DEC 3000 Models 600/600S AXP and 800/800S AXP

Service Information

Order Number: EK–FLSPC–SV. A01

Digital Equipment Corporation, Maynard, MA

First Printing, September 1993

S2388

This document was prepared using VAX DOCUMENT, Version 2.1.

Contents

Preface xv

Part I DEC 3000 Model 600/600S AXP Specific Information

1 System Overview

Overview 1–1
Components and Features 1–2
Front View 1–7
Rear View 1–9

2 System Configuration

Overview 2–1
Serial ROM Jumpers 2–2
Console Security 2–3
ROM Update 2–7
Storage Devices 2–8
Memory Configuration 2–11

3 Removal and Replacement Procedures

Overview 3–1
Locating Field Replaceable Units 3–3
Cable Routing 3–5
BA47X–AA Vertical Floor Stand 3–8
System Cover 3–14
Fixed Media Devices 3–17
Removable Media Devices 3–19
Drive Shelf 3–24
TURBOchannel Option 3–29
SIMMs 3–31

I/O Board 3–34
System Board 3–39
Power Supply 3–42

4 Diagnostic Testing

Overview 4–1
Power-On Diagnostics 4–2
FRU Code Table 4–4
Diagnostic Listing 4–5
Running Single/Multiple Tests 4–7
Entering/Exiting Console and Service Mode 4–10
ASIC Diagnostic 4–13
NVR Diagnostic 4–14
MEMORY Diagnostic 4–16
SCSI Diagnostic 4–20
NI Diagnostic 4–23
SCC Diagnostic 4–26
ISDN Diagnostic 4–29
TURBOchannel Testing 4–31

5 Troubleshooting

Overview 5–1
LED Codes 5–2
84 Fail 5–14
Troubleshooting Tables 5–15

Part II DEC 3000 Model 800/800S AXP Specific Information

6 System Overview

Overview 6–1
Front View 6–5
Rear View 6–8
System Block Diagram 6–11

7 System Configuration

Overview 7–1
Jumper Locations 7–3
Console Security 7–6
Storage Devices 7–8
Internal Cable Routing 7–11
Memory Configuration 7–13

8 Removal and Replacement Procedures

Overview 8–1
Locating Field Replaceable Units 8–3
System Cover 8–6
Front Bezel 8–8
Side Panels 8–10
Rear Bezel 8–12
Audio Module Assembly 8–14
Lights and Switch Module 8–16
Power Supply 8–18
RZ*xx* Disk Drives 8–22
Regulator Module 8–27
I/O Module 8–29
Fans 8–34
Memory Mother Board 8–37
Memory Module 8–40
System Module 8–43
System Cable and Power Routing 8–50

9 Diagnostic Testing

Overview 9–1
FRU Code Table 9–2
Diagnostic Listing 9–3
Running Diagnostic Tests 9–4
Entering and Exiting Console and Service Mode 9–6
ASIC Diagnostic 9–8
NVR Diagnostic 9–9
Memory Diagnostic 9–11
SCSI Diagnostic 9–15
NI Diagnostic 9–18
SCC Diagnostic 9–20
ISDN Diagnostic 9–22

TURBOchannel Testing 9–24

10 Troubleshooting

Overview 10–1
System Device FRU Codes 10–2
LED Codes 10–2
84 Fail Message 10–10
Troubleshooting Tables 10–11

11 Rackmount Installation for the IEC RS–310 Cabinet

Installation Procedure 11–1

12 Rackmount Installation for the H9A00–AJ Cabinet

Installation Procedure 12–1

Part III Common System Information

13 Using the Console and Utilities Commands

Overview 13–1
Console Commands List 13–1
BOOT 13–2
BOOT Command Parameters 13–3
CONTINUE 13–5
DEPOSIT 13–6
EXAMINE 13–10
HALT 13–15
HELP 13–15
INITIALIZE 13–17
LOGIN 13–18
REPEAT 13–19
SET 13–20
SET Command Parameters 13–21
SHOW 13–39
SHOW Command Parameters 13–41
START 13–55
TEST 13–56
Alternate Consoles 13–56
SCSI Utilities 13–58

14 LED Codes and Status/Error Messages

Overview 14–1
LED Codes 14–2
Console Error Messages 14–8
Console Halt Messages 14–9
ASIC Diagnostic Error Codes 14–10
NVR Diagnostic Error Codes 14–11
ISDN Diagnostic Error Codes 14–12
SCC Diagnostic Error Codes 14–13
SCSI Diagnostic Error Codes 14–15
NI Diagnostic Error Codes 14–16
MEMORY Diagnostic Error Codes 14–20
ASIC Diagnostic Status/Error Messages 14–20
NVR Diagnostic Status/Error Messages 14–20
ISDN Diagnostic Status/Error Messages 14–21
SCC Diagnostic Status/Error Messages 14–23
SCSI Diagnostic Status/Error Messages 14–25
NI Diagnostic Status/Error Messages 14–31
MEMORY Diagnostic Status/Error Messages 14–34
MIPS Emulator Status Messages 14–36

15 Recommended Spares List

Spares List for the DEC 3000 Model 600/600S AXP 15–1
DEC 3000 Model 600/600S AXP TURBOchannel Options Parts List 15–3
Recommend Spares List for the DEC 3000 Model 800/800S AXP 15–5

16 SCSI ID Settings for Drives

Setting a Unique SCSI Address 16–1

Part IV System Upgrading Information

17 Upgrading a DEC 3000 Model 400/400S AXP to a Model 600/600S AXP

Overview 17–1
Options Supported 17–2
Upgrade Kit Contents 17–8
Performing the Upgrade 17–8
Completing the Upgrade 17–9

Index

Figures

1–1 DEC 3000 Model 600/600S AXP System Module Block Diagram 1–4
1–2 DEC 3000 Model 600/600S AXP I/O Subsystem Block Diagram 1–5
1–3 Front View 1–8
1–4 Rear View 1–9
2–1 Serial ROM Jumpers 2–2
2–2 Secure Jumper 2–4
2–3 ROM Update Jumper 2–7
2–4 Example of a Memory Bank 2–12
3–1 System Major Assembly View (Front) 3–4
3–2 System Power Cable Routing 3–5
3–3 SCSI Disk Cable Routing 3–6
3–4 Disk Power Cabling 3–7
3–5 Cable Location in Floor Stand Configuration 3–9
3–6 Lifting the Floor Stand 3–10
3–7 Removing the Floor Stand 3–11
3–8 Removing the Mounting Plate 3–12
3–9 Removing the System Cover 3–15
3–10 Removing a Fixed Media Device 3–18
3–11 Loosening the Screws on the Bracket 3–20
3–12 Removing a Removable Media Device 3–22
3–13 Disconnecting the Cables and Loosening the Screws from Drive Shelf 3–25
3–14 Removing the Drive Shelf 3–27

3–15	Removing the Screws and Standoffs from a TURBOchannel Option	3–30
3–16	Removing the Memory Mother Board	3–32
3–17	Removing the SIMMs	3–33
3–18	Removing the I/O Board	3–36
3–19	Replacing the I/O Board	3–37
3–20	Verifying Jumper Settings	3–38
3–21	Removing a System Board	3–40
3–22	Removing the Power Supply	3–43
4–1	MMB	4–20
6–1	Front View	6–6
6–2	Rear View	6–9
6–3	System Block Diagram	6–11
7–1	System Module Jumper Locations	7–3
7–2	I/O Module Jumper Locations	7–5
7–3	Internal Cable Routing	7–11
7–4	Factory-Default SCSI ID Settings for Drives	7–12
7–5	Power Cabling	7–13
7–6	Memory Bank Layout	7–14
8–1	FRU Locations (Right Side)	8–4
8–2	FRU Locations (Left Side)	8–5
8–3	Removing the Top Cover	8–7
8–4	Removing the Front Bezel	8–9
8–5	Removing the Side Panel	8–11
8–6	Removing the Rear Bezel	8–13
8–7	Removing the Audio Module Assembly	8–15
8–8	Removing the LSM Module	8–17
8–9	Power Supply Cabling	8–19
8–10	Removing the Power Supply	8–20
8–11	Removing an RZ*xx* Drive	8–24
8–12	Default SCSI ID Settings	8–25
8–13	Removing the Regulator Module	8–28
8–14	I/O Module Cable Connections	8–30
8–15	Removing the I/O Module (Side View)	8–31
8–16	I/O Module Jumper Locations	8–33
8–17	Removing a Fan	8–35
8–18	Removing a Memory Mother Board	8–38

8–19 Removing SIMMs 8–41
8–20 System Module Power Connections 8–44
8–21 TURBOchannel Connections 8–45
8–22 Removing the System Module 8–46
8–23 System Module Jumper Locations 8–48
8–24 Internal Cabling 8–50
8–25 Power Cabling 8–51
9–1 Memory Bank Layout 9–15
11–1 Determining the Installation Area 11–3
11–2 Installing the Top Air Deflector 11–5
11–3 Installing the Bottom Air Deflector Assembly 11–7
11–4 Assembling the Right Side Chassis Slide Subassembly 11–9
11–5 Installing the Right Side Chassis Slide Assembly 11–11
11–6 Assembling the Left Side Chassis Slide Subassembly 11–13
11–7 Installing the Left Side Chassis Slide Assembly 11–15
11–8 Installing the Chassis Slide Support Brackets 11–17
11–9 Securing the PE50A–B9/D9 Unit to the Chassis Slide Assembly 11–19
11–10 Installing the Faceplate Mounting Brackets 11–21
11–11 Installing the Faceplate 11–22
11–12 Installing the Rear Support Bracket 11–24
11–13 Rear View of the System 11–25
11–14 Front View of the System 11–27
12–1 Determining the Installation Area 12–3
12–2 Installing the Top Air Deflector 12–5
12–3 Installing the Bottom Air Deflector Assembly 12–6
12–4 Assembling the Right Side Chassis Subassembly 12–8
12–5 Installing the Right Side Chassis Slide Assembly 12–10
12–6 Assembling of the Left Side Slide Subassembly 12–12
12–7 Installing the Left Side Chassis Slide Assembly 12–14
12–8 Installing the Chassis Slide Support Brackets 12–16
12–9 Securing the PE50A–B9/D9 Unit to the Chassis Slide Assembly 12–18
12–10 Installing the Faceplate Mounting Brackets 12–20
12–11 Installing the Faceplate 12–22
12–12 Installing the Rear Support Bracket 12–24
12–13 Rear View of the System 12–25

12–14	Front View of the System	12–27
16–1	RRD42 Compact Disc Drive SCSI ID Settings	16–3
16–2	RX26 Diskette Drive SCSI ID Settings	16–5
16–3	RX26 Unit Select Switch	16–6
16–4	TZK10/TZK11 Tape Drive SCSI ID Settings	16–7
16–5	TZ30 SCSI Switches	16–8
16–6	TLZ06 Tape Drive SCSI ID Settings	16–9
16–7	RZ24L Fixed Disk Drive SCSI ID Settings	16–10
16–8	RZ25 Fixed Disk Drive SCSI ID Settings	16–11
16–9	RZ25 Secondary SCSI Address Port	16–12
16–10	RZ25L Fixed Disk Drive SCSI ID Settings	16–13
16–11	RZ26 Fixed Disk Drive SCSI ID Settings	16–14
16–12	RZ26L Fixed Disk Drive SCSI ID Settings	16–15
16–13	RZ28 Fixed Disk Drive SCSI ID Settings	16–16

Tables

1	Parts Description	xvi
2	DEC 3000 Model 600/600S AXP Systems Reference Documentation	xviii
3	DEC 3000 Model 800/800S AXP Systems Reference Documentation	xix
4	Telephone Numbers of Digital Support Centers	xx
1–1	DEC 3000 Model 600/600S AXP System (Front)	1–8
1–2	DEC 3000 Model 600/600S AXP System (Rear)	1–9
2–1	Recommended SCSI Jumper Settings	2–10
2–2	Recommended SCSI Switch Settings	2–10
3–1	FRU Table	3–3
4–1	System Device FRU Codes	4–4
4–2	TURBOchannel Options FRU Codes	4–5
4–3	TURBOchannel Options FRU Codes	4–5
4–4	Diagnostics Environments	4–7
4–5	ASIC Diagnostic Subtests	4–13
4–6	ASIC Error Identification	4–14
4–7	NVR Diagnostic Subtests	4–15
4–8	NVR Error Identification	4–16
4–9	Memory Diagnostic Subtests	4–18

4–10	Memory Test Options	4–18
4–11	Memory Error Code Description	4–19
4–12	SCSI Diagnostic Subtests	4–22
4–13	SCSI Error Identification	4–23
4–14	NI Diagnostic Subtests	4–24
4–15	NI Error Identification	4–25
4–16	SCC Diagnostic Subtests	4–28
4–17	SCC Error Identification	4–28
4–18	ISDN Diagnostic Subtests	4–30
4–19	ISDN Error Identification	4–30
5–1	Serial ROM LED Codes Action Table	5–2
5–2	Serial ROM LED Codes	5–3
5–3	ASIC LED Codes	5–4
5–4	ASIC LED Codes Action Table	5–5
5–5	NVR LED Codes	5–6
5–6	NVR LED Codes Action Table	5–7
5–7	SCC LED Codes	5–7
5–8	SCC LED Codes Action Table	5–8
5–9	NI LED Codes	5–9
5–10	NI LED Codes Action Table	5–10
5–11	ISDN LED Codes	5–11
5–12	ISDN LED Codes Action Table	5–11
5–13	SCSI LED Codes	5–12
5–14	SCSI LED Codes Action Table	5–13
5–15	Console LED Codes	5–13
5–16	Console LED Codes Action Table	5–14
5–17	System Problems	5–16
5–18	Monitor Problems	5–18
5–19	Mouse Problems	5–19
5–20	Keyboard Problems	5–19
5–21	Drive Problems	5–20
5–22	Network Problems	5–20
5–23	Firmware Upgrade Problems	5–21
6–1	DEC 3000 Model 800/800S AXP System (Front)	6–7
6–2	DEC 3000 Model 800/800S AXP System (Rear)	6–10
7–1	System Module Jumpers	7–4
7–2	I/O Module Jumpers	7–5

