deposits 0123456789ABCDEF into general purpose registers 00 through 31 inclusive:

```
>>> D -R -N:1F 0 0123456789ABCDEF [Return]
```

Continued on next page

To verify that the deposit was successful, enter the following:

```
>>> E -R -N:1F 0 [Return]
```

Result:

```
GPR: 00 01234567 89ABCDEF
GPR: 01 01234567 89ABCDEF
GPR: 02 01234567 89ABCDEF
GPR: 03 01234567 89ABCDEF
GPR: 04 01234567 89ABCDEF
GPR: 05 01234567 89ABCDEF
GPR: 06 01234567 89ABCDEF
GPR: 07 01234567 89ABCDEF
GPR: 08 01234567 89ABCDEF
GPR: 09 01234567 89ABCDEF
GPR: 0A 01234567 89ABCDEF
GPR: 0B 01234567 89ABCDEF
GPR: 0C 01234567 89ABCDEF
GPR: 0D 01234567 89ABCDEF
GPR: 0E 01234567 89ABCDEF
GPR: 0F 01234567 89ABCDEF
GPR: 10 01234567 89ABCDEF
GPR: 11 01234567 89ABCDEF
GPR: 12 01234567 89ABCDEF
GPR: 13 01234567 89ABCDEF
GPR: 14 01234567 89ABCDEF
GPR: 15 01234567 89ABCDEF
GPR: 16 01234567 89ABCDEF
GPR: 17 01234567 89ABCDEF
GPR: 18 01234567 89ABCDEF
GPR: 19 01234567 89ABCDEF
GPR: 1A 01234567 89ABCDEF
GPR: 1B 01234567 89ABCDEF
GPR: 1C 01234567 89ABCDEF
GPR: 1D 01234567 89ABCDEF
GPR: 1E 01234567 89ABCDEF
GPR: 1F 01234567 89ABCDEF
```

Continued on next page

This example deposits 0123456789ABCDEF into floating point registers 0-8 inclusive:

```
>>> D -FR -N:8 0 0123456789ABCDEF Return
```

To verify that the deposit worked properly, enter the following:

```
>>> E -N:1F -FR 0 Return
```

Result:

```
FPR: 00 01234567 89ABCDEF
FPR: 01 01234567 89ABCDEF
FPR: 02 01234567 89ABCDEF
FPR: 03 01234567 89ABCDEF
FPR: 04 01234567 89ABCDEF
FPR: 05 01234567 89ABCDEF
FPR: 06 01234567 89ABCDEF
FPR: 07 01234567 89ABCDEF
FPR: 08 01234567 89ABCDEF
FPR: 09 00000000 00000000
FPR: 0A 00000000 00000000
FPR: 0B 00000000 00000000
FPR: 0C 00000000 00000000
FPR: 0D 00000000 00000000
FPR: 0E 00000000 00000000
FPR: 0F 00000000 00000000
FPR: 10 00000000 00000000
FPR: 11 00000000 00000000
FPR: 12 00000000 00000000
FPR: 13 00000000 00000000
FPR: 14 00000000 00000000
FPR: 15 00000000 00000000
FPR: 16 00000000 00000000
FPR: 17 00000000 00000000
FPR: 18 00000000 00000000
FPR: 19 00000000 00000000
FPR: 1A 00000000 00000000
FPR: 1B 00000000 00000000
FPR: 1C 00000000 00000000
FPR: 1D 00000000 00000000
FPR: 1E 00000000 00000000
FPR: 1F 00000000 00000000
```

EXAMINE

Description

The EXAMINE command displays the contents of the specific memory locations.

Format

To execute the EXAMINE command, enter the following:

```
>>> E[XAMINE] [qualifier_list] [{address}] Return
```

The address specifies the address (or first address) to be read.

Qualifier_list

The following qualifiers specify data size options:

Data Size (option)	Description
-B	byte (8 bits)
-W	word (16 bits)
-L	longword (32 bits)
-Q	quadword (64 bits)

The following qualifiers specify address type options:

Address Type (option)	Description
-VM	Virtual address
-PM	Physical address
-I	Internal processor register
PS*	Processor status register (PS). The data size is always quadword.
-R	General purpose register set, R0 through R31. The data size is always quadword.

*These options should *not* be typed with (-), otherwise the command will not work.

Continued on next page

Address Type (option)	Description
-FR	Floating point register, F0 through F31. The data size is always quadword.
PC*	Program Counter. The data size is always quadword.
SP*	Stack Pointer. The data size is always quadword.

*These options should *not* be typed with (-), otherwise the command will not work.

The following qualifiers specify the miscellaneous options:

Miscellaneous Options	Description
-N:{count}	Specifies the number of locations to be written with the value specified by data.
-S	Address increment size. Default is data size.

The following qualifier specifies the display option:

Display Option	Description
-A	ASCII data representation.

Address

Address is a longword address that specifies the first location to be examined.

Examples

This example reads the value which was written into locations starting at physical memory address 00100000. For this example, the DEPOSIT command is used to put a known value.

Continued on next page

```
>>> DEPOSIT -PM -N:5 00100000 01234567 [Return]
>>> EXAMINE -PM -N:5 00100000 [Return]
```

Result:

```
P 00100000 01234567
P 00100004 01234567
P 00100008 01234567
P 0010000C 01234567
P 00100010 01234567
P 00100014 01234567
```

This example examines and displays byte data.

```
>>> E -B 1000000 [Return]
```

Result:

```
PMEM:  00000000.01000000 00
>>>
```

This example examines the word data size option.

```
>>> E -W 1000000 [Return]
```

Result:

```
PMEM:  00000000.01000000 0000
>>>
```

This example examines the longword.

```
>>> E -L 1000000 [Return]
```

Result:

```
PMEM:  00000000.01000000 00000000
>>>
```

This example examines the quadword.

```
>>> E -Q 1000000 [Return]
```

Continued on next page

Result:

```
PMEM: 00000000.01000000 00000000 00000000
>>>
```

This example examines the location of the next three memory address locations.

>>> **E -N:2 1000000** Return

Result:

```
PMEM:   000000.01000000 00000000 00000000
PMEM:   000000.01000008 00000000 00000000
PMEM:   000000.01000010 00000000 00000000
>>>
```

This example examines physical memory.

>>> **E -PM 1000000** Return

Result:

```
PMEM:   000000.01000000 00000000 00000000
>>>
```

This example examines the physical memory longword.

>>> **E -L -PM 1000000** Return

Result:

```
PMEM:   000000.01000000 00000000
>>>
```

This example examines the contents of the general purpose register 0.

>>> **E -R 0** Return

Result:

```
GPR:00   00000000 00000000
>>>
```

Continued on next page

This example examines the contents of the processor status register.

```
>>> E PS  [Return]
```

Result:

```
PS:  00000000 00001F00
>>>
```

This example examines the contents of the stack pointer.

```
>>> E SP [Return]
```

Result:

```
GPR: 1E 01234567 89ABCDEF
>>>
```

This example examines the contents of the program counter.

```
>>> E PC [Return]
```

Result:

```
PC: 00000000 20000000
>>>
```

HALT

Overview

The HALT command stops the execution of instructions and initiates console I/O mode. A message is displayed indicating the processor has halted along with the contents of the program counter.

If the processor was halted prior to the receipt of a HALT command, then the HALT command has no effect.

NOTE

Pressing the Halt button on the back panel performs the same function as the HALT command.

Format

To execute the HALT command, enter the following:

```
>>> HA[LT] Return
```

HELP

Description

The HELP command displays a brief list of commands, parameters, and qualifiers. If a specific topic is specified, then information for only that topic will be displayed.

Format

To execute the HELP command, enter the following:

```
>>> HE[LP] [Return]
         or
>>> ? [Return]
```

Examples

This example displays a list of HELP commands:

```
>>> HELP [Return]
```

Result:

```
    BOOT
    HELP ADVANCED
        SET [ENV] <ENVAR> <VALUE>
    SHOW | PRINTENV [<ENVAR>]
    TEST
>>>
```

To obtain an expanded listing of available HELP features, enter the following:

```
>>> HE[LP] ADVANCED [Return]
```

Continued on next page

Examples (continued)

Result:

```
BOOT [-FL <bflg> ] [-FI <filnam>] <devlist>
CONTINUE
DEPOSIT [{ -B | -W | -L | -Q | -A }] [{ -PM | -VM }] [-G] [-U] [-N:
<n>]
         [{ <addr> | <sym> | + | - | * | @ }
[<datum>]]
EXAMINE [{ -B | -W | -L | -Q | -A }] [{ -PM | -VM }] [-G] [-U] [-N:
<n>]
    [{ <addr> | <sym> | + | - | * | @ }]
HALT
HELP [MIPS_EMULATOR | SET | SHOW]
INITIALIZE
LOGIN
REPEAT <cmd>
SET[ENV] <envar> <value>
SHOW | PRINTENV [<envar>]
START <addr>
TEST <devnam> [<tstnam>]
>>>
```

To see what SET commands are available, enter the following:

```
>>> HELP SET Return
```

Result:

```
SET[ENV] AUTO_ACTION <{RESTART | 1} | {BOOT | 2} | {HALT | 3}>
SET[ENV] BOOTDEF_DEV <ddau>
SET[ENV] BOOT_OSFLAGS <bflg>
SET[ENV] BOOT_RESET <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_LOE <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_QUICK <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_SECTION <1-3>
SET[ENV] ENABLE_AUDIT <{OFF | 0} | {ON | 1}>
SET[ENV] ETHERNET <{THICK | 0} | {TENBT | 1}>
SET[ENV] LANGUAGE <0-15>
SET[ENV] MOP <{OFF | 0} | {ON | 1}>
SET[ENV] PASSWORD
SET[ENV] RADIX < 0 | 10 | 16 >
SET[ENV] {SCSI_A | SCSI_B} <0-7>
SET[ENV] SCSI_RESET <0-7>
SET[ENV] SECURE <{OFF | 0} | {ON | 1}>
SET[ENV] SERVER <{OFF | 0} | {ON | 1}>
SET[ENV] TRIGGER <{OFF | 0} | {ON |1}>
```

Continued on next page

Examples (continued)

This example displays the commands available for the SHOW command.

```
>>> HELP SHOW [Return]
```

Result:

```
PRINTENV |
SHOW { AUTO_ACTION    | BOOTDEF_DEV | BOOT_OSFLAGS  |
       BOOT_RESET     | CONFIG      | DEVICE        |
       DIAG_LOE       | DIAG_QUICK  | DIAG_SECTION  |
       ENABLE_AUDIT   | ETHERNET    | ERROR         |
       LANGUAGE       | MEMORY      | MOP           |
       RADIX          | SCSI_A      | SCSI_B        |
       SCSI_RESET     | SECURE      | SERVER        |
       TRIGGER}
>>>
```

INITIALIZE

Description

The INITIALIZE command initializes the processor, console, and any devices connected to the system by default values.

Format

To execute the INITIALIZE command, enter the following:

```
>>> I[NITIALIZE]  Return
```

Example

This example initializes the processor, console, and any devices connected to the system.

```
>>> I[NITIALIZE]  Return
```

Result:

```
INIT-S-CPU...
INIT-S-RESET_TC...
INIT-S-ASIC...
INIT-S-NVR...
INIT-S-SCC...
INIT-S-NI...
INIT-S-SCSI...
INIT-S-ISDN...
INIT-S-TC1...
INIT-S-TC0...
>>>
```

LOGIN

Description

The LOGIN command enables restricted console commands when the Secure bit is set. Enter the console password on the line following the LOGIN command.

Format

To execute the LOGIN command, enter the following:

```
>>> LO[GIN] Return
```

Example

This example shows the successful usage of the LOGIN command with the password feature enabled.

```
>>> LOGIN Return
```

```
PSWD0>>>
```

This example shows the unsuccessful usage of the LOGIN command because the password feature was not enabled.

```
>>> LOGIN Return
```

Result:

```
?35 PSWD NOTEN
>>>
```

REPEAT

Description

The REPEAT command causes the console program to repeatedly execute any specified tests.

To terminate the REPEAT command, press Control C.

Format

To execute the REPEAT command, enter the following:

>>> **R[EPEAT]T[EST]{qualifier_list},[{qualifier_list}],..** Return

Examples

This example shows the test ASIC being repeated.

>>> **R T ASIC** Return

This example shows the tests ASIC, MEMORY, and SCSI tests being repeated.

>>> **R T ASIC,MEM,SCSI** Return

This example shows the repeating of tests starting with ASIC and ending with ISDN.

>>> **R T ASIC:ISDN** Return

Result:

```
T-STS-ASIC - OK
T-STS-MEM - OK
T-STS-NVR - OK
T-STS-SCC - OK
T-STS-NI - OK
T-STS-SCSI A - OK
T-STS-SCSI B - OK
T-STS-ISDN - OK
```

```
T-STS-ASIC - OK
T-STS-MEM - OK
T-STS-NVR - OK
T-STS-SCC - OK
T-STS-NI - OK
T-STS-SCSI A - OK
T-STS-SCSI B - OK
T-STS-ISDN - OK
```

SET

Description

The SET command:

- Sets/Resets an environmental variable to a value or setting
- Defines a command qualifier
- Defines the console password

Overview

The information in this section provides the environmental variables required when the SET command is used. All parameter names are listed in the far left margin in alphabetic order and qualifiers will be listed within that particular parameter.

Format

To execute the SET command, enter the following:

```
>>> SET {parameter} [{qualifier}] Return
```

Continued on next page

Example

This example displays the commands available with the SET command.

```
>>> HELP SET Return
```

Result:

```
SET[ENV] AUTO_ACTION <{RESTART | 1} | {BOOT | 2} | {HALT | 3}>
SET[ENV] BOOTDEF_DEV <ddau>
SET[ENV] BOOT_OSFLAGS <bflg>
SET[ENV] BOOT_RESET <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_LOE <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_QUICK <{OFF | 0} | {ON | 1}>
SET[ENV] DIAG_SECTION <1-3>
SET[ENV] ENABLE_AUDIT <{OFF | 0} | {ON | 1}>
SET[ENV] ETHERNET <{THICK | 0} | {TENBT | 1}>
SET[ENV] LANGUAGE <0-15>
SET[ENV] MOP <{OFF | 0} | {ON | 1}>
SET[ENV] PASSWORD
SET[ENV] RADIX < 0 | 10 | 16 >
SET[ENV] {SCSI_A | SCSI_B} <0-7>
SET[ENV] SCSI_RESET <0-7>
SET[ENV] SECURE <{OFF | 0} | {ON | 1}>
SET[ENV] SERVER <{OFF | 0} | {ON | 1}>
SET[ENV] TRIGGER <{OFF | 0} | {ON | 1}>
```

SET Command Parameters/Qualifiers

AUTO_ACTION

The AUTO_ACTION parameter specifies the default halt action for all halts or power-on halts.

Format

To execute the SET AUTO_ACTION command, enter the following:

```
>>> SET AUTO[_ACTION] {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers when setting AUTO_ACTION:

Qualifier*		Description
1	Restart	A restart will be executed
2	Boot	A re-boot will be executed
3	Halt	A halt will be executed

*The qualifier can take the form of either a number or the actual qualifier name. For example, 1 indicates restart, 2 boot, and 3 halt.

Example

This example sets the auto action to restart.

```
>>> SET AUTO_ACTION RESTART [Return]
```

Result:

```
AUTO_ACTION = RESTART
>>>
```

This example sets the auto action to re-boot.

```
>>> SET AUTO_ACTION BOOT [Return]
```

Continued on next page

Result:

```
AUTO_ACTION = BOOT
>>>
```

This example sets the auto action to halt.

```
>>> SET AUTO_ACTION 3 [Return]
```

Result:

```
AUTO_ACTION = HALT
>>>
```

Continued on next page

BOOTDEF_DEV

The BOOTDEF_DEV parameter defines the default device that the operating system will bootstrap. The device names must be valid boot devices supported by the BOOT command.

Issuing the SHOW DEVICE command displays the available boot devices.

Format

To execute the SET BOOTDEF_DEV command, enter the following:

```
>>> SET BOOTDEF_DEV {qualifier} [Return]
```

Qualifier

The following names are supported device name identifiers:

VMS Device Identifiers	OSF Device Identifiers	Device Type
DK	RZ	Fixed or removable disk
MK	TZ	Tape
ES	–	Ethernet, MOP protocol
–	EZ	Ethernet, BOOTP protocol

Refer to the SHOW BOOT command for a complete list and sample of the syntax to use with the BOOT commands.

Continued on next page

Example

This example sets the BOOT default device to DKA100.

```
>>> SET BOOTDEF_DEV DKA100 Return
```

Result:

```
BOOTDEF_DEV = DKA100
>>>
```

In this example, the DEC 3000 Model 400/400S AXP system will try booting from ESA0 first and then booting from DKA400 if ESA0 fails.

```
>>> SET BOOTDEF_DEV ESA0, DKA400 Return
```

Result:

```
BOOTDEF_DEV = ESA0,DKA400
>>>
```

Continued on next page

BOOT_OSFLAGS

The BOOT_OSFLAGS parameter defines additional default boot flags, which may be overrided by the -fl switch at boot time.

Format

To execute the BOOT_OSFLAGS command, enter the following:

```
>>> SET BOOT_OSFLAGS {value} [Return]
```

Qualifiers

The function of the {value} field is to define the type of boot.

Value	Significance
0,0	Default boot of operating system
E,0	Perform boot standalone backup
0,1	Enter SYSBOOT (conversational boot)
0,80	CD ROM update conversational boot

Example

This example sets the default BOOT_OSFLAGS value.

```
>>> SET BOOT_OSFLAGS 0,0 [Return]
```

Result:

```
BOOT_OSFLAGS = 0,0
>>>
```

This example sets up the CDROM update conversational boot.

```
>>> SET BOOT_OSFLAGS 0,80 [Return]
```

Result:

```
BOOT_OSFLAGS = 0,80
>>>
```

Continued on next page

BOOT_RESET

The BOOT_RESET parameter determines whether or not the console will initialize the system prior to booting.

Format

To execute the BOOT_RESET command, enter the following:

```
>>> SET BOOT_RESET {qualifier} Return
```

Qualifier

Select one of the following qualifiers when resetting the BOOT.

Qualifier*		Description
1	ON	Enables the system to be initialized before booting
0	OFF	Disables the system initialization before booting

*The qualifier can take the form of either a number or the actual qualifier name.

Example

This example enables the system to be initialized before booting.

```
>>> SET BOOT_RESET ON Return
```

Result:

```
BOOT_RESET = ON
>>>
```

This example disables system initialization before booting.

```
>>> SET BOOT_RESET 0 Return
```

Result:

```
BOOT_RESET = OFF
>>>
```

Continued on next page

DIAG_LOE

The DIAG_LOE parameter allows a diagnostic to loop on an error (non-TURBOchannel devices only). All output will be suppressed. To exit the diagnostic error loop, press the Halt button to return to the diagnostic environment (either console or service mode).

This feature is available on loadable diagnostics only.

Format

To execute the DIAG_LOE parameter, enter the following:

```
>>> SET DIAG_LOE {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers when setting the DIAG_LOE parameter.

Qualifier*		**Description**
1	ON	Enables loop on error feature
0	OFF	Disables loop on error feature

*The qualifier can take the form of either a number or the actual qualifier name.

Continued on next page

Example

This example sets the loop on error feature.

```
>>>SET DIAG_LOE ON  Return
```

Result:

```
DIAG_LOE = ON
>>>
```

This example also sets the loop on error feature.

```
>>>SET DIAG_LOE 0  Return
```

Result:

```
DIAG_LOE = OFF
>>>
```

Continued on next page

DIAG_QUICK

The DIAG_QUICK parameter sets the diagnostic startup mode to either normal or fast startup testing. When fast mode is selected, all diagnostic tests on the base system are run. No TURBOchannel options are tested *unless* they are graphics options.

Format

To execute the DIAG_QUICK command, enter the following:

```
>>> SET DIAG_QUICK {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the diagnostic startup mode.

Qualifier*		Description
1	ON	Quick verify testing
0	OFF	Normal testing

*The qualifier can take the form of either a number or the actual qualifier name.

Continued on next page

Example

This example sets the quick verify testing.

```
>>> SET DIAG_QUICK ON [Return]
```

Result:

```
DIAG_QUICK = ON
>>>
```

This example sets the normal testing.

```
>>> SET DIAG_QUICK 0 [Return]
```

Result:

```
DIAG_QUICK = OFF
>>>
```

Continued on next page

DIAG_SECTION

The DIAG_SECTION parameter sets the diagnostic environment in which the diagnostics can be run.

Format

To set the diagnostic operating environment, enter the following:

```
>>> SET DIAG_SECTION {qualifier} Return
```

Qualifier

Select one of the following qualifiers to set the diagnostic environment.

Qualifier	Mode	Description
1	Console	Default mode after power-on. Loopbacks are not required.
2	Service	Provides a more thorough test than in console mode. Special loopback connectors may be required to execute certain tests.

Example

This example sets the diagnostic environment to the console mode.

```
>>> SET DIAG_SECTION 1 Return
```

Result:

```
DIAG_SECTION = 1
>>>
```

Continued on next page

ENABLE_AUDIT

The ENABLE_AUDIT parameter defines if the boot audit trail message generation is enabled.

Format

To execute the ENABLE_AUDIT command, enter the following:

```
>>> SET ENABLE_AUDIT {qualifier} Return
```

Qualifier

Select one of the following qualifiers to set the boot audit trail:

Qualifier*		Description
1	ON	Enables boot audit trail
0	OFF	Disables boot audit trail

*The qualifier can take on the form of either a number or the actual qualifier name.

Example

This example enables the boot audit trail.

```
>>> SET ENABLE_AUDIT 1 Return
```

Result:

```
ENABLE_AUDIT = ON
>>>
```

Continued on next page

ETHERNET

The ETHERNET parameter sets the Ethernet port to either Thickwire or twisted pair.

Format

To execute the SET ETHERNET command, enter the following:

```
>>> SET ETHERNET {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the Ethernet port:

Qualifier	Description
THICK	AUI Ethernet port (Thickwire)
TENBT	10Base-T port (twisted pair)

Example

This example selects a Thickwire network.

```
>>> SET ETHERNET THICK [Return]
```

Result:

```
ETHERNET = THICK
 >>>
```

This example selects a 10Base-T network.

```
>>> SET ETHERNET TENBT [Return]
```

Result:

```
ETHERNET = TENBT
 >>>
```

Continued on next page

LANGUAGE

The LANGUAGE parameter defines the keyboard language when executed from a graphics console.

NOTE

English (3) is the default value setting. The keyboard must be of the correct language type to match the language command; otherwise, the language command will not execute.

Format

To execute the LANGUAGE command, enter the following:

```
>>> SET LANGUAGE {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the appropriate language.

Qualifier	Description
0) Dansk	Danish
1) Deutsch	German/Swiss
2) Deutsch (Schweiz)	Schweiz
3) English	Default setting
4) English (British/Irish)	British/Irish
5) Español	Spanish
6) Francais	French
7) Francais (Canadian)	Canadian
8) Francais (Suisse Romande)	Suisse Romande
9) Italiano	Italian
10) Nederlands	Netherlands
11) Norsk	—
12) Portugues	Portuguese
13) Suomi	—
14) Svenska	Swedish

Continued on next page

Qualifier	Description
15) Vlaams	—

Example

This example is executed from a graphic display. This command shows the default language, which is English. If you press Return, you will get the default setting. If you want to change the language, enter the number then press Return.

```
>>> SET LANGUAGE  Return
```

Result:

```
0) Dansk                      8) Francais  (Suisse Romande)
1) Deutsch                    9) Italiano
2) Deutsch (Schweiz)          10) Nederlands
3) English                    11) Norsk
4) English (British/Irish)    12) Portugues
5) Espanol                    13) Suomi
6) Francais                   14) Svenska
7) Francais (Canadien)        15) Vlaams

3 >>>

LANGUAGE = 3
>>>
```

This example is executed from the alternate console. Set language commands should only be executed from a graphics option.

```
>>> SET LANGUAGE  Return
```

Result:

```
?23  ILL CMD
>>>
```

Continued on next page

MOP

The MOP parameter enables the NI (Ethernet) listener while the system is in console mode. The listener sends and receives messages on the network.

Format

To set the MOP bit, enter the following:

```
>>> SET MOP {qualifier} Return
```

Qualifier

Select one of the following qualifiers to enable or disable the MOP bit.

Qualifier	Description
ON*	Network listener enabled. Able to receive and transmit messages on the network. Allows access to the console through the network and boot network firmware update procedure.
OFF	Network listener disabled. Cannot access the console through the network or boot network firmware update procedure.

*Default setting

Continued on next page

Examples

This example enables the network listener.

```
>>>  SET MOP ON [Return]
```

Result:

```
MOP = ON
>>>
```

This example disables the network listener.

```
>>>  SET MOP OFF [Return]
```

Result:

```
MOP = OFF
>>>
```

Continued on next page

PASSWORD

The PASSWORD parameter sets the console password.

The following are key points to remember about passwords:

- The password must be exactly 16 characters (hexadecimal, 0 to F).
- The password feature is enabled when SECURE = ON.
- The password feature is disabled when SECURE = OFF.

NOTE

The secure jumper must be in the correct configuration for the password feature to operate correctly. Refer to *Secure Jumper* in Chapter 2 for information on configuring the secure system jumper.

Format

To set the console password, enter the following:

```
>>> SET PASSWORD [Return]
```

Example

This example sets the console password.

```
>>> SET PASSWORD [Return]
```

Result:

```
PSWD0>ENTER_OLD_PASSWORD [Return]  !Type old password
         (if one has been set)
PSWD1>ENTER_NEW_PASSOWRD [Return]  !Type new password
PSWD2>ENTER_NEW_PASSWORD [Return]  !Verify new password
>>>
```

Continued on next page

SECURE

The SECURE parameter enables the console password bit to restrict access to the console.

Format

To enable or disable the SECURE bit, enter the following:

```
>>> SET SECURE {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the SECURE bit.

NOTE

If SECURE is set to ON, then enter LOGIN at the console prompt (>>>), and the password at the (PSWD0 >>>) prompt.

Qualifier*		Description
1	ON	Security features enabled
0	OFF	Security features disabled

*The qualifier can take the form of either a number or the actual qualifier name.

Continued on next page

Example

This example enables the security features.

```
>>> SET SECURE ON [Return]
```

Result:

```
SECURE=ON
>>>
```

This example disables the security features.

```
>>> SET SECURE OFF [Return]
```

Result:

```
SECURE=OFF
>>>
```

Continued on next page

RADIX

The RADIX parameter defines the default Radix to a specified value. The default is hexadecimal.

Format

To execute the RADIX command, enter the following:

```
>>> SET RADIX {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the base address.

Qualifier	Description
0	Default base address (hexadecimal)
10	Decimal base address
16	Hexadecimal base address

Example

This example sets the base address to a decimal base address.

```
>>> SET RADIX 10 [Return]
```

Result:

```
RADIX = 10
>>>
```

Continued on next page

SCSI_A

The SCSI_A parameter sets the SCSI host ID. The default value is 6.

Format

To set the SCSI host ID, enter the following:

```
>>> SET SCSI_A {qualifier} [Return]
```

Qualifier

Select a qualifier of 0 through 7 to set the host ID.

Example

This example sets the SCSI_A host ID to 6.

```
>>> SET SCSI_A 6 [Return]
```

Result:

```
SCSI_A = 00000006
>>>
```

Continued on next page

SCSI_B

The SCSI_B parameter sets the host ID. The default value is 6.

Format

To execute the SET SCSI_B command, enter the following:

```
>>> SET SCSI_B {qualifier} [Return]
```

Qualifier

Select a qualifier of 0 through 7 to set the host ID.

Example

This example sets the SCSI B host ID to 6.

```
>>> SET SCSI_B 6 [Return]
```

Result:

```
SCSI_B = 00000006
>>>
```

Continued on next page

SCSI_RESET

The SCSI_RESET parameter causes a time delay after a SCSI reset before booting.

- A value of 3 is recommended if a floppy or a hard disk is being booted.
- A value of 4 is recommended for tape drives.
- A value of 6 is recommended for CDROMs.

  The time delay is in seconds. The qualifier value is actually the n in the 2^n; therefore, the 3 for a floppy means 8 seconds or 2^3.

Format

To execute the SET SCSI_RESET command, enter the following:

```
>>> SET SCSI_RESET {value} [Return]
```

Value

Select a value of 0 to 7 to set the SCSI_RESET parameter. The qualifier value is actually the n in the 2^n; therefore, the 3 for a floppy means 8 seconds or 2^3.

Example

This example sets a time delay of 4.

```
>>> SET SCSI_RESET 4 [Return]
```

Result:

```
SCSI_RESET = 4
>>>
```

Continued on next page

SERVER

The SERVER parameter modifies the SCC power-up diagnostics when the configuration is a DEC 3000 Model 400/400S AXP .

When selected as a server, the keyboard and mouse need not be connected to successfully complete power-up diagnostics.

When selected as a workstation, the keyboard and mouse must be connected to successfully complete power-up diagnostics.

Format

To select either a Model 400 or Model 400S configuration, enter the following:

```
>>> SET SERVER {qualifier} Return
```

Qualifier

Select one of the following qualifiers when setting the SERVER parameter.

Qualifier*		Description
1	ON	When configuration is a server (model 400S)
0	OFF	When configuration is a workstation (model 400) (default setting)

*The qualifier can take on the form of either a number or the actual qualifer name.

Continued on next page

Examples

This example sets the configuration to a server.

```
>>> SET SERVER ON Return
```

Result:

```
SERVER = ON
```

This example sets the configuration to a non-server.

```
>>> SET SERVER OFF Return
```

Result:

```
SERVER = OFF
>>>
```

Continued on next page

TRIGGER

The TRIGGER parameter enables the Entity-Based Module (EMB).

With EMB and the NI listener enabled (TRIGGER = ON), you can access the console or boot the system from a remote system.

Format

To enable or disable the TRIGGER bit, enter the following:

```
>>> SET TRIGGER {qualifier} [Return]
```

Qualifier

Select one of the following qualifiers to set the remote trigger.

Qualifier*		Description
1	ON	Enables trigger
0	OFF	Disables trigger

*The qualifier can take on the form of either a number or the qualifier name.

Example

This example enables the trigger.

```
>>> SET TRIGGER ON [Return]
```

Result:

```
TRIGGER = ON
>>>
```

This example disables the trigger.

```
>>> SET TRIGGER 0 [Return]
```

Result:

```
TRIGGER = OFF
>>>
```

SHOW

Description

The SHOW console command displays information concerning:

- Environmental variable
- Console options
- Hardware configuration

Overview

The information in this section will provide the environmental variables required when the SHOW command is used. All parameter names are listed in the far left margin in alphabetical order and qualifiers will be listed within that particular parameter.

Format

To execute the SHOW command, enter the following:

>>> **SHOW [parameter]** [Return]

Continued on next page

Example

This example displays the current values for environmental variables.

```
>>> SHOW [Return]
```

Result:

```
AUTO_ACTION = HALT
BOOTDEF_DEV = ESA0,DKA400
BOOT_OSFLAGS = 0,0
ENABLE_AUDIT = ON
BOOT_RESET = OFF
SCSI_RESET = 4
DIAG_LOE = OFF
DIAG_QUICK = OFF
DIAG_SECTION = 1
ETHERNET = 08-00-2B-1A-38-31 , THICK
MOP = ON
SECURE = OFF
RADIX = 0
SCSI_A = 6
SCSI_B = 6
SERVER = OFF
TRIGGER = ON
>>>
```

NOTE

DIAG_LOE is not presently implemented; however, it is for future diagnostic testing.

SHOW Command Parameters

AUTO_ACTION

The AUTO_ACTION parameter displays the action the console will take following an error halt or power-up halt.

Format

To execute the SHOW AUTO_ACTION command, enter the following:

```
>>> SHOW AUTO_ACTION [Return]
```

One of the following functions will be displayed on the screen.

Function	Description
Restart	A restart will be executed.
Boot	A re-boot will be executed.
Halt	A halt will be executed.

Example

This example shows the current setting of AUTO ACTION.

```
>>> SHOW AUTO_ACTION [Return]
```

Result:

```
AUTO_ACTION = HALT
>>>
```

Continued on next page

BOOTDEF_DEV

The BOOTDEF_DEV parameter displays the default device or device list from which booting will next be attempted.

Format

To execute the SHOW BOOTDEF_DEV command, enter the following:

```
>>> SHOW BOOTDEF_DEV [Return]
```

Example

This example shows booting from the ESAO, DKA400 device.

```
>>> SHOW BOOTDEF_DEV [Return]
```

Result:

```
BOOTDEF_DEV = ESA0,DKA400
>>>
```

Continued on next page

BOOT_OSFLAGS

The BOOT_OSFLAGS parameter displays additional default parameters that were passed to system software during the last boot operation.

Format

To execute the SHOW BOOT_OSFLAGS command, enter the following:

```
>>> SHOW BOOT_OSFLAGS [Return]
```

Qualifiers

See the list of qualifiers for the SET BOOT_OSFLAGS command.

Example

This example displays the current OSFLAGS.

```
>>> SHOW BOOT_OSFLAGS [Return]
```

Result:

```
 BOOT_OSFLAGS = 0,0
>>>
```

Continued on next page

BOOT_RESET

The BOOT_RESET parameter displays the value of the BOOT_RESET variable.

Format

To execute the SHOW BOOT_RESET command, enter the following:

```
>>> SHOW BOOT_RESET [Return]
```

One of the following reset settings will be displayed on the screen.

Resets	Description
ON	Enables system initialized before booting
OFF	Disables system initialized before booting

Example

This example shows that the BOOT RESET was set to ON.

```
>>> SHOW BOOT_RESET [Return]
```

Result:

```
BOOT_RESET=ON
>>>
```

Continued on next page

CONFIG

The CONFIG parameter displays the system configuration and device status.

Format

To execute the SHOW CONFIG command, enter the following:

```
>>> SHOW CONFIG [Return]
```

Example

This example shows the system configuration and device status.

```
>>> SHOW CONFIG [Return]

DEC 3000 - M400
Digital Equipment Corporation
VPP PAL X5.12-82000101/OSF PAL X1.09-82000201-Built on
   8-SEP-1992 09:54:48.32

TCINFO   DEVNAM    DEVSTAT
------   --------  --------
           CPU       OK KN15-BA - Vx.x-Syyy-Izzz-sBLa.b -
   DECchip 21064 P3.0
P3.0
            ASIC      OK
            MEM       OK
8
7
            NVR       OK
            SCC       OK
            NI        OK
            ISDN      OK
6
            SCSI      OK
1-PMAGB-B  TC1

>>>
```

Response	Meaning
VPP PAL X5.12-82000101	VAX PAL code revision
OSF PAL X1.09-82000102	OSF PAL code revision
KN15-BA	Identifies the system type
Vx.x	Identifies the system revision
Syyy	Identifies the system ROM edit revision

Continued on next page

Response	Meaning
Izzz	Identifies the I/O ROM EDIT firmware revision
sBLa.b	Identifies the serial ROM firmware revision
TCINFO	Lists system slots • Slots 0 to 2 = TURBO slots • Slot 6 = SCSI controller • Slot 7 and 8 = built-in system devices
DEVNAM	Device name
DEVSTAT	Device status

Continued on next page

DEVICE

The DEVICE parameter displays SCSI and Ethernet device information.

Format

To execute the SHOW DEVICE command, enter the following:

```
>>> SHOW DEVICE Return
```

Example

This example shows the current devices. See the following table for further explanation of each column in this example.

```
>>> SHOW DEVICE
Result:
  BOOTDEV    ADDR     DEVTYPE   NUMBYTES  RM/FX   WP   DEVNAM   REV
  -------    ----     -------   --------  -----   --   ------   ---
  ESA0        08-00-2B-1A-38-31 , THICK
 ..HostID..  A/6      INITR
 ..HostID..  B/6      INITR
>>>
```

Column	Meaning
BOOTDEV	Console boot name for the device
ADDR	Either hardware address or SCSI ID
DEVTYPE	Device type (RODISK is a read only disk)
NUMBYTES	Drive capacity
RM/FX	Indicates whether the drive has removable or fixed media
WP	Indicates whether the drive is write protected
DEVNAM	Device name for the drive
REV	Firmware revision level for the drive

Continued on next page

DIAG_LOE

The DIAG_LOE parameter displays whether or not the diagnostic loop on error feature has been selected or not.

Format

To display the current DIAG_LOE parameter setting, enter the following:

```
>>> SHOW DIAG_LOE  Return
```

Example

This example shows that the current setting of DIAG_LOE is OFF.

```
>>> SHOW DIAG_LOE Return
```

Result:

```
DIAG_LOE = OFF
```

One of the following settings will be displayed on the screen.

Setting	Description
ON	Enables loop on error feature
OFF	Disables loop on error feature

Continued on next page

DIAG_QUICK

The DIAG_QUICK parameter displays the diagnostic mode.

Format

To execute the SHOW DIAG_QUICK command, enter the following:

```
>>> SHOW DIAG_QUICK [Return]
```

One of the following diagnostic settings will be displayed on the screen.

Diagnostic Setting	Description
ON	Quick verify testing
OFF	Normal testing

Example

This example shows that the diagnostic mode is set on quick verify testing.

```
>>> SHOW DIAG_QUICK [Return]
```

Result:

```
DIAG_QUICK = ON
```

Continued on next page

DIAG_SECTION

The DIAG_SECTION parameter determines the diagnostic environment in which the diagnostics can be run.

Format

To execute the SHOW DIAG_SECTION command, enter the following:

```
>>> SHOW DIAG_SECTION [Return]
```

One of the following diagnostic modes will be displayed on the screen.

Setting	Mode	Description
1	Console	Default mode upon power-on
2	Service	Provides a more thorough test than in console mode. Special loopback connectors may be required to execute certain tests.

Example

This example shows that the current diagnostic mode is in console mode.

```
>>> SHOW DIAG_SECTION [Return]
```

Result:

```
DIAG_SECTION = 1
>>>
```

Continued on next page

ENABLE_AUDIT

The ENABLE_AUDIT parameter indicates if the boot audit trail message generation has been enabled.

Format

To execute the SHOW ENABLE_AUDIT command, enter the following:

```
>>> SHOW ENABLE_AUDIT [Return]
```

One of the following audit settings will be displayed on the screen.

Audit Setting	Description
ON	Enables boot audit trail
OFF	Disables boot audit trail

Example

This example displays that the boot audit trail has been enabled.

```
>>> SHOW ENABLE_AUDIT [Return]
```

Result:

```
ENABLE_AUDIT = ON
>>>
```

Continued on next page

ERROR

The ERROR parameter displays error information for all devices listed by the SHOW CONFIG with the exception of errors occurring on TURBOchannel options. The TURBOchannel option error information is not saved by the MIPS Emulator and must be obtained from the console display.

Format

To execute the SHOW ERROR command, enter the following:

```
>>> SHOW ERROR [Return]
```

Example

This example shows an error caused by a missing loopback connector.

```
>>> SHOW ERROR [Return]
```

Result:

```
     ??000   NI 0x00f2
>>>
```

Continued on next page

ETHERNET

The ETHERNET parameter displays the hardware Ethernet address and Ethernet port.

Format

To execute the SHOW ETHERNET command, enter the following:

```
>>> SHOW ETHERNET [Return]
```

Result:

```
ETHERNET = 08-00-2B-1A-38-31 , THICK
>>>
```

Continued on next page

LANGUAGE

The LANGUAGE parameter identifies the language in which console messages are displayed when using a graphics console.

Format

To execute the SHOW LANGUAGE command, enter the following:

```
>>> SHOW LANGUAGE [Return]
```

Examples

This example shows language from a graphics option.

```
>>> SHOW LANGUAGE [Return]
```

Result:

```
LANGUAGE = 3
>>>
```

This example shows language from an alternate console.

```
>>> SHOW LANGUAGE [Return]
```

Result:

```
?23 ILL CMD
>>>
```

Continued on next page

MEMORY

The MEMORY parameter displays memory status information on:

- Bank number
- Memory size per bank
- Starting address of each bank

Format

To execute the SHOW MEMORY command, enter the following:

```
>>> SHOW MEMORY [Return]
```

Example

This example shows the memory status information.

```
SHOW MEMORY
DEC 3000 - M400 Memory: 80 Mbytes
------------------------------------------
BANK #     MEMORY_SIZE       START_ADDRESS
------     -----------       -------------
0           032 Mbytes       0x00000000
1           032 Mbytes       0x02000000
2           016 Mbytes       0x04000000
3           000 Mbytes       0x00000000
 >>>
```

Response	Meaning
Bank #	Two memory slots. Each memory card can be populated on both sides, totalling 64 Mbyte per SIMM card maximum (32 Mbyte on each side).
Banks 0 and 1	Occupy slot 1. Two-sided SIMMs consisting of 64 Mbytes.
Banks 2 and 3	Occupy slot 2. Single-sided SIMMs consisting of 16 Mbytes.

Continued on next page

MOP

The MOP parameter indicates if the MOP network listener has been enabled.

Format

To execute the SHOW MOP command, enter the following:

```
>>> SHOW MOP [Return]
```

One of the following network listener settings will be displayed on the screen.

Setting	Description
ON	Network listener enabled. Able to receive and transmit messages on the network.
OFF	Network listener disabled.

Continued on next page

Example

This command enables examining the current MOP status regardless of whether MOP is enabled or disabled.

```
>>> SHOW MOP  [Return]
```

Result:

```
UTC      = 00000000.D27234E0
AccurTDF = 10000000.000186A0
BytesRx  = 00000000.00000000
BytesTx  = 00000000.00000078
FramesRx = 00000000.00000000
FramesTx = 00000000.00000002
McBytsRx = 00000000.00000000
McFrmsRx = 00000000.00000000
FrmDefer = 00000000.00000000
Frm1Coll = 00000000.00000000
FrmMColl = 00000000.00000000
TerXsCol = 00000000.00000000
TerCarCk = 00000000.00000000
TerShCkt = 00000000.00000000
TerOpCkt = 00000000.00000000
TerFrLng = 00000000.00000000
TerNoDef = 00000000.00000000
RerFCSEr = 00000000.00000000
RerFrmEr = 00000000.00000000
RerFrLng = 00000000.00000000
UnknDest = 00000000.00000000
DataOvrn = 00000000.00000000
SyBuffUn = 00000000.00000000
UsBuffUn = 00000000.00000000
HrtBtErr = 00000000.00000002

MOP = ON
>>>
```

Continued on next page

SECURE

The SECURE parameter displays the console security.

Format

To execute the SHOW SECURE command, enter the following:

```
>>> SHOW SECURE [Return]
```

One of the following SECURE mode settings will be displayed on the screen.

SECURE Setting	Description
ON	Security features enabled
OFF	Security features disabled

Example

This example shows the current SECURE value.

```
>>> SHOW SECURE [Return]
```

Result:

```
SECURE = OFF
>>>
```

Continued on next page

RADIX

The RADIX parameter displays the default radix (base number). The default is hexadecimal.

Format

To execute the SHOW RADIX command, enter the following:

```
>>> SHOW RADIX [Return]
```

One of the following base address settings will be displayed on the screen.

Base Address Setting	Description
0	Default base address (hexadecimal)
10	Decimal base address
16	Hexadecimal base address

Example

This example shows that the current radix is set at the default base address.

```
>>> SHOW RADIX [Return]
```

Result:

```
RADIX = 0
>>>
```

Continued on next page

SCSI_A

The SCSI_A parameter displays the SCSI ID for the system (A bus).

Format

To execute the SHOW SCSI_A command, enter the following:

```
>>> SHOW SCSI_A [Return]
```

A host ID number between 0 and 7 will be displayed on the screen.

Example

This example shows the SCSI A for the system is 6.

```
>>> SHOW SCSI_A [Return]
```

Result:

```
SCSI_A = 6
```

Continued on next page

SCSI_B

The SCSI_B parameter displays the SCSI ID for the system (B bus).

Format

To execute the SHOW SCSI_B command, enter the following:

```
>>> SHOW SCSI_B [Return]
```

A host ID number between 0 and 7 will be displayed on the screen.

Example

This example shows the SCSI B for the system is 6.

```
>>> SHOW SCSI_B [Return]
```

Result:

```
SCSI_B = 6
>>>
```

Continued on next page

SCSI_RESET

The SCSI_RESET command displays the current time delay setting.

- A value of 3 is recommended if a floppy and hard disk are being booted.
- A value of 4 is recommended for tape drives.
- A value of 6 is recommended for CDROM.

Format

To execute the SHOW SCSI_RESET command, enter the following:

```
>>> SHOW SCSI_RESET {qualifier} Return
```

A number between 0 and 7 will be displayed on the screen.

Example

This example shows the current value of the SCSI reset is 4.

```
>>> SHOW SCSI_RESET  Return
```

Result:

```
SCSI_RESET = 4
```

Continued on next page

SERVER

The SERVER parameter shows which server configuration has been selected.

Format

To display the current configuration, enter the following:

```
>>> SHOW SERVER  Return
```

One of the following settings will be displayed on the screen:

Setting	Description
ON	When configuration is a server (Model 400S)
OFF	When configuration is a workstation (Model 400) (default setting)

Example

This example shows the current SERVER configuration is set to OFF.

```
>>> SHOW SERVER  Return
```

Result:

```
SERVER = OFF
>>>
```

Continued on next page

TRIGGER

The TRIGGER parameter displays the current trigger setting.

Format

To execute the SHOW TRIGGER command, enter the following:

```
>>> SHOW TRIGGER [Return]
```

One of the following trigger settings will be displayed on the screen.

Trigger Setting	Description
ON	Enables trigger. Allows you to access the console or boot the system from a remote system.
OFF	Disables trigger.

Example

This example shows the trigger enabled.

```
>>> SHOW TRIGGER [Return]
```

Result:

```
TRIGGER = ON
>>>
```

START

Description

The START command sets the program counter (PC) and starts the CPU. The command causes the system to exit console mode and enter program mode.

Format

To execute the START command, enter the following:

>>> **START {address}** [Return]

TEST

Description

The TEST command executes selected diagnostic tests.

Format

To execute the TEST command, enter the following:

```
>>> [T]EST {qualifier} Return
```

Qualifier

See Chapter 4 for a diagnostic listing.

Example

This example will run the ASIC diagnostic.

```
>>> T ASIC Return
```

Alternate Consoles

Overview

The DEC 3000 Model 400 AXP workstation provides two ways to use alternate consoles if the graphics subsystem fails. Console commands may be entered on a terminal connected to the printer port or from a network connection.

Alternate Console Port

To access the printer port console, verify that the:

- Baud rate of the terminal connected to the alternate console port is set at 9600 baud.
- Alternate switch located in the rear of the unit is switched to the up position when the DEC 3000 Model 400/400S AXP system is using a graphics console. When the switch is in the down position, the alternate console port can be connected to the alternate console.

NOTE

The state of the alternate console switch is only read at power up. Changing the switch setting when the system is powering up has no effect until the unit is powered down and up again.

Continued on next page

Network Console

The system console can also be accessed from the network. The network console allows you to remotely troubleshoot the system or provide a console when no other consoles are available.

Some console tests and commands cause the network connection to be terminated because the commands use the network device, or they cause a connection timeout at the remote node.

To access the console:

- Obtain the hardware Ethernet address of the workstation
- Obtain access to an operating system on the same Ethernet segment as the DEC 3000 (the systems cannot be separated by a bridge or router)
- Set the following DEC 3000 workstation parameters:
  - A console password
  - MOP, TRIGGER

Once the Model 400 is set up, perform the following steps from the other operating system to connect to the console:

1. Log into the user account (no special privileges are required)
2. Type the following commands:

```
$ MC NCP
NCP> SHOW KNOWN CIRCUITS
NCP> CONNECT VIA  circuit SERVICE PASSWORD xxxx
     PHYSICAL ADDRESS 08-00-2B-XX-XX-XX
>>>
>>> CTRL/D
NCP> EXIT
$ LO
```

Continued on next page

Network Console (continued)

Response	Meaning
$MC NCP	Enters the Network Control Program (NCP)
NCP> SHOW KNOWN CIRCUITS	Shows available circuits you can connect through
NCP> CONNECT VIA circuit SERVICE PASSWORD xxxx PHYSICAL ADDRESS 08-00-2B-XX-XX-XX	Connects to the console
>>>Login	Performs console functions
Password	System response to LOGIN command. The correct password must be entered to gain access to the system.
>>> CTRL/D	Disconnects console
NCP> EXIT	Exits NCP
$LO	Logs off the system

NOTE

Do not run the memory diagnostic. It will cause the console to hang and you will have to power off the system.

Chapter 4
Diagnostic Testing

Overview

Chapter Overview

The following topics are contained in this chapter:

- Power on diagnostics
- FRU code table
- List of diagnostics
- Running single/multiple tests
- Running a test continuously
- Entering/exiting console and service mode
- Diagnostics:
  - ASIC
  - NVR
  - MEMORY
  - SCSI
  - NI
  - SCC
  - ISDN
- TURBOchannel testing

Power On Diagnostics

Power On Diagnostics

The Power On Diagnostics executes automatically whenever the DEC 3000 Model 400/400S AXP system is powered up. The power up self test runs limited memory testing. The power up self test tests the first eight megabytes of memory, which is where the operating system is loaded. If the rest of the memory is to be tested, then the memory diagnostics must be executed.

Examples

This example shows a typical power up diagnostics. See the following table for further explanation of this example.

```
DEC 3000 - M400
Digital Equipment Corporation
System conducting power up tests
------------------------------------------------------------
Devnam       Devstat
--------     -------
CPU          OK KN15-BA -Vx.x-Syyy-Izzz  - DECchip 21064 P2.0
ASIC         OK
MEM          OK 64MB
NVR          OK
SCC          OK ptr(0) = Present  keybd(2) = Present
NI           OK Ethernet Address: 08-00-2B-1A-38-31 , THICK
SCSI         OK
ISDN         OK
TC0          OK - PMAGB-BA
------------------------------------------------------------
System power up OK.
Enter B to boot software from ESA0
```

Column	Meaning
KN15-BA	Identifies the system type
Vx.x	Identifies the system revision
Syyy	Identifies the system ROM edit revision
Izzz	Identifies the I/O ROM edit firmware revision
DECchip 21064 P2.0	Chip revision
MEM	Total configured memory

Continued on next page

Column	Meaning
SCC	Displays options connected in I/O ports Mouse/tablet is connected on port 0 Keyboard is connected on port 2
NI	Displays the Ethernet Address and the type (Thickwire or ThinWire connection)
TC0	Displays the option in the TURBOchannel slot. In this example, a graphics option PMAGB-BA is located in slot 0.

This example shows an unsuccessful power up of the DEC 3000 Model 400/400S AXP system because of the network connected improperly or because of a missing Thickwire loopback connector.

```
DEC 3000 - M400
Digital Equipment Corporation
System conducting power up tests
-----------------------------------------------------------

Devnam     Devstat
--------   -------
CPU         OK KN15-BA - BL7.1-S0F9-I081 - sBL5.3 - DECchip 21064 P3.0
ASIC        OK
MEM         OK 64MB
NVR         OK
SCC         OK ptr(0) = Present  keybd(2) = Present
NI          ?? 000 00f2 Ethernet Address: 08-00-2B-1A-38-31 , THICK
SCSI        OK
ISDN        OK
TC0         OK - PMAGB-BA
-----------------------------------------------------------
System power up tests detected errors.
See your system documentation for more information.

>>>
```

Continued on next page

Power On Diagnostics, Continued

Examples (continued)

This example shows an unsuccessful power up of a DEC 3000 Model 400/400S AXP system because the red and blue lines were not properly connected or unterminated.

```
DEC 3000 - M400
Digital Equipment Corporation
System conducting power up tests
------------------------------------------------------------

Devnam      Devstat
--------    -------
CPU          OK KN15-BA - BL7.1-S0F9-I081 - sBL5.3 - DECchip 21064 P3.0
ASIC         OK
MEM          OK 64MB
NVR          OK
SCC          OK ptr(0) = Present  keybd(2) = Present
NI           OK Ethernet Address: 08-00-2B-1A-38-31 , THICK
SCSI         OK
ISDN         OK
TC0          ?? 300 TC0    0 - PMAGB-BA
------------------------------------------------------------
System power up OK.
Enter B to boot software from DKA100

>>>
```

FRU Code Table

System Device FRU Codes

Table 4–1 shows the system device FRU codes and their meaning.

Table 4–1 System Device FRU Codes

FRU Code	Meaning
000	Unknown or diagnostic does not support FRU reporting
001	System module is most probable FRU
002	I/O module is most probable FRU
003	Keyboard is most probable FRU
004	Mouse or pointing device is most probable FRU

TURBOchannel Options FRU Codes

Table 4–2 shows the TURBOchannel options FRU codes and their meaning.

Table 4–2 TURBOchannel Options FRU Codes

FRU Code	Meaning
010	TURBOchannel option 0 is most probable FRU
011	TURBOchannel option 1 is most probable FRU
012	TURBOchannel option 2 is most probable FRU
013-FF	Reserved

Continued on next page

SCSI Device FRU Codes

Table 4–3 shows the SCSI device FRU codes and their meaning.

Table 4–3 TURBOchannel Options FRU Codes

FRU Code	Meaning
1TL	SCSI device on bus A (internal), Target T, Logical unit L (for example, FRU code for DKA0 is 100)
2TL	SCSI device on bus B (external), Target T, Logical unit L

Diagnostic Listing

Diagnostic Listing

A diagnostic test is a composite of a string of sub-tests. A sub-test may be selected rather than executing the full device test.

When a device is selected without specifying a sub-test, all sub-tests will be executed.

The following are the available diagnostics.

ASIC
NVR
MEM
SCSI
NI
SCC
ISDN

Format

To obtain a diagnostic sub-test listing, enter the following:

```
>>> T[EST] {device name} ? [Return]
```

NOTE

You must be in either console or service mode to obtain a listing.

Continued on next page

Example

This example shows the sub-tests associated with the diagnostic ASIC.

```
>>> T ASIC ?    Return
```

Results:

```
T ASIC INIT
T ASIC SGMAP
T ASIC ?
 >>>
```

Running Single/Multiple Tests

Before You Begin

You must take the following actions before running diagnostics:

Step	Action	Refer to...
1	Put the system in console mode.	Entering Console Mode
2	Attach loopbacks if required.	Chapter 4
3	Select the diagnostic environment.	Table 4–4

Diagnostic Environment

Table 4–4 describes the diagnostic environments and how they can be accessed.

Table 4–4 Diagnostics Environments

Environment	To Access	Requirements
Console	Enter the following at the >>> prompt: >>>**SET DIAG_SECTION 1**	Requires no setup beyond installation of the system.
Service	Enter the following at the >>> prompt: >>>**SET DIAG_SECTION 2**	Requires loopbacks but provides a more comprehensive test. The key utilities must be run in this environment.

Running a Single Diagnostic Test

To execute a single diagnostic test, enter the following:

```
>>> T[EST] {device_name} Return
```

Continued on next page

Example

This example executes all ASIC sub-tests.

When a diagnostic test is selected, that test will execute its complete set of sub-tests.

```
>>> T ASIC [Return]
```

Running Diagnostic Sub-Tests

To execute a diagnostic sub-test, enter the following:

```
>>> T[EST] {device name} {sub-test} [Return]
```

Example

This example indicates that testing of the sub-test SGMAP has been selected. ASIC testing will *only* be performed on those areas defined by the SGMAP sub-tests.

```
>>> T ASIC SGMAP [Return]
```

Running Multiple Diagnostic Tests

Diagnostics may be linked together in different combinations depending on your needs. Diagnostic tests are executed one at a time in the order specified on the command line. The diagnostic selection chosen may require that:

- Service mode be selected
- Loopback connector be connected

The following are sample diagnostic combinations:

```
>>> T[EST] {device name}, {device name}.. [Return]

>>> T[EST {device name}:{device name} [Return]

>>> T[EST] {device name}:{device name},{device name}... [Return]
```

Continued on next page

Examples

This example executes testing on MEM and NVR diagnostics. You may add any combination of diagnostics but separate the device names with a comma.

```
>>> T MEM,NVR [Return]
```

This example executes testing on a range of diagnostics starting with the ASIC diagnostic and ending with the ISDN diagnostic. When specifying a range, separate the device names with a colon.

```
>>> T ASIC:ISDN [Return]
```

Listed below is the starting and ending diagnostic range:

ASIC
MEM
NVR
SCC
NI
SCSI
ISDN

NOTE

When running diagnostics in the above configuration, remember that some of the selected diagnostics may require that service mode be selected and that loopback connectors be mounted; otherwise, an error will occur.

Diagnostics that run in console mode will also run in service mode.

This example starts testing the SCC diagnostic, then the diagnostics testing with the ASIC, and ending with the MEMORY diagnostic.