7–3	Recommended SCSI Jumper Settings	7–10
8–1	FRU Table	8–3
8–2	I/O Module Jumper Locations	8–33
8–3	System Module Jumper Locations	8–49
9–1	System Device FRU Codes	9–2
9–2	TURBOchannel FRU Codes	9–2
9–3	SCSI FRU Codes	9–3
9–4	Diagnostics Environments	9–4
9–5	ASIC Diagnostic Subtests	9–8
9–6	ASIC Error Identification	9–9
9–7	NVR Diagnostic Subtests	9–10
9–8	NVR Error Identification	9–11
9–9	Memory Diagnostic Subtests	9–12
9–10	Memory Test Options	9–13
9–11	Memory Error Identification	9–14
9–12	SCSI Diagnostic Subtests	9–17
9–13	SCSI Error Identification	9–18
9–14	NI Diagnostic Subtests	9–19
9–15	NI Error Identification	9–20
9–16	SCC Diagnostic Subtests	9–21
9–17	SCC Error Identification	9–22
9–18	ISDN Diagnostic Subtests	9–23
9–19	ISDN Error Identification	9–24
10–1	System Device FRU Codes	10–2
10–2	Serial ROM LED Error Codes	10–4
10–3	NVR LED Error Codes	10–6
10–4	SCC LED Error Codes	10–7
10–5	NI LED Error Codes	10–8
10–6	ISDN LED Error Codes	10–9
10–7	SCSI LED Error Codes	10–9
10–8	Console LED Error Codes	10–10
10–9	System Problems	10–12
10–10	Monitor Problems	10–14
10–11	Mouse Problems	10–15
10–12	Keyboard Problems	10–15
10–13	Drive Problems	10–16
10–14	Network Problems	10–16

10–15	Firmware Upgrade Problems	10–18
11–1	DEC 3000 Model 800/800S AXP System (Rear)	11–26
11–2	DEC 3000 Model 800/800S AXP System (Front)	11–28
12–1	DEC 3000 Model 800/800S AXP System (Rear)	12–26
12–2	DEC 3000 Model 800/800S AXP System (Front)	12–28
13–1	OpenVMS AXP and DEC OSF/1 AXP Device Naming Conventions	13–4
13–2	SCSI Utility Options	13–58
13–3	Erasing a Hard Disk	13–59
13–4	Formatting a Diskette	13–61
13–5	Verifying a Disk	13–61
14–1	Power-Up Test Serial ROM Codes	14–2
15–1	DEC 3000 Model 600/600S AXP Spares List	15–1
15–2	DEC 3000 Model 600/600S AXP TURBOchannel Options List	15–3
15–3	DEC 3000 Model 800/800S AXP Spares List	15–5
16–1	SCSI ID Settings	16–1
17–1	Supported Internal Options	17–2
17–2	External Supported Options	17–5
17–3	Other Supported Options	17–7

Preface

About This Document

Purpose

This document provides information for servicing the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems. A variety of diagnostic and troubleshooting aids is provided, along with procedures to remove and replace failed or damaged field replaceable units (FRUs).

Audience

This manual is a support and reference document for Digital services personnel who perform maintenance work on the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems. It is also intended for Digital customers who have a self-maintenance agreement with Digital.

Structure

This guide consists of 17 chapters and an index. It is organized into four parts as Table 1 describes.

Table 1 Parts Description

Part	Title	Description
I	DEC 3000 Model 600 /600S AXP Specific Information	Chapters 1-5 in Part I provide information specific to the DEC 3000 Model 600/600S AXP system. The chapters include a system overview, configurations, FRU removal and replacements, diagnostics, and troubleshooting.
II	DEC 3000 Model 800 /800S AXP Specific Information	Chapters 6-12 in Part II provide information specific to the DEC 3000 Model 800 /800S AXP system. The chapters include a system overview, configurations, FRU removal and replacements, diagnostics, troubleshooting, and rackmount installation.
III	Common System Information	Chapters 13-16 in Part III provide information common to both the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems. The chapters describe console commands, LED codes and status/error messages, spare parts, and SCSI ID option devices information.
IV	System Upgrading Information	Chapter 17 in Part IV provides information for upgrading a DEC 3000 Model 400/400S AXP system to a DEC 3000 Model 600/600S AXP system.

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 key name in a box used in text and examples means that you press that key on your keyboard.
[ ]	Optional. The information contained within these brackets is optional.
{ }	Required. The information contained within these delimiters is required.
TEST ASIG	User input. Bolded text indicates that the user must supply this information.
SET PASSWORD	In text, commands are shown in all uppercase to differentiate them from text.
❶	A number in a circle corresponds to that number in an illustration.

Related Documentation

The following documents listed in Table 2 and Table 3 provide additional information about the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems.

Table 2 DEC 3000 Model 600/600S AXP Systems Reference Documentation

Document	Order Number
DEC 3000 Model 600/600S AXP System Owner's Guide	EK–SNDPL–OG
DEC 3000 Model 600/600S AXP Setting Up Your Workstation (Quick Card)	EK–SNDWS–QC
DEC 3000 Model 600/600S AXP Setting Up Your Server (Quick Card)	EK–SNDSR–QC
DEC 3000 Model 600/600S AXP Technical Summary	EK–SNDPR–TM
DEC 3000 Model 600/600S AXP Options Guide	EK–SNDPL–OP
OpenVMS Factory Installed Software User Card	EK–A0377–UG
Guide to Installing DEC OSF/1	EK–SFFIS–UG
DEC 3000 Model 600/600S AXP Floor Stand Installation Card	EK–SNDPR–QC
TURBOchannel Expander Box Owner's Guide	EK–TRBXT–IN
Alpha AXP Systems Firmware Release Notes	AA–PW8YD–TE

Table 3 DEC 3000 Model 800/800S AXP Systems Reference Documentation

Document	Order Number
DEC 3000 Model 800/800S AXP Owner's Guide	EK–FLMUL–OG
DEC 3000 Model 800/800S AXP Options Guide	EK–FLMUL–OP
DEC 3000 Model 800 AXP Quick Installation Card	EK–FLUM–QC
DEC 3000 Model 800S AXP Quick Installation Card	EK–FLUMSR–QC
DEC 3000 Model 800/800S AXP Technical Summary	EC–N0094–51

Digital Support Centers

Availability

Digital services representatives are available at Digital Support Centers for on-site warranty and service contract customers. If you do not currently receive this support but would like to, please contact either a Digital Support Center listed in Table 4 or your local Digital office.

Contact Numbers

Table 4 lists several telephone numbers for Digital Support Centers.

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

Table 4 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

Part I

DEC 3000 Model 600/600S AXP Specific Information

Part I provides information specific to the DEC 3000 Model 600/600S AXP system. This part includes the following chapters:

Chapter	Title
1	System Overview
2	System Configuration
3	Removal and Replacement Procedures
4	Diagnostic Testing
5	Troubleshooting

1
System Overview

Overview

Chapter Overview

This chapter contains the following topics:

- Components and features of the DEC 3000 Model 600/600S AXP system
- Front view of the system
- Rear view of the system

Introduction

The DEC 3000 Model 600/600S AXP can be used as either a workstation or a server. The system uses the DECchip 21064 implementation of the Alpha AXP architecture.

The DEC 3000 Model 600 AXP 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 600S AXP 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 600/600S AXP 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 600 AXP system consists of the following components:

- System unit, which includes:
  - System module
  - I/O Module
  - Memory mother board (MMB)
  - Memory SIMMs
  - Mass storage shelf
  - Power supply
- Monitor
- Keyboard
- Mouse

Server

The DEC 3000 Model 600S AXP system includes a system unit, which consists of:

- System module
- I/O Module
- Memory mother board (MMB)
- Memory SIMMs
- Mass storage shelf
- Power supply

System Module

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

- DECchip 21064 processor chip
- DECchip 21064 Icache and Dcache
- Bcache and main memory control
- TURBOchannel interface

Interconnection: The system card (Syscard) provides connectors to interface to the DEC 3000 Model 600/600S AXP I/O module (SPIOMOD) and to the SIMM 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 Bcache are controlled by the ELVIS chip.

I/O Module

The DEC 3000 Model 600/600S AXP I/O module (SPIOMOD, Figure 1–2) contains all of the internal and external I/O connectors along with three TURBOchannel options connectors.

The I/O module has the following features:

- Two SCSI-2 interface chips
- Interface to the TURBOchannel
- Ethernet, ISDN, printer, and audio communication ports that have DMA
- 32K-entry scatter/gather map for virtual DMA

The I/O module contains the following hardware jumpers:

- ROM Update jumper–Enables/disables the writeable feature of the FEPROMs.
- Secure System jumper–When placed in the enabled position, this jumper enables the operator to lock out certain console commands from unauthorized users. It can also be used to clear a forgotten password.

- External SCSI terminator–enable/disable.

Figure 1–1 DEC 3000 Model 600/600S AXP System Module Block Diagram

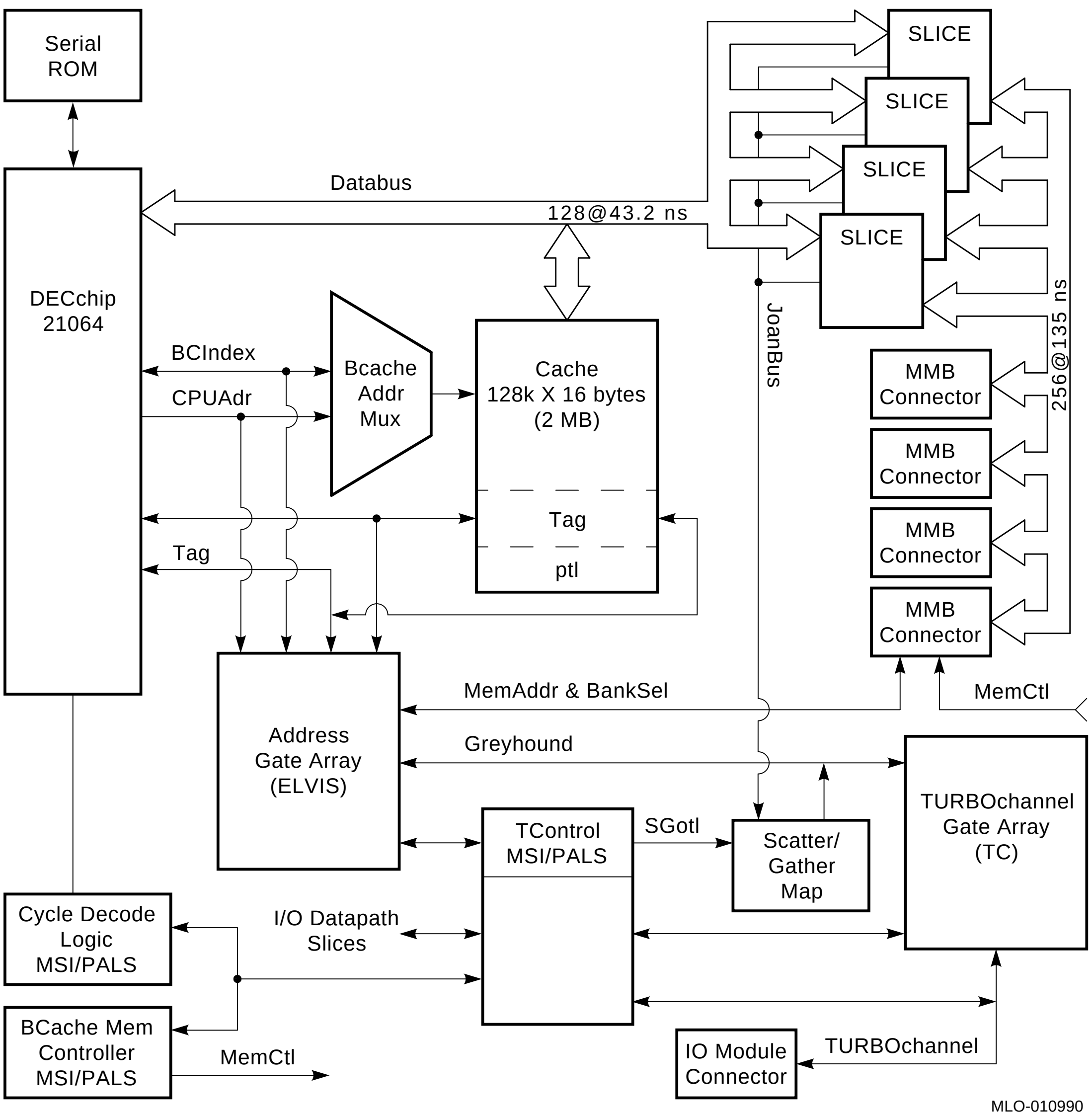
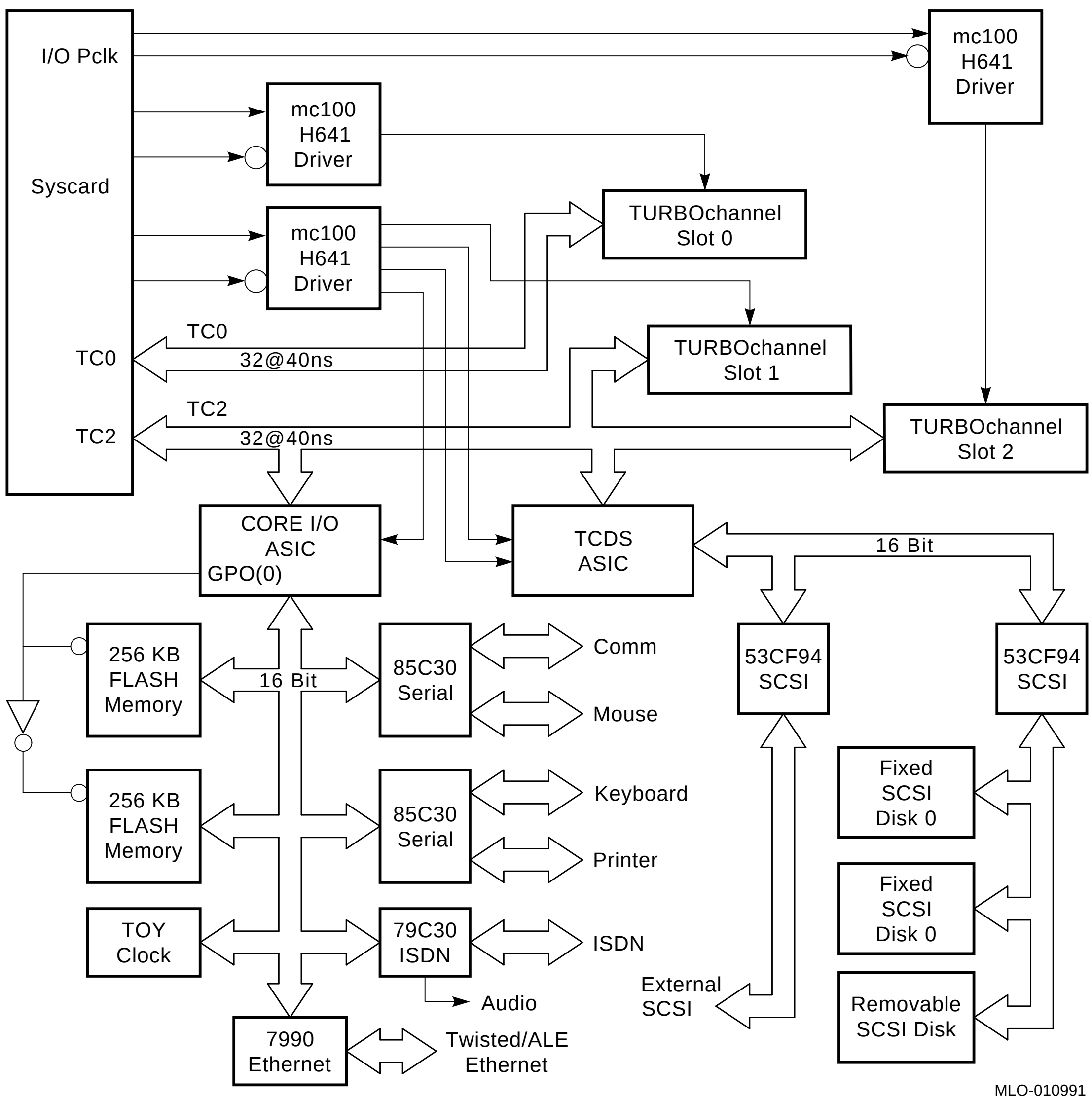


Figure 1–2 DEC 3000 Model 600/600S AXP I/O Subsystem Block Diagram



Memory Mother Board

The DEC 3000 Model 600/600S AXP consists of four memory mother boards (MMBs). 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.