```
>>> T SCC,ASIC:MEM [Return]
```

Running Tests Continuously

Continuous Run

The console REPEAT command runs a diagnostic or a sequence of diagnostics continuously. The REPEAT command executes testing continuously until a Control C is entered at the console, or the Halt button is depressed, or until an error occurs.

NOTE

If you press the Halt button, then you will initialize the system.

Format

To execute the REPEAT command, enter the following:

>>> **R[EPEAT] T[EST] {device name}, {device name}** Return

Example

This example shows that the memory diagnostic will run continuously until a Control C is entered at the console.

>>> **R T MEM** Return

This example shows that the memory diagnostic and the NVR diagnostic will run continuously until a Control C is entered at the console.

>>> **R T MEM,NVR** Return

Entering/Exiting Console and Service Mode

Entering Console Mode

You may enter console mode by performing one of the following:

NOTE

Perform a system shutdown before pushing the Halt button.

- Push in the Halt button (this will place you in console mode).
- Enter SET DIAG_SECTION 1 from service mode (this will place you in console mode).
- Enter console mode by default after power on is executed by issuing one of the following SET command while in console mode:
  - SET AUTO_ACTION HALT
  - Set AUTO_ACTION 3

For more information, see Chapter 3.

Exiting Console Mode

Issue one of the following console commands at the console prompt to exit console mode and enter program mode:

NOTE

If memory tests are run and the contents of memory is changed, then the CONTINUE command will cause a system failure. This is normal operation since you have overwritten the program information.

- BOOT

  Issuing the BOOT command will initiate a system bootstrap operation. See Chapter 3.

Continued on next page

Exiting Console Mode (continued)

- CONTINUE

  Issuing the CONTINUE command will clear the RC State Flag bit and resume processor execution. See Chapter 3.

  NOTE

  If memory tests are run and the contents of memory is changed, then the CONTINUE command will cause a system failure. This is normal operation since you have overwritten the program information.

- SET DIAG_SECTION 2

  Console mode can be exited and service mode entered by using the SET DIAG_SECTION 2 command. Setting the diagnostic environment to service mode allows for extended testing of certain diagnostics. To enter service mode, enter:

  ```
  >>> SET DIAG_SECTION 2 [Return]
  ```

Entering Service Mode

Some diagnostics require that service mode be used when testing. To enter service mode, you must first enter console mode. At the console prompt, enter:

```
>>> SET DIAG_SECTION 2 [Return]
```

Continued on next page

Entering/Exiting Console and Service Mode, Continued

Exiting Service Mode

Service mode can be exited by issuing one of the following console commands at the console prompt:

NOTE

BOOT and CONTINUE will cause you to exit the diagnostic environment and enter program mode.

SET DIAG_SECTION 1 keeps you in the diagnostic environment.

- BOOT

  Issuing the BOOT command will initiate a system bootstrap operation. See Chapter 3.

- CONTINUE

  Issuing the CONTINUE command will clear the RC State Flag bit and resume processor execution. See Chapter 3.

  NOTE

  If the memory contents changed while you were in service mode, this command will cause a failure and should not be used.

- SET DIAG_SECTION 1

  Issuing the SET DIAG_SECTION 1 command selects console mode.

ASIC Diagnostic

Overview

The ASIC diagnostic tests the scatter/gather MAP registers.

TURBOchannel and CORE I/O ASIC registers are initialized by placing all registers in a *known state*.

Diagnostic testing will be performed when:

- Unit is powered-on
- Console mode is entered and ASIC diagnostic selected

Fault isolation will be to the field replaceable unit (FRU).

Running ASIC Diagnostics

To select and execute the ASIC diagnostic and/or sub-tests, enter the following:

>>> **T[EST] {device name} [sub-test]** Return

Example:

This example executes the ASIC diagnostic SGMAP sub-test.

>>> **T ASIC** Return

This example executes the ASIC diagnostic and SGMAP sub-test.

>>> **T ASIC SGMAP** Return

Table 4–5 lists the ASIC diagnostic sub-tests.

Table 4–5 ASIC Diagnostic Sub-Tests

Sub-Tests	Description
INIT	Executes the INIT test
SGMAP	Executes the scatter/gather map register
?	Lists available sub-tests

Continued on next page

ASIC Diagnostic, Continued

Error Reporting Format

All reported errors contain a hexadecimal longword of data and FRU code to identify the failing FRU. The error reporting format is as follows:

```
>>> T ASIC
?? 001 ASIC XXXXXXXX
```

Table 4–6 describes the diagnostic error message and the FRU that needs to be replaced.

Table 4–6 ASIC Error Identification

FRU Code	Failing Test	Error Code	Replace
001	ASIC	Refer to Appendix B.	System module
002	ASIC	Refer to Appendix B.	I/O module

NVR Diagnostic

Overview

The NVR diagnostic ensures the integrity of the TOY/NVR controller located on the I/O module.

The NVR diagnostic tests will test 50 bytes of non-volatile RAM along with an NVR register test/initiation sequence.

The TOY testing verifies if the Time-Of-Year clock has been set. If it has been set, then the diagnostic verifies the operation of the clock. If no time has been set, then testing of all registers used by the Time-Of-Year clock will be executed.

The register test verifies that each TOY register is capable of holding all possible values.

Diagnostic testing will be performed when:

- Unit is powered-on
- Console mode is entered and NVR diagnostics selected

Fault isolation will be to the field replaceable unit (FRU).

Running NVR Diagnostics

To select and execute the NVR diagnostic and/or sub-tests, enter the following:

```
>>> T[EST] {device name} [sub-test] [Return]
```

Example

This example selects and executes the NVR diagnostic.

```
>>> T NVR [Return]
```

This example selects and executes the NVR diagnostic TOY sub-test.

```
>>> T NVR TOY [Return]
```

Continued on next page

Refer to Table 4–7 for a list of test NVR diagnostic sub-tests and their description.

Table 4–7 NVR Diagnostic Sub-tests

Sub-Tests	Description
TOY	Executes the following diagnostic tests: • Clock test • Assure clock is ticking test • Clock re-entry test
NVR	Executes the following diagnostic tests: • Check battery test • NVR register test
INTERRUPT	Executes the Interrupt diagnostic test
INIT	Executes the Init diagnostic test
?	Provides a list of available diagnostics

Continued on next page

NVR Diagnostic, Continued

Error Reporting

All reported errors contain a hexadecimal longword of data and FRU code to identify the failing FRU.

When the diagnostic encounters an error, the error reporting procedure format is as follows:

```
>>> T NVR
?? 002 NVR XXXXXXXX
```

Table 4–8 describes the diagnostic error message and the FRU that needs to be replaced.

Table 4–8 NVR Error Identification

FRU Code	Failing Test	Error Code	Replace
002	NVR	See Appendix B	I/O module

MEMORY Diagnostic

Overview

The MEMORY diagnostic detects address and data that is stuck at faults as well as performs ECC testing of memory.

The memory diagnostic is executed when:

- Power-on occurs
- Console mode is entered and the MEMORY diagnostic selected

During power-on, the MEMORY diagnostic:

- Checks the previous memory configuration
- Tests enough memory to load the secondary boot (APB.EXE for VMS)

All but the lowest 2 MB of memory will be exercised when run from console mode. 2 MB of memory is reserved and is tested by the SROM code before the console is loaded.

Fault isolation will be to the field replaceable unit (FRU).

Running Memory Diagnostics

To select and execute the MEMORY diagnostic and/or sub-tests, enter the following:

```
>>> T[EST] {device name} [sub-test] Return
```

Continued on next page

Examples

This example selects and executes the MEMORY diagnostic.

```
>>> T MEM Return
```

Results:

```
T-STS-MEM - Cell Test    00200000   <->  08000000
T-STS-MEM -      WR       AAAAAAAA   ADDR 07FFFFFC
T-STS-MEM -      FWD-RD  AAAAAAAA   WR   55555555  ADDR 07FFFFFC
T-STS-MEM -      REV-RD  55555555   WR   AAAAAAAA  ADDR 00200000
T-STS-MEM - ADDR Test    00200000   -->  08000000
T-STS-MEM -      WR DATA =  ADDR 07FFFFFC
T-STS-MEM -      RD DATA =  ADDR 07FFFFFC
T-STS-MEM - LLSC Test ADDR 00200000
T-STS-MEM - CLR  MEM  ADDR 00200000  -->  08000000
T-STS-MEM -      WR   00200000   ADDR  07FFFFFC
OK
>>>
```

This example selects and executes the MEMORY diagnostic sub-test CELL.

```
>>> T MEM CELL Return
```

This example shows the HELP command being executed.

```
>>> T MEM ? Return
```

```
Mem Self Test Routines:
 ?      - this help screen
 ALL    - perform all tests
 LLSC   - ldl_l/stl_c
 CELL   - memory cells
 ADDR   - address lines & refresh
 INIT   - zero all mem
Options:
 -l:xxxxxxxx, starting address
 -h:xxxxxxxx, ending address
 -n:xxx, number of retries (hex)
 -x[-] stop on err ON [OFF]
 -i[-] init mem after test ON [OFF]
```

Table 4–9 lists the MEMORY diagnostic sub-tests and their description.

Continued on next page

Table 4–9 Memory Diagnostic Sub-Tests

Sub-Tests	Test description
ALL	Performs all tests
CELL	Memory cell test
ADDR	Address lines test
LLSC	Load-locked/Store-conditional
INIT	Zero all memory
?	Provides a list of available diagnostics

Memory options are provided to modify any memory subtest. Default values are used when option inputs are invalid or exceed their ranges. Table 4–10 lists the memory options and their description.

Table 4–10 Memory Test Options

Option	Default	Description
-l:xxxxxxxx	002000000 (2Mb)	Lower address boundary
-h:xxxxxxxx	Top of memory	Upper address boundary
-n:xx	0	Number of retries[1]
-x[-]	On	Stops on an error condition when set to ON [OFF]
-i[-]	On	Initializes memory after tests ON [OFF]

[1]Must be a hexadecimal value

Continued on next page

Error Reporting

All reported errors contain a hexadecimal longword of data and FRU code to identify the failing memory SIMM.

When the diagnostic encounters an error, the error reporting procedure format is as follows:

```
>>> T MEM
  ?? 8XY MEM XXXXXXXX
```

Table 4–11 breaks down the memory error code.

Table 4–11 Memory Error Code Description

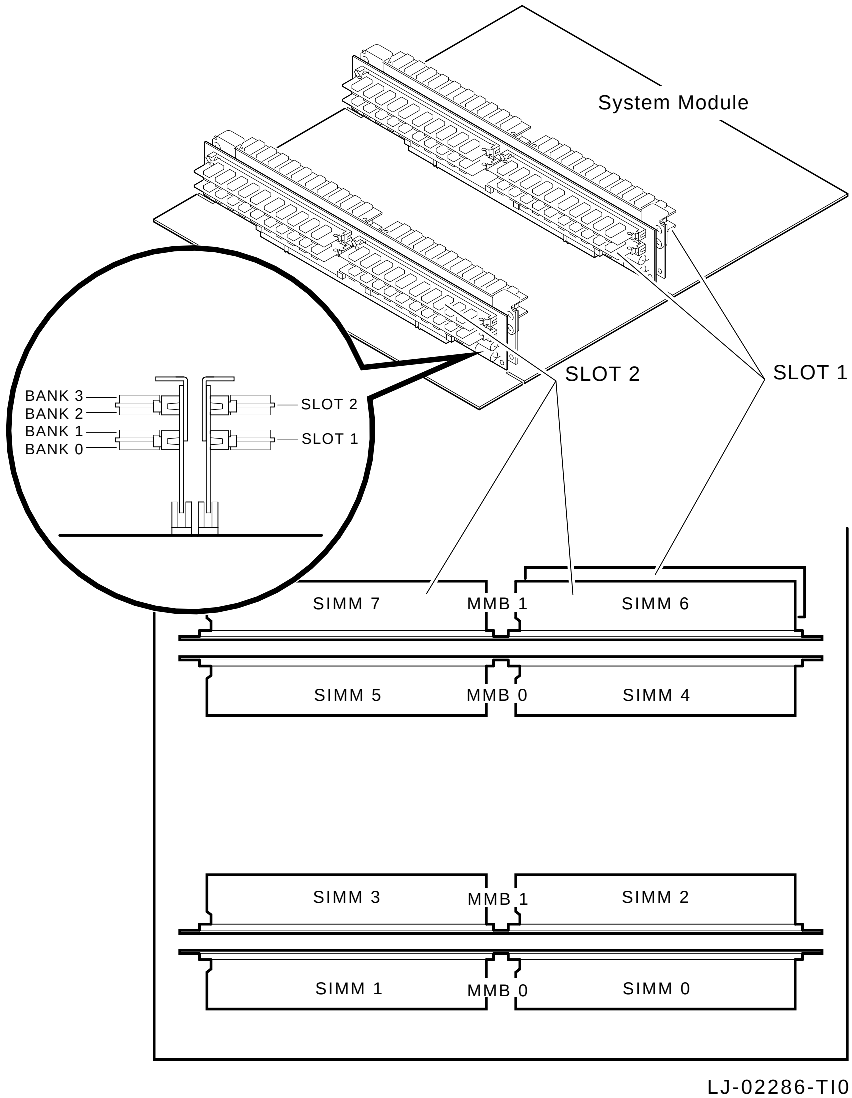
Error Reporting Value	Description
8	Extended error code prefix
x	Bank 0 to 3
y	SIMM 0 to 7 for data errors in only one SIMM SIMM 8 to B for data errors in both SIMMs, where:

Where	Description
8	SIMMs 0,1
9	SIMMs 2,3
A	SIMMs 4,5
B	SIMMs 6,7

Figure 4–1 shows the location of the SIMMs.

Continued on next page

Figure 4–1 MMB



SCSI Diagnostic

Overview

SCSI diagnostic testing verifies several areas of the SCSI subsystem including:

- SCSI controller chips
- Dual SCSI ASIC
- SCSI bus problems
- DMA path in physical and virtual modes

Testing can be performed:

- Upon power on
- In console mode

  Testing in console mode exercises the data paths between:

  – CPU and TURBOchannel interface
  – TURBOchannel interface and dual SCSI ASIC
  – Dual SCSI ASIC and SCSI controllers
  – SCSI controllers and SCSI bus

- In service mode

  Testing performed in service mode includes all testing performed in console mode with the addition of a map error test and minimal device test.

Utilities:

- Provide status information on SCSI devices
- Spin up an erase/format hard disks
- Erase/format floppy diskettes
- Execute disk verifier testing

All utilities require user interaction and will not be executed at power-on. See Chapter 5.

Continued on next page

Running SCSI Diagnostics

To select and execute the SCSI diagnostic and/or sub-tests, enter the following:

```
>>> T[EST] {device name} [sub-test] Return
```

Example

This example selects and executes the SCSI diagnostics.

```
>>> T SCSI Return
```

This example selects and executes the SCSI diagnostic REGISTER sub-test.

```
>>> T SCSI REGISTER Return
```

Refer to Table 4–12 for a list of diagnostic sub-tests.

Table 4–12 SCSI Diagnostic Sub-Tests

Sub-Test	Description	Mode
ASIC[1]	Test dual SCSI ASIC registers and two SCSI DMA buffers	Console
REGISTER[1]	Test both sets of SCSI controller registers (on SCSI A/B)	Console
INTERRUPT[1]	Test interrupt logic (SCSI A/B)	Console
TRANSFER	Test SCSI A/B bus data transfers	Console

[1]Does not require any devices to be present on either SCSI bus.

Console mode is DIAG_SECTION 1
Service mode is DIAG_SECTION 2

Continued on next page

Table 4–12 (Continued) SCSI Diagnostic Sub-Tests

Sub-Test	Description	Mode
MAP[2]	Test for map and parity errors	Service
DEVICE[3]	Test SCSI devices	Service
ERASE	Refer to Hard Disk Eraser Utility	–
FORMAT	Refer to Floppy Formatter Utility	–
VERIFY	Refer to Disk Verifier Utility	–
INIT	Initializes the drive	–
?	Lists all sub-tests	–

[2]Test will only be executed on the first device that responds to the TRANSFER test.

[3]Removable media drives *must* have media installed before testing. Tapes will be rewound and started from BOT.

Error Reporting Format

All reported errors contain a hexadecimal longword of data and a FRU code to identify the failing FRU. The error reporting format will be as follows:

```
>>> T SCSI
?? 001 SCSI XXXXXXXX
```

Table 4–13 describes the diagnostic error message and the FRU that needs to be replaced.

Continued on next page

Table 4–13 SCSI Error Identification

Identifies Test Failed	FRU Code	Failing Test	Error Code	Replace...
??	001	SCSI	See Appendix B	System module
??	002	SCSI	See Appendix B	I/O module
??	1xy	SCSI	See Appendix B	SCSI controller A
??	2xy	SCSI	See Appendix B	SCSI Controller B

NI Diagnostic

Overview

The NI diagnostic verifies that the LANCE chip is operational. The diagnostics also induces "forced errors" to ensure functionality.

When the unit is powered on, limited testing will be performed. Complete testing of the NI diagnostics should be performed under service mode.

Testing can be performed:

- Upon power-up
- In console mode
- In service mode

  Testing under service mode will provide a full complement of patterns rather than a single pattern. Additionally, the full addressing range will be tested for DMA read/write access.

Running NI Diagnostics

Before testing, a loopback connector (P/N 12-22196-01) *must* be connected to the NI port or the port must be directly connected to the network. Failure to do so will result in an external loopback failure.

To select and execute the NI diagnostic and/or sub-tests, enter the following:

>>> **T[EST] {device name} [sub-test]** Return

Example

This example selects and executes the NI diagnostic.

>>> **T NI** Return

This example selects and executes the NI diagnostic NAR sub-test.

>>> **T NI NAR** Return

Continued on next page

Refer to Table 4–14 for a list of diagnostic sub-tests.

Table 4–14 NI Diagnostic Sub-Tests

Sub-Test	Description
NAR	Network address ROM test
REGISTER	LANCE register test
DMA_INIT	Initialize LANCE and test DMA logic test
ILPBK	Internal loopback and DMA test
INTERRUPT	Interrupt test
EXT_LPBK	External loopback test
CRC[1]	Test internal loopback with CRC check
RX_MISS_BUFF[1]	Test internal loopback with MISS error
COLLISION[1]	Test internal loopback with collision
FILTER[1]	Test internal loopback with address filter checking
TX_BUFF[1]	Test internal loopback with transmit buffer error
Init	Initializes the NI port
?	Lists all the sub-tests.

[1]Diagnostic can only be executed in service mode, DIAG_SECTION 2.

Error Reporting

All reported errors contain a hexadecimal longword of data and FRU code to identify the failing FRU.

Continued on next page

Error Reporting (continued)

When the diagnostic encounters an error, the error reporting procedure format is as follows:

```
>>> T NI
?? 001 NI XXXXXXXX
```

Table 4–15 NI Error Identification

Identifies Test Failed	FRU Code	Failing Test	Error Code	Replace
??	002	NI	See Chapter 6 and Appendix B for more information.	I/O module

Examples

This example shows the results of pulling off the Ethernet loopback connector after the system is already up and running.

```
>>>  T NI   Return
```

Results:

```
T-STS-NI - Net  ADDR ROM Test
T-STS-NI - Lance Reg Test
T-STS-NI - Init Test
T-STS-NI - Int Lpbk and DMA Test
T-STS-NI - Int Test
T-STS-NI - Ext Lpbk Test
?  T -ERR-NI   - Ext Lpbk Test
?  T -ERR-NI   - ERR = ac
??000          NI  0x00f2
84 Fail
>>>
```

Continued on next page

This example shows the results of when the loopback connector is reinstalled and the unit is powered up.

```
>>>  T NI   [Return]
```

Results:

```
T-STS-NI - Net  ADDR ROM Test
T-STS-NI - Lance Reg Test
T-STS-NI - Init Test
T-STS-NI - Int Lpbk and DMA Test
T-STS-NI - Int Test
T-STS-NI - Ext Lpbk Test
OK
>>>
```

SCC Diagnostic

Overview

The Serial Communication Controller (SCC) diagnostic will test the functionality of:

- Data path to the SCC
- Ability to operate in asynchronous mode
- Data path from the SCC to the connectors

  A serial line loopback (P/N 12-25083-01) will be needed for the printer and a modem port loopback (P/N 29-24795-01) for the modem port.
- Printer and communication ports using DMA transfers

The diagnostic will only test the SCC chips in asynchronous mode.

The diagnostic may be executed:

- Upon power-up (If server, set console command SET SERVER).
- In console mode
- In service mode

Running SCC Diagnostics

To select and execute the SCC diagnostic and/or sub-tests, enter the following:

>>> **T[EST] {device name} [sub-test]** Return

Example

This example selects and executes the SCC diagnostic.

>>> **T SCC** Return

This example selects and executes the SCC diagnostic sub-test LK401.

>>> **T SCC LK401** Return

Continued on next page

Table 4–16 lists the diagnostic sub-tests.

Table 4–16 SCC Diagnostic Sub-Tests

Sub-Tests	Description
INIT	Perform a reset on both SCC controllers
POLLED	Test SCC controllers using polled I/O
INTERRUPT	Test SCC controllers using interrupt driven I/O
DMA	Test SCC controllers using DMA transfers
LK401	Test for presence of a keyboard
MOUSE	Test for presence of a mouse
MODEM[1]	Test modem control signals
?	Lists the sub-tests.

[1]Requires modem loopback (P/N 29-24795). Testing in service mode, DIAG_SECTION 2.

Continued on next page

Error Reporting

All reported errors contain a hexadecimal longword of data and a FRU code to identify the failing FRU.

When the diagnostic encounters an error, the error reporting procedure format will be as follows:

```
>>> T SCC
?? 003 SCC  XXXXXXXX
```

Table 4–17 describes the diagnostic error message and the FRU that needs to be replaced.

Table 4–17 SCC Error Identification

Identifies Test Failed	FRU Code	Failing Test	Error Code	Replace
??	002	SCC	See Appendix B	I/O module
??	003	SCC	See Appendix B	Keyboard
??	004	SCC	See Appendix B	Mouse

ISDN Diagnostic

Overview

NOTE
The ISDN port is not presently accessible.

The ISDN diagnostic will ensure that the 79C30A chip is fully functional by testing the following:

- 79C30A internal registers
- Generate, verify, and disable interrupts
- Internal digital analog loopback
- Tone output
- DMA

The selftest may be executed:

- Upon power-up
- In console mode
- In service mode

Running ISDN Diagnostics

To select and execute the ISDN diagnostic and/or sub-tests, enter the following:

>>> **T[EST] {device name} [sub-test]** Return

Example

This example selects and executes the ISDN diagnostic.

>>> **T ISDN** Return

This example selects and executes the ISDN diagnostic REGISTER sub-test.

>>> **T ISDN REGISTER** Return

Continued on next page

Table 4–18 lists the diagnostic sub-tests.

Table 4–18 ISDN Diagnostic Sub-Tests

Sub-Test	Description	Mode
INIT	Initialize	Console
REG	Internal registers test	Console
TONE[1]	Audio output	Service
D_LOOP	Internal digital audio loopback	Service
A_LOOP	Analog loopback	Console
INT	Interrupt test	Console
DMA	DMA	Console
LOGO[1]	DEC audio logo	Power up
RECORD[1]	Record	Service
PLAYBACK[1]	Playback of recorded message	Service
REPEAT[1]	Playback of recorded message	Service
?	List subtests	

[1]Requires headset to perform diagnostics.

Continued on next page

Error Reporting

All reported errors contain a hexadecimal longword of data and a FRU code to identify the failing FRU.

When the diagnostic encounters an error, the error reporting procedure format is as follows:

```
>>> T ISDN
  ?? 002 ISDN XXXXXXXX
```

Table 4–19 ISDN Error Identification

Identifies Test Failed	FRU Code	Failing Test	Error Code	Replace
??	002	ISDN	See Appendix B.	I/O module

TURBOchannel Testing

Caution

Double width TURBOchannel options should always be installed in slots 0 and 1. Attempting to install a double width option into slot 2 could cause both permanent damage to the option and intermittent operation.

MIPS Emulator Overview

The MIPS emulator performs the following tasks on a TURBOchannel option:

- Performs diagnostic testing on a TURBOchannel option
- Initializes a TURBOchannel option
- Displays configuration on a TURBOchannel option
- Runs the console on a TURBOchannel graphics option
- Boots the operating system using a TURBOchannel option

The device name for a TURBOchannel option will be "TC#".

```
TC   =  TURBOchannel option
#    =  TURBOchannel slot number
```

A TURBOchannel option located in slot 2 will have a device name of TC2.

Before You Begin

Before testing, perform the following:

Step	Action	Description
1	Enter console command	See Entering Console Mode
2	Enter the following at the console prompt: >>> **SHOW CONFIG**	Displays TURBOchannel device names. Identifies and records TURBOchannel device names that you want to test (for example, TC2).

Continued on next page

Step	Action	Description
3	Enter the following at the console prompt: >>>**T[EST] {device_ name} ls**	Lists available TC scripts. If an asterisk (*****) is at the end of a script, then this indicates an object script and will fail if selected.

Obtaining Script Listing

If an asterisk (*****) is at the end of a script, then this indicates a object script and will fail if selected. Object scripts are not executable. To obtain a listing of diagnostic test scripts, enter the following:

```
>>> T [device_name] [ls] Return
```

Example

This example obtains a script listing.

```
>>> T TC1 ls Return
```

Running Default Test Scripts

The following command executes the pst-t test script, which executes a string of diagnostic test scripts. If the pst-t script is not available, then the test command will fail. If failure occurs, then enter the following:

```
>>>  T [dev_name] ls Return
```

This will list available scripts. If an asterisk (*) is at the end of a script, then this indicates an object script. Object scripts are not executable. See *Running Single Diagnostic Test Scripts* to execute test scripts.

```
>>> T[EST] [device_name] Return
```

Continued on next page

Example

This example executes the default test scripts.

```
>>> T TC1 Return
```

Running Single Test Scripts

To execute diagnostic test scripts, enter the following:

```
>>> T [dev_name] {test_name} Return
```

Example

This example executes a single test script.

```
>>>  T TC1 pst-m Return
```

Initializing a TURBOchannel Option

To initialize a selected TURBOchannel option, enter the following:

```
>>> T [device_name] INIT   Return
```

Example

This example initializes TURBOchannel option 1.

```
>>> T TC1 INIT Return
```

Additional Commands

Listed below are additional commands that will support the TEST command:

Command	Description
T [dev_name] [cnfg]	Displays configuration on TC option slot
T [dev_name] [init]	Initializes option in TC slot
T [dev_name] [initc]	Initializes console device
T [dev_name] [putc]	Outputs a character
T [dev_name] [cat scriptname]	Lists contents of a script

Chapter 5
Utilities

Overview

Chapter Overview

The following topics are contained in this chapter:

- SCSI Utility Listing
- Show Device Utility
- Hard Disk Eraser Utility
- Floppy Formatter Utility
- Disk Verifier Utility

SCSI Utility Listing

Utility Listing

Table 5–1 describes the SCSI utilities.

Table 5–1 SCSI Utility Options

Utility Name	Description
SHOW DEV	Displays SCSI device information
FORMAT	Formats a floppy

Show Device Utility

Overview

The Show Device Utility displays information about all SCSI devices attached to the SCSI bus.

The following information will be obtained when the Show Device Utility is issued:

- Inquiry command to obtain device types and device names
- Spin up disks
- Device capacity of disks
- Write protection information
- Print information:

  ID, controller, Logical Unit Number (LUN)
  VMS device name
  Device type
  Device capacity
  Removable or fixed media
  Write protection information
  Device name
  Firmware revision

Format

To obtain information about devices attached to the SCSI bus, enter the following:

>>> **SHOW DEV** Return

Continued on next page

Example

This is an example of the results caused by executing the SHOW DEV command.

```
>>> SHOW DEV [Return]
```

Result:

```
BOOTDEV   ADDR  DEVTYPE  NUMBYTES  RM/FX  DEVNAM  REV
ESA0      08-00-2B-1A-38-26
DKA0      A/0/0  DISK    426.25MB  FX     RZ25    0700
DKA100    A/1/0  DISK    426.25MB  FX     RZ25    0700
..HostID A/6     INITR
..HostID B/6     INITR
>>>
```

Hard Disk Eraser Utility

Overview

The Hard Disk Eraser Utility spins up and erases a hard disk.

Format

To erase a hard disk, enter the following command and answer the questions that will appear:

>>> T[EST] SCSI ERASE Return

Warning

Make sure that the customer has backed up all their data. Once this command is issued, all customer data will be destroyed. **No verification is requested.**

Continued on next page

Example

This example erases data on the device DKA100. See Table 5–2 for an explanation of the diagnostic prompts.

```
>>> T SCSI ERASE [Return]

SCSI_bus(A,B)>>>A
SCSI_id(0-7)>>>1
SCSI_lun(0-7)>>>0

SCSI HD_DSK_ERAS_UTIL
DKA100 OK?  OK

SCSI-bb-repl 0
SCSI-util_succ

OK
>>>
```

Table 5–2 Erase Utility Prompts

Utility Prompts With...	Action
SCSI_bus(A,B)>>>	Select SCSI bus (A = internal, B = external)
SCSI_id(0-7)>>>	Select SCSI ID number <07:00>
SCSI_lun(0-7)>>>	Select logical unit number <07:00>
DKA100 OK?	Prompts user to verify if device is correct

Error Reporting

See Appendix B.

Floppy Formatter Utility

Overview

The Floppy Formatter Utility formats a floppy diskette. Once the utility has begun, do not terminate the utility or halt the machine. This action will corrupt the device being tested, and the formatter will have to be performed again.

Format

To format a floppy diskette, enter the following and answer the questions that will appear:

```
>>> T[EST] SCSI FORMAT [Return]
```

Warning

Make sure that the customer has backed up all their data. Once this command is issued, all customer data will be destroyed.

Continued on next page

Example

This example formats the device DKA100. See Table 5–3 for an explanation of diagnostic prompts.

```
>>> T SCSI FORMAT [Return]
SCSI_bus(A,B)>>>A
SCSI_id(0-7)>>>1
SCSI_lun(0-7)>>>0
```

Table 5–3 Floppy Utility Prompts

Utility Prompts With...	Action
SCSI_bus(A,B)>>>	Select SCSI bus (A = internal, B = external)
SCSI_id(0-7)>>>	Select SCSI ID number <07:00>
SCSI_lun(0-7)>>>	Select logical unit number <07:00>

Error Reporting

See Appendix B.

Disk Verifier Utility

Overview

The Disk Verifier Utility verifies that all blocks on a disk can be read.

Format

To verify a disk, enter the following command and answer the questions that will appear:

```
>>> T[EST] SCSI VERIFY [Return]
```

Continued on next page

Example

This example verifies the device DKA100. See Table 5–4 for an explanation of the diagnostic prompts.