System Features

The DEC 3000 Model 600/600S AXP provides the following features:

Feature	Benefit
Alpha AXP 64-bit computing using the DECchip 21064 microprocessor chip, which contains 8 KB of instruction cache and 8 KB of data cache	Double the industry-standard 32-bit data path. Internal instruction and data caches improve performance.
Expandable from 16 MB to 512 MB of memory	Memory expands using either 2, 4, 8, 16, or 32 MB DRAM SIMMs.
A 2 MB secondary cache	Improves speed and performance.
Internal and external SCSI 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).

Feature	Benefit
Three TURBOchannel I/O adapter slots	Allow for high-performance module interconnection that makes available a variety of options.
Password security	Additional security for privileged commands in console mode.
Audio technology	Built-in audio for voice grade output capabilities.
Choice of operating systems	Currently, choice of OpenVMS Alpha AXP, and DEC OSF/1 Alpha AXP.
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 600/600S AXP system.

Figure 1–3 Front View

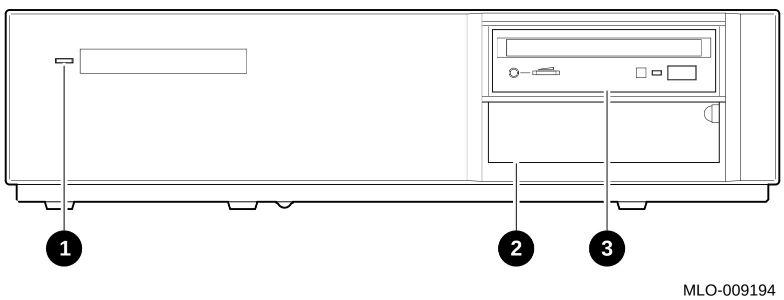


Table 1–1 DEC 3000 Model 600/600S AXP System (Front)

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

Rear View

Rear View

See Figure 1–4 and Table 1–2 for information pertaining to the rear of the DEC 3000 Model 600/600S AXP.

Figure 1–4 Rear View

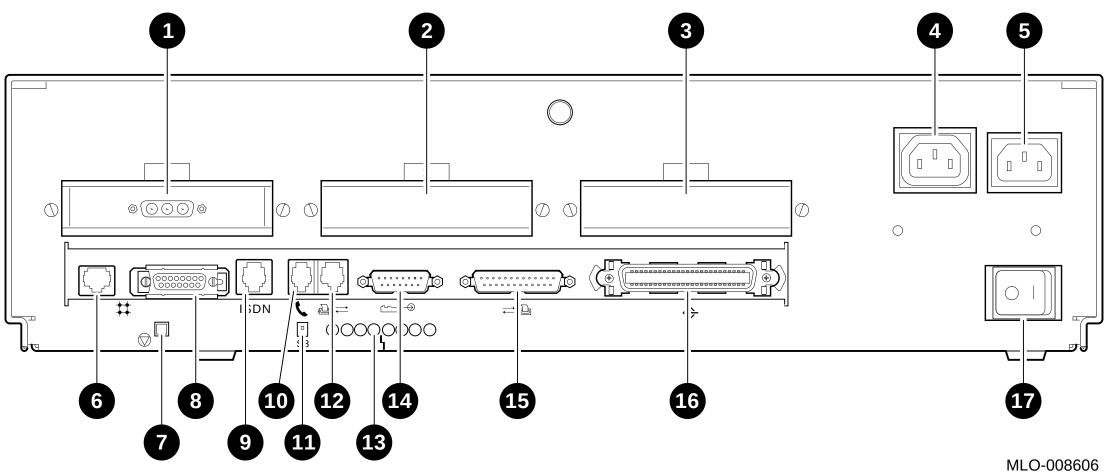


Table 1–2 DEC 3000 Model 600/600S AXP System (Rear)

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

(continued on next page)

Table 1–2 (Cont.) DEC 3000 Model 600/600S AXP System (Rear)

Feature		Function
❸	TURBOchannel slot 2	Connect a TURBOchannel option.
❹	Monitor power socket	Connect the monitor power cord.
❺	System power socket	Connect the system power cord.
❻	10BASE-T port	Connect a 10BASE-T twisted pair Ethernet network cable.
❼	Halt button	Place the system in console mode.
❽	AUI Ethernet network port	Connect an AUI Thickwire Ethernet network cable.
❾	ISDN port (not presently accessible for use)	Connect an ISDN network cable.
❿	Audio port	Connect a voice grade audio output cable.
⓫	Alternate 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, the system is in graphic mode, with the switch in the down position, the system is in alternate console mode.
⓬	Printer/alternate console port	Connect either a printer or an alternate console using an MMJ connector.
⓭	Eight amber diagnostic display LEDs	Decode diagnostic error codes.
⓮	Keyboard/mouse port	Connect the keyboard/mouse cable.

(continued on next page)

Table 1–2 (Cont.) DEC 3000 Model 600/600S AXP System (Rear)

Feature		Function
⓯	Synch/Asynch full modem communications port	Connect to a communications device such as a printer, plotter, modem, or console terminal.
⓰	External SCSI port	Connect small computer system interface (SCSI) peripheral devices.
⓱	Power ON/OFF switch	Turn the system unit power on (|) and off (O).

2

System 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, record the present conditions before making any changes. Record 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 show the configuration of the system devices and options:

- SHOW CONFIGURATION
- SHOW MEMORY
- SHOW DEVICE

Serial ROM Jumpers

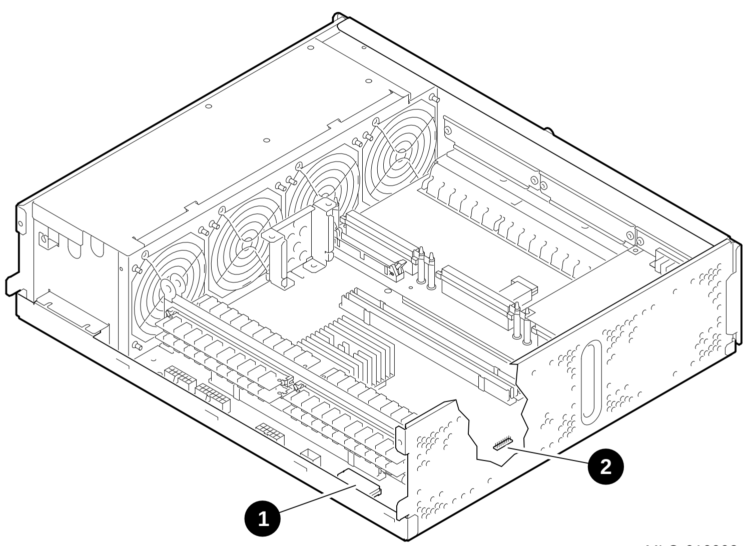
Serial ROM Jumpers

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

Caution

Installing multiple jumpers can cause permanent damage to the system module. Moving the jumper from position 0 keeps the system from entering console mode or boot.

Figure 2–1 Serial ROM Jumpers



Console Security

Password Protection

The DEC 3000 Model 600/600S AXP system has a password-protected console security feature that prevents unauthorized users from accessing all the console commands. Authorized users can access the console commands by using the following privileged commands:

- BOOT (with parameters)
- DEPOSIT
- EXAMINE
- FIND
- HALT
- INITIALIZE
- REPEAT
- SET
- SHOW
- START
- TEST

The unprivileged commands are:

- BOOT (no parameters)
- LOGIN
- CONTINUE
- HELP

Setting the Password

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

1. Set the jumper to the enabled position. See Figure 2–2.

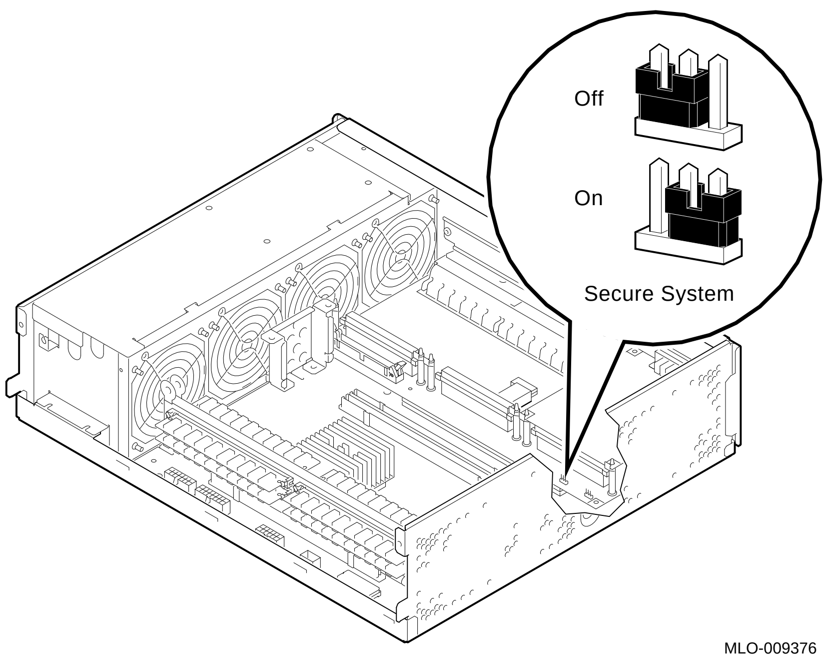
2. Set the password (if not already set).

```
>>> SET PASSWORD Return
PSWD1 >>> ENTER_NEW_PASSWORD
PSWD2 >>> ENTER_NEW_PASSWORD
```

Secure Jumper

Figure 2–2 shows the secure jumper in the off position (disabled) and on position (enabled).

Figure 2–2 Secure Jumper



Enabling the Password

Once you enter and confirm 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 is not enabled.

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

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

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

Setting a New Password

Use this procedure to set a new password.

1. Log in to access the privileged functions.
2. Enter console mode. The console prompt (>>>) appears.
3. Enter SET PASSWORD at the console prompt:

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

   The prompt PSWD0 >>> appears.
4. Enter your old password. The password must be exactly 16 hexadecimal characters (0 through F):

   ```
   PSWD0 >>> ENTER_OLD_PASSWORD [Return]
   ```

   The prompt PSWD1 >>> appears.
5. Enter your new password.

   ```
   PSWD1 >>> ENTER_NEW_PASSWORD [Return]
   ```

6. Enter your new password again. The prompt PSWD2 >>> appears to verify that you entered the password correctly.

   ```
   PSWD2 >>> ENTER_NEW_PASSWORD [Return]
   ```

7. If the two entries match, then the new password is in nonvolatile memory.

Entering the Privileged State

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

```
>>> LOGIN [Return]
PSWD0 >>> ENTER_PASSWORD
```

Exiting the Privileged State

The following commands allow you to exit the privileged state:

- BOOT
- CONTINUE
- HALT

Disabling Console Security

Use the next procedure to disable console security.

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

Restoring the 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. Set the secure jumper to the disabled position.
2. While in console mode, enter the following DEPOSIT command:

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

3. Move the jumper to the enabled (on) position.
4. Enter your new password.

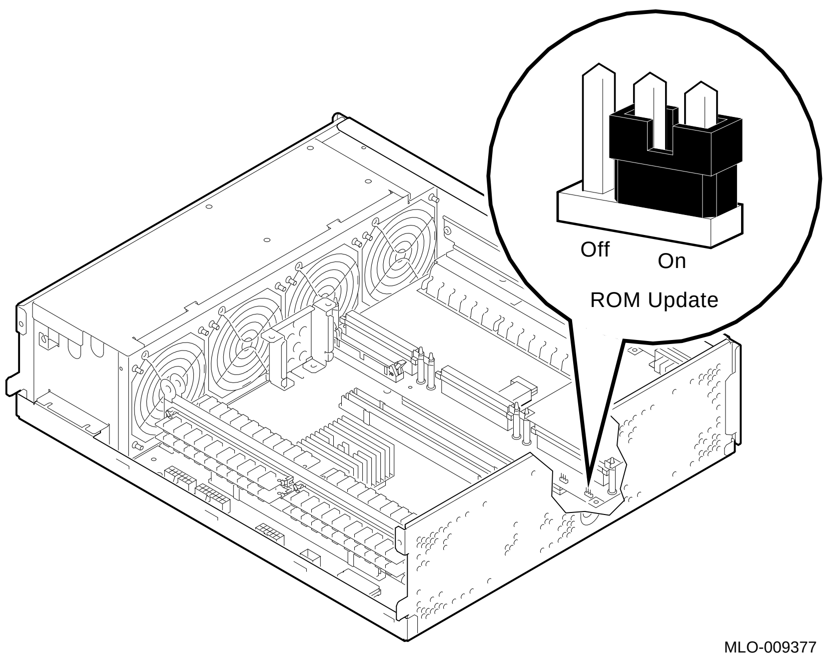
   ```
   >>> ENTER_NEW_PASSWORD Return
   ```

ROM Update

ROM Update Jumper

Figure 2–3 shows the ROM update jumper in the disabled position and the enabled position. The factory default setting is in the enabled 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 you replace a SCSI device, you must configure the new device to match the old device.