```
>>> T SCSI VERIFY [Return]
SCSI_bus(A,B)>>>A
SCSI_id(0-7)>>>1
SCSI_lun(0-7)>>>0
SCSI_DSK_VER_UTIL
SCSI-util_succ
OK
>>>
```

Table 5–4 Verify Utility Prompts

Utility Prompts With...	Action
SCSI_bus(A,B)>>>	Select SCSI bus (A = internal, B = external)
SCSI_id(0-7)>>>	Select SCSI ID number <07:00>
SCSI_lun(0-7)>>>	Select logical unit number <07:00>

Error Reporting

See Appendix B.

Chapter 6 Troubleshooting

Overview

Chapter Overview

This chapter contains the following topics:

- LED codes
- Troubleshooting tables:

  System problems
  Monitor problems
  Mouse/tablet problems
  Keyboard problems
  Drive problems
  Network problems
  Audio problems

Introduction

The troubleshooting techniques described in this section neither identify all possible problems with the system, nor do the suggested corrective actions remedy all problems.

Loopbacks are supplied with each DEC 3000 Model 400/400S AXP system and should be used when executing diagnostics.

Before You Start

Before performing any procedures, check cables, terminators, cable connection, loopbacks and proper termination. Replace the most probable FRU as reported by diagnostics. Refer to Chapter 4.

LED Codes

Serial ROM LED Codes

The LED codes described in this section identify diagnostics that are executed when the unit is first powered-on. If an error occurs before the system enters the console program, then the failed test will be displayed as a hexadecimal error.

Use the diagnostic LEDs to help diagnose problems when the system is unable to set up the console.

This portion of the testing is not displayed on the monitor.

Use Table 6–1 and then perform the specified steps in Table 6–2 to isolate the failed FRU.

Continued on next page

Table 6–1 Serial ROM LED Codes

LED Code	HEX Code	First Try...	Then Replace FRU...	Finally Replace...
●●●●●●●●	ff	2	3	—
●●●●●●●○	fe	2	3	—
●●●●●●○●	fd	2	3	—
●●●●●●○○	fc	2	3	—
●●●●●○●●	fb	Informational only, will never stop here.		
●●●●●○●○	fa	2	5	3
●●●●●○○●	f9	2	5	3
●●●●●○○○	f8	2	5	3
●●●●○●●●	f7	2	5	3
●●●●○●●○	f6	Informational only, will never stop here.		
●●●●○●○●	f5	Informational only, will never stop here.		
●●●●○●○○	f4	1	4	—
●●●●○○●●	f3	Informational only, will never stop here.		
●●●●○○●○	f2	1	4	—
●●●●○○○●	f1	Informational only, will never stop here.		
●●●●○○○○	f0	1	4	—
○○●○○○○○	20	2	5	—

Continued on next page

Table 6–2 Serial ROM LED Codes Action Table

Step	Action
1	Ensure that a good connection is made between the system module and I/O module.
2	Ensure that all memory SIMMs are properly installed, it may be necessary to reseat memory SIMMs.
3	Replace system module.
4	Replace I/O module.
5	Replace MMB/SIMMs.

Refer to Figure B–1 for instructions on reading code for the display.

ASIC LED Codes

The following LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

If the system enters the console program, then execute ASIC diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–3 and then perform the specified steps in Table 6–4 to isolate the failed FRU.

All values are in hexadecimal.

Continued on next page

Table 6–3 ASIC LED Codes

LED Code	HEX Code	First Try...	Then Replace...	Finally Replace...
○○●●○○○○	30	1	2	3[1]
○○●●○○○●	31	1	2	3[1]
○○●●○○●○	32	1	2	3[1]
○○●●○○●●	33	1	2	3[1]
○○●●○●○○	34	1	2	3[1]
○○●●○●○●	35	1	2	3[1]
○○●●○●●○	36	1	2	3[1]
○○●●○●●●	37	1	2	3[1]
○○●●●○○○	38	1	2	3[1]
○○●●●○○●	39	1	2	3[1]

[1]If replacing the I/O module fixes the system, then try reinstalling the original system module.

Table 6–4 ASIC LED Codes Action Table

Step	Action
1	Reseat I/O module.
2	Replace I/O module.
3	Replace system module.

Memory LED Codes

The Memory LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

Continued on next page

If the system enters the console program, then execute the MEMORY diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4

If the unit does not enter the console program (>>>) displayed on the monitor or DD is displayed on the LEDs, then replace the failing SIMM.

All values are in hexadecimal.

LED Code	HEX Code	Description
○○●○○○○○	20	Machine Check
○○●○○○○●	21	CELL Fill mem with test pattern data
○○●○○○●○	22	CELL Forward Rd/Compare /Complement/Wr
○○●○○○●●	23	CELL Reverse Rd/Compare /Complement/Wr
○○●○○●○○	24	ADDR Fill mem with addresses as data
○○●○○●○●	25	ADDR Read/Compare data = address
○○●○○●●○	26	Reserved
○○●○○●●●	27	Reserved
○○●○●○○○	28	Reserved
○○●○●○○●	29	Reserved
○○●○●○●○	2a	Reserved
○○●○●○●●	2b	LLSC load-locked/store-conditional tests
○○●○●●○○	2c	BCTP Bcache Tag Parity detection
○○●○●●○●	2d	ECC detection
○○●○●●●○	2e	Reserved
○○●○●●●●	2f	Clear memory to zeroes

NVR LED Codes

The NVR LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

Continued on next page

LED Codes, Continued

If the system enters the console program, then execute NVR diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–5 and then perform the specified steps in Table 6–6 to isolate the failed FRU.

All values are in hexadecimal.

Table 6–5 NVR LED Codes

LED Code	HEX Code	First try	Then Replace
○○●●●○●○	3A	1	2
○○●●●○●●	3B	1	2
○○●●●●○○	3C	1	2
○○●●●●○●	3D	1	2
○○●●●●●○	3E	1	2

Table 6–6 NVR LED Codes Action Table

Step	Action
1	Reseat I/O module.
2	Replace I/O module.

Continued on next page

LED Codes, Continued

SCC LED Codes

The SCC LED codes represent continued power on and extended self test testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

If the system enters the console program, then execute SCC diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–7 and then perform the specified steps in Table 6–8 to isolate the failed FRU.

NOTE

If a DEC 3000 Model 400S AXP server is the unit being tested, then the console command SERVER is required to be set to 1 (SET SERVER 1).

All values are in hexadecimal.

Table 6–7 SCC LED Codes

LED Code	Hex Code	First Try...	Then Replace...	Finally Replace...
○●○○○○○○	40	Informational Only — will never stop here.		
○●○○○○○●	41	Informational Only — will never stop here.		
○●○○○○●○	42	1	5	—
○●○○○○●●	43	2	5	—
○●○○○●○○	44	1	5	—
○●○○○●○●	45	1	5	—
○●○○○●●○	46	1	5	—

Continued on next page

Table 6–7 (Continued) SCC LED Codes

LED Code	Hex Code	First Try...	Then Replace...	Finally Replace...
○●○○○●●●	47	4	7	5[1]
○●○○●○○○	48	3	6	5[1]
○●○○●○○●	49	Reserved	—	—
○●○○●○●○	4A	Reserved	—	—
○●○○●○●●	4B	Reserved	—	—
○●○○●●○○	4C	Reserved	—	—
○●○○●●○●	4D	Reserved	—	—
○●○○●●●○	4E	Reserved	—	—
○●○○●●●●	4f	Informational Only — will never stop here.		

[1]If replacing the I/O module fixes the system, then try reinstalling the original keyboard.

Table 6–8 SCC LED Codes Action Table

Step	Action
1	Reseat I/O module.
2	Reseat modem loopback (only in service mode).
3	Reseat mouse connection.
4	Reseat keyboard connection.
5	Replace I/O module.
6	Replace mouse.
7	Replace keyboard.

Continued on next page

LED Codes, Continued

NI LED Codes

The NI LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

If the system enters the console program, then execute NI diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–9 and then perform the specified steps in Table 6–10 to isolate the failed FRU.

All values are in hexadecimal.

Table 6–9 NI LED Codes

LED Code	HEX Code	First Try...	Then Replace...
○●○●○○○●	50	1	2
○●○●○○●○	51	1	2
○●○●○○●○	52	1	2
○●○● ○○●●	53	1	2
○●○●○●○○	54	1	2
○●○●○●○●	55	1	2
○●○●○●●○	56	1	2
○●○●○●●●	57	1	2
○●○●●○○○	58	1	2
○●○●●○○●	59	1	2

Continued on next page

Table 6–9 (Continued) NI LED Codes

LED Code	HEX Code	First Try...	Then Replace...
○●○●●○●○	5A	1	2
○●○●●○●●	5B	1	2
○●○●●●○○	5C	1	2
○●○●●●○●	5D	1	2
○●○●●●●○	5E	1	2
○●○●●●●●	5F	1	2

Table 6–10 NI LED Codes Action Table

Step	Action
1	Reseat I/O module and system module.
2	Replace I/O module.

ISDN LED Codes

The ISDN LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

If the system enters the console program, then execute ISDN diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–11 and then perform the specified steps in Table 6–12 to isolate the failed FRU.

Continued on next page

NOTE

Ensure loopback is installed.

All values are in hexadecimal.

Table 6–11 ISDN LED Codes

LED Code	HEX Code	First Try...	Then Replace...
○●●●○○○○	70	1	2
○●●●○○○●	71	1	2
○●●●○○●○	72	1	2
○●●●○○●●	73	1	2
○●●●○●○○	74	1	2
○●●●○●○●	75	1	2

Table 6–12 ISDN LED Codes Action Table

Step	Action
1	Reseat I/O module.
2	Replace I/O module.

SCSI LED Codes

The SCSI LED codes represent continued power on testing. If an error occurs during this testing sequence, then a hexadecimal code will be displayed along with FRU and error code information on the monitor.

If the system enters the console program, then execute SCSI diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Appendix B

Continued on next page

LED Codes, Continued

If the unit does not enter the console program (>>>) or if DD is displayed on the LEDs, then use Table 6–13 and then perform the specified steps in Table 6–14 to isolate the failed FRU.

All values are in hexadecimal.

Table 6–13 SCSI LED Codes

LED Code	HEX Code	First Try...	Then Replace...
○●●○○○○○	60	1	2
○●●○○○○●	61	1	2
○●●○○○●○	62	1	2
○●●○○○●●	63	1, then 3	2, then 4
○●●○○●○○	64	1, then 3	2, then 4
○●●○○●○●	65	1, then 3	2, 4, then 5
○●●○○●●○	66	Reserved for future use	–
○●●○○●●●	67	Reserved for future use	–
○●●○●○○○	68	Reserved for future use	–
○●●○●○○●	69	Reserved for future use	–
○●●○●○●○	6A	Reserved for future use	–
○●●○●○●●	6B	Reserved for future use	–
○●●○●●○○	6C	Reserved for future use	–
○●●○●●○●	6D	Reserved for future use	–

Continued on next page

Table 6–13 (Continued) SCSI LED Codes

LED Code	HEX Code	First Try...	Then Replace...
○●●○●●●○	6E	Reserved for future use	–
○●●○●●●●	6F	Reserved for future use	–

Table 6–14 SCSI LED Codes Action Table

Step	Action
1	Reseat I/O module and system module.
2	Replace I/O module.
3	Check SCSI cables and SCSI ID.
4	Replace the drive.
5	All removable disk devices must have media installed.

Console LED Codes

The last testing sequence before entering the console program now begins. If this is successful, then the LEDs should display DD for console entry.

If the unit does not enter the console program, then use Table 6–15 and then perform the specified steps in Table 6–16 to isolate the failed FRU.

No information will be displayed other than the console (>>>) prompt to indicate that the console program has been entered.

All values are in hexadecimal.

Continued on next page

Table 6–15 Console LED Codes

LED Code	HEX Code	First Replace...	Then Replace...
●●●○●●●●	EF	Informational Only — will never stop here.	
●●●○●●●○	EE	Informational Only — will never stop here.	
●●●○●●○●	ED	Informational Only — will never stop here.	
●●●○●●○○	EC	1	2
●●●○●○●●	EB	1	2
●●●○●○●○	EA	1	2
●●●○●○○●	E9	1	2
●●●○●○○○	E8	1	2
●●●○○●●●	E7	1	2
●●●○○●●○	E6	1	2
●●●○○●○●	E5	1	2
●●●○○●○○	E4	1	2
●●●○○○●●	E3	1	2
●●●○○○●○	E2	1	2
●●●○○○○●	E1	1	2
●●●○○○○○	E0	Informational Only — will never stop here.	
●●○●●●●●	DF	1	2
●●○●●●●○	DE	1	2
●●○●●●○●	DD	Console entry >>>	–
○○○○○○○○	00	Console is about to be exited	–

Continued on next page

Table 6–16 Console LED Codes Action Table

Step	Action
1	Replace I/O module.
2	Replace system module.

84 Fail

Overview

84 Fail is a general purpose failure message that is generated under two conditions:

- Using the TEST command

  When an 84 code failure occurs, diagnostic error code information will also be displayed. Disregard the 84 Fail message and rely on the error code information that will be provided.

- Using the BOOT command

  When an 84 code failure occurs during a BOOT command, the probable cause for the failure is:

  - BOOT device is not present
  - BOOT device is present but there is no media
  - BOOT block is not found on the media

Troubleshooting Tables

Overview

The following tables contain corrective actions to problems that may be encountered during troubleshooting a damaged or failed unit. The tables are divided into categories for easier identification.

System Problems

Table 6–17 lists the symptoms, possible causes, and corrective actions during troubleshooting a damaged or failed unit.

Table 6–17 Troubleshooting

Symptom	Possible Cause	Corrective Action
DC OK LED is off.	Defective power supply.	Replace the power supply.
No LEDs are displayed.	Possible bad I/O module/cable or system module.	Reseat the I/O module. Then replace the I/O module. Finally, replace the system module. See Chapter 7 for location and procedure.
Power-on display does not display and the LEDs display F0.	SROM jumper setting incorrect.	See Chapter 2 for setting and location.
Power-on display does not display and the LEDs display DD.	Monitor is not turned on.	Turn on the monitor.
	Monitor brightness and contrast controls are too dark to see the screen display.	Adjust the monitor brightness and contrast controls.

Continued on next page

Table 6–17 (Continued) Troubleshooting

Symptom	Possible Cause	Corrective Action
	Loose or broken cable.	Check the monitor cable/video connections.
	Monitor fuse is blown.	See the monitor guide for fuse replacement instructions.
	Check that the alternate console switch is in the correct position.	If the console is connected to an alternate console port, then make sure the alternate console switch is set for the alternate console position (down). If the console is connected through a graphics option, then make sure that the alternate console switch is set to the graphic position (up).
System does not boot after power-on.	Software is not installed.	Install the system software. Refer to the software documentation for installation instructions.

Continued on next page

Table 6–17 (Continued) Troubleshooting

Symptom	Possible Cause	Corrective Action
	Default recovery action is set to halt.	In console mode (>>>), perform the SHOW AUTO_ACTION command for proper setting. Modify using the SET AUTO_ACTION command. See Chapter 3 for further information.
	Incorrect boot device was specified.	In console mode (>>>), perform the SHOW BOOTDEF_DEV command for proper setting. Modify using the SET BOOTDEF_DEV command.
	Boot device is not properly configured.	Do the SHOW DEVICE command and check to see that all devices are configured properly. If they are not, then check IDs and cables.
	Faulty boot device.	Run diagnostic /utilities for faulty devices. See Chapter 4.

Continued on next page

Monitor Problems

If the corrective actions listed in Table 6–18 do not correct the problem, then check all cable connections. If connections are correct, then it will be necessary to check the graphics option by executing the T TCx command.

Table 6–18 Monitor Problems

Symptoms	Possible Cause	Corrective Action
There is no monitor display.	Alternate console is enabled.	Check that the alternate console switch setting is in the up position.
The monitor screen is unstable.	Monitor needs alignment.	Refer to the monitor reference material for adjustment procedures.

Mouse Problems

If the corrective actions listed in Table 6–19 do not correct the problem, then check all cable connections. If cable connections are correct, then it will be necessary to execute the SCC diagnostics. See Chapter 4 for further information.

Continued on next page

Table 6–19 Mouse Problems

Symptom	Possible Cause	Corrective Action
System boots but mouse or optional tablet pointer does not appear on the screen, or monitor does not respond to pointing device commands.	Pointing device cable is installed incorrectly or is loose.	Shut down the system. Reseat the cable. Reboot the system. Connect the mouse cable to the mouse/keyboard cable and make sure that the cable is connected to the workstation.
	The system is halted; no pointer appears on the screen.	If in console mode (>>>), then boot the system.
Pointer does not appear on screen or does not respond.	Pointer mode is disabled.	Press Ctrl F3 to enable pointer.

Keyboard Problems

If the corrective actions listed in Table 6–20 do not correct the problem, then check all cable connections. If the connections are correct, then it will be necessary to execute the SCC diagnostics. See Chapter 4 for further information.

Table 6–20 Keyboard Problems

Symptom	Possible Cause	Corrective Action
Keys do not work.	Hold Screen key is active. Hold screen light is on.	Press the Hold Screen key to release hold on the screen.

Continued on next page

Table 6–20 (Continued) Keyboard Problems

Symptom	Possible Cause	Corrective Action
	The keyboard cable is loose or not connected.	Check the keyboard cable at both ends.
The system boots but the mouse or optional tablet pointer does not appear on the screen, or monitor does not respond to pointing device commands.	Pointing device cable is installed incorrectly or is loose.	Shut down the system. Reseat the cable. Reboot the system. Connect the mouse cable to the mouse/keyboard cable and make sure that the cable is connected to the workstation.

Drive Problems

If the corrective actions listed in Table 6–21 do not correct the problem, then check all the cable connections. If the connections are correct, then it will be necessary to execute the SCSI diagnostics or utilities to isolate a media problem. See Chapter 4 for further information.

NOTE

Before running diagnostics, terminate the SCSI B. This will eliminate any external problems.

Continued on next page

Table 6–21 Drive Problems

Symptom	Possible Cause	Corrective Action
Drive does not work.	Two SCSI identifiers are set to the same ID number.	Issue the SHOW DEVICE command while in the console mode. Reset the SCSI IDs to a unique number.
	The cables could be loose.	Check to make sure that all cables are connected.
	The drive could be defective.	Run diagnostics to isolate the fault. Replace the FRU.
	Check if cables are terminated properly.	Check if the last device is terminated.

Network Problems

If the corrective actions listed in Table 6–22 do not correct the problem, then it will be necessary to execute the ASIC, and NI diagnostics while in service mode (for extended testing capabilities). See Chapter 4.

Table 6–22 Network Problems

Symptom	Possible Cause	Corrective Action
NI error message is displayed when verifying Ethernet.	No Thickwire /10Base-T terminator or cable was installed.	Attach appropriate terminator.

Continued on next page

Table 6–22 (Continued) Network Problems

Symptom	Possible Cause	Corrective Action
	Cable connection is loose.	Check that all connections on the Ethernet segment are secure.
Cannot boot from the network.	There could be a local network problem.	The problem is most likely caused by the customer server system or the network.
	There could be a defective NI interface.	Run diagnostics (TEST NI command) with terminators attached. Replace faulty FRU if test fails.

Audio Problems

To isolate audio problems, it will be necessary to execute the ISDN diagnostics while in service mode (for extended testing capabilities). See Chapter 4.

Console Secure Problems

Refer to Chapter 2 for procedures to:

- Enable console security
- Reset console password
- Enter the privileged state

Continued on next page

Firmware Upgrade

If you have encountered problems trying to upgrade the flash EEPROMs, refer to Table 6–23 in isolating the problem.

Table 6–23 Firmware Upgrade Problems

Symptom	Possible Cause	Corrective Action
Unable to perform the upgrade.	ROM update jumpers on the I/O module is not set to the on position.	See Appendix A.

Chapter 7
Removal and Replacement

Overview

Chapter Overview

This chapter contains the following topics:

- Using the exploded view
- Cable routing
- BA47X-AA vertical floor stand
- Workstation cover
- Fixed media
- Removable media
- Drive shelf
- TURBOchannel option
- SIMMs
- I/O board
- System board
- Power supply

Caution

Always follow antistatic procedures when handling drives and other static-sensitive items.