Replacing SCSI Drives

Configure a new device as follows:

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

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

2. Go to Chapter 3 for procedures to remove the device.
3. Set all jumpers/switches on the replacement drives same as the removed device.
4. Replace the device.
5. At the console prompt, enter SHOW DEVICE to verify that the replacement device is correct.

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

6. Go to Chapter 13 and run the disk verifier diagnostic.

Adding SCSI Drives

When you add a SCSI drive, you must configure the device.

Configure the new drive as follows:

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

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

2. Set the SCSI address. See Table 2–1 and Table 2–2 for the recommended SCSI jumper/switch settings.
3. Mount the device. Refer to:
   - Figure 3–2 for the system power cable routing.
   - Figure 3–3 for the SCSI disk cable routing and placement of drives within the DEC 3000 Model 600/600S AXP.
   - Figure 3–4 for the disk drive power cable routing.

4. Install the device.
5. At the console prompt, enter SHOW DEVICE to verify that the device installation is correct.

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

6. Go to Chapter 13 and run the disk verifier diagnostic.

Table 2–1 lists the recommended SCSI jumper settings.

Note

For each SCSI bus in your system, you can only have one device for each address.

Table 2–1 Recommended SCSI Jumper Settings

Drive	SCSI Address	2	1	0
RZ2x	0	Out	Out	Out
RZ2x	1	Out	Out	In
RZ2x	2	Out	In	Out
Factory-installed RZ2x	3	Out	In	In
RRD42	4	In	Out	Out
(Open ID)	6	In	In	In
SCSI Controller	7	In	In	Out

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	—
TZK11		Left	Left	Right	Left
TZ30					

Note

SCSI ID 7 is reserved for the SCSI controller.

Memory Configuration

Banks and Slots

A bank represents the eight memory arrays (SIMMs 0 through 7) as shown in Figure 2–4. A slot consists of two banks because every memory array can be populated on both sides as shown.

Example

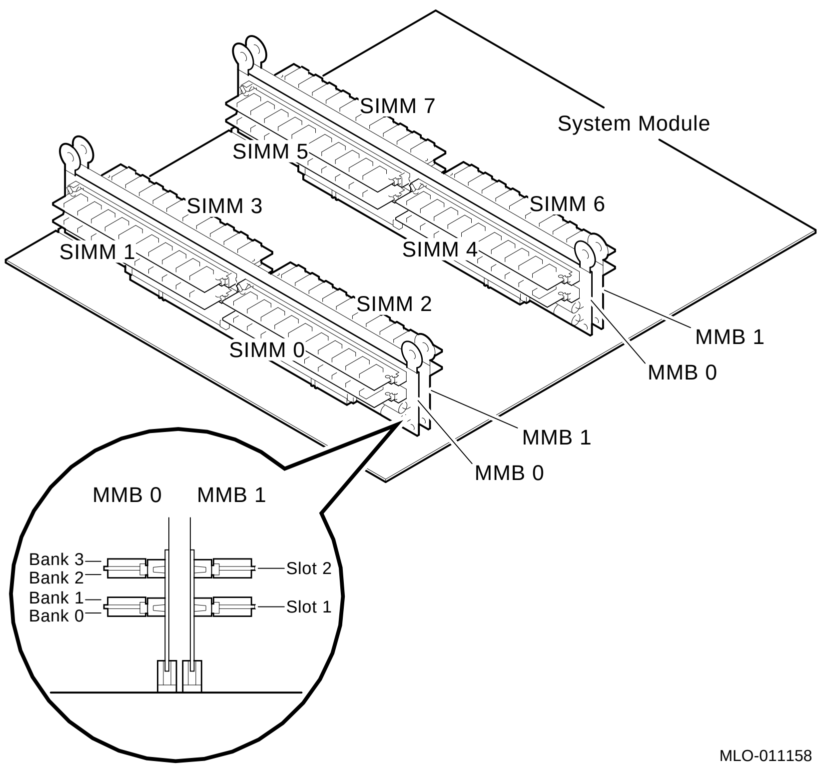
The following example shows a sample memory mother board configuration and the relationship between banks, SIMM memory size, and slots. For the DEC 3000 Model 600/600S AXP system, the banks are numbered 0 through 3.

```
DEC 3000 - M600 Memory: 96 Mbytes
------------------------------------------
BANK #      MEMORY_SIZE         START_ADDRESS
------      -----------         -------------
0            032 Mbytes         0x00000000
1            032 Mbytes         0x02000000
2            032 Mbytes         0x04000000
3            000 Mbytes         0x00000000
 >>>
```

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

Two banks occupy one memory slot. Each memory card (SIMM) can be populated on both sides, which total 64 MB per SIMM card maximum (32 MB on each side). This is not the case with the 16 MB and 32 MB SIMMs.

Figure 2–4 Example of a Memory Bank



Memory Configuration Rules

When installing memory, you must follow these configuration rules:

- 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 you violate these memory rules, then the memory size displayed will be that of the smallest size SIMM installed.

Identifying the SIMMs

The following table lists the part numbers for 2, 4, 8, 16, and 32 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
54-22389-AA	16 MB Memory SIMM
54-22389-BA	32 MB Memory SIMM

3

Removal and Replacement Procedures

Overview

Chapter Overview

This chapter contains the following topics:

- Locating field replaceable units (FRUs)
- Cable routing
- BA47X–AA vertical floor stand
- System cover
- Fixed media devices
- Removable media devices
- 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, the customer must prepare the system by doing the following:

1. If the system is in working condition, back up all data files.
2. Shut down the software.
3. Record the present system configuration. Refer to the SHOW CONFIG command for the procedure.
4. Record environmental values.
5. Power down the system and start the removal/replacement procedure.

Antistatic Precautions

Anytime you remove or replace a module in the DEC 3000 Model 600/600S AXP system, you must take antistatic precautions. 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 system power supply.
3	Remove the part or module that you want to remove or replace.

Caution: Power Source

Before removing the cover to access the system, you must power down the system and disconnect the power cable from the power source.

Locating Field Replaceable Units

Using the Exploded View

To locate a particular FRU, refer to Table 3–1 and Figure 3–1. Table 3–1 lists each FRU and the associated number showing the location in Figure 3–1.

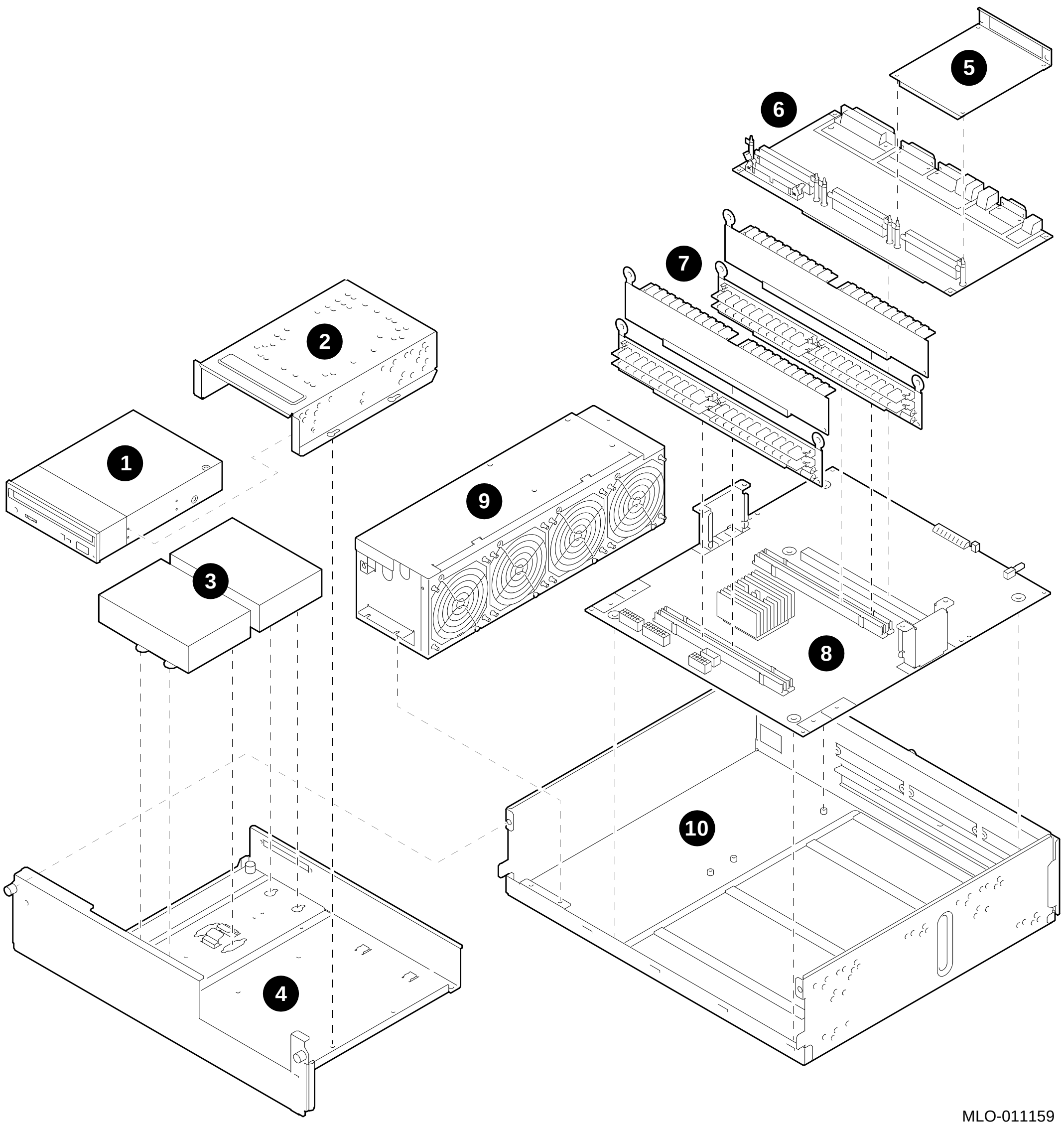
FRU Table

Table 3–1 FRU Table

FRU	Refer to Figure 3–1
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 3–1 shows the assembly front view of the DEC 3000 Model 600/600S AXP system.

Figure 3–1 System Major Assembly View (Front)

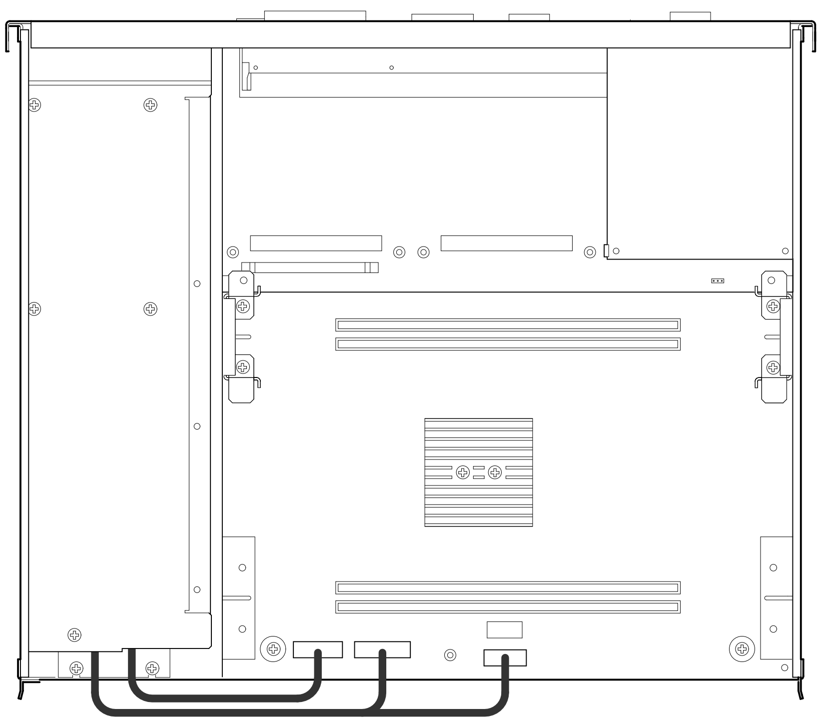


Cable Routing

System Power Cable Routing

Figure 3–2 illustrates the system power cable connections and routing. These cables are part of the H7816–AA power supply.

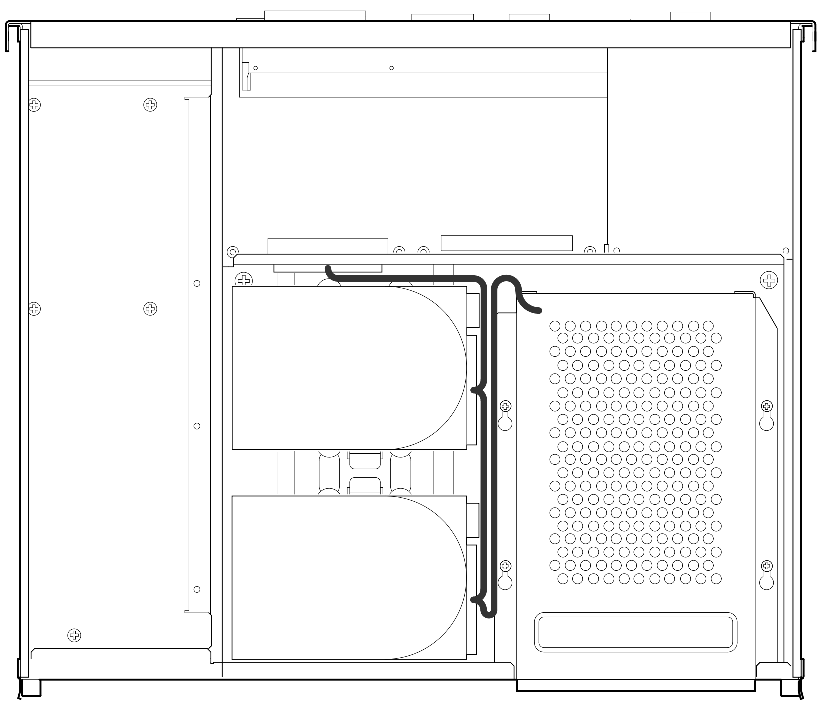
Figure 3–2 System Power Cable Routing



SCSI Disk Cable Routing

Figure 3–3 shows the SCSI disk drive cable (PN 17-03487-01) routing and placement of drives within the DEC 3000 Model 600/600S AXP.

Figure 3–3 SCSI Disk Cable Routing

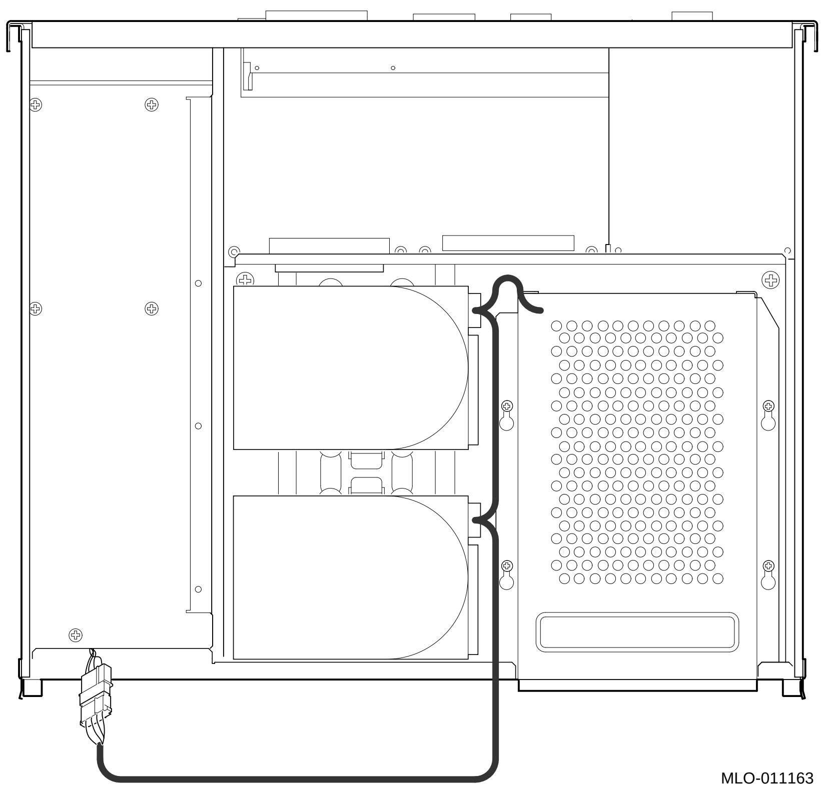


MLO-011162

Disk Drive Power Cable Routing

Figure 3–4 shows the disk drive power cable (PN 17-03489-01) connections and routing.

Figure 3–4 Disk Power Cabling



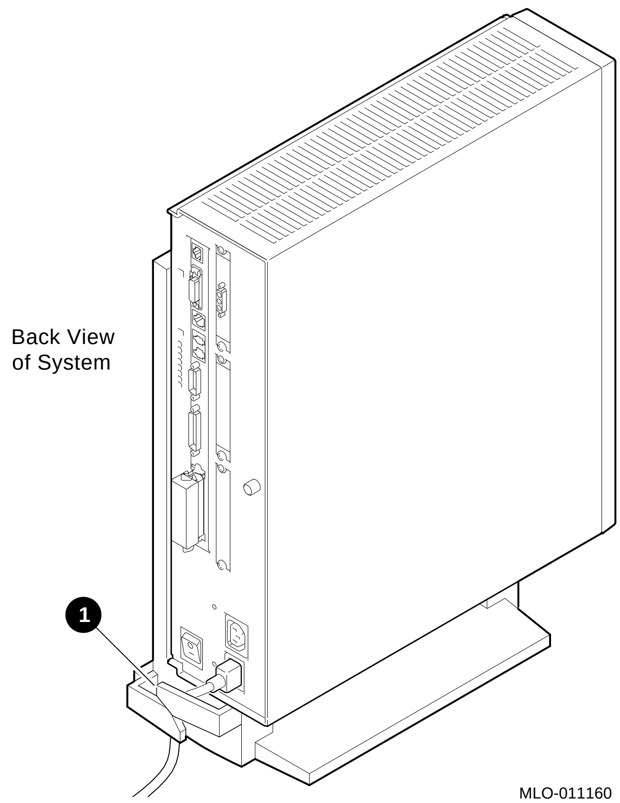
BA47X–AA Vertical Floor Stand

Removal

To remove the BA47X–AA vertical floor stand, use the next procedure.

Step	Action	Refer to Figure 3–5
1	Shutdown the system.	–
2	Power down the system.	–
3	Disconnect all cables from the power source and then from the rear of the system. Remove all cables from the floor stand guide.	❶

Figure 3–5 Cable Location in Floor Stand Configuration

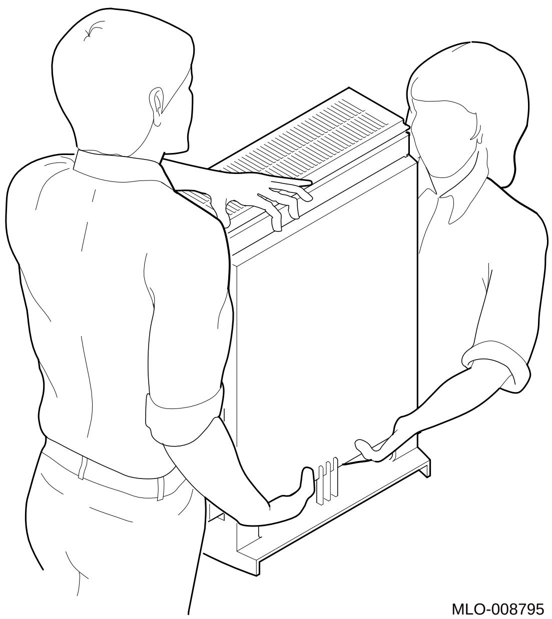


Step	Action	Refer to Figure 3–6
4	With the aid of an assistant, lift the floor stand and unit upright by grasping them as shown in Figure 3–6.	–

Caution

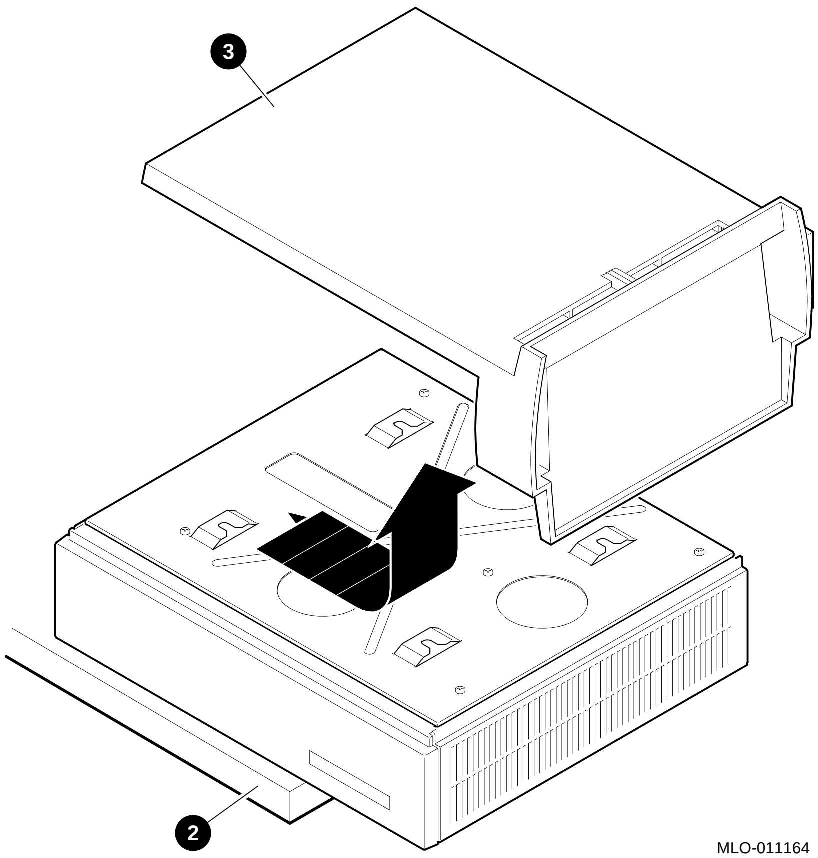
Due to the weight of the system and floor guide, two people are required to lift them.

Figure 3–6 Lifting the Floor Stand



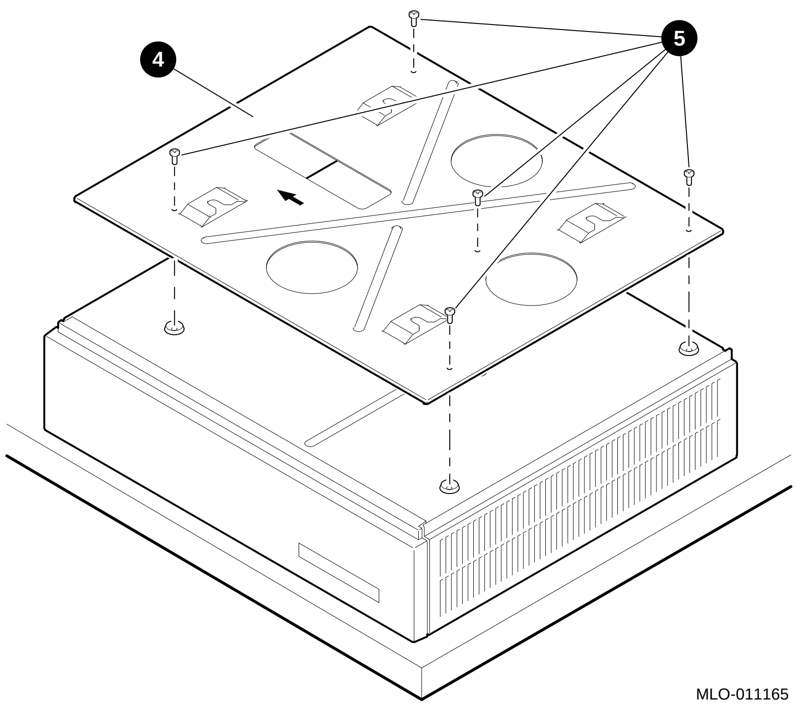
Step	Action	Refer to Figure 3–7
5	Place the floor stand and system on the edge of a table, laying the system with the top side facing down. Be careful not to either scratch the top or drop the system.	❷
6	While holding the system box, slide the floor stand toward its base and lift the floor stand free of the base unit.	❸

Figure 3–7 Removing the Floor Stand



Step	Action	Refer to Figure 3–8
7	If necessary, remove the floor stand mounting plate to access modules inside the system. You need to remove five screws securing the plate to the base.	❹ and ❺

Figure 3–8 Removing the Mounting Plate



The following table describes the parts you need to replace the floor stand.

Part	Qty.	Refer to...
Floor stand cable guide ❶	1	Figure 3–5
System	1	Figure 3–5
Floor stand base ❸	1	Figure 3–7
Floor stand mounting plate ❹	1	Figure 3–8
Mounting plate screws ❺	4	Figure 3–8

Replacement

Reverse all the steps in the removal procedure to install a floor stand.

System Cover

Warning: Power Supply

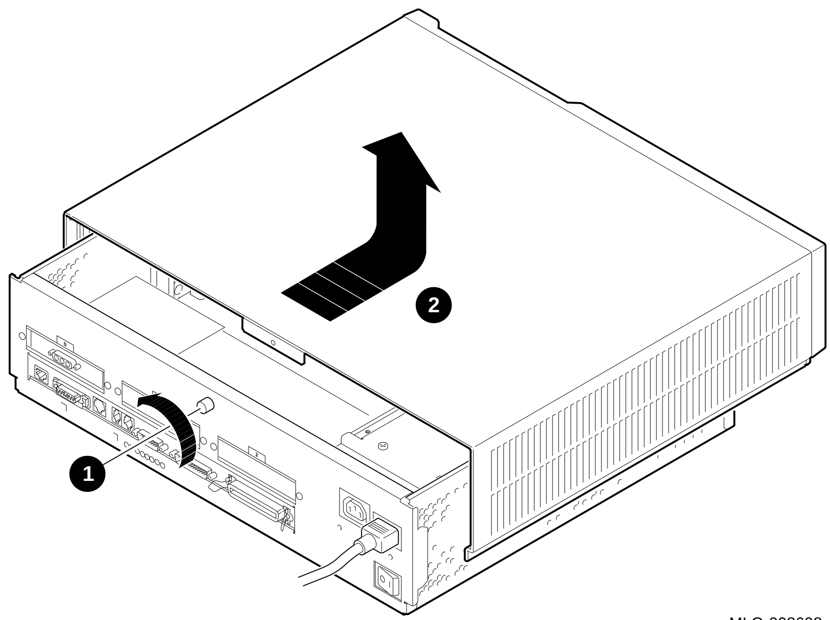
Wait at least five minutes after turning off the system unit power before you open the system unit. This gives the power supply capacitors time to discharge safely.

Removing the System Cover

To remove the system cover, use the next procedure.

Step	Action	Refer to Figure 3–9
1	Shutdown the system.	–
2	Power off the system.	–
3	If the your system is mounted in a floor stand, then remove the floor stand using the *BA47X–AA Vertical Floor Stand* procedures in the document.	–
4	Disconnect all cables from the power source and then from the rear of the system.	–
5	Loosen the captive screw by turning it counterclockwise.	❶
6	Slide the cover toward the front of the system and lift the cover off.	❷

Figure 3–9 Removing the System Cover



MLO-008608

Part Numbers

The following table describes the parts you need to replace the system cover.

Part	Part Number	Qty.	Refer to...
Captive screw ❶	12-32249-01	1	Figure 3–9
Cover ❷	70-29546-01	1	Figure 3–9

Replacement

Reverse all steps in the removal procedure to install a system cover.

Fixed Media Devices

Note

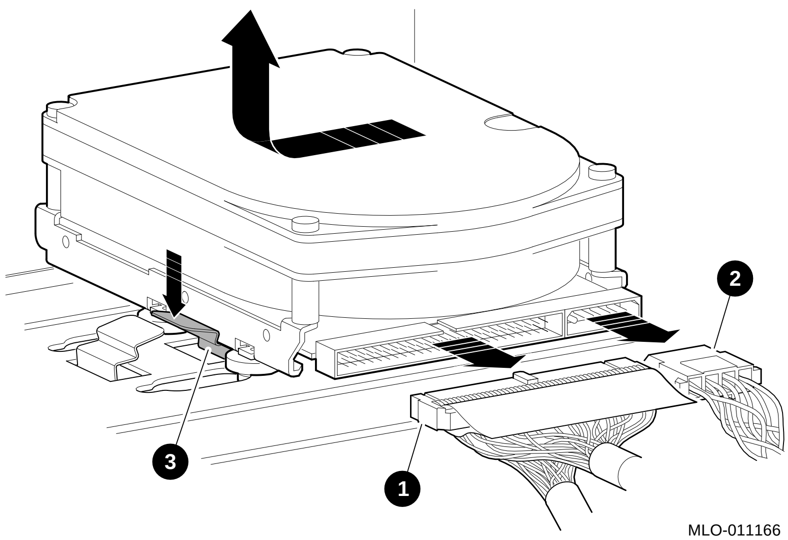
If you are replacing a drive, record the switch settings on the old drive and set the switches on the new drive to the same settings. In many cases, the whole drive is not a FRU. Follow the replacement procedure for the specific option.