Before You Start

Before removing or replacing defective parts, either you or your customer should prepare the system by doing the following:

1. If the DEC 3000 Model 400/400S AXP system is in a working condition, then have the customer back up all of their data files.

Continued on next page

2. Have the customer shut down their software.
3. Record your present system configuration. Refer to the SHOW CONFIG command for the procedure.
4. Record environmental values

After you have completed these procedures, power down the system and start the removal/replacement procedure.

Antistatic Precautions

Anytime a module is replaced in the DEC 3000 Model 400/400S AXP system workstation, antistatic precautions should be taken. To use the antistatic mat, perform the following:

Step	Action
1	Place the elastic end of the antistatic wrist strap on your wrist.
2	Attach the alligator clip to the power supply of the DEC 3000 Model 400/400S AXP system.
3	Proceed with removing the part or module that you will remove or replace.

Using the Exploded View

How to Use the Exploded View

To locate a particular FRU:

1. See Table 7–1 to identify the FRU name and its associated reference number.
2. Go to Figure 7–1 and find the location of the FRU by the FRU reference number identified in Table 7–1.
3. Refer to the particular removal procedure within the chapter for information to remove that FRU.

Continued on next page

FRU Table

Use Table 7–1 in conjunction with Figure 7–1 to locate the FRUs.

Table 7–1 FRU Table

FRU	Refer to Figure 7–1
Compact disc or removable media (optional)	❶
Drive bracket	❷
Fixed disk drives	❸
Drive shelf	❹
TURBOchannel option (Slot 0 shown)	❺
I/O board	❻
MMBs with SIMMs installed	❼
System module	❽
Power supply	❾
Chassis	❿

Figure 7–1 shows the assembly front view of the DEC 3000 Model 400/400S AXP system.

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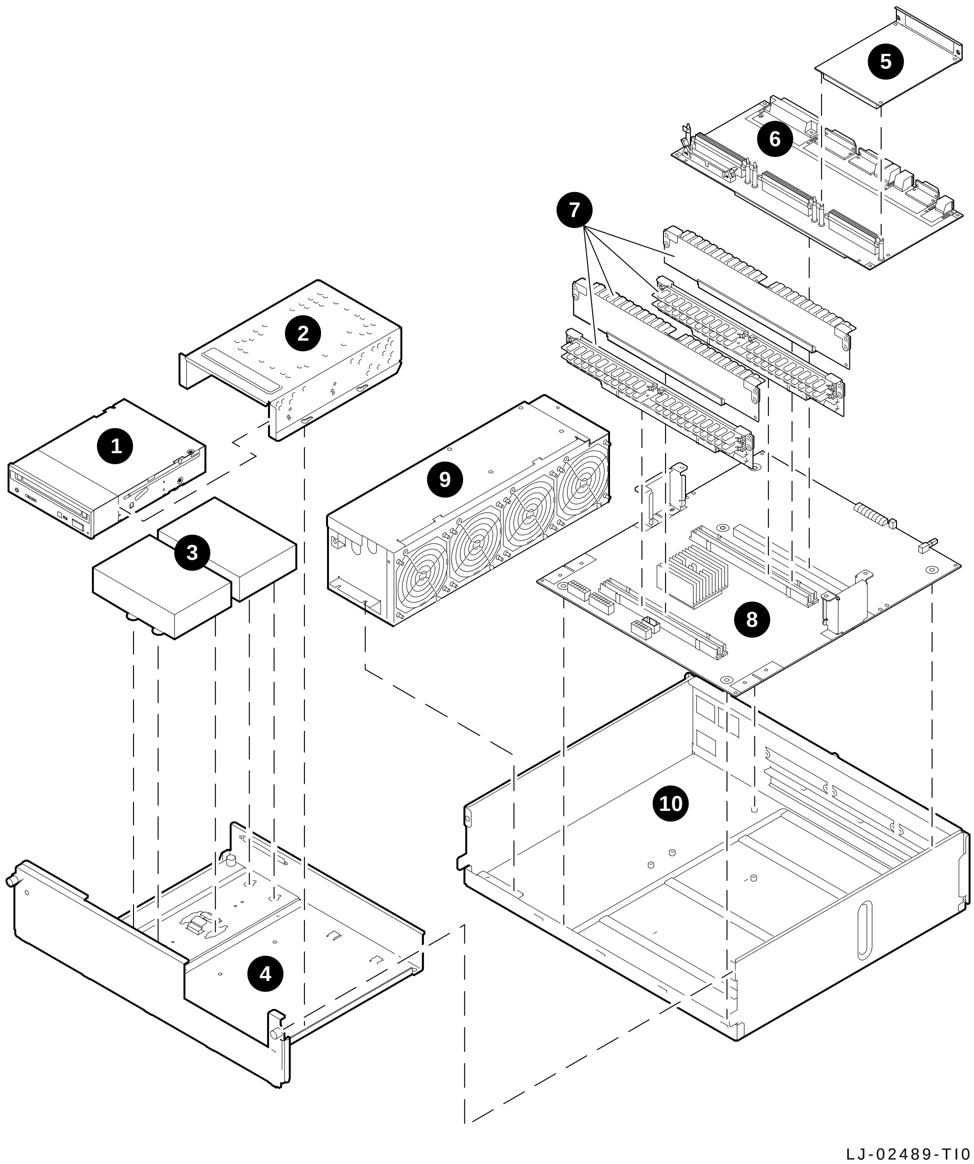
Figure 7–1 System Major Assembly View (Front)



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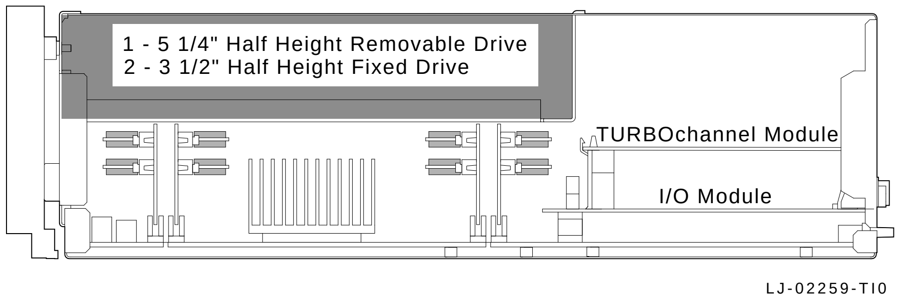
Using the Exploded View, Continued

Figure 7–2 System Major Assembly View (Side)

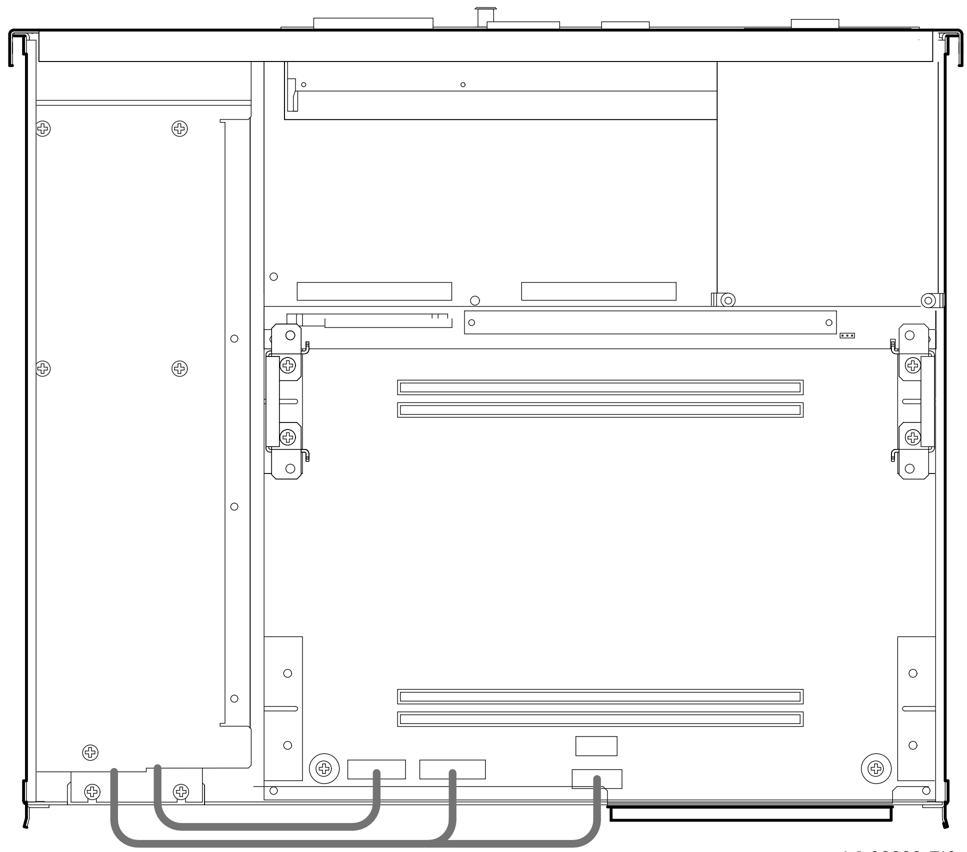


Cable Routing

System Power Cable Routing

Figure 7–3 illustrates the system power cable connections and routing. These cables are part of the H7816-AA power supply.

Figure 7–3 System Power Cable Routing



Disk SCSI Cable Routing

Figure 7–4 shows the disk SCSI cable (P/N 17-03487-01) routing and placement of drives within the DEC 3000 Model 400/400S AXP system.

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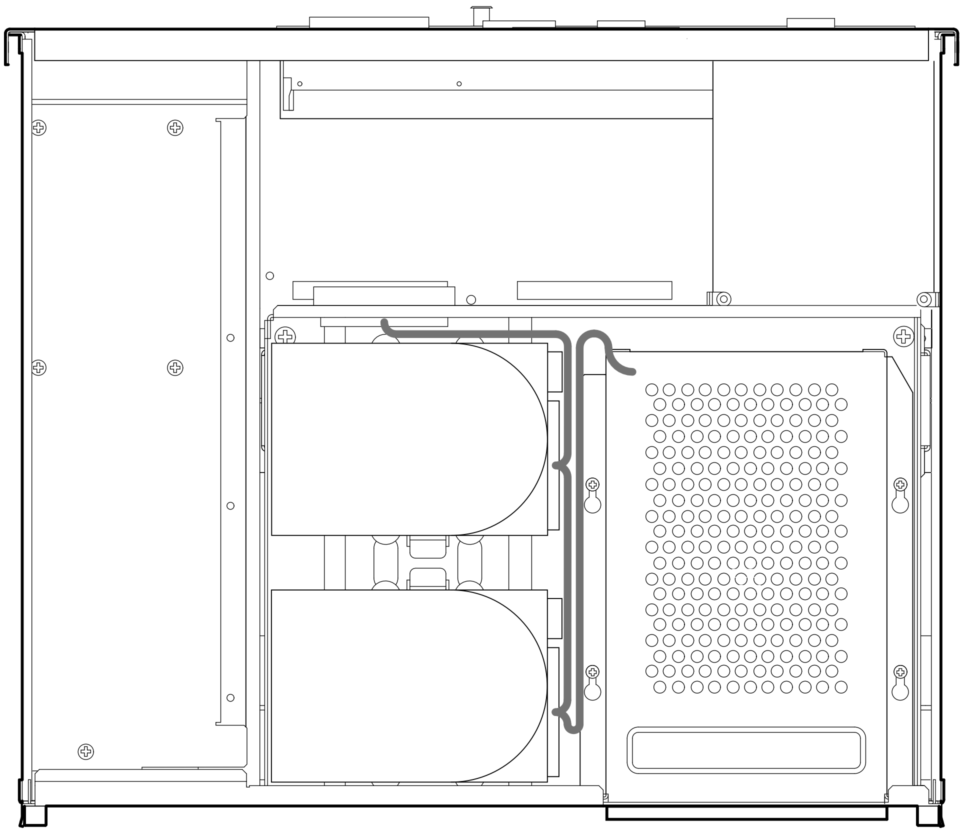
Figure 7–4 Disk SCSI Cable Routing



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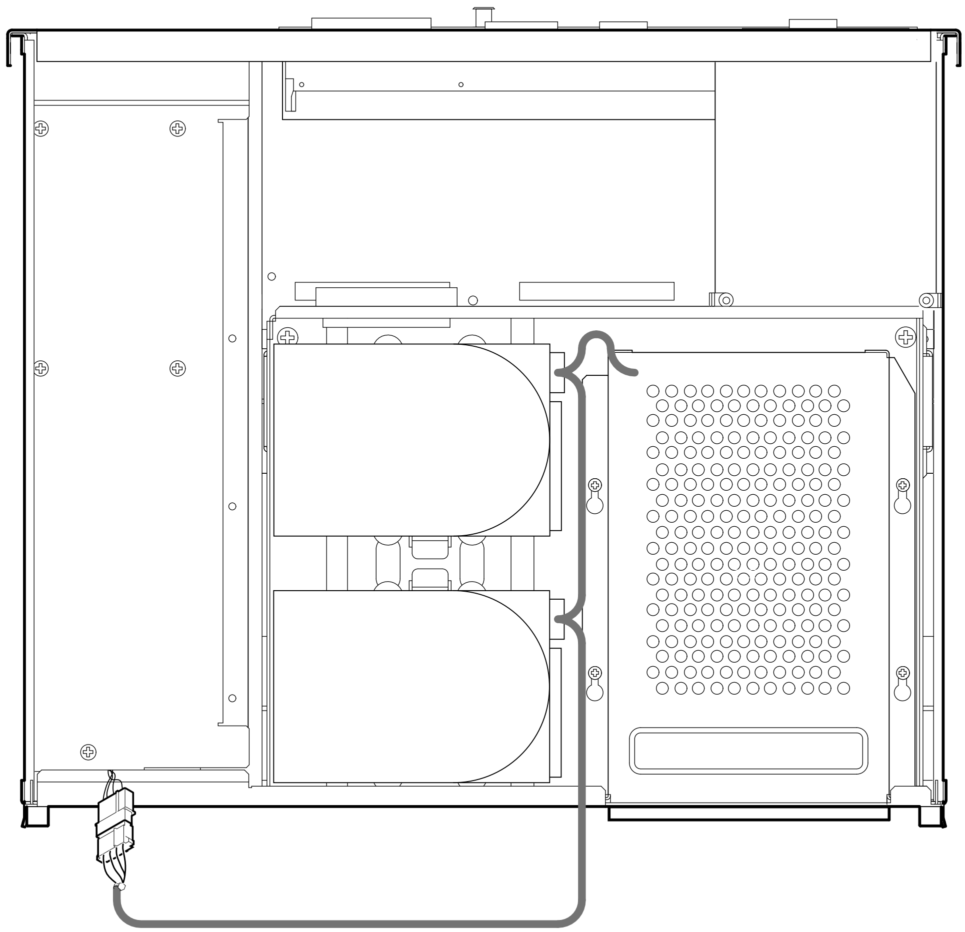
Drive Power Cable Routing

Figure 7–5 shows the disk power cable (P/N 17-03489-01) connections and routing.

Figure 7–5 Disk Power Cabling



BA47X-AA Vertical Floor Stand

Removing the Floor Stand

To remove the BA47X-AA vertical floor stand:

Step	Action	Refer to Figure 7–6
1	Perform a system shutdown.	–
2	Power down the workstation.	–
3	Disconnect all cables from the power source and then from the rear of the workstation. Remove all cables from the floor stand guide.	❶

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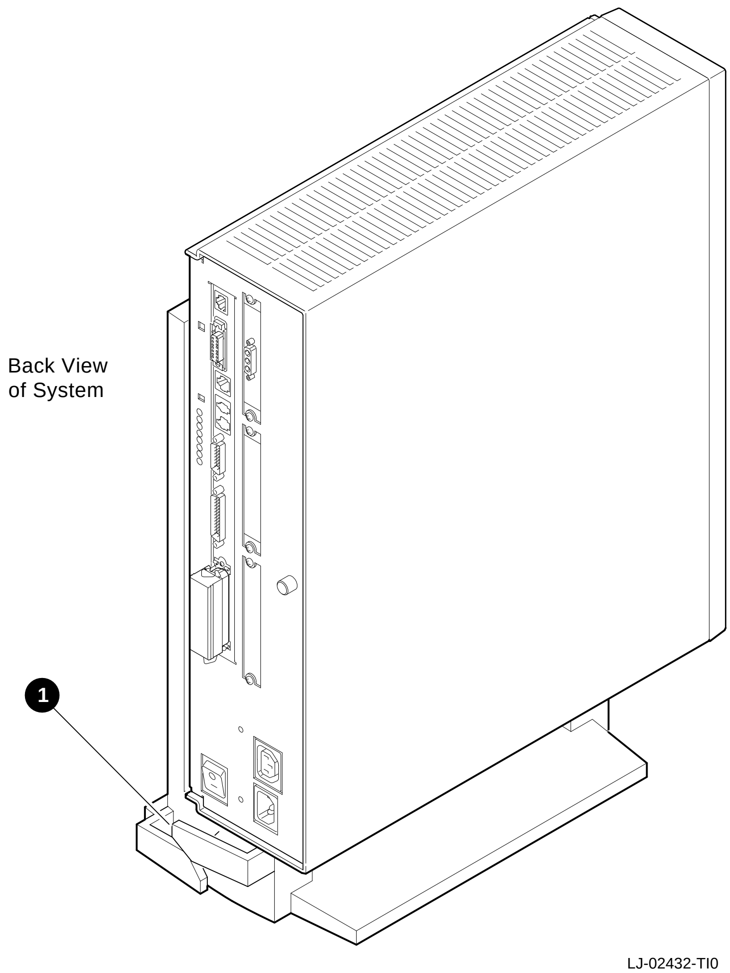
Figure 7–6 Back View of DEC 3000 Model 400/400S AXP System



Step	Action	Refer to Figure 7–7
4	With the aid of an assistant, lift the floor stand and unit upright by grasping as shown in Figure 7–7.	–

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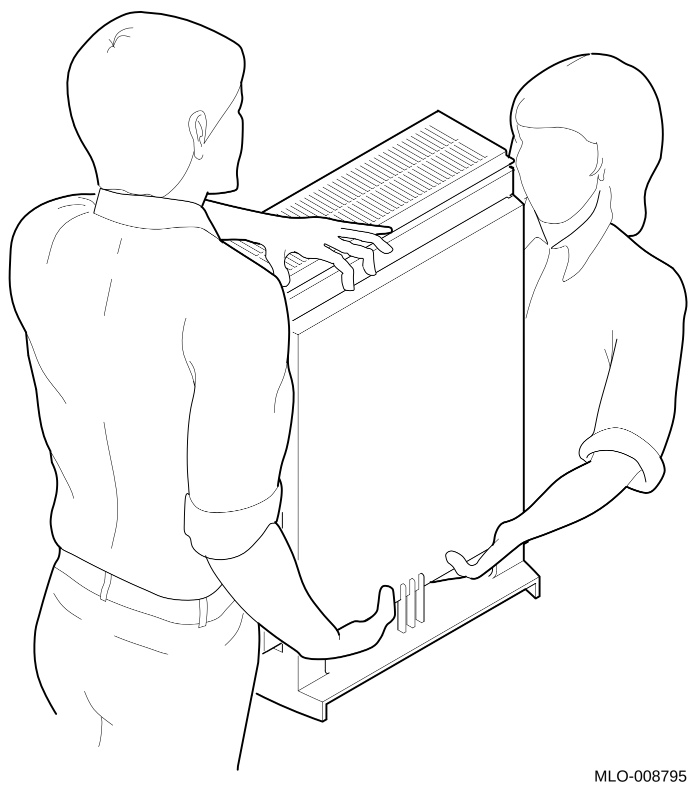
Figure 7–7 Lifting the Floor Stand

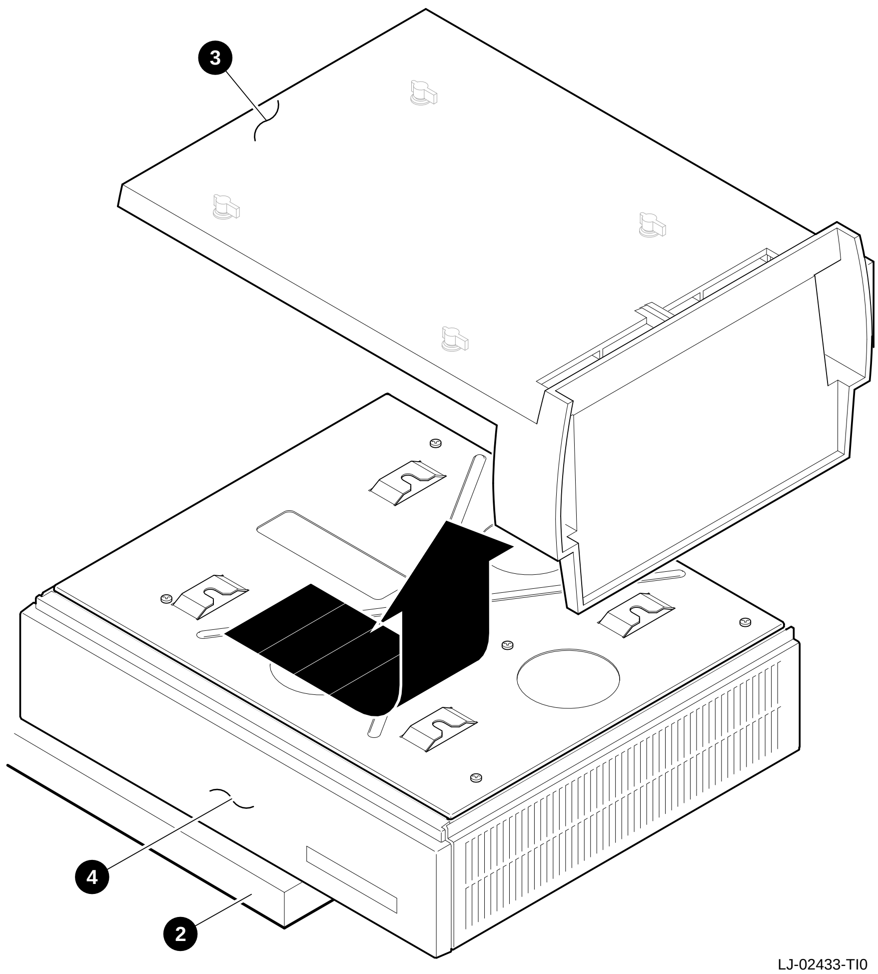


Step	Action	Refer to Figure 7–8
5	Place the floor stand and system on the edge of a table laying the system with its top side facing down. Be careful not to either scratch the top or drop the system.	❷
6	While holding the system box, slide the floor stand toward its base and lift the floor stand free of the base unit.	❸

Continued on next page

Step	Action	Refer to Figure 7–8
7	In most cases, you can access the modules in the DEC 3000 Model 400 /400S AXP system without removing the floor stand mounting plate.	➍

Figure 7–8 Removing the Floor Stand



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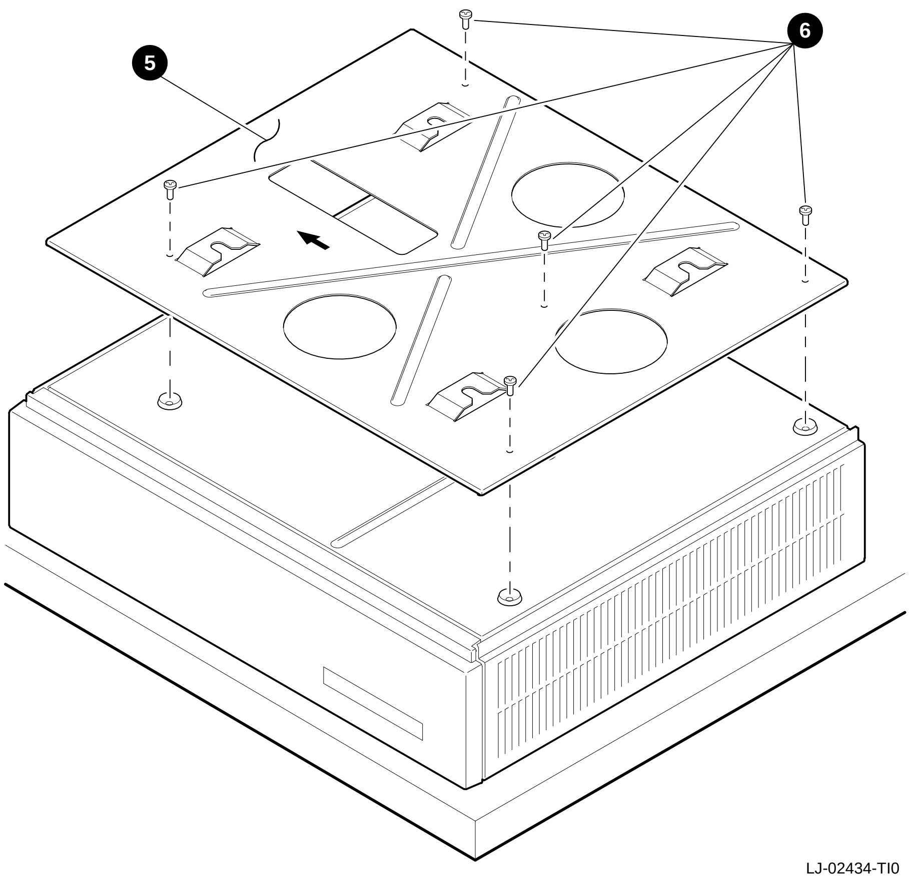
Step	Action	Refer to Figure 7–9
	If the mounting plate must be removed, then remove the five mounting screws.	❺ and ❻

Figure 7–9 Removing the Mounting Plate



The following table describes the parts needed if replacing the floor stand.

Continued on next page

Refer to...	Description	Qty.
Figure 7–6	Floor Stand cable guide❶	1
Figure 7–6	System	1
Figure 7–8	Floor stand base❸	1
Figure 7–8	Top of the system box❹	1
Figure 7–9	Floor stand mounting plate❺	1
Figure 7–9	Mounting plate screws❻	4

Replacing the Floor Stand

Reverse all the steps in the removal procedure for installation of the floor stand.

Workstation Cover

Warning: Power Supply

Allow at least five minutes from the time the system unit power is turned off until you open the system unit. This gives the power supply capacitors time to discharge safely.

Removing the Workstation Cover

To remove the workstation cover:

Step	Action	Refer to Figure 7–10
1	Perform a system shutdown.	–
2	Power off the workstation.	–
3	If the DEC 3000 Model 400/400S AXP system is mounted in a floor stand, then remove the floor stand using the *BA47X-AA Vertical Floor Stand* procedures.	–
4	Disconnect all cables from the power source and then from the rear of the workstation.	–
5	Turn the captive screw counterclockwise until it is free of the chassis.	❶
6	Slide the cover toward the front of the machine and lift the cover off.	❷

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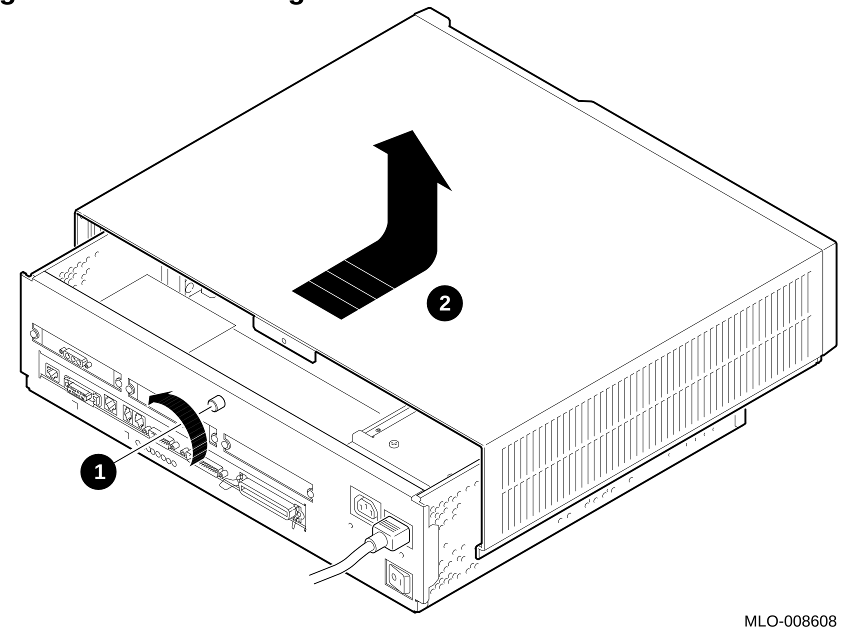
Figure 7–10 Removing the Workstation Cover



The following table describes the parts needed if replacing the workstation cover.

Refer to...	Description	Part Number	Qty.
Figure 7–10	Captive screw❶	12-32249-01	1
Figure 7–10	Cover❷	70-29546-01	1

Replacing the Workstation Cover

Reverse all steps in the removal procedure for installation of the workstation cover.

Fixed Media

Note

If this is a replacement drive, then check the switch settings on the old drive and set the switches on the new drive to the same setting. In many cases, the whole drive is not a FRU. Follow the replacement procedure for the specific option.

Removing the Fixed Media

To remove the fixed media devices from the workstation:

Step	Action	Refer to Figure 7–11
1	Remove the workstation cover. See the section *Removing the Workstation Cover*.	–
2	Disconnect the power cable connector from the drives.	❶
3	Remove the SCSI signal cable from the drives.	❷
4	Depress the retaining spring. Slide the drive toward the retaining spring and lift the drive out.	❸

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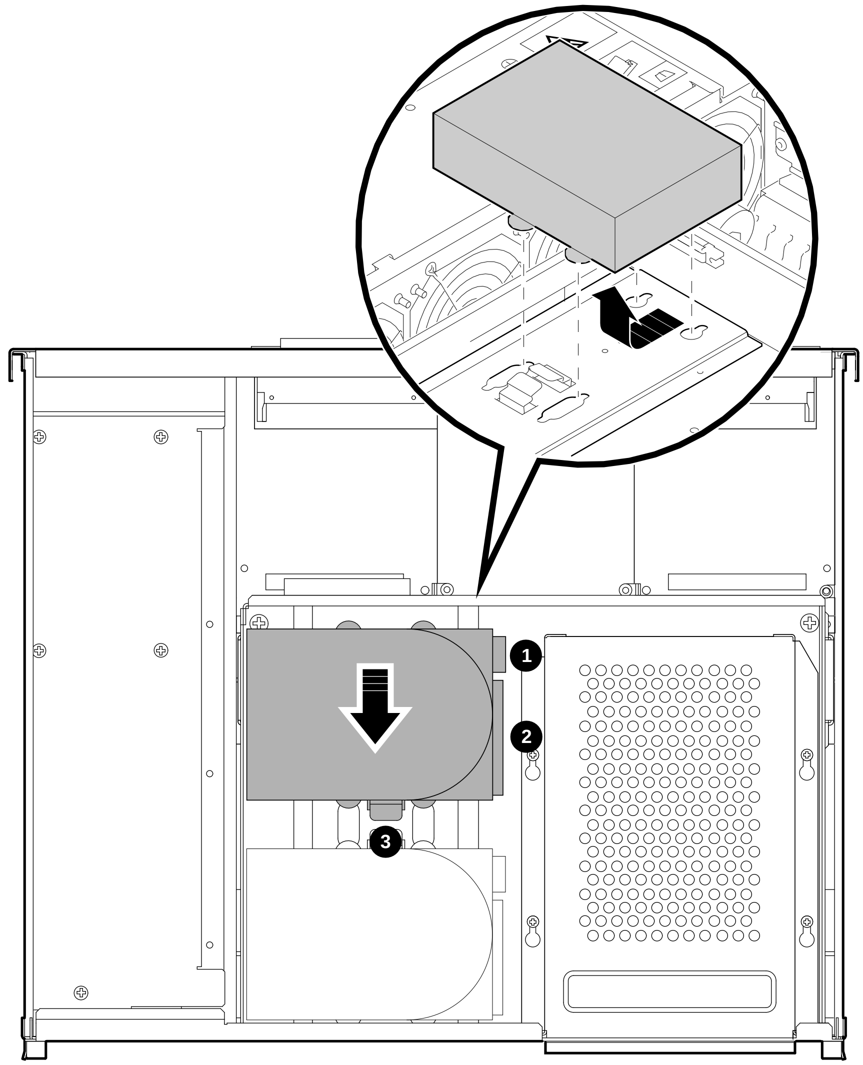
Figure 7–11 Removing the Fixed Media



The following table describes the parts needed if replacing the fixed media.

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Refer to...	Description	Part Number	Qty.
Figure 7–11	Drive power connector❶	17-03252-01	1
Figure 7–11	Long SCSI cable❷	17-03487-01	1
Figure 7–11	Retaining spring❸	74-39211-01	2

Replacing the Fixed Media

Reverse all the steps in the removal procedure for installation of the fixed media.

Removable Media

Note

If this is a replacement drive, then record the switch settings. When replacing with another drive, set the switches on the new drive with the same characteristics. In many cases the whole drive is not a FRU. Follow the replacement procedure for the specific option.

Removing the Removable Media

Use the following procedure to remove either a CDROM (P/N RRD42-AA), tape drive (P/N TZK10-FM or TZ30), or the fixed half height 3 1/2" disk drive (P/N RX26):

Step	Action	Refer to Figure 7–12
1	Remove the workstation cover. See the section *Removing the Workstation Cover*.	–
2	Loosen the four screws holding the bracket in place and slide the bracket toward the back of the enclosure.	❶

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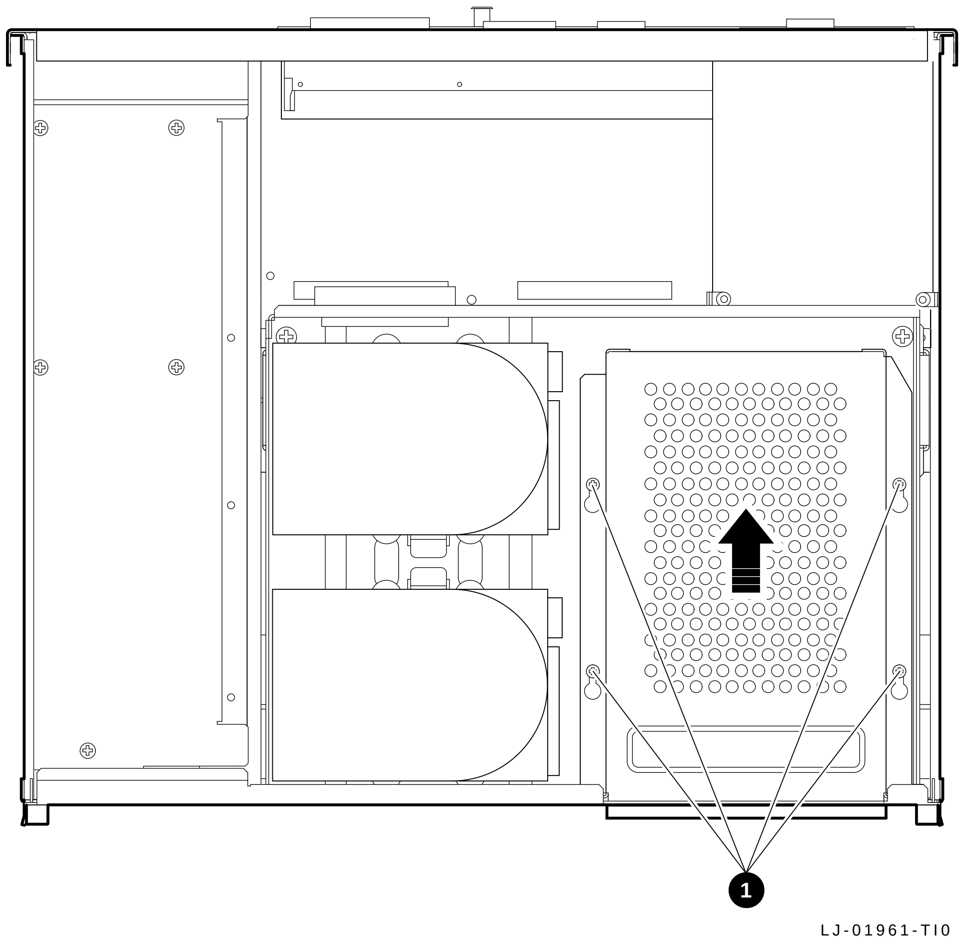
Figure 7–12 Loosening the Screws on the Bracket



Step	Action	Refer to Figure 7–13
3	Position the drive bracket on its side to remove the four screws that mount the drive to the bracket. Remove the drive from the bracket.	❷

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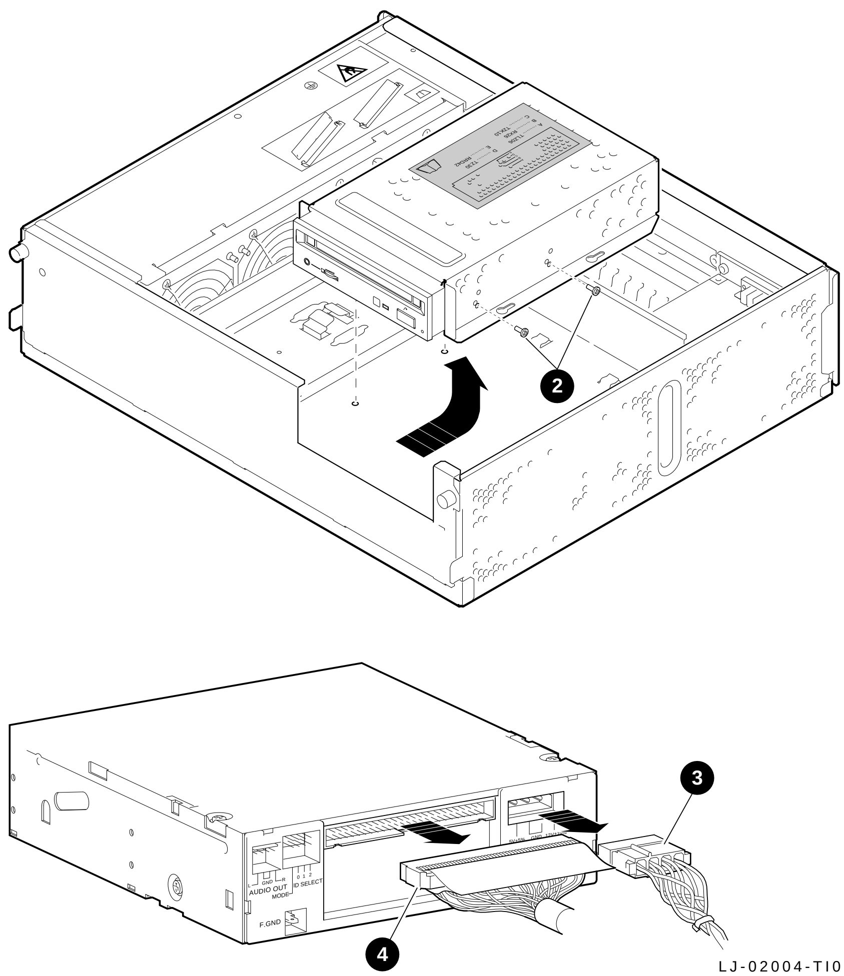
Step	Action	Refer to Figure 7–13
4	Remove the power cable connector attached to the drive.	❸
5	Remove the SCSI signal cable connector from the drive.	❹

Figure 7–13 Removing the Removable Media



The following table describes the parts needed if replacing the removable media.

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Refer to...	Description	Part Number	Qty.
Figure 7–12	Screws - bracket to chassis❶	–	4
Figure 7–13	Screws - drive to bracket❷	–	4
Figure 7–13	Drive power connector cable❸	17-03489-01	1
Figure 7–13	Long SCSI cable❹	17-03487-01	1

Replacing the Removable Media

Reverse all the steps in the removal procedure for installation of the removable media.

Drive Shelf

Removing the Drive Shelf

To remove the drive shelf from the workstation:

Step	Action	Refer to Figure 7–14
1	Remove the workstation cover. See the section *Removing the Workstation Cover*.	–
2	Disconnect the short SCSI cable from the connector.	❶
3	Loosen the two captive screws mounted on the front face plate.	❷
4	Loosen the two knurled screws located near the rear of the shelf.	❸

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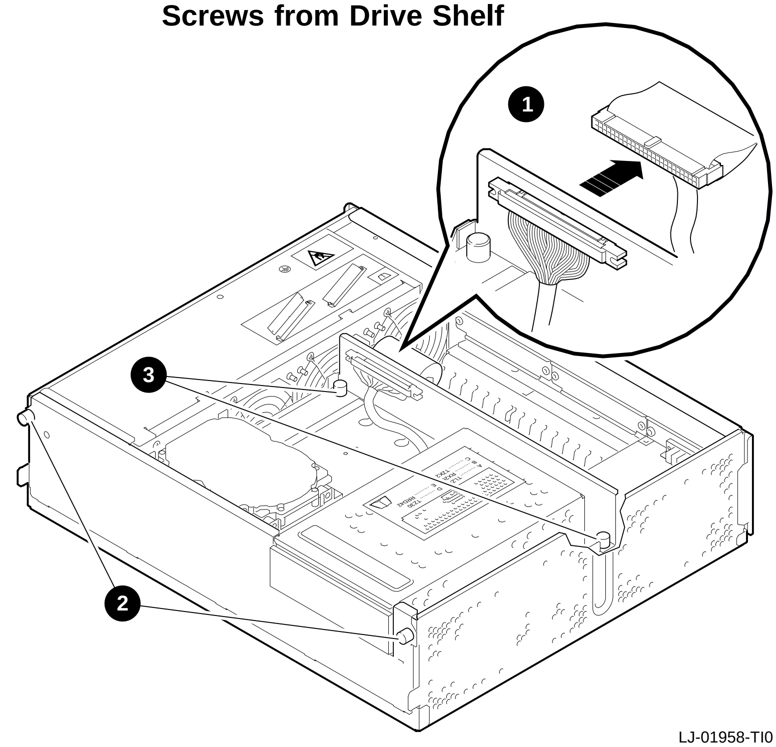
Figure 7–14 Disconnecting the Cables and Loosening the Screws from Drive Shelf



Step	Action	Refer to Figure 7–15
5	From the rear of the drive shelf, tilt the shelf forward so as to allow access to the power cable connector. Disconnect the power connector attached to the power cable.	❹
6	From the rear, tilt the drive plate assembly forward completely and lift out from the slots located on the front of the chassis.	❺

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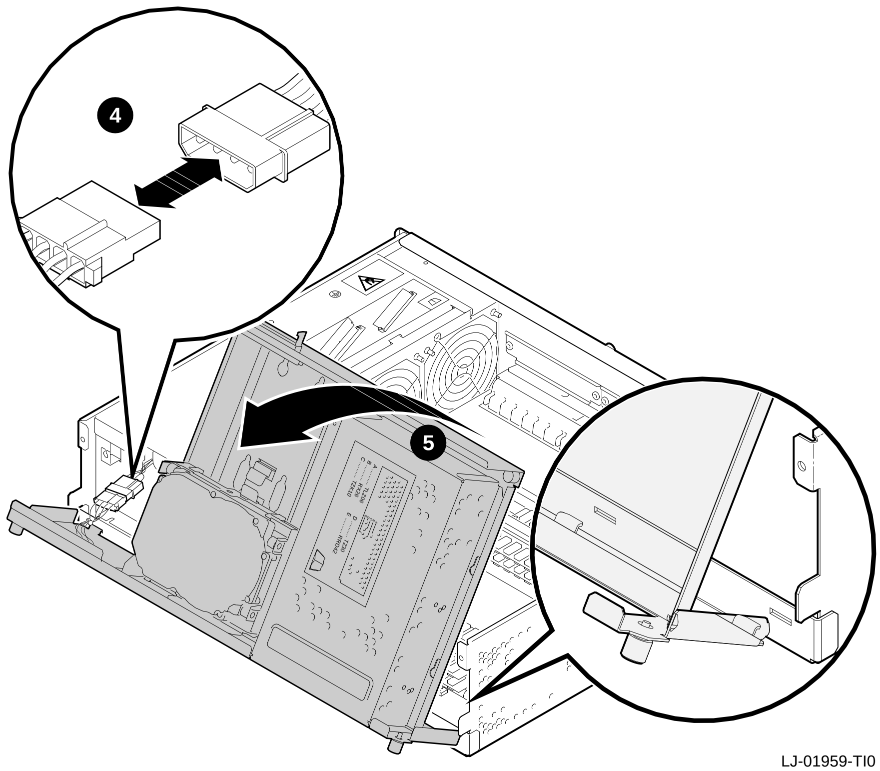
Figure 7–15 Removing the Drive Shelf



The following table describes the parts needed if replacing the drive shelf.

Refer to...	Description	Part Number	Qty.
Figure 7–14	Short SCSI cable❶	17-02488-01	1
Figure 7–14	Captive screws❷	12-32249-0	2
Figure 7–14	Captive screws❸	12-32249-0	2

Continued on next page

Refer to...	Description	Part Number	Qty.
Figure 7–15	Connector - Power distribution harness (part of power supply)❹	H7816-AA	1
Figure 7–15	Drive plate assembly❺	70-30262-01	1

Replacing the Drive Shelf

Reverse all the steps in the removal procedure for installation of the drive shelf.

TURBOchannel Option

Note

If a dual width TURBOchannel option is installed, then it must be placed in slots 0 and 1. If necessary, move the single width TURBOchannel option to slot 2.

Antistatic Precautions

Anytime a module is replaced in the DEC 3000 Model 400/400S AXP system, antistatic precautions should be taken. Refer to *Antistatic Precautions*.

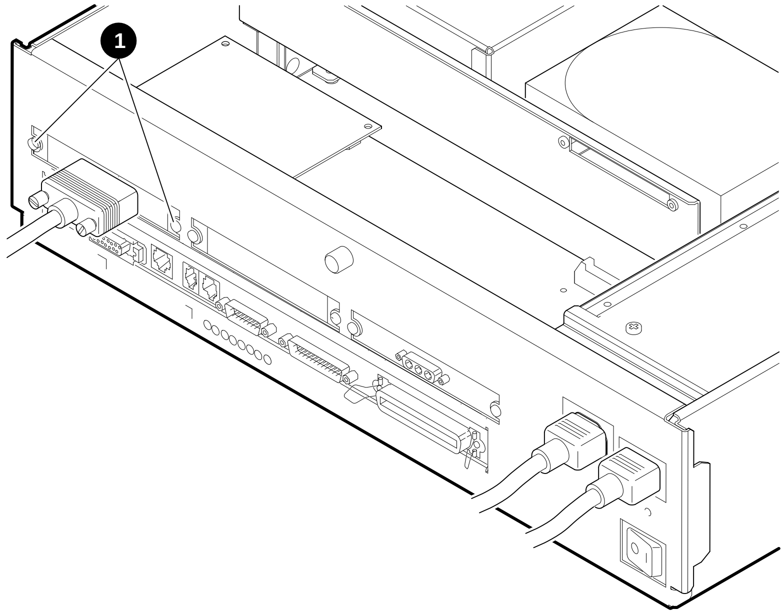
Removing the TURBOchannel Option

To remove the TURBOchannel option:

Step	Action	Refer to Figure 7–16
1	Disconnect any external connections to the TURBOchannel in the rear of the workstation.	–
2	Remove the workstation drive shelf (This may not be necessary in all cases.) See the section *Removing the Drive Shelf*.	–
3	If the option board is being replaced, note any switch settings or jumpers on the old FRU and set the same value to the new board.	–
4	Remove the screws located on the rear of the chassis that secure the TURBOchannel option.	❶

Continued on next page

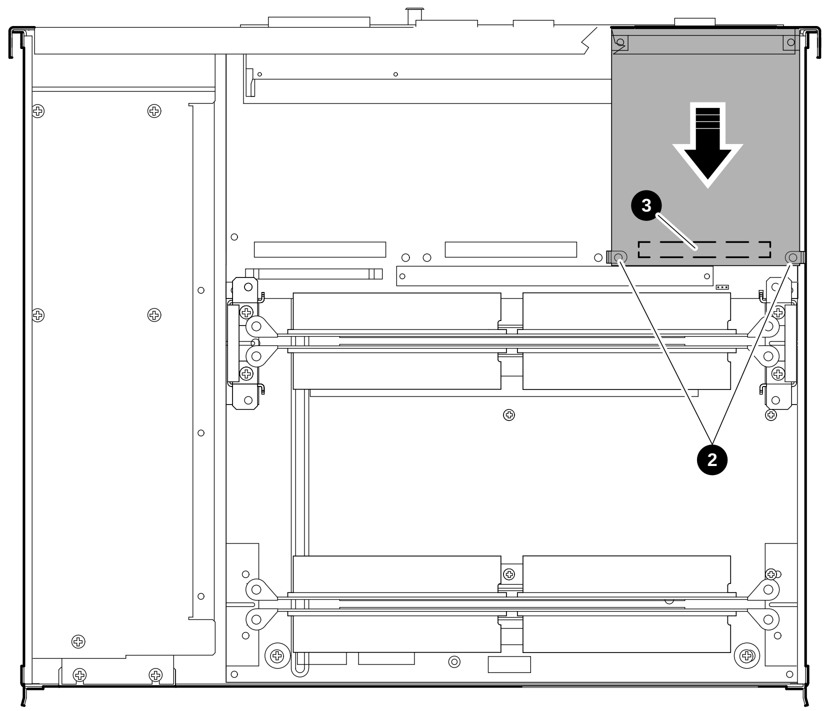
Figure 7–16 Removing the Screws from TURBOchannel Option



Step	Action	Refer to Figure 7–17
5	If your version contains standoffs❷, then release the standoffs. Lift the TURBOchannel option board from the the connector located on the I/O module.	❸

Continued on next page

Figure 7–17 Removing the TURBOchannel Option



LJ-01967-TI0

The following table describes the parts needed if replacing the TURBOchannel option.

Refer to...	Description	Part Number	Qty.
Figure 7–16	Screws PAN, 6-32❶	90-09984-07A	1
Figure 7–17	Standoffs❷	Not required.	1

Replacing the TURBOchannel Option

Reverse all the steps in the removal procedure for installation of the TURBOchannel option.

SIMMs

Note

If replacing one SIMM, make sure the replaceable SIMM is the same memory size and speed as the remaining seven SIMMs located on the same plane.

Antistatic Precautions

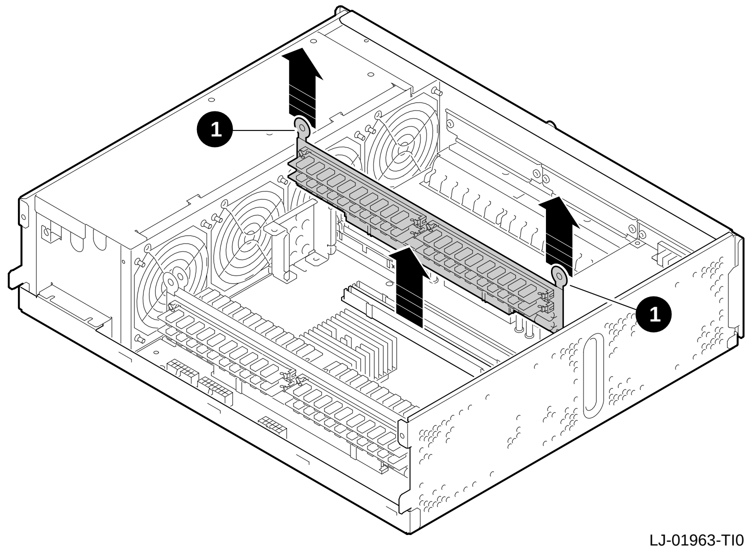
Anytime a module is replaced in the DEC 3000 Model 400/400S AXP system workstation, antistatic precautions should be taken. Refer to *Antistatic Precautions*.

Removing the SIMMs/MMB

Step	Action	Refer to Figure 7–18
1	Remove the workstation drive shelf. See the section *Removing the Drive Shelf*.	–
2	Remove the memory mother board (MMB) in which the SIMMs are mounted by pulling straight up on the tabs at the end of the MMB.	❶

Continued on next page

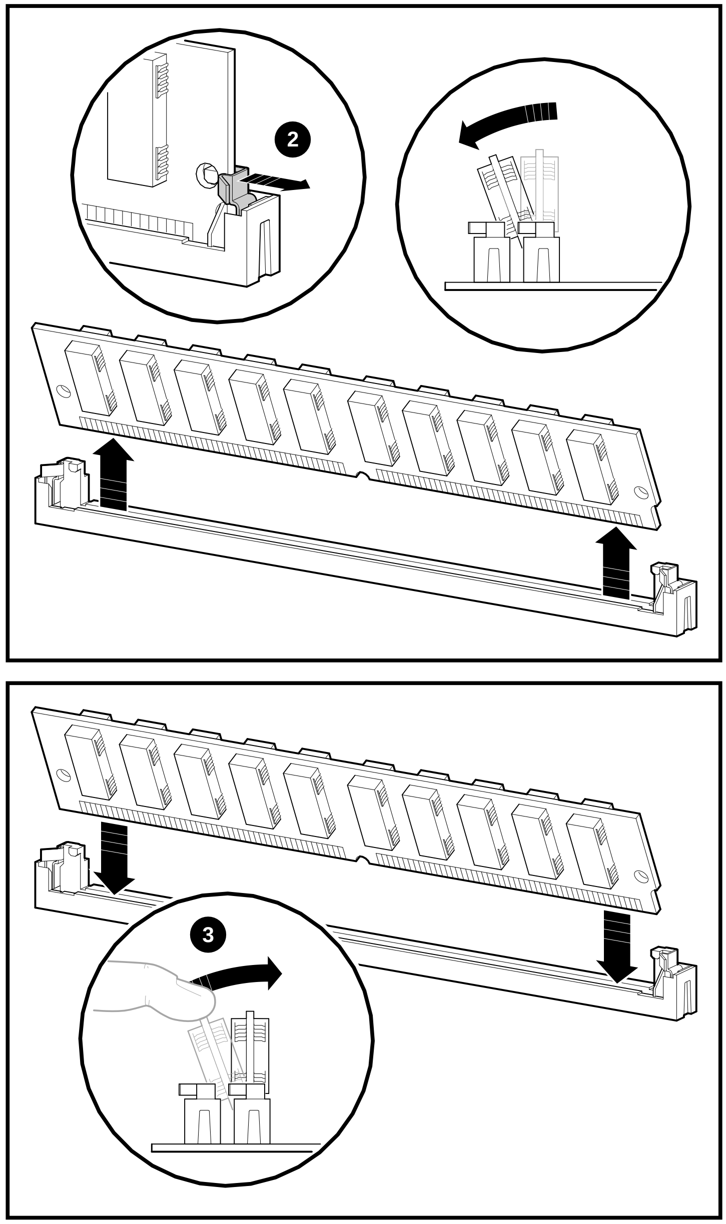
Figure 7–18 Removing the Memory Mother Board



Step	Action	Refer to Figure 7–19
3	To remove the SIMMs:	❷ ❸
	a. Release the clip located at both ends of the SIMM board. b. Tilt the board forward at a 30° angle. c. Pull the SIMM module out.	

Continued on next page

Figure 7–19 Removing the SIMMs



LJ-02431-TI0

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The following table describes the parts needed if replacing the SIMMs.

Refer to...	Description	Part Number	Qty.
Figure 7–18	MMB❶	54-21815-01	4
Figure 7–19	Clip❷	–	–
Figure 7–19	Lock❸	–	–

Replacing the SIMMs

Reverse all the steps in the removal procedure for installation of the SIMMs, making sure you push the SIMM in place so as to lock the SIMM in place.

I/O Board

Note

When replacing the I/O board, make sure the I/O shield is installed on the replacement module.

Antistatic Precautions

Anytime a module is replaced in the DEC 3000 Model 400/400S AXP system workstation, antistatic precautions should be taken. Refer to *Antistatic Precautions*.

Removing the I/O Board

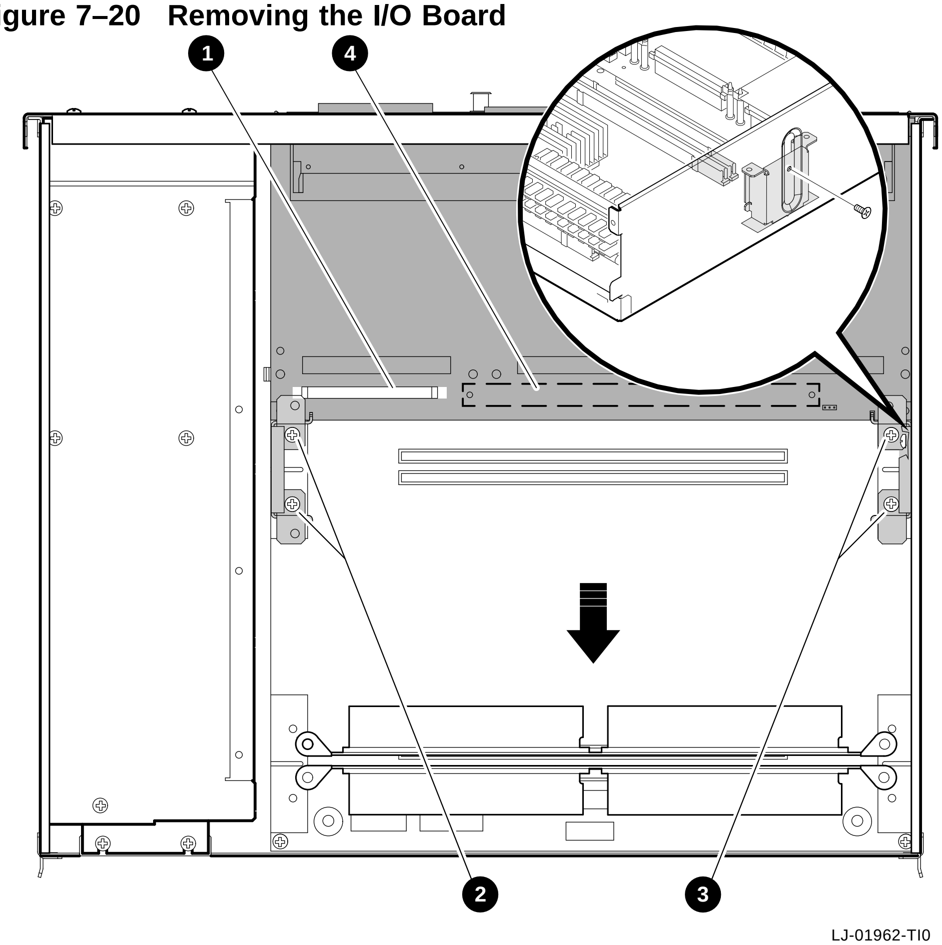
To remove the I/O board:

Step	Action	Refer to Figure 7–20
1	Remove the TURBOchannel options. See the section *Removing the TURBOchannel Option*.	–
2	Remove the two MMBs located closest to the I/O board. See the section *Removing the SIMMs /MMB*.	–
3	Remove the short SCSI cable from the connector.	❶
4	Remove all the screws on the two transport tray support brackets that secure the I/O board. Slide the brackets toward the front of the unit. Remove the transport brackets with care so as not to damage any components on the system card.	❷ and ❸

Continued on next page

Step	Action	Refer to Figure 7–20
5	Lift the I/O board straight up by applying pressure evenly throughout the length of the connector that attaches the I/O board to the system board.	❹

Figure 7–20 Removing the I/O Board



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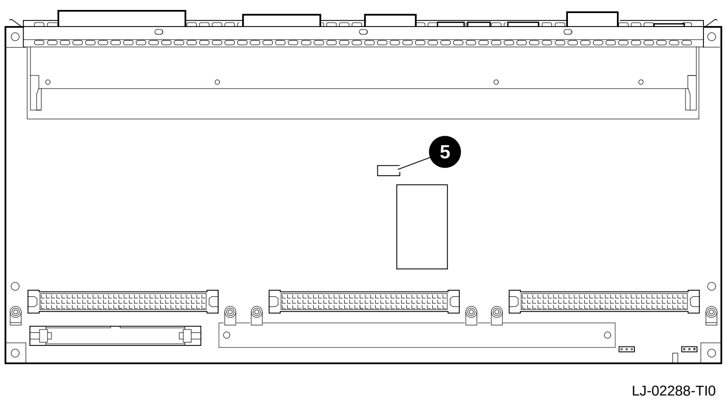
Step	Action	Refer to Figure 7–21
6	Remove the Ethernet ROM chip and install it on the replacement I/O board.	❺
7	Replace the I/O board.	–
8	Set the environmental variables just as they were set on the board you are replacing. Refer to Chapter 3, SET Command Parameters/Qualifiers	–

Figure 7–21 Replacing the I/O board



Step	Action	Refer to Figure 7–22
9	Check that the SECURE system jumper is installed correctly on the replacement module.	❶
10	Check that the ROM upgrade jumper on the replacement module is installed in the disabled position.	❷

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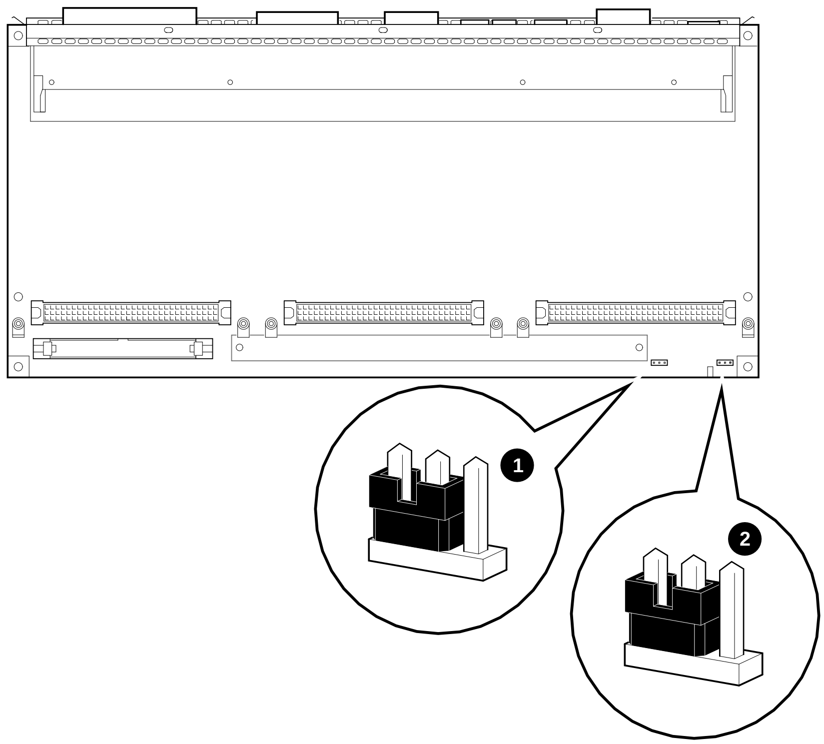
Figure 7–22 Checking Jumpers



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The following table describes the parts needed if replacing the I/O board.

Refer to...	Description	Part Number	Qty.
Figure 7–20	Short SCSI cable❶	17-02488-01	1
Figure 7–20	Screws - left bracket 6-32 pan❷	90-09984-07	2
Figure 7–20	Screws - right bracket 6-32 pan❸	90-09984-07	3
Figure 7–20	I/O module❹	54-21813-01	1
Figure 7–21	Ethernet ROM chip❺	–	1

Replacing the I/O Board

Reverse all the steps in the removal procedure for installation of the I/O board.

System Board

Note

Record the position of the switches. When replacing the board, set the switches in the same position.

Make sure that the new board has the shield installed toward the rear of the workstation.

Antistatic Precautions

Anytime a module is replaced in the DEC 3000 Model 400/400S AXP system workstation, antistatic precautions should be taken. Refer to *Antistatic Precautions*.

Removing the System Board

To remove the system board:

Step	Action	Refer to Figure 7–23
1	Remove the I/O board. See the section *Removing the I/O Board*.	–
2	Remove all MMBs with the SIMMs installed.	❶
3	Unplug the power cable connectors.	❷
4	Remove the screws that attach the module to the base of the workstation chassis. Lift the system board from the front and slide it forward.	❸

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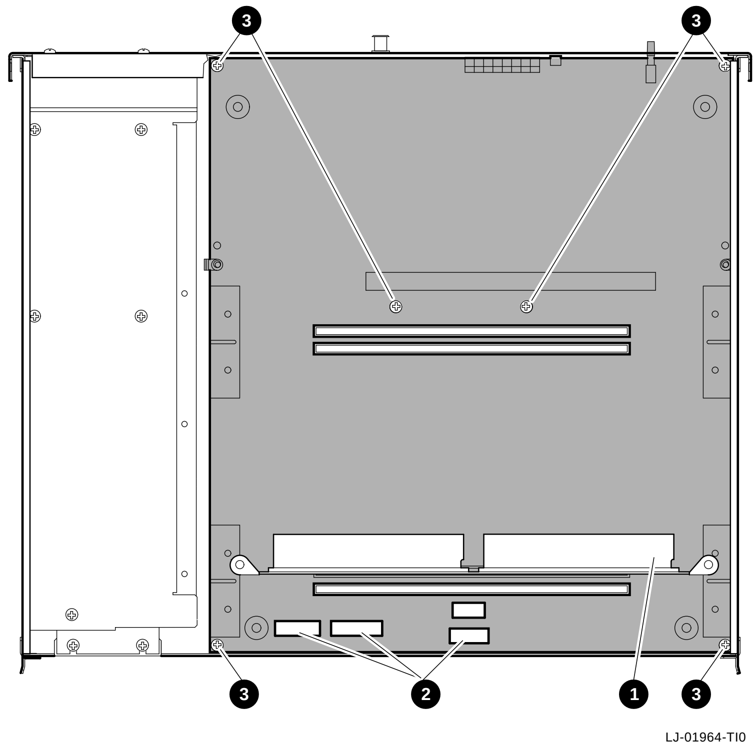
Step	Action	Refer to Figure 7–23

Figure 7–23 Removing the System Board



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System Board, Continued

This table describes the parts needed to replace system board.

Refer to...	Description	Part Number	Qty.
Figure 7–23	MMB❶	54-21815-01	6
Figure 7–23	Connectors - Power cable❷	–	3
Figure 7–23	Screws, 6-32 pan❸	90-09984-07	4
	System board	54-21149-02	1

Replacing the CPU Board

Reverse all the steps in the removal procedure for installation of the CPU board.

Power Supply

Removing the Power Supply

To remove the power supply:

Step	Action	Refer to Figure 7–24
1	Remove the drive shelf. See the section *Removing the Drive Shelf*.	–
2	Disconnect all power connectors.	❶ and ❷
3	Remove the four Phillip screws located on the front and back of the workstation chassis.	❸ and ❹
4	Lift the power supply out, carefully avoiding contact with the lip on the chassis.	–

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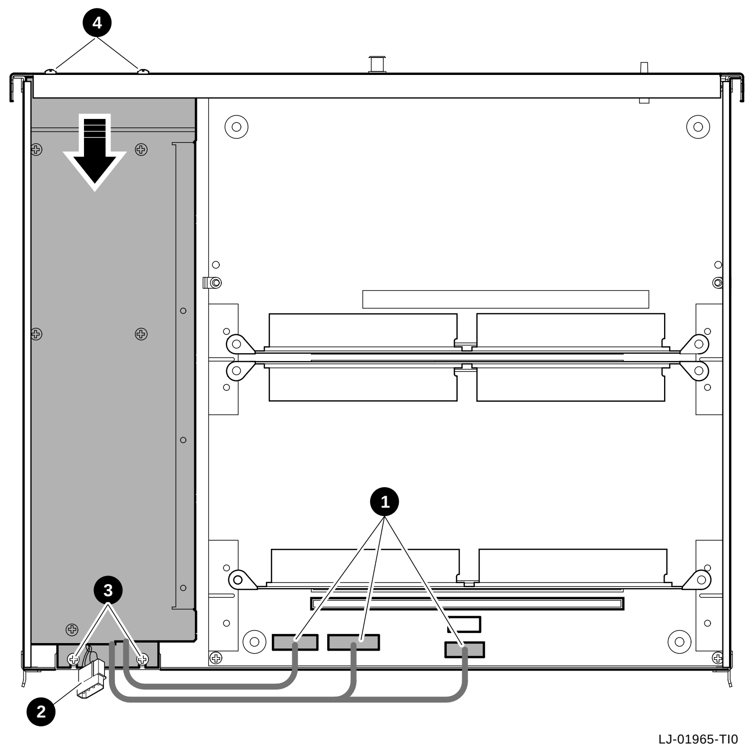
Figure 7–24 Removing the Power Supply



The following table describes the parts needed if replacing the power supply.

Refer to...	Description	Part Number	Qty.
Figure 7–24	Screws, 6-32 pan - power supply mounting (front)❸	90-09984-07	2
Figure 7–24	Screws, 6-32 pan - power supply mounting (back)❹	90-09984-07	2

Continued on next page

Replacing the Power Supply

Reverse all the steps in the removal procedure for installation of the power supply.

Appendix A
Miscellaneous

Firmware Upgrade Using CDROM

Description

The Flash ROM Update Utility is used to upgrade the system ROM and I/O ROM with the latest firmware revision.

NOTE

Both the I/O and system ROM must be updated; otherwise, the console program will not execute.

Before You Begin

Before you proceed with the firmware upgrade using a CDROM perform the following:

1. Log into a privileged account
2. Perform a system shutdown and enter console mode by pressing the Halt button
3. Obtain the RRD42 boot device name by issuing the SHOW DEVICE command
4. Insert the disc into the RRD42
5. Install the ROM update jumper on the I/O board.

Continued on next page

Sample Session Using CDROM

Below is a sample session using CDROM. All user input is bolded and comments are identified by an exclamation point (!):