Removal

To remove fixed media devices from the system, use the next procedure.

Step	Action	Refer to Figure 3–10
1	Remove the system cover. See the section *Removing the System Cover*.	–
2	Disconnect the power cable connector from the drives.	❶
3	Remove the SCSI signal cable from the drive.	❷
4	Depress the retaining spring. Slide the drive toward the retaining spring and lift the drive out.	❸

Figure 3–10 Removing a Fixed Media Device



Part Numbers

The following table describes the parts you need to replace fixed media devices.

Part	Part Number	Qty.	Refer to...
Drive power connector ❶	17-03252-01	1	Figure 3–10
Long SCSI cable ❷	17-03487-01	1	Figure 3–10
Retaining spring ❸	74-39211-01	2	Figure 3–10

Replacement

Reverse all the steps in the removal procedure to install the fixed media devices.

Removable Media Devices

Note

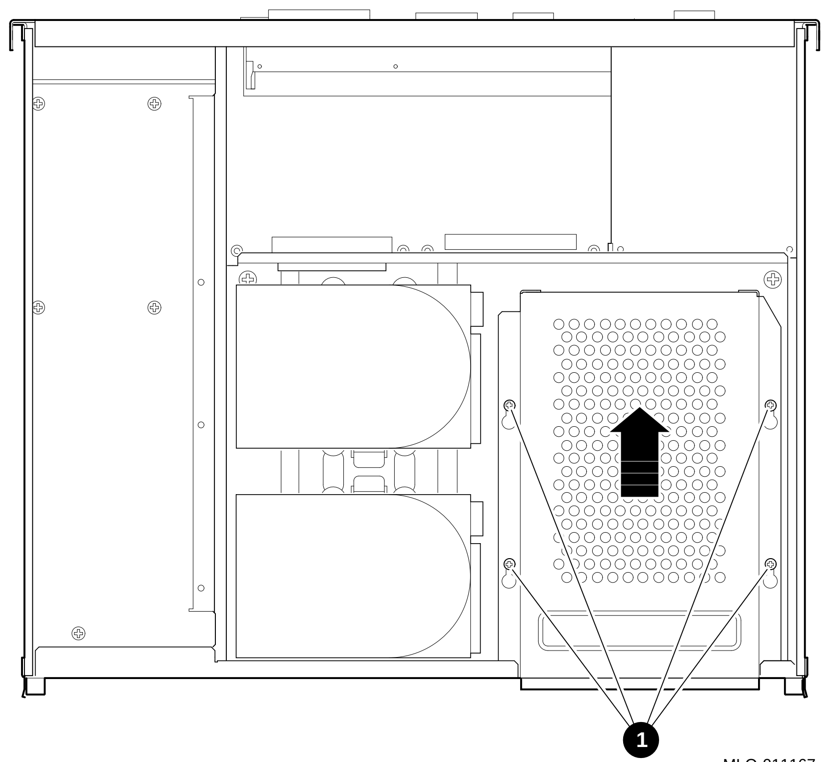
If you are replacing a drive, record the switch settings on the old drive and set the switches on the new drive with the same settings. In many cases the whole drive is not a FRU. Follow the replacement procedure for the specific option.

Removal

Use the following procedure to remove either a CDROM (PN RRD42–AA), tape drive (PN TZK10-FM or TZ30), or the fixed, half-height, 3.5-inch disk drive (PN RX26):

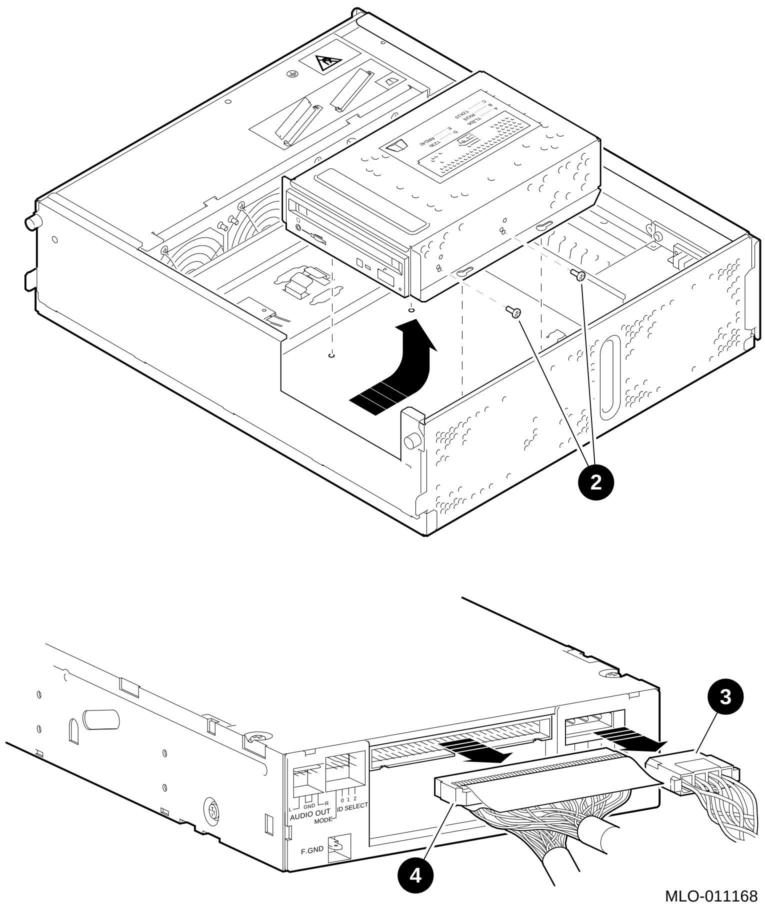
Step	Action	Refer to Figure 3–11
1	Remove the system cover. See the section *Removing the System Cover*.	–
2	Loosen the four screws holding the bracket in place and slide the bracket toward the back of the enclosure.	❶

Figure 3–11 Loosening the Screws on the Bracket



Step	Action	Refer to Figure 3–12
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
4	Remove the power cable connector attached to the drive.	❸
5	Remove the SCSI signal cable connector from the drive.	❹

Figure 3–12 Removing a Removable Media Device



Part Numbers

The following table describes the parts you need to replace removable media devices.

Part	Part Number	Qty.	Refer to...
Screws - bracket to chassis ❶	–	4	Figure 3–11
Screws - drive to bracket ❷	–	4	Figure 3–12
Drive power connector cable ❸	17-03489-01	1	Figure 3–12
Long SCSI cable ❹	17-03487-01	1	Figure 3–12

Replacement

Reverse all the steps in the removal procedure to install removable media devices.

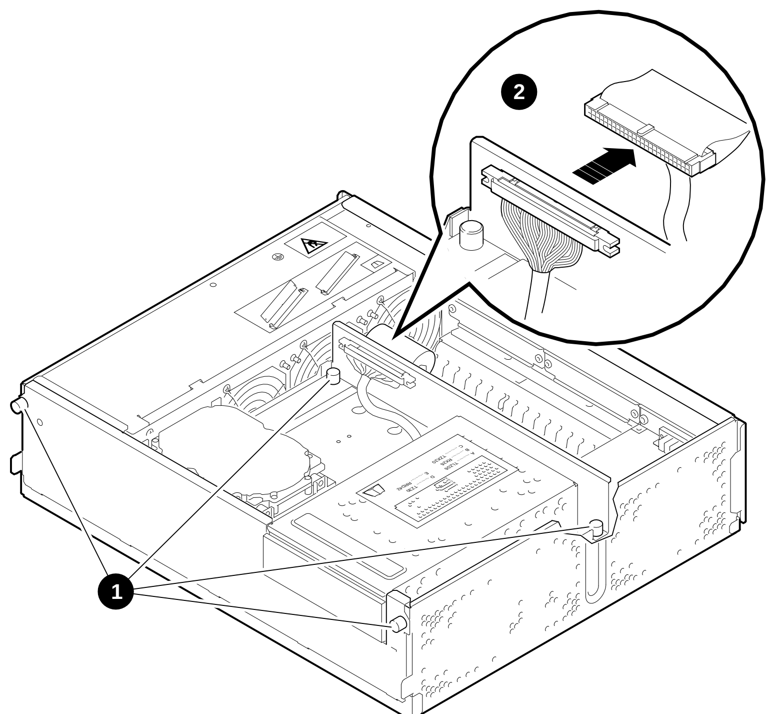
Drive Shelf

Removing the Drive Shelf

To remove the drive shelf from the system, use the next procedure.

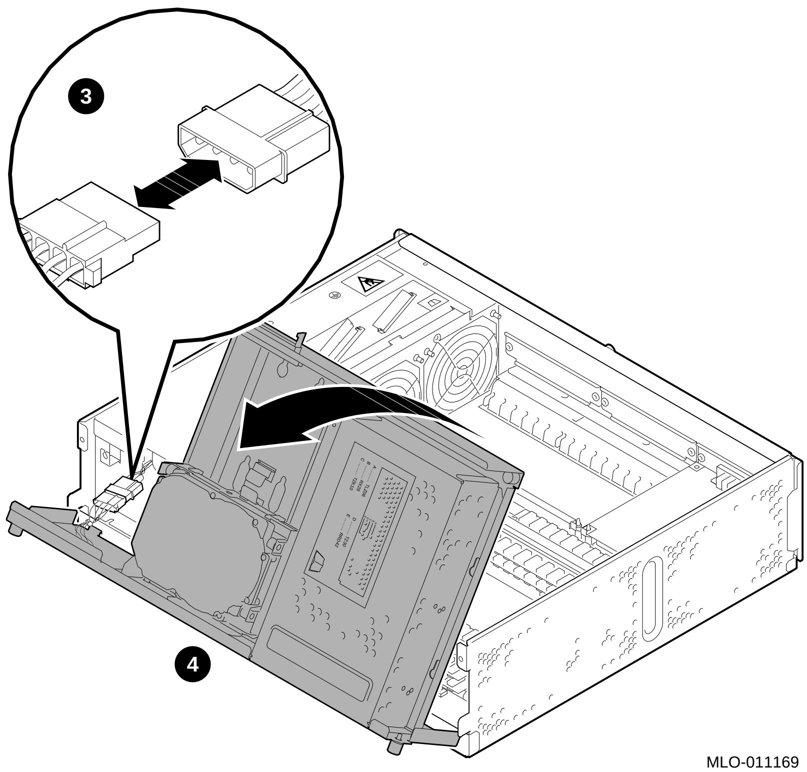
Step	Action	Refer to Figure 3–13
1	Remove the system cover. See the section *Removing the System Cover*.	–
2	Loosen the four captive screws mounted on the front face plate.	❶
3	Disconnect the short SCSI cable from the connector.	❷

Figure 3–13 Disconnecting the Cables and Loosening the Screws from Drive Shelf



Step	Action	Refer to Figure 3–14
4	From the rear of the drive shelf, tilt the shelf forward, allowing access to the power cable connector. Disconnect the power connector attached to the power cable.	❸
5	From the rear, tilt the drive plate assembly forward completely and lift it out from the slots located on the front of the chassis.	❹

Figure 3–14 Removing the Drive Shelf



Part Numbers

The following table describes the parts you need to replace the drive shelf.

Part	Part Number	Qty.	Refer to...
Captive screws ❶	12-32249-0	2	Figure 3–13
Short SCSI cable ❷	17-03488-01	1	Figure 3–13
Connector - Power distribution harness (part of power supply) ❸	H7816-AA	1	Figure 3–14
Drive plate assembly ❹	70-30262-01	1	Figure 3–14

Replacement

Reverse all the steps in the removal procedure to install 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.

Precautions

Anytime you replace a module in a system, you must follow antistatic precautions. Refer to the section *Antistatic Precautions*.

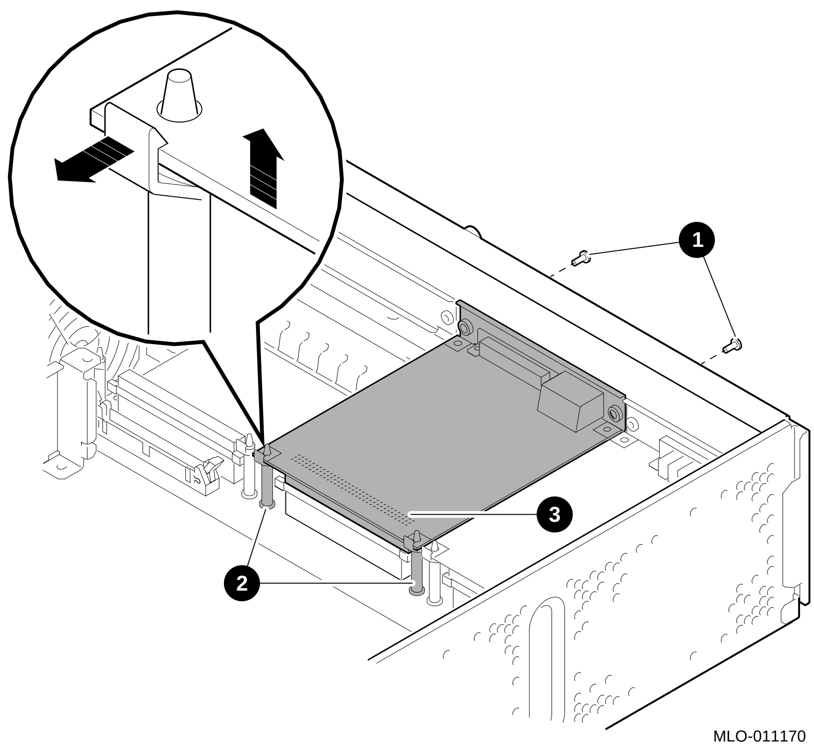
Removing the TURBOchannel Option

To remove the TURBOchannel option, use the next procedure.

Step	Action	Refer to Figure 3–15
1	Disconnect any external connections to the TURBOchannel in the rear of the system.	–
2	Remove the system drive shelf (this may not be necessary in all cases). See the section *Removing the Drive Shelf*.	–
3	If you are replacing the option board, record any jumpers or switch settings on the old board and set the same value on the new board.	–
4	Remove the screws located on the rear of the chassis that secure the TURBOchannel option.	❶
5	Release the standoffs ❷. Lift the TURBOchannel option board from the connector located on the I/O module.	❸

)

Figure 3–15 Removing the Screws and Standoffs from a TURBOchannel Option



Part Numbers

The following table describes the parts you need to replace a TURBOchannel option.

Part	Part Number	Qty.	Refer to...
Screws PAN, 6-32 ❶	90-09984-07A	1	Figure 3–15
Standoffs ❷	–	1	Figure 3–15

Replacement

Reverse all the steps in the removal procedure to install a TURBOchannel option.

SIMMs

Note

If you are replacing one SIMM, the new SIMM must be the same memory size and speed as the remaining seven SIMMs located on the same plane.

Precautions

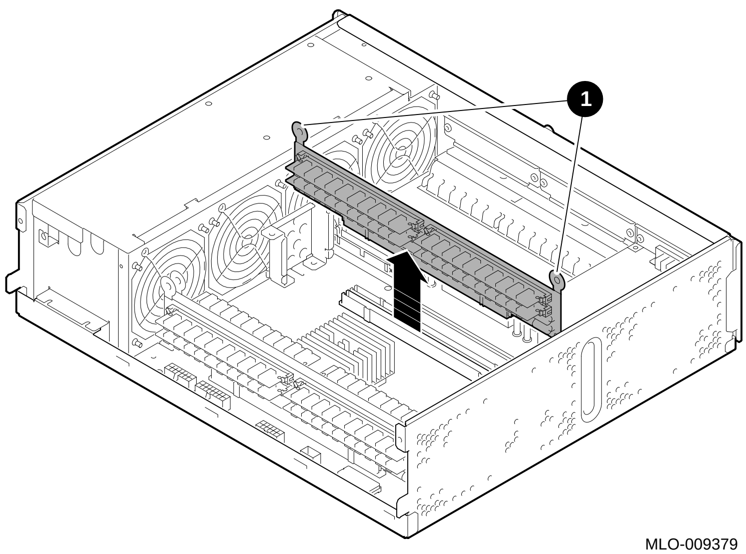
Anytime you replace a module in the DEC 3000 Model 600/600S AXP system, antistatic precautions must be taken. Refer to the section *Antistatic Precautions*.

Removing the SIMMs

Use the next procedure to remove a SIMM.

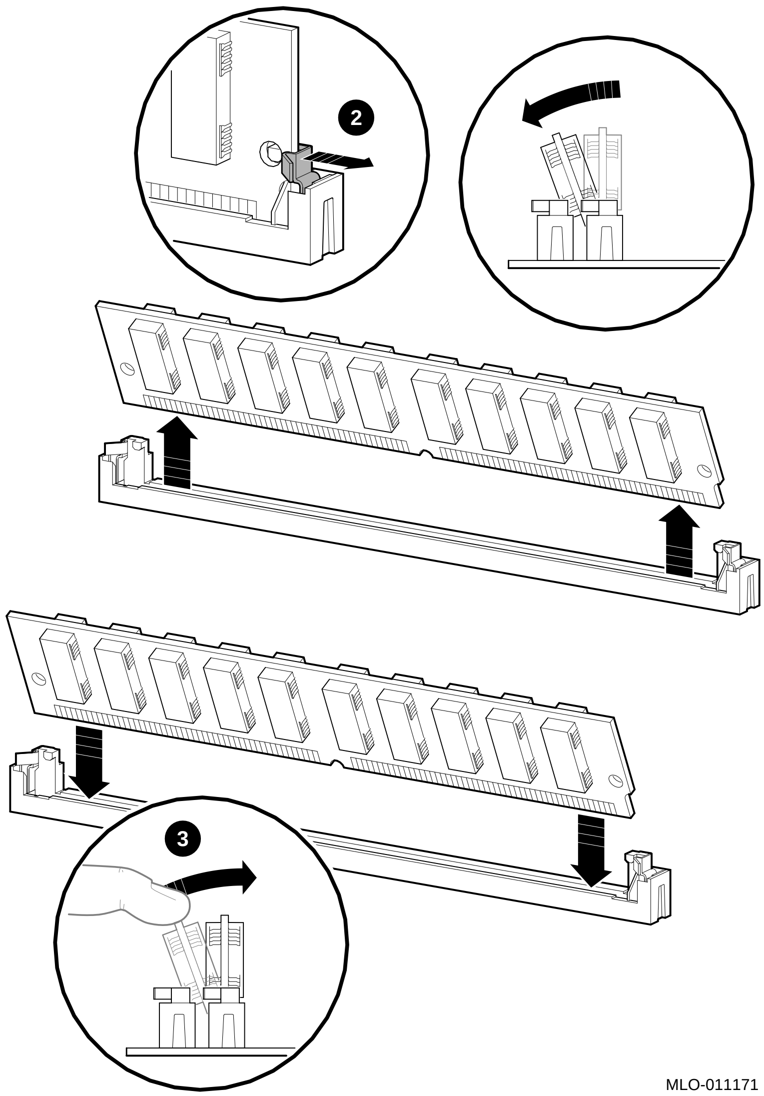
Step	Action	Refer to Figure 3–16
1	Remove the system drive shelf. See the section *Removing the Drive Shelf*.	–
2	Remove the memory mother board (MMB) in which the SIMMs are mounted by pulling straight up on the tabs at the end of the MMB.	❶

Figure 3–16 Removing the Memory Mother Board



Step	Action	Refer to Figure 3–17
3	To remove the SIMMs: a. Release the clip located at both ends of the SIMM. b. Tilt the board forward at a 30-degree angle. c. Pull the SIMM out.	❷ and ❸

Figure 3–17 Removing the SIMMs



Part Numbers

The following table describes the parts you need to replace SIMMs.

Part	Part Number	Qty.	Refer to...
MMB ❶	54-21815-01	4	Figure 3–16
Clip ❷	–	–	Figure 3–17
Lock ❸	–	–	Figure 3–17

Replacement

Reverse all the steps in the removal procedure to install SIMMs, making sure you push firmly on the SIMM to lock it in place.

I/O Board

Note

When replacing the I/O board, you must install the I/O shield on the replacement module.

Precautions

Anytime you replace a module in the DEC 3000 Model 600/600S AXP system, antistatic precautions must be taken. Refer to the section *Antistatic Precautions*.

Removal

To remove the I/O board, use the next procedure.

Step	Action	Refer to Figure 3–18
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*.	–
3	Remove the short SCSI cable from the connector.	❶

Step	Action	Refer to Figure 3–18
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 to avoid damaging any components on the system card.	❷ and ❸
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 3–18 Removing the I/O Board

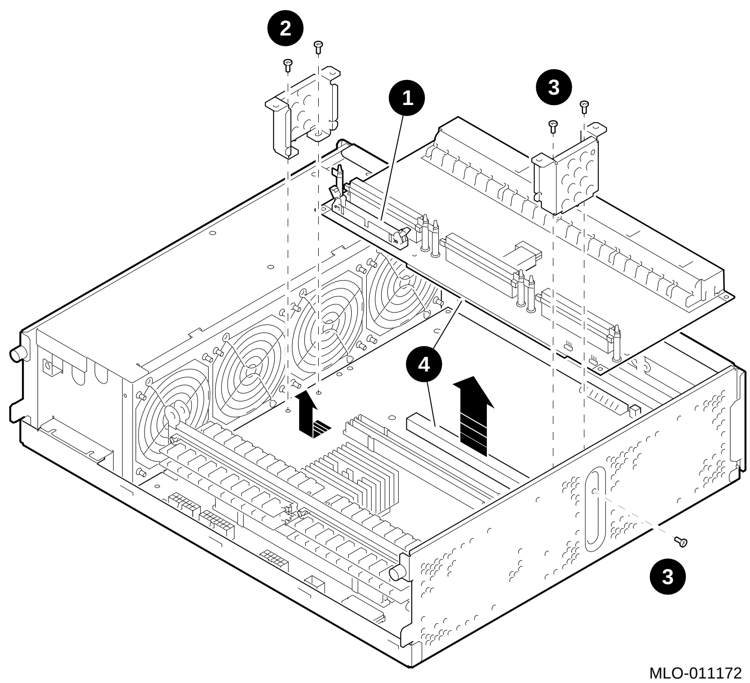
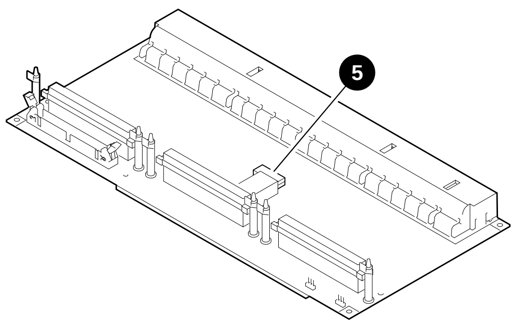


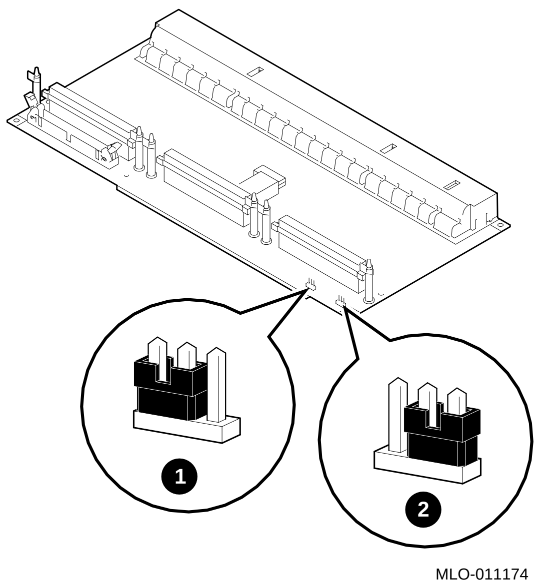
Figure 3–19 Replacing the I/O Board



Step	Action	Refer to Figure 3–19
6	Remove the Ethernet ROM chip and install it on the replacement I/O board.	❺
7	Install the new I/O board.	–
8	Set the environmental variables just as they were set on the board you are replacing. Refer to Chapter 13, SET Command Parameters .	–

Step	Action	Refer to Figure 3–20
9	Verify that the SECURE system jumper is installed on the board in the same position as the one you removed.	❶
10	Verify that the ROM upgrade jumper on the replacement board is installed in the same position as the one you removed.	❷

Figure 3–20 Verifying Jumper Settings



Part Numbers

The following table describes the parts you need to replace an I/O board.

Part	Part Number	Qty.	Refer to...
Short SCSI cable ❶	17-03488-01	1	Figure 3–18
Screws - left bracket 6-32 pan ❷	90-09984-07	2	Figure 3–18
Screws - right bracket 6-32 pan ❸	90-09984-07	3	Figure 3–18
I/O module ❹	54-21813-02	1	Figure 3–18
Ethernet ROM chip ❺	–	1	Figure 3–19

System Board

Note

Record the position of the switches. When replacing the board, set the switches in the same position on the new board.

Make sure that the new board has the shield installed toward the rear of the system.

Precautions

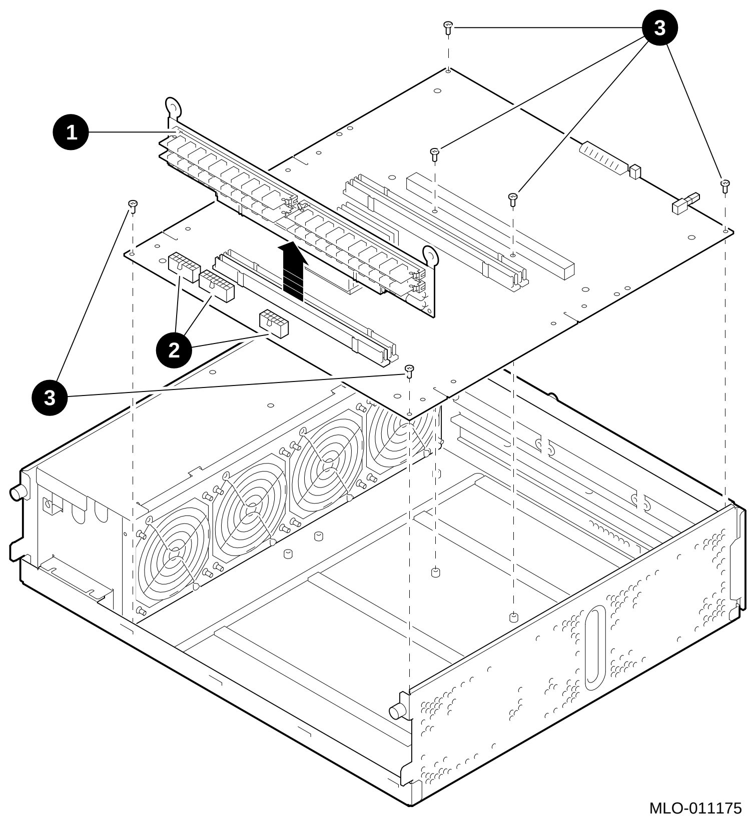
Anytime you replace a module in the DEC 3000 Model 600/600S AXP system, antistatic precautions must be taken. Refer to the section *Antistatic Precautions*.

Removal

To remove a system board, use the next procedure.

Step	Action	Refer to Figure 3–21
1	Remove the I/O board. See the section *Removal*.	–
2	Remove all MMBs with the SIMMs installed.	❶
3	Unplug the power cable connectors.	❷
4	Remove the screws attaching the board to the base of the system chassis. Lift the system board from the front and slide it forward.	❸

Figure 3–21 Removing a System Board



Part Numbers

This table describes the parts you need to replace the system board.

Part	Part Number	Qty.	Refer to...
MMB ❶	54-21815-01	6	Figure 3–21
Connectors - power cable ❷	–	3	Figure 3–21
Screws, 6-32 pan ❸	90-09984-07	4	Figure 3–21
Nylon washers	90-08992-00	2	Figure 3–21

Part	Part Number	Qty.	Refer to...
System board	54-23153-03	1	Figure 3–21

Replacement

Reverse all the steps in the removal procedure to install the CPU board.

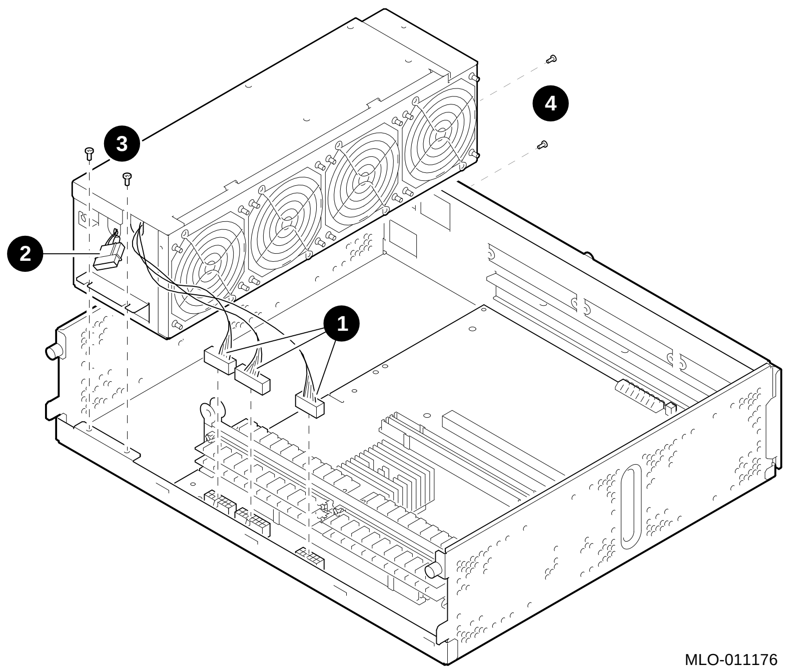
Power Supply

Removal

To remove the power supply, use the next procedure.