```
>>> BOOT DKA400 [Return]  !Boot RRD42 load update program
INIT-S-CPU...
AUDIT_CHECKSUM_GOOD
AUDIT_LOAD_DONE
*** FIRMWARE UPDATE UTILITY V1.0 ***
*** SYSTEM TYPE: MODEL 400 ***
UPDATE                 ! See Table A-1
VERIFY                 ! See Table A-1
LIST                   ! See Table A-1
SHOW                   ! See Table A-1
SET                    ! See Table A-1
?                      ! See Table A-1

UPD->UPDATE [Return]  ! Update Utility prompt,user input required

READ IO ROM DEVICE ID
UPD-I VERIFY LOADED ROM IMAGE
..............................
UPD-I VERIFY LOADED ROM IMAGE DONE
MANUFACTURER INTEL (0x89)
DEVICE CODE = 28F020 (0xBD) 256K x 8
UPDATE SYSTEM ROM DEVICE
UPD-I VERIFY LOADED ROM IMAGE
...............................
UPD-I VERIFY LOADED ROM IMAGE DONE
FIRMWARE REVISION: BLx.x LENGTH: 0x3FF28 -> 261928 BYTES CHECKSUM: 0xdf
MANUFACTURER = INTEL (0x89)
DEVICE CODE =28F020 (0xbd) 256k x 8
UPD-I *** ROM CONTENTS WILL BE DESTROYED ***
UPD I ARE YOU READY TO PROGRAM DEVICE ? (Y/N) Y
!Program prompts for decision
UPD-I PRECHARGING DEVICE
.........................................................
UPD-I ERASING ROM DEVICE
.........................................................
UPD-I PROGRAMMING DEVICE
.........................................................
UPD-I PROGRAMMING COMPLETED
.........................................................
SYSTEM ROM UPDATE SUCCESSFUL
UPDATE IO ROM DEVICE
UPD-I VERIFY LOADED ROM IMAGE
................................................
UPD-I VERIFY LOADED ROM IMAGE DONE
FIRMWARE REVISION: BLx.x LENGTH: 0x3da08 -> 252424 BYTES CHECKSUM: 0xb8
MANUFACTURER = INTEL (0x89)
DEVICE CODE = 28F020 (0xbd) 256k x 8
UPD-I PRECHARGING DEVICE
................................................
UPD-I ERASING ROM DEVICE
................................................
UPD-I PROGRAMMING DEVICE
................................................
UPD-I PROGRAMMING COMPLETED
................................................
IO ROM UPDATE SUCCESSFUL
UPD-> QUIT [Return]              !Exits update program
```

Continued on next page

Table A–1 shows the Update Utility Menu commands.

Table A–1 Update Utility Menu

Command	Description
UPDATE	Upgrades system and I/O ROMs to latest firmware revision.
VERIFY	Verifies that ROMs have been loaded.
SHOW	Shows current ROM revision and ROM revision for loaded image.
SET	Sets the platform type (model) when the platform cannot be determined or is incorrect.
LIST	Lists current supported devices that can be updated.
?	Generates help on the above commands (? SHOW).

Loading the Updated Firmware

Once the updating for the I/O and system ROMs have been updated, load the new version of the ROM code into the volatile memory of the computer. To load the current version, perform the following:

1. Power down the system.
2. Power up the system.
3. Verify the new firmware is in the ROM chip by executing a SHOW CONFIG command.

Creating a Bootable Disk

Before You Begin

Before you begin creating a bootable image, perform the following:

1. Log into a privileged account.
2. Copy the system/IO ROM .EXE code to your system disk.
3. Install the ROM update jumper on the system board.
4. You need to be in the operating system.

Sample Session

Following is a sample session of creating a bootable disk over the network. All user input is bolded:

```
$ writeboot:==$[sysexe]writeboot.exe  Return
$ init DKA100: test  Return
$ mount DKA100: TEST  Return
$ CREATE/DIR DKA100:[TEST]  Return
$ COPY BL4_1_P2.EXE DKA100:[TEST]*/CONT/LOG  Return
$ WRITEBOOT  Return
Update VAX portion of boot block (default is Y)  N  Return
Update Alpha AXP portion of boot block (default is Y) Y  Return
Enter Filename:
$DKA100:[TEST]BL4_1_P2.EXE  Return   ! Enter Alpha AXP boot file
$ DISMOUNT DKA100  Return
$ @SYS$SYSTEM:SHUTDOWN  Return
```

Follow the procedures in the section Firmware Upgrade Using CDROM to upgrade the system and I/O ROMs.

Loading the Updated Firmware

Once the I/O and system ROMs have been updated, load the new version of the ROM code into the volatile memory of the computer. To load the current version, perform the following:

1. Power down the system.
2. Power up the system.
3. Verify the new firmware is in the ROM chip by executing a SHOW CONFIG command.

Appendix B
LED Codes/Error/Status Messages

Overview

Chapter Overview

This appendix contains the following topics:

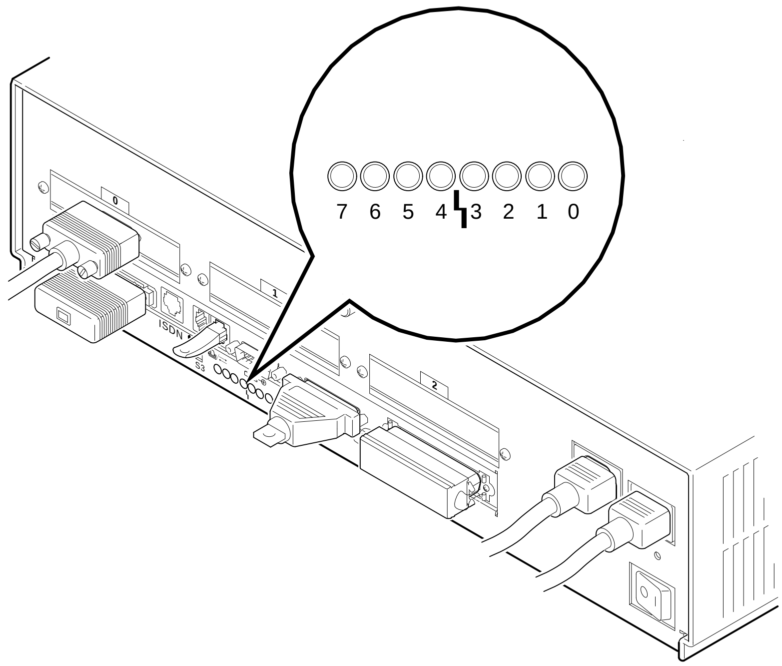
- LED codes
- Console error messages
- Console halt messages
- ASIC diagnostics error codes
- NVR diagnostic error codes
- ISDN diagnostic error codes
- SCC diagnostic error codes
- SCSI diagnostic error codes
- NI diagnostic error codes
- MEMORY diagnostic error codes
- ASIC diagnostic status/error messages
- NVR diagnostic status/error messages
- ISDN diagnostic status/error messages
- SCC diagnostic status/error messages
- SCSI diagnostic status/error messages
- NI diagnostic status/error messages
- MEMORY diagnostic status/error messages
- MIPS Emulator diagnostic status/error messages

LED Codes

Serial ROM LED Codes

Serial ROM LED codes will be displayed when the unit is first powered-on. Figure B–1 shows the location of the LEDs.

Figure B–1 LEDs on the DEC 3000 Model 400/400S AXP System



LED	LED Code	Description	Failing Description
••••••••	ff	Set all 8 MCRs to 128M	MCR did not read back as expected (fatal error, branches to SROM mini console.)

Continued on next page

LED	LED Code	Description	Failing Description
●●●●●●●○	fe	Mapping out an MCR per macrocoders manual (only displayed on error)	MCR did not read back as expected (fatal error, branches to SROM mini console.)
●●●●●●○●	fd	Memory sizing completed	All MCRs mapped out (no memory detected - fatal error, branches to SROM mini console.)
●●●●●●○○	fc	Mapping an MCR	Only MCR did not read back as expected (fatal error, branches to SROM mini console.)
●●●●●○●●	fb	Memory configuration completed	Should never stop here.
●●●●●○●○	fa	Mem test with non-bcache bit SET, dcache OFF and mchk enabled	If read .NE. write, then send error dump to SROM port, and branch to SROM mini console.
●●●●●○○●	f9	Mem test with non-bcache bit CLEAR, dcache OFF and mchk enabled	If read .NE. write, then send error dump to SROM port and branch to SROM mini console.
●●●●●○○○	f8	Mem test with non-bcache bit SET, dcache ON, and mchk enabled	If read .NE. write, then send error dump to SROM port, and branch to SROM mini console.

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LED	LED Code	Description	Failing Description
●●●●○●●●	f7	Mem test with non-bcache bit CLEAR, dcache ON, and mchk enabled	IF read .NE. write, then send error dump to SROM port and branch to SROM mini console.
●●●●○●●○	f6	tc register test and init	Should never stop here. If read .NE. write, then send error dump to SROM port.
●●●●○●○●	f5	Coreio reg test and init	Should never stop here. If read .NE. write, then send error dump to SROM port.
●●●●○●○○	f4	Look for system ROM mfg data	Read of system ROM mfg data did not return data expected. Send error dump to SROM port and branch to SROM mini console.
●●●●○○●●	f3	Completed load of system ROM into memory	Should never stop here.
●●●●○○●○	f2	Look for I/O ROM mfg data	Read of I/O ROM mfg data did not return data expected. Send error dump to SROM port and branch to SROM mini console.
●●●●○○○●	f1	Completed load of I/O ROM into memory	Should never stop here.

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LED	LED Code	Description	Failing Description
●●●●○○○○	F0	SROM code execution completed normally	Should never stop here.
○○●○○○○○	20	Machine check	Send mchk dump to SROM port and to SROM mini console.

ASIC LED Codes

The following LED codes represent ASIC diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

All values are in hexadecimal.

LED	LED Code	Description
○○●●○●○●	35	Scatter/Gather Map Test
○○●●●●●●	3F	All tests passed

Memory LED Codes

The following LED codes represent MEMORY diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor. All values are in hexadecimal.

LED	LED Code	Description
○○●○○○○○	20	Machine Check
○○●○○○○●	21	CELL Fill mem with test pattern data
○○●○○○●○	22	CELL Forward Rd/Compare /Complement/Wr

Continued on next page

LED Codes, Continued

LED	LED Code	Description
○○●○○○●●	23	CELL Reverse Rd/Compare/Complement /Wr
○○●○○●○○	24	ADDR Fill mem with addresses as data
○○●○○●○●	25	ADDR Read/Compare data = address
○○●○○●●○	26	reserved
○○●○○●●●	27	reserved
○○●○●○○○	28	reserved
○○●○●○○●	29	reserved
○○●○●○●○	2A	reserved
○○●○●○●●	2b	LLSC load-locked/store-conditional tests
○○●○●●○○	2c	BCTP Bcache Tag Parity detection
○○●○●●○●	2d	ECC detection
○○●○●●●○	2e	reserved
○○●○●●●●	2f	Clear memory to zeroes

NVR LED Codes

The following LED codes represent NVR diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

All values are in hexadecimal.

LED	LED Code	Description
○○●●●○●○	3A	Check Battery Test
○○●●●○●●	3B	Test NVR Registers
○○●●●●○○	3C	Assure Clock is Ticking Test
○○●●●●○●	3D	Test TOY Registers
○○●●●●●○	3E	Interrupt Test

SCC LED Codes

The following LED codes represent SCC diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

Continued on next page

All values are in hexadecimal.

LED	LED Code	Description
○●○○○○○○	40	SCC self-test has been entered
○●○○○○○●	41	SCC self-test is connecting to driver
○●○○○○●○	42	SCC Reset/Init test is being executed
○●○○○○●●	43	SCC Modem test is being executed
○●○○○●○○	44	SCC Polled test is being executed
○●○○○●○●	45	SCC Interrupt test is being executed
○●○○○●●○	46	SCC DMA test is being executed
○●○○○●●●	47	SCC LK401 test is being executed
○●○○●○○○	48	SCC Mouse test is being executed
○●○○●○○●	49	Reserved
○●○○●○●○	4A	Reserved
○●○○●○●●	4B	Reserved
○●○○●●○○	4C	Reserved
○●○○●●○●	4D	Reserved
○●○○●●●○	4E	Reserved
○●○○●●●●	4f	SCC test has exited

NI LED Codes

The following LED codes represent NI diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

All values are in hexadecimal.

LED	LED Code	Description
○●○ ●○○○ ○	50	Network address ROM test
○●○●○○○●	51	Test LANCE registers
○●○●○○●○	52	LANCE initialization test
○●○●○○●●	53	LANCE internal loopback and DMA test
○●○●○●○○	54	Interrupt test
○●○●○●○●	55	LANCE CRC generation and detection test

Continued on next page

LED	LED Code	Description
○●○●○●●○	56	Test LANCE MISS and BUFF errors test
○●○●○●●●	57	Test LANCE collision detection test
○●○●●○○○	58	LANCE address filtering test
○●○●●○○●	59	LANCE external loopback test
○●○●●○●○	5A	LANCE transmit BUFF error test
○●○●●●●●	5F	All tests passed

ISDN LED Codes

The following LED codes represent ISDN diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

All values are in hexadecimal.

LED	LED Code	Description
○●●●○○○○	70	Register Test
○●●●○○○●	71	Tone Test
○●●●○○●○	72	Digital Loop Test
○●●●○○●●	73	Analog Loop Test
○●●●○●○○	74	Interrupt Test
○●●●○●○○	74	DMA Test

SCSI LED Codes

The following LED codes represent SCSI diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

All values are in hexadecimal.

LED	LED Code	Description
○●●○○○○○	60	Dual SCSI ASIC register test

Continued on next page

LED Codes, Continued

LED	LED Code	Description
○●●○○○○●	61	SCSI controller chip register test
○●●○○○●○	62	Interrupt test
○●●○○○●●	63	Data transfer test
○●●○○●○○	64	Map error test
○●●○○●○●	65	Minimal device test
○●●○●●●●	6f	All tests passed

Console LED Codes

The last code displayed on the LEDs should be DD for console entry.

All values are in hexadecimal.

LED	LED Code	Description
●●●○●●●●	EF	Entry
●●●○●●●○	EE	Powerup
●●●○●●○●	ED	powerup and saved state is 2 (put a hexadecimal number here)
●●●○●●○○	EC	Init$build_config completed
●●●○●○●●	EB	Init$crb completed
●●●○●○●○	EA	Init$mem_clear completed
●●●○●○○●	E9	Call class init_driver
●●●○●○○○	E8	Console init driver done
●●●○○●●●	E7	Call driver reset_input
●●●○○●●○	E6	Call NVR self test
●●●○○●○●	E5	NVR self test done
●●●○○●○○	E4	Init$console_device done
●●●○○○●●	E3	Page tables initialized
●●●○○○●○	E2	HWRPB initialized
●●●○○○○●	E1	TURBOchannel sizing completed
●●●○○○○○	E0	Powerup banner printout
●●○●●●●●	DF	Class driver reset_input
●●○●●●●○	DE	Driver reset output (SCC only)
●●○●●●○●	DD	Console entry >>>

Continued on next page

LED Codes, Continued

LED	LED Code	Description
○○○○○○○○	00	Console is about to be exited

MIPS Emulator LEDs

The following LED codes represent MIPS Emulator diagnostic tests. If an error occurs during one of these tests, then a FRU and error code will be displayed on the monitor.

LED	LED Code	Description
●○○●○○○○	90	MIPS emulator running with no errors
●○○●○○○●	91	Invalid REX command entered
●○○●○○●○	92	Unsupported REX command entered supported in REX but not yet supported by emulator
●○○●○○●●	93	Bad Address detected by the emulator
●○○●○●○○	94	ROM not found in this slot
●○○●○●○●	95	ROM object not found
●○○●○●●○	96	Cannot load ROM object
●○○●○●●●	97	Invalid MIPS-I instruction detected
●○○●●○○○	98	ROM object called halt
●○○●●○○●	99	Invalid Callback called
●○○●●○●○	9A	Unsupported callback called. Callback will be included in the next release

Console Error Messages

Console Error Messages

The following contains a list of console error messages that will be displayed if a command line is improperly entered:

Message	Description
? 21 CORRPTN	Console data structures have been corrupted
? 22 ILL REF	Illegal reference attempted
? 23 ILL CMD	Illegal command entered
? 24 INV DGT	Invalid digit was found by parser
? 25 LTL	Too many characters entered on command line
? 26 ILL ADDR	Invalid address was entered
? 27 LEN VIO	Length violation (currently unused)
? 28 VAL TOO LRG	The value entered was too large
? 29 ILL SW	Illegal switch was entered
? 2A SW CONF	Conflicting switches entered on the command line
? 2B UNK SW	Unknown switch entered on the command line
? 2C UNK SYM	Unknown symbol entered on the command line
? 2D AMB SYM	Ambiguous symbol entered on the command line
? 2E CHKSM	Incorrect checksum passed by the X command
? 31 TMOUT	Timeout while waiting for input during the X command
? 32 MEM ERR	Invalid virtual address translation or memory error
? 34 ILL PSWD	Illegal password was entered
? 35 PSWD NOTEN	Password system is not enabled
? 36 NO PSWD DEF	No password defined
? 37 NOT IMPL	Function not implemented by the console
? 38 IPR NOT IMPL	Internal processor register not implemented on this system
? 39 IPR NOACCS	Internal processor register can not be accessed

Continued on next page

Console Error Messages, Continued

Message	Description
? 3A INV ACCS	Internal processor register can not be accessed as specified
? 3B NVR RDERR	Problem reading NVR
? 3C NVR WRTERR	Problem writing NVR

Console Halt Messages

Console Halt Messages

The following table contains a listing of console halt messages that will be displayed when a halt sequence is entered:

```
?02 EXT HLT
PC=xxxxxxxx.xxxxxxxx PSL=xxxxxxxx.xxxxxxxx
>>>
```

The PC and PSL of the halt are also printed out.

nn	Message	Meaning
02	EXT HLT	Console entered due to external Halt button being pressed
06	HLT INST	Console was entered due to a HALT instruction being executed
08	KSP INVAL	Console was entered because PALcode detected an invalid Kernel Stack pointer while building a stack frame
18	HW MCHK	Console was entered because PALcode detected a non-recoverable machine check
20	SCBB BAD	Console was entered because PALcode detected an invalid SCB base while trying to dispatch to a user's handler

ASIC Diagnostic Error Codes

ASIC Diagnostic Error Codes

The following table contains the error codes produced by the ASIC diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then reseat the system and I/O module connection.

Execute ASIC diagnostic to verify. If a failure reoccurs, FRU replacement will be necessary. Replace the items listed below one at a time and execute ASIC diagnostic to verify if the failure has been corrected.

Error Code	Description	Replace
18	ASIC$K_SG_PASS1_FAILED	Refer to Chapter 6
1A	ASIC$K_SG_PASS2_FAILED	Refer to Chapter 6
1C	ASIC$K_SG_PARITY_FAILED	Refer to Chapter 6

NVR Diagnostic Error Codes

NVR Diagnostic Error Codes

The following table contains the error codes produced by the NVR diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then reseat the system and I/O module connection.

Execute NVR diagnostic to verify. If failure reoccurs, FRU replacement will be necessary. Replace the items listed below one at a time and execute the NVR diagnostic to verify that failure has been corrected.

Error Code	Description	Replace
03	Soft-error on power-on, check time	I/O module
04	Battery failure	I/O module
08	Data miscompare testing NVR registers	I/O module
10	Data miscompare testing TOY registers	I/O module
20	Valid RAM and time bit clear. Possible RAM corruption due to power loss	I/O module
40	Battery codes do not match	I/O module
80	Update in progress, bit will not clear	I/O module
100	CSR_A data miscompare	I/O Module
200	CSR_B data miscompare	I/O module
400	Interrupt test failed - no interrupt generated	I/O, system module

ISDN Diagnostic Error Codes

ISDN Diagnostic Error Codes

The following table contains the error codes produced by the ISDN diagnostic.

NOTE

ISDN is not initially supported.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then reseat the system and I/O module connection.

Execute the ISDN diagnostic to verify. If a failure reoccurs, FRU replacement will be necessary. Replace the following items one at a time and execute ISDN diagnostic to verify if failure has been corrected:

1. Audio cable
2. I/O module

Error Code	Description
02	Data miscompare testing line interface Unit Status register
04	Data miscompare testing line interface Unit Priority register
06	Data miscompare testing line interface Unit Mode register 1
08	Data miscompare testing line interface Unit Mode register 2
A	Data miscompare testing Multiplexer Control register 1
C	Data miscompare testing Multiplexer Control register 2
E	Data miscompare testing Multiplexer Control register 3

Continued on next page

ISDN Diagnostic Error Codes, Continued

Error Code	Description
10	Data miscompare testing Main Audio Processor Mode register 1
12	Data miscompare testing Main Audio Processor Mode register 2
14	Data miscompare testing Data Link Controller Mode register 1
16	Data miscompare testing Data Link Controller Mode register 4
20	Data miscompare testing internal digital loopback using MCR1
22	Data miscompare testing internal digital loopback using MCR2
24	Data miscompare testing internal digital loopback using MCR3
26	Data miscompare testing internal digital loopback using MCR3
28	Data miscompare testing internal analog loopback
30	Interrupt test data miscompare
32	Interrupt test time out
34	Invalid 79C30A interrupt
36	Interrupt not generated
38	All interrupts not received
40	DMA test time out
42	DMA test unexpected interrupts
44	DMA test data miscompare

SCC Diagnostic Error Codes

SCC Error Codes

The following table contains the error codes produced by the SCC diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then:

1. Reseat the keyboard connection
2. Reseat the mouse connection
3. Reseat the system and I/O module connection

Execute SCC diagnostic to verify. If failure reoccurs, FRU replacement will be necessary. Replace the following items one at a time and execute SCC diagnostic to verify if failure has been corrected.

Error Code	Description	Replace
10	SCC reset test has failed	I/O module
20	SCC modem test failed when testing CTS<->RTS	I/O module
22	SCC modem test failed when testing DSR<->SS	I/O module
24	SCC modem test failed when testing CD<->SS	I/O module
26	SCC modem test failed when testing RI<->DTR	I/O module
30	SCC polled test has failed due to transfer timeout	I/O module

Continued on next page

SCC Diagnostic Error Codes, Continued

Error Code	Description	Replace
32	SCC polled test has failed due to parity error on receive	I/O module
34	SCC polled test has failed due to framing error on receive	I/O module
36	SCC polled test has failed due to overrun error in receive	I/O module
38	SCC polled test has failed due to data comparison error	I/O module
40	SCC Interrupt not seen at the COREIO	I/O module
42	SCC interrupt not seen at TURBOchannel ASIC	I/O module
44	SCC interrupt not seen at DECchip 21064 CPU	I/O module
50	SCC LK401 test has failed due to transfer timeout	Keyboard, I/O module
52	SCC LK401 test has failed due to Illegal response received	Keyboard, I/O module
60	SCC Mouse Test failed due to transfer timeout	Mouse, I/O module
62	SCC Mouse Test failed due to illegal response received	Mouse, I/O module
70	SCC Self test was unable to connect to the driver	
80	SCC was unable to find free memory to test with	

Continued on next page

SCC Diagnostic Error Codes, Continued

Error Code	Description	Replace
90	SCC had a transmit timeout during the DMA test	I/O module
92	SCC had unexpected interrupts during DMA test	I/O module
94	SCC had incorrect buffer pointers during the DMA test	I/O module
96	SCC had a data buffer miscompare during the DMA test	I/O module

SCSI Diagnostic Error Codes

SCSI Error Codes

The following table contains the error codes produced by the SCSI diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then:

1. Ensure the proper device connection
2. Reseat the system and I/O module connection

Execute SCSI diagnostic to verify. If a failure reoccurs, FRU replacement will be necessary. Replace the following items one at a time and execute the SCSI diagnostic to verify if failure has been corrected.

Error Code	Description	Replace
02	SCSI ASIC register test failed testing bus A	System, I/O module
04	SCSI controller register test failed testing bus A	System, I/O module
06	SCSI interrupt test failed testing bus A	System, I/O module
08	SCSI data transfer test failed testing bus A	SCSI A device, I/O, system module
0A	SCSI map error test failed testing bus A	SCSI A device, I/O, system module
0C	SCSI minimal device test failed testing bus A	SCSI A device, I/O, system module
52	SCSI ASIC register test failed testing bus B	SCSI B device, I/O, system module

Continued on next page

Error Code	Description	Replace
54	SCSI controller register test failed testing bus B	SCSI B device, I/O, system module
56	SCSI interrupt test failed testing bus B	SCSI B device, I/O, system module
58	SCSI data transfer test failed testing bus B	SCSI B device, I/O, system module
5A	SCSI map error test failed testing bus B	SCSI B device, I/O, system module
5C	SCSI minimal device test failed testing bus B	SCSI B device, I/O, system module

NI Diagnostic Error Codes

NI Error Codes

The following table contains the error codes produced by the NI diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then:

1. Reseat the loopback connector (if failure is between error codes A0 to AC)
2. Reseat the system and I/O module connection

Execute the NI diagnostic to verify. If failure reoccurs, FRU replacement will be necessary. Replace the following items one at a time and execute NI diagnostic to verify if failure has been corrected.

1. Loopback connector (if failure is between error codes A0 to AC)
2. System module
3. I/O module

Error Code	Description
10	Network Address ROM: read access failed
12	Network Address ROM: null address
14	Network Address ROM: bad group address
16	Network Address ROM: bad checksum
18	Network Address ROM: bad group 2
1A	Network Address ROM: bad group 3
1C	Network Address ROM: bad test patterns
20	LANCE Register Address Port R/W error
22	LANCE CSR0 R/W error
24	LANCE CSR1 R/W error
26	LANCE CSR2 R/W error
28	LANCE CSR3 R/W error

Continued on next page

NI Diagnostic Error Codes, Continued

Error Code	Description
30	LANCE initialization failed
32	LANCE initialization: receiver disabled
34	LANCE initialization: transmitter disabled
36	LANCE initialization: receiver enabled
38	LANCE initialization: transmitter enabled
40	LANCE internal loopback/DMA: initialization failed
42	LANCE internal loopback/DMA: transmit failed
44	LANCE internal loopback/DMA: receive failed
46	LANCE internal loopback/DMA: packet comparison failed
48	LANCE internal loopback/DMA: init DMA error
4A	LANCE internal loopback/DMA: transmit DMA error
4C	LANCE internal loopback/DMA: receive DMA error
4E	LANCE internal loopback/DMA: unknown tx or rx error
50	LANCE interrupts: initialization failed
52	LANCE interrupts: TC interrupt register bit not set
54	LANCE interrupts: SIR NI interrupt register bit not set
56	LANCE interrupts: NI ISR not entered
60	LANCE CRC: initialization failed
62	LANCE CRC: transmit failed
64	LANCE CRC: receive failed
66	LANCE CRC: packet comparison failed
68	LANCE CRC: LANCE generated bad CRC
6A	LANCE CRC: LANCE rejected good CRC
6C	LANCE CRC: LANCE accepted bad CRC
6E	LANCE CRC: Other error
70	LANCE rx MISS/BUFF: initialization failed
72	LANCE rx MISS/BUFF: transmit failed
74	LANCE rx MISS/BUFF: unknown receive error
76	LANCE rx MISS/BUFF: MISS error not flagged
78	LANCE rx MISS/BUFF: BUFF error not flagged

Continued on next page

Error Code	Description
80	LANCE collision: initialization failed
82	LANCE collision: unknown transmit error
84	LANCE collision: RETRY not flagged
86	LANCE collision: transmitter disabled
90	LANCE address filtering: initialization failed
92	LANCE address filtering: transmit failed
94	LANCE address filtering: receive failed
96	LANCE address filtering: packet comparison failed
98	LANCE address filtering: broadcast filtering failed
9A	LANCE address filtering: promiscuous mode failed
9C	LANCE address filtering: null destination accepted
9E	LANCE address filtering: good logical address rejected
A0	LANCE external loopback: initialization failed
A2	LANCE external loopback: transmit failed
A4	LANCE external loopback: receive failed
A6	LANCE external loopback: packet comparison failed
A8	LANCE external loopback: unknown transmit error
AA	LANCE external loopback: unknown receive error
AC	LANCE external loopback: check NI port lpbk connector
B0	LANCE tx BUFF: initialization failed
B2	LANCE tx BUFF: BUFF error not flagged
B4	LANCE tx BUFF: transmitter enabled
B6	LANCE tx BUFF: unknown transmit error
D0	DMA registers: MAP_BASE register error
D2	DMA registers: I/O write access to map registers failed
D4	DMA registers: I/O read access to map registers failed
D6	DMA registers: parity error not flagged
E4	LANCE DMA: valid DMA failed
E6	LANCE DMA: DMA failed during init
E8	LANCE DMA: DMA failed during transmit

Continued on next page

NI Diagnostic Error Codes, Continued

Error Code	Description
EA	LANCE DMA: DMA failed during receive
F0	LANCE initialization failed
F2	LANCE transmit failed
F4	LANCE unknown transmit error
F6	LANCE receive failure
F8	LANCE unknown receive error

Memory Diagnostic Error Codes

Memory Error Codes

The following table contains the error codes produced by the Memory diagnostic.

All status codes are displayed in hexadecimal.

If the diagnostic fails, then reseat the MEMORY SIMMs:

Execute MEMORY diagnostic to verify. If failure reoccurs, FRU replacement will be necessary. Replace the Memory SIMM and execute the MEMORY diagnostic to verify if failure has been corrected.

Error Code	Description	Replace
02	CELL data did not equal pattern expected on forward pass	Memory SIMM
04	CELL data did not equal pattern expected on reverse pass	Memory SIMM
10	ADDR data should equal address but does not	Memory SIMM
20	LLSC load-locked /store-conditional failure	Memory SIMM

ASIC Diagnostic Status/Error Messages

ASIC Status/Error Messages

The following status/error information is displayed when an error is encountered:

```
T-STS-ASIC-ASIC$SG_MAP TEST
          ? T-ERR-ASIC - SCATTER/GATHER MAP REGISTER  DATA MISMATCH
```

NVR Diagnostic Status/Error Messages

TOY/NVR Status/Error Messages

The following status/error information is displayed when an error occurs:

```
T-STS-NVR - NVR_REG TEST
            ? T-ERR-NVR - BATTERY FAILURE WHILE POWER WAS OFF
            ? T-ERR-NVR - VRT BIT FAILURE, FINAL CHECK

T-STS-NVR - NVR CHECK BATTERY TEST
            ? T-ERR-NVR - BATTERY CODES DON'T MATCH

T-STS-NVR - NVR INIT TEST
            ? T-ERR-NVR - NVR REGISTER ERROR  - DATA MISMATCH

T-STS-NVR - NVR CLOCK TEST
        ? T-ERR-NVR - UIP FAILED TO CLEAR ERROR

T-STS-NVR - NVR ASSURE_CLOCK_IS_TICKING TEST
        ? T-ERR-NVR - ON POWERUP ALWAYS SET TIME -  ERROR (3)

T-STS-NVR - NVR TOY REGISTERS TEST
            ? T-ERR-NVR - TOY REGISTER ERROR - DATA MISMATCH

T-STS-NVR - NVR CLOCK_REENTRY TEST
            ? T-ERR-NVR - UIP FAILED TO CLEAR ERROR
            ? T-ERR_NVR - CLOCK HASN'T TICKED
            ? T-ERR_NVR - CSR_A ERROR - DATA MISMATCH
            ? T-ERR_NVR - CSR_B ERROR - DATA MISMATCH

T-STS-NVR - NVR INTERRUPT TEST
            ? T-ERR-NVR - WRONG NUMBER OF INTERRUPTS
```

ISDN Diagnostic Status/Error Messages

ISDN Status/Error Messages

The following status/error information is displayed when an error is encountered.

The failing FRU for all error messages will be the I/O module.

Before replacement of the FRU, first reseat the FRU, then execute the ISDN diagnostic to verify if failure reoccurs.

```
T-STS-ISDN - REGISTER TEST
     ? T-ERR-ISDN - REG FAILED - DATA MISMATCH
     failing address  =  (indirect address of failing register)
     data read         =  (data read)
     data expected    =  (data expected)

     ? T-ERR-ISDN - ISDN REGISTER ERROR - DATA MISMATCH)
     failing address = (indirect address of failing register)
     data read       = (data read)
     data expected   = (data expected)

T-STS-ISDN - TONE TEST
T-STS-ISDN - TONE RINGER:Use tone ringer to generate sound
T-STS-ISDN - TONE GENERATOR:Use tone generator to generate sound
T-STS-ISDN - DTMF:Use DTMF to generate sound

T-STS-ISDN - DIGITAL_LOOP TEST
     ? T-ERR-ISDN - ISDN DIGITAL_LOOP ERROR - DATA MISCOMPARE

T-STS-ISDN - ANALOG_LOOP TEST
     ? T-ERR-ISDN - ISDN ANALOG_LOOP - DATA MISCOMPARE

T-STS-ISDN - INTERRUPT TEST
     ? T-ERR-ISDN - NO INTERRUPT GENERATED
       data read  = (current value of DSR2 register in 79C30A)
       data exp   = (data expected)
     ? T-ERR-ISDN - INVALID INTERRUPT
       data read  = (current value of IR register in 79C30A)
       data exp   = (data expected)
     ? T-ERR-ISDN - DATA MISMATCH
       data read  = (data read)
       data exp   = (data expected)

      ? T-ERR-ISDN - INVALID DSR2 INT
       data read  = (data read)
       data exp   = (data expected)

      ? T-ERR-ISDN - TIME OUT

T-STS-ISDN - DMA TEST
     ? T-ERR-ISDN - TIME OUT
     ? T-ERR-ISDN - INVALID INTERRUPT
       data read  = (current value of System Interrupt register)
       data exp   = (interrupt expected)
     ? T-ERR-ISDN - DATA MISMATCH
       fail addr      = (sparse address of mis-matched data)
       data read  = (data read)
       data exp   = (data expected)

T-STS-ISDN - LOGO:Send out DIGITAL's sound logo D-E-C
```

Continued on next page

ISDN Diagnostic Status/Error Messages , Continued

```
T-STS-ISDN - RECORD TEST:Records and plays back a user's message
 T-STS-ISDN-Recording begins: Queues user to start talking
 T-STS-ISDN-Recording ends:Queues user that recording has ended
 T-SYS-ISDN-Playback recording: Queues user that message is being
 played back

T-STS-ISDN - REPEAT TEST:Allows user to speak and hear their message
              simultaneously

T-STS-ISDN - Will leave line open for about 10 seconds then turn off

T-STS-ISDN -PLAYBACK:Play back what was recorded using the RECORD
 utility
```

SCC Diagnostic Status/Error Messages

SCC Diagnostic Status Messages

The following is a list of the SCC diagnostic status messages:

`T-STS-SCC - Reset/Init Test`

This message means that the SCC reset test is being executed.

`T-STS-SCC - Modem Test`

This message means that the SCC modem test is being executed.

`T-STS-SCC - Poll test`

This message means that the SCC POLLED mode test is being executed. The polled test currently only executes in internal loopback mode.

`T-STS-SCC - Intrpt Test`

This message means that the SCC Interrupt test is being executed.

`T-STS-SCC - DMA test`

This message means that the SCC DMA test is being executed. The printer port will only be tested out when the console is not attached to it.

`T-STS-SCC - LK401 test`

This message means that the LK401 test is being executed.

`T-STS-SCC - Mouse test`

This message means that the Mouse test is being executed.

The following is a list of the SCC diagnostic error messages:

NOTE

All modem error messages require a modem loopback (P/N 29-24795) and requires that service mode be selected (diag_sec 2) or an error will occur.

Continued on next page

```
? T-ERR-SCC-MODEM - CTS bit Exp = 0 Rec =1
```

This message means that the modem test expected to see the CTS bit to be set to a 0 but it was read as a 1.

```
? T-ERR-SCC-MODEM - CTS bit Exp = 1 Rec = 0
```

This message means that the modem test expected to the CTS bit to be set but it is clear.

```
? T-ERR-SCC-MODEM - DSR bit Exp = 0 Rec =1
```

This message means that the modem test expected to see the DSR bit to be set to a 0 but it was read as a 1.

```
? T-ERR-SCC-MODEM - DSR bit Exp = 1 Rec = 0
```

This message means that the modem test expected to see the DSR bit to be set but it is clear.

```
? T-ERR-SCC-MODEM - DCD bit Exp = 0 Rec =1
```

This message means that the modem test expected to see the DCD bit to be set to a 0 but it was read as a 1.

```
? T-ERR-SCC-MODEM - DCD bit Exp = 1 Rec = 0
```

This message means that the modem test expected to see the DCD bit to be set but it is clear.

```
? T-ERR-SCC-MODEM - RI bit Exp = 0 Rec =1
```

This message means that the modem test expected to see the RI bit to be set to a 0 but it was read as a 1.

```
? T-ERR-SCC-MODEM - RI bit Exp = 1 Rec = 0
```

This message means that the modem test expected to see the RI bit to be set but it is clear.

```
? T-ERR-SCC - POLLED test - Transfer timed out
```

This message means that the transfer has not completed. This usually means that we have not received the characters that were transmitted.

Continued on next page

```
? T-ERR-SCC-DMA - Xfer tmout, Line x
```

This message means that the DMA transmit has not completed on line x.

```
? T-ERR-SCC-DMA - Unexp ints,Line x
  T-STS-SCC - Exp = %x  Rec = %x
```

This message means that we did not receive the interrupts that were expected.

```
? T-ERR-SCC-DMA - Data buf miscomp,Line x
  T-STS-SCC - Addr = %x  Exp = %x  Rec = %x
```

This message means that the data received by the DMA WRITE was not the same data that was transmitted on line x.

```
? T-ERR-SCC-LK401 - %x char rcvd
```

This message means that the response received from the LK401 was less than the number of characters expected.

```
? T-ERR-SCC-LK401 - ill resp rcvd
```

This message means that the response received from the LK401 was not the correct response.

```
? T-ERR-SCC-Mouse - %x char rcvd
```

This message means that the response received from the mouse was less than the number of characters expected.

```
? T-ERR-SCC-Mouse - ill resp rcvd
```

This message means that the mouse has failed its powerup self test.

```
? T-ERR-SCC-CCR - Parity error
```

This message means that a character received contains a parity error.

```
? T-ERR-SCC-CCR - Framing error
```

This message means that a character received contains a framing error.

Continued on next page

```
? T-ERR-SCC-CCR - Overrun error
```

This message means that a character received contains an overrun error.

```
? T-ERR-SCC-CCR - rec (%x) != exp (%x)"
```

This message means that the character received does not equal the character transmitted.

```
? T-ERR-SCC-INTR - SCC%x not set at COREIO
```

This message means that SCC bit %x is not set at COREIO.

```
? T-ERR-SCC-INTR - Not set in TCASIC
```

This message means that the COREIO interrupt is not set at the TURBOchannel ASIC.

```
? T-ERR-SCC-INTR - Not set at CPU
```

This message is not set at the DECchip 21064 CPU.

```
? T-ERR-SCC - TNF - %s
```

This message is printed out when the user requests a test that does not exist. The test name the user types in will be placed where the % is placed.

SCSI Diagnostic Status/Error Messages

SCSI Status Messages

The following is a list of the SCSI diagnostic status messages:

```
T-STS-SCSI (bus) - SCSI ASIC register test
T-STS-SCSI (bus) - SCSI Ctrl register test
T-STS-SCSI (bus) - Interrupt test
T-STS-SCSI (bus) - Data transfer test
T-STS-SCSI (bus) - Map error test
T-STS-SCSI (bus) - Minimal device test
```

SCSI Error Messages

The following is a list of the SCSI diagnostic error messages: Errors will be displayed using one of the lines with a question mark, followed by the lines without question marks.

NOTE

Possible failure in the I/O module. For the following error messages, reseat the modules before replacing.

```
? T-ERR-SCSI -  nvr err

? T-ERR-SCSI (bus) - DMA map err

? T-ERR-SCSI (bus) - SCSI ASIC Reg test - Data miscompare
  T-ERR-SCSI (bus) - Addr = (address) Exp = (exp data)
                     Act = (actual data)

? T-ERR-SCSI (bus) - SCSI Ctrl Reg test - Data miscompare
  T-ERR-SCSI (bus) - Addr = (address) Exp = (exp data)
                     Act = (actual data)

? T-ERR-SCSI (bus) - SCSI Ctrl Register test - Reg bit  wrong
  T-ERR-SCSI (bus) - Addr = (address) Info = (informational value)

? T-ERR-SCSI (bus) - Int test - cause no int

? T-ERR-SCSI (bus) - Int test - int disab high ipl

? T-ERR-SCSI (bus) - Int test - int enab high ipl

? T-ERR-SCSI (bus) - Int test - int enab low ipl
```

NOTE

Possible failure device or I/O module. For the following error messages, reseat the device or module before replacing.

```
  T-ERR-SCSI (bus) - info = (informational value)
                     Status = (status)
  T-ERR-SCSI (bus) - IR = (ir) CIR = (cir) IME = (ime)

? T-ERR-SCSI (bus) - Data Trans test - nondma inq

? T-ERR-SCSI (bus) - Data Trans test - dma inq
```

Continued on next page

```
? T-ERR-SCSI (bus) - Data Trans test - dma nonaligned inq

? T-ERR-SCSI (bus) - Data Trans test - sync dma inq

? T-ERR-SCSI (bus) - Data Trans test - virt dma inq
  T-ERR-SCSI (bus)  - id = (device id)
        lun = (logical unit number)
                      info = (informational value)
  T-ERR-SCSI (bus) - actcmd = (actual command)
                     curcmd = (current command)
              status = (status) int = (interrupt)
  T-ERR-SCSI (bus) - IR = (ir) CIR = (cir) IME = (ime)
  T-ERR-SCSI (bus) - snskey = (sense key)
       extfru = (extended fru info)

? T-ERR-SCSI (bus) - Data  Trans test - nondma inq not enough
   data

? T-ERR-SCSI (bus) - Data Trans test - nondma/dma inq size
   miscompare

? T-ERR-SCSI (bus) - Data Trans test - nondma/dma_nonal inq size
       miscompare

? T-ERR-SCSI (bus)  - Data Trans test - nondma/dma_nonal inq data
        miscompare

? T-ERR-SCSI (bus) - Data Trans test-nondma/sync inq size
   miscompare

? T-ERR-SCSI (bus) - Data Trans test-nondma/sync inq data
   miscompare

? T-ERR-SCSI (bus) - Data Trans test-nondma/virt inq size
   miscompare

? T-ERR-SCSI (bus) - Data Trans test-nondma/virt inq data
   miscompare
  T-ERR-SCSI (bus) - id = (device id) lun = (logical unit number)
```

NOTE

Possible failure in the I/O module. For following error messages, reseat the module before replacing.

```
? T-ERR-SCSI (bus) - Map Err test - ir notval  not set

? T-ERR-SCSI (bus) - Map Err test - ir parerr  not set
  T-ERR-SCSI (bus) - id = (device id) lun = (logical unit number)
  T-ERR-SCSI (bus) - virt data addr = (data addr)
                     map reg addr   = (map reg adr)
  T-ERR-SCSI (bus) - map reg data = (map data) IR = (ir)
   CIR = (cir)
```

Continued on next page

```
? T-ERR-SCSI (bus) - Map Err test - DMA inq err
  T-ERR-SCSI (bus) - id = (device id) lun = (logical unit number)
                     info = (informational value)
  T-ERR-SCSI (bus) - actcmd = (actual command)
                     curcmd = (current command)
              status = (status) int = (interrupt)
  T-ERR-SCSI (bus) - IR = (ir) CIR = (cir) IME = (ime)
  T-ERR-SCSI (bus) - snskey = (sense key)
       extfru = (extended fru info)
```

NOTE

Possible failure in the device or I/O module. For following error messages, reseat device or module before replacing.

```
? T-ERR-SCSI (bus) - Min Dev test - start unit

? T-ERR-SCSI (bus) - Min Dev test - test unit ready

? T-ERR-SCSI (bus) - Min Dev test - rewind

? T-ERR-SCSI (bus) - Min Dev test - mode select

? T-ERR-SCSI (bus) - Min Dev test - read

? T-ERR-SCSI (bus) - Min Dev test - send diagnostic
  T-ERR-SCSI (bus) - id = (device id)
              lun = (logical unit number)
             info = (informational value)
  T-ERR-SCSI (bus) - actcmd = (actual command)
       curcmd = (current command)
              status = (status) int = (interrupt)
  T-ERR-SCSI (bus) - IR = (ir) CIR = (cir) IME = (ime)
  T-ERR-SCSI (bus) - snskey = (sense key)
                     extfru = (extended fru info)

? T-ERR-SCSI (bus) - Min Dev test - wrong num bytes

? T-ERR-SCSI (bus) - Min Dev test - data miscompare
  T-ERR-SCSI (bus) - id = (device id) lun (logical unit number)
```

where:

`address` = Sparse address of failing location

`exp data` - Expected data

`actual data` - Actual data

`bus` = A or B

`device id` = SCSI id

`logical unit number` = logical unit number of device

`info` = informational value from table below

`actcmd` = original command that was sent to SCSI bus

`curcmd` = actual command that failed

`status` = SCSI controller status register contents at time of error

Continued on next page

`interrupt` = SCSI controller interrupt register contents at time of error
`ir` = TURBOchannel interrupt register contents at time of error
`cir` = DUAL SCSI ASIC control interrupt register contents at time of error
`ime` = DUAL SCSI ASIC interrupt mask enable register contents at error.
`data addr` = virtual address of data
`map reg adr` = map register address

NOTE

The next 2 values will only be printed out when a request sense command has been executed

`snskey` = sense key from request sense data packet
`extfru` = FRU value from request sense data packet

Informational Values

Information	Description
01	Terminal count bit clear in controller status register
02	Gross error bit clear in controller status register
03	Interrupt bit clear in controller status register
04	Bus service bit clear in controller status register
05	Disconnect bit clear in controller interrupt register
06	Disconnect bit set in controller interrupt register
07	Illegal command bit clear in controller interrupt register
08	Illegal command bit set in controller interrupt register
09	Arbitration not won
0A	Selection timeout
0B	Invalid sequence in sequence step register
0C	Unexpected ISR hit
0D	Interrupt service routine was not entered
0E	Interrupt bit in controller status register will not clear
0F	Bad request sense key
10	Bad status returned from status phase

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SCSI Diagnostic Status/Error Messages, Continued

Information	Description
11	Not enough sense data returned from a request sense command
12	Phase did not go to command phase
13	Phase did not go to message out phase
14	Phase did not go to message in phase
15	Command phase changed too soon
16	Message in phase changed too soon
17	Stuck in command phase
18	Stuck in message in phase
19	Stuck in message out phase
1A	Stuck in data out phase
1B	Stuck in data in phase
1C	Should not be in message out phase
1D	No interrupt after sending SCSI command
1E	No interrupt after sending command complete
1F	No interrupt after sending message accepted
20	No interrupt after sending transfer information
21	All data out bytes were not sent
22	Unexpected message reject from device
23	Fifo flag count is wrong
24	Message is unsupported
25	Bus device reset was sent, but device didn't drop off bus
26	Illegal phase
27	Should not be in data in phase
28	Problem with a device trying to reconnect
29	Unexpected disconnect message received
2A	Device not seen before is trying to reconnect
2B	Bad identify message received on reconnection
2C	Out of retries for this command
2D	Too many bytes sent in data out phase
2E	Too many bytes received in data in phase
2F	SCSI parity error
30	SCSI map error
31	SCSI bit in TURBOchannel interrupt register is not set
32	SCSI bit in TURBOchannel interrupt register is set

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Information	Description
33	SCSI bit in control interrupt register is not set
34	SCSI bit in control interrupt register is set
35	SCSI bit in control interrupt register won't clear
36	Controller interrupt reg contents different from expected
37	Controller status reg contents different from expected
50	Wrong device type. Device is not of type specified
51	Not enough data returned in mode sense command
52	Byte count specified for read or write is too small
53	Boot block checksum error
54	Boot block flags is not zero
55	Boot block count is zero
56	Device is too small for specified read or write
57	Device block size is not valid
58	Prom$ routine error
59	Error parsing boot string
90	SCSI bus specified is not valid
91	Utility specified is not valid
92	Device number specified is not valid
93	LUN specified is not valid
94	Wrong number of parameters for utility
95	Device number specified is the same as the host
96	Wrong mode of operation
97	Not enough data returned from device
98	Device is not a disk
99	Device is not a tape
9A	Device is not removable
9B	Device is removable
9C	Media is write protected
9D	Device is not ready
9E	Data read is incorrect
9F	LUN is illegal
A0	Problem building format page
A1	Problem building flexible page
A2	Disk capacity is too small

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SCSI Diagnostic Status/Error Messages, Continued

Information	Description
A3	Console function error
A4	Illegal floppy drive
A5	Illegal floppy media

NI Diagnostic Status/Error Messages

Status Messages

The following is a list of the NI diagnostic status messages:

```
T-STS-NI - Net Addr ROM test
T-STS-NI - LANCE Reg test
T-STS-NI - Init test
T-STS-NI - Int Lpbk and DMA test
T-STS-NI - Int test
T-STS-NI - CRC test
T-STS-NI - Rx Miss and Buff Err test
T-STS-NI - Collision test
T-STS-NI - Addr Filter test
T-STS-NI - Ext Lpbk test
T-STS-NI - Tx Buff Err test
```

Error Messages

Errors will be displayed using one of the lines with a question mark, followed by the lines without question marks.

```
? T-ERR-NI - DMA Init err

? T-ERR-NI - DMA Rx err

? T-ERR-NI - DMA Tx err

? T-ERR-NI - Init test - DMA err

? T-ERR-NI - Int test - DMA err

T-ERR-NI - Err = (error code) CSR0 = (csr0)

T-ERR-NI - IR = (ir) dma_addr = (dma address)

? T-ERR-NI - Init err

? T-ERR-NI - Init test - Init err

? T-ERR-NI- Int test - Init err
  T-ERR-NI - Err = (error code) CSR0 = (csr0)
      iblk_addr = (init address)
  T-ERR-NI - iblk_mode = (mode) ladrf0 = (filter0)
      ladrf1 = (filter1)

? T-ERR-NI - Tx err

? T-ERR-NI - Collision test - tx error

? T-ERR-NI - Tx Buff Err test - tx err
  T-ERR-NI - Err = (error code) CSR0 = (csr0)
      tx_addr = (tx address)
  T-ERR-NI - tx_desc1 = (tx data1) tx_desc2 = (tx data2)

? T-ERR-NI - Rx err
  T-ERR-NI - Err = (error code) CSR0 = (csr0)
      rx_addr = (rx address)
  T-ERR-NI - rx_desc1 = (rx data1) rx_desc2 = (rx data2)
```

Continued on next page

```
? T-ERR-NI - Net Addr ROM test - group err
  T-ERR-NI - Err = (error code) na_base = (base addr)
      na_data1 = (data1)
  T-ERR-NI - na_data2 = (data2) cksum = (checksum)

? T-ERR-NI - Net Addr ROM test - test patt err
  T-ERR-NI - Err = (error code) patt1 = (pattern1)
              patt2 = (pattern2)

? T-ERR-NI - LANCE Reg test - data miscompare
  T-ERR-NI - Err = (error code) Addr = (address)
              Exp = (exp data)   Act = (actual  data)

? T-ERR-NI - Int Lpbk and DMA test - Pkt err

? T-ERR-NI - Int test - Pkt err

? T-ERR-NI - CRC test - Pkt err

? T-ERR-NI - Addr Filter test - Pkt err

? T-ERR-NI - Ext Lpbk test - Pkt err
  T-ERR-NI - Err = (error code) CSR0 = (csr0)
  T-ERR-NI - pkt_len = (packet length) pkt_pattern=(packet pattern)
      pkt_crc = (packet crc)

? T-ERR-NI - Int test - int err
  T-ERR-NI - Err = (error code) IR = (ir)
  T-ERR-NI - SIR = (sir) SIM = (sim)

? T-ERR-NI - Ext Lpbk test - Pkt err
  T-ERR-NI - Err = (error code)
```

where:

`error code` = Error code from Ni error codes section, above.

`csr0` = Contents of LANCE CSR0

`ir` = TURBOchannel interrupt register contents at error

`dma address` = Physical DMA address

`tx address` = Physical DMA address of the current transmit descriptor

`tx data1` = First four bytes of the transmit descriptor

`tx data2` = Second four bytes of the transmit descriptor

`rx address` = Physical DMA address of the current receive descriptor

`rx data1` = First four bytes of the receive descriptor

`rx data2` = Second four bytes of the receive descriptor

`mode` = Initialization block mode

`ladrf0` = Upper longword of the logical address filter

`ladrf1` = Lower longword of the logical address filter

`ir` = TURBOchannel interrupt register contents at time of error

`init address` = Physical DMA address of the initialization block

`base addr` = Base address of the network address ROM

`data1` = First four bytes of the network address ROM

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`data2` = Next two bytes or network address and two byte check
`checksum` = Calculated checksum
`pattern1` = First four bytes of test patterns
`pattern2` = Last four bytes of test patterns
`address` = Sparse address of failing location
`exp data` = Expected data
`actual data` = Actual data
`packet length` = Packet length in bytes
`packet pattern` = Packet pattern or packet index
`packet crc` = Packet CRC
`ir` = TURBOchannel interrupt register contents at error
`sir` = COREIO ASIC system interrupt register at error
`sim` = COREIO ASIC system interrupt mask register at error

Memory Diagnostic Status/Error messages

Status Messages

The following is a list of the MEMORY diagnostic status messages:

```
T-STS-MEM - Cell Test (address) <-> (address)
T-STS-MEM -  Wr (pattern) Addr (address)
T-STS-MEM -  FWD Rd (pattern) Wr (~pattern) Addr (address)
T-STS-MEM -  REV  Rd (pattern) Wr (~pattern) Addr (address)
T-STS-MEM -  Addr Test (address) -> (address)
T-STS-MEM -  Wr Data = Addr (address)
T-STS-MEM -  Rd Data = Addr (address)
T-STS-MEM - LLSC Test Addr (address)
T-STS-MEM - Clr Mem (address) -> (address)
T-STS-MEM -        Wr 00000000 Addr (address)
T-STS-MEM - Errors (nmbr)
```

Continued on next page

Error Messages

The following is a list of the SCSI diagnostic error messages:

```
? T-ERR-MEM - Addr = (address) Exp = (data exp)
                Rec = (data rec) retries = (dec)

? T-ERR-MEM - Bad page = (hex)  page count = (hex)  test count = (hex)

? T-ERR-MEM - ldl_l/stl_c atomic sequence

? T-ERR-MEM - ldl_l/stl_c intervening io transaction

? T-ERR-MEM - ldl_l bcache hit

? T-ERR-MEM - stl_c bcache hit

? T-ERR-MEM - ldl_l bcache miss no victim

? T-ERR-MEM - ldl_l bcache miss with victim

? T-ERR-MEM - stl_c bcache miss with victim

? T-ERR-MEM - stl_c bcache miss no victim
```

`address` = 8 character hex representation of the address
`data exp` = 8 character hex representation of the data expected
`data rec` = 8 character hex representation of the data received
`pattern` = 8 character hex representation of the test pattern data
`dec` = decimal number
`hex` = hexadecimal number

MIPS Emulator Status Messages

MIPS Status Messages

The following are MIPS emulator status messages:

```
ERR-MIPS - DID NOT FIND ROM IN SLOT <N>
```

This means that no ROM was found at TURBOchannel slot N.

```
ERR-MIPS - UNRECOGNIZED COMMAND
```

This means that an unrecognized command was passed to the MIPS Emulator.

```
ERR-MIPS - REX COMMAND NOT SUPPORTED
```

This means that the REX command passed to the emulator is not supported at this time.

```
ERR-MIPS - COULD NOT LOAD ROM OBJECT <object_name>
```

This means the the object called <object_name> was not found in the option ROM.

```
ERR-MIPS - ROM OBJECT REPORTED A SEVERE ERROR
```

This means that a TURBOchannel ROM has returned a severe error code to the emulator.

Appendix C
Recommended Spares List

Recommended Spares List

Spares List

Table C–1 lists the recommended spare parts.

Table C–1 Spares List

Part	Part Number
I/O board	54-21813-01
System board	54-21149-02
MMB	54-21815-01
Power supply	H7816-AA
Memory SIMMs, 2MB	54-21139-BA
Memory SIMMs, 4MB	54-21139-CA
Memory SIMMs, 8MB	54-21139-DA
Drive power cable	17-03489-01
SCSI cable, long	17-03487-01
SCSI cable, short	17-02488-01
TURBOchannel FRUs:	
TC dual DMA SCSI	54-21833-01
TC NVRAM(1MB)	54-21856-01
Loopbacks and terminators	
Printer port loopback	12-25083-01

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Recommended Spares List, Continued

Table C–1 (Continued) Spares List

Part	Part Number
Thickwire Ethernet loopback	12-22196-01
SCSI terminators	12-30552-01
10Base-T Ethernet loopback	H4082-AA
Modem port loopback	29-24795

TURBOchannel Options Parts List

TURBOchannel Part Numbers

Table C–2 lists the TURBOchannel part numbers.

Table C–2 TURBOchannel Options List

Option Name	Option Number	Part Number
SCSI controller	PMAZ-AB	54-19876-01
Thickwire Ethernet controller	PMAD-AA	54-19874-01
FDDI interface module	DEFZA-AA	DEFZA-AA
TCE option module	-	54-20623-01
Monochrome frame buffer (MX)	PMAG-AA	54-20609-01
Color frame buffer (CX)	PMAG-BA	54-19815-01
Smart frame buffer 1280X1024, 72HZ 1280X1024, 66HZ (HX)	PMAGB-BA	54-21143-01
Smart frame buffer 1280X1024, 72HZ 1024X864, 60HZ (HX)	PMAGB-BC	54-21143-02
Smart frame buffer 1280X1024, 72HZ 1024X768, 72HZ (HX)	PMAGB-BE	54-21143-03
2D graphics accelerator (PX)	PMAG-CA	54-20314-01
True color frame buffer 66HZ (TX)	PMAG-JA	30-35790-01
True color frame buffer 72HZ (TX)	PMAGB-JA	30-35790-02

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Table C–2 (Continued) TURBOchannel Options List

Option Name	Option Number	Part Number
True color frame buffer picture-in-picture board		30-35788-01
Lo 3D graphics accelerator 66HZ (PXG)	PMAG-DA	54-20185-01
Lo 3D graphics accelerator 72HZ (PXG+)	PMAGB-DA	54-20185-02
Lo 3D graphics accelerator 66HZ (PXG+)	PMAGB-DC	54-20185-04
Mid 3D graphics accelerator 66HZ (PXG)	PMAG-EA	54-20185-02
Lo 3D graphics accelerator 72HZ with Z-buffer (PXG+)	PMAGB-EA	54-20185-05
Lo 3D graphics accelerator 66HZ with Z-buffer (PXG+)	PMAGB-EC	54-20185-06
Hi 3D graphics accelerator 66HZ (PXG turbo)	PMAG-FA	54-20114-01
Hi 3D graphics accelerator 72HZ (PXG turbo+)	PMAGB-FA	54-20114-02
8 bit Z-buffer		54-20410-AA
16 bit Z-buffer		54-20352-AA
8 plane video SIMM		54-20116-AA

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