Step	Action	Refer to Figure 3–22
1	Remove the drive shelf. See the section *Removing the Drive Shelf*.	–
2	Disconnect all power connectors.	❶ and ❷
3	Remove the four screws located on the front and back of the system chassis.	❸ and ❹
4	Lift the power supply out, carefully avoiding contact with the lip on the chassis.	–

Figure 3–22 Removing the Power Supply



Part Numbers

The following table describes the parts you need to replace the power supply.

Part	Part Number	Qty.	Refer to...
Screws, 6-32 pan - power supply mounting (front) ❸	90-09984-07	2	Figure 3–22
Screws, 6-32 pan - power supply mounting (back) ❹	90-09984-07	2	Figure 3–22

Replacement

Reverse all the steps in the removal procedure to install the power supply.

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 you turn on the DEC 3000 Model 600/600S AXP system. The power-up self-test runs limited memory testing; it tests the first eight megabytes of memory, which is where the operating system is loaded. To test the rest of the memory, you must execute the memory diagnostics.

Examples

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

```
DEC 3000 - M600
Digital Equipment Corporation
System conducting power up tests
------------------------------------------------------------

Devnam       Devstat
--------     -------
     CPU          OK KN17-BA -V3.0-S4A3-I077 - sV2.0 - DECchip 21064 P3.0
    ASIC          OK
     MEM          OK 80MB
     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 DKA200
```

Code	Meaning
KN17–BA	System type
V3.0	System revision
S4A3	System ROM edit revision
I077	I/O ROM edit firmware revision
sV2.0	SROM Version
DECchip 21064 P3.0	Chip revision
MEM	Total configured memory

Code	Meaning
SCC	Displays options connected to the I/O ports Mouse/tablet is connected to port 0 Keyboard is connected to 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.

The next example shows an unsuccessful power up of the DEC 3000 Model 600/600S AXP system due to the network being connected improperly, a thickwire loopback connector is missing, or an NI logic problem in the system.

```
DEC 3000 - M600
Digital Equipment Corporation
System conducting power up tests
------------------------------------------------------------

Devnam    Devstat
--------  -------
    CPU       OK KN17-BA - V3.0-S4A3-I077 - sV2.0 - DECchip 21064 P3.0
   ASIC       OK
    MEM       OK 80MB
    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.

>>>
```

The next example shows an unsuccessful power up of a DEC 3000 Model 600/600S AXP system. Due to a problem in the PMAGB graphics option, the red and blue lines were not properly connected or terminated.

```
DEC 3000 - M600
Digital Equipment Corporation
System conducting power up tests
------------------------------------------------------------

Devnam     Devstat
--------   -------
     CPU       OK KN17-BA - V3.0-S4A3-I077 - sV2.0 - DECchip 21064 P3.0
    ASIC       OK
     MEM       OK 80MB
     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 tests detected errors.
See your system documentation for more information.

>>>
```

FRU Code Table

System Device FRU Codes

Table 4–1 shows the system device FRU codes that appear in error messages and their meaning.

Table 4–1 System Device FRU Codes

FRU Code	Meaning
000	Unknown or diagnostic does not support FRU reporting.
001	Failed FRU is most likely the system module.
002	Failed FRU is most likely the I/O module.
003	Failed FRU is most likely the keyboard.
004	Failed FRU is most likely the mouse or pointing device.

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	Failed FRU is most likely TURBOchannel option 0.
011	Failed FRU is most likely TURBOchannel option 1.
012	Failed FRU is most likely TURBOchannel option 2.
013-FF	Reserved

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 subtests. You can select a sub-test to be executed rather than executing the full device test.

When a device is selected without specifying a sub-test, all subtests are 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.

Example

The next example shows the subtests 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 to access them.

Table 4–4 Diagnostics Environments

Environment	To Access	Requirements
Console	Enter the following at the >>> prompt: >>>**SET DIAG_SECTION 1**	None except installation of the system.
Service	Enter the following at the >>> prompt: >>>**SET DIAG_SECTION 2**	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
```

Example

The next example executes all ASIC subtests.

When you select a diagnostic test, that test executes its complete set of subtests.

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

Running Diagnostic Subtests

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

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

Example

The next example indicates that testing of the sub-test SGMAP has been selected. ASIC testing is performed *only* on those areas defined by the SGMAP subtests.

```
>>> 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 you specify 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
```

Examples

The next 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
```

The next 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

The starting and ending diagnostic range is:

ASIC
MEM
NVR
SCC
NI
SCSI
ISDN

Note

When running diagnostics in the previous configuration, those run in service mode require loopback connectors. Otherwise, all of these tests can be run in console mode.

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

The next example starts testing the SCC diagnostic, then the ASIC diagnostic, and ending with the MEMORY diagnostic.

>>> **T SCC,ASIC:MEM** Return

Running Tests Continuously

The console REPEAT command runs a diagnostic or a sequence of diagnostics continuously. The REPEAT command executes testing continuously until you enter Ctrl C at the console or depress the Halt button, or until an error occurs.

Note

If you press the Halt button, this interrupts the running test and returns to the console prompt.

Format

To execute the REPEAT command, enter the following:

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

Example

The next example shows that the memory diagnostic runs continuously until you enter Ctrl C at the console.

`>>> R T MEM` Return

The next example shows that the memory diagnostic and the NVR diagnostic runs continuously until you enter Ctrl C 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.

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

For more information, see Chapter 13.

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 are changed, then the CONTINUE command causes a system failure. This is normal operation since you have overwritten the program information.

- BOOT

  Issuing the BOOT command initiates a system bootstrap operation. See Chapter 13.

- CONTINUE

  Issuing the CONTINUE command clears the RC State Flag bit and resumes processor execution. See Chapter 13.

Note

If memory tests are run and the contents of memory is changed, then the CONTINUE command causes a system failure. This is a 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]
```

Exiting Service Mode

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

Note

BOOT and CONTINUE 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 initiates a system bootstrap operation. See Chapter 13.

- CONTINUE

  Issuing the CONTINUE command clears the RC State Flag bit and resumes processor execution. See Chapter 13.

  Note

  If the memory contents changed while you were in service mode, this command causes 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 is performed when:

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

Fault isolation is to the field replaceable unit (FRU).

Running ASIC Diagnostics

To select and execute the ASIC diagnostic and/or subtests, enter the following:

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

Example:

The next example executes the ASIC diagnostic SGMAP sub-test.

>>> **T ASIC** Return

The next example executes the ASIC diagnostic and SGMAP sub-test.

>>> **T ASIC SGMAP** Return

Subtests

Table 4–5 lists the ASIC diagnostic subtests.

Table 4–5 ASIC Diagnostic Subtests

Subtests	Description
INIT	Executes the INIT test
SGMAP	Executes the Scatter/Gather Map register
?	Lists available subtests

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 Chapter 14.	System module
002	ASIC	Refer to Chapter 14.	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 50 bytes of non-volatile RAM (NVR) along with an NVR register test/initiation sequence.

The TOY test 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 are executed.

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

Diagnostic testing is performed when:

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

Fault isolation is to the field replaceable unit (FRU).

Running NVR Diagnostics

To select and execute the NVR diagnostic and/or subtests, enter the following:

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

Example

The next example selects and executes the NVR diagnostic.

```
>>> T NVR Return
```

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

```
>>> T NVR TOY Return
```

Subtests

Refer to Table 4–7 for a list of NVR diagnostic subtests and their description.

Table 4–7 NVR Diagnostic Subtests

Subtests	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

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 Chapter 14	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. Two MB of memory is reserved and is tested by the SROM code before the console is loaded.

Fault isolation is to the field replaceable unit (FRU).

Running Memory Diagnostics

To select and execute the MEMORY diagnostic and/or subtests, enter the following:

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

Examples

The next 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
>>>
```

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

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

The next 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]
```

Subtests

Table 4–9 lists the MEMORY diagnostic subtests and their description.

Table 4–9 Memory Diagnostic Subtests

Subtests	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 sub-test. 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 (2 MB)	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

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 describes the memory error code.

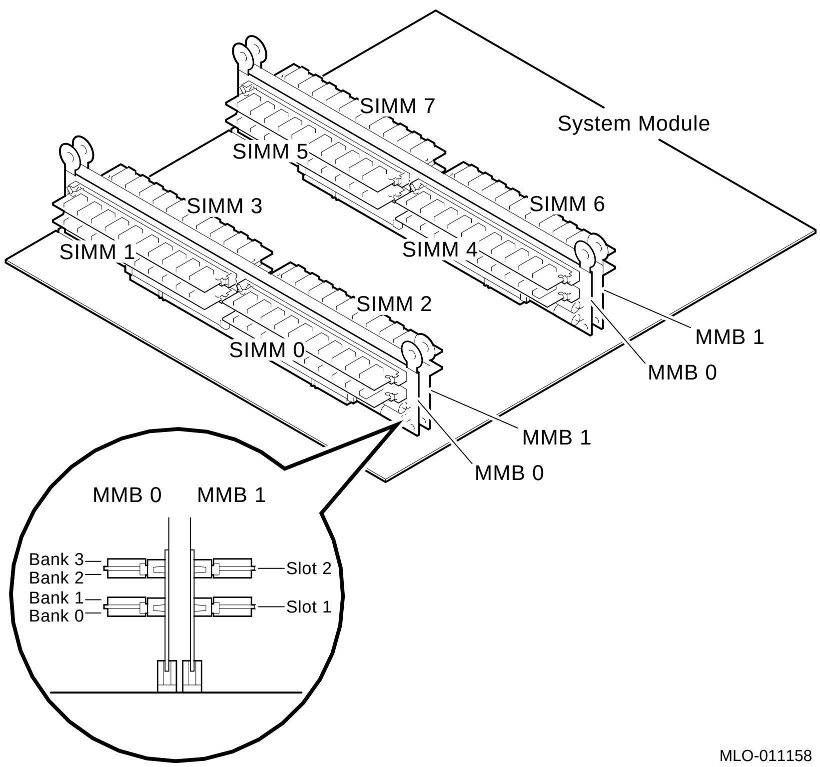
Table 4–11 Memory Error Code Description

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	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.

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 plus a map error test and minimal device test.

Available SCSI utilities:

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

All utilities require user interaction and are to be executed at power-on. See Chapter 13.

Running SCSI Diagnostics

To select and execute the SCSI diagnostic and/or subtests, enter the following:

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

Example

The next example selects and executes the SCSI diagnostics.

>>> **T SCSI** Return

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

>>> **T SCSI REGISTER** Return

Subtests

Table 4–12 lists diagnostic subtests.

Table 4–12 SCSI Diagnostic Subtests

Subtests	Description	Mode
ASIC[1]	Tests dual SCSI ASIC registers and two SCSI DMA buffers	Console
REGISTER[1]	Tests both sets of SCSI controller registers (on SCSI A and B)	Console
INTERRUPT[1]	Test interrupt logic (SCSI A and B)	Console
TRANSFER	Test SCSI A and B bus data transfers	Console
MAP[2]	Test for map and parity errors	Service
DEVICE[3]	Test SCSI devices	Service
ERASE	Refer to *Hard Disk Eraser Utility*	Any mode
FORMAT	Refer to *Floppy Formatter Utility*	Any mode
VERIFY	Refer to *Disk Verifier Utility*	Any mode
INIT	Initializes the drive	Any mode
?	Lists all subtests	Any mode

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

[2]Test executes only on the first device that responds to the TRANSFER test.

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

Console mode is DIAG_SECTION 1
Service mode is DIAG_SECTION 2

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 is as follows:

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

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

Table 4–13 SCSI Error Identification

Identifies Test Failed	FRU Code	Failing Test	Error Code	Replace
??	001	SCSI	See Chapter 14	System module
??	002	SCSI	See Chapter 14	I/O Module
??	1xy	SCSI	See Chapter 14	SCSI controller A
??	2xy	SCSI	See Chapter 14	SCSI Controller B

NI Diagnostic

Overview

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

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

Testing can be performed:

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

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

Running NI Diagnostics

Before testing, a loopback connector (PN 12-22196-01) *must* be connected to the NI port or the port must be directly connected to the network. Failure to do so results in an external loopback failure. You must also verify that Thickwire has been selected.

To select and execute the NI diagnostic or subtests, enter the following:

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

Example

The next 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

Subtests

Refer to Table 4–14 for a list of diagnostic subtests.

Table 4–14 NI Diagnostic Subtests

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

(continued on next page)

Table 4–14 (Cont.) NI Diagnostic Subtests

Sub-Test	Description
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 subtests

[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.

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 5 and Chapter 14 for more information.	Enet ROM

Examples

The next example shows the results of running the NI diagnostics without the Ethernet loopback connector installed.

```
>>> 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
>>>
```

The next 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 tests the functionality of:

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

You need a serial line loopback connector (PN 12-25083-01) for the printer, and a modem port loopback (PN 29-24795-01) for the modem port.

- Printer and communication ports using DMA transfers

The diagnostic tests only 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 or subtests, enter the following:

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

Example

The next example selects and executes the SCC diagnostic.

>>> **T SCC** Return

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

>>> **T SCC LK401** Return

Subtests

Table 4–16 lists the diagnostic subtests.

Table 4–16 SCC Diagnostic Subtests

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

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

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 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 Chapter 14	I/O Module
??	003	SCC	See Chapter 14	Keyboard
??	004	SCC	See Chapter 14	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, generating, verifying, and disable interrupting the following:

- 79C30A Internal registers
- Internal digital and analog loopback
- Tone output
- DMA

The self test may be executed:

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

Running ISDN Diagnostics

To select and execute the ISDN diagnostic or subtests or both, enter the following:

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

Example

The next example selects and executes the ISDN diagnostic.

```
>>> T ISDN Return
```

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

```
>>> T ISDN REGISTER Return
```

Subtests

Table 4–18 lists the diagnostic subtests.

Table 4–18 ISDN Diagnostic Subtests

Subtests	Description	Mode
INIT	Initialize	Console
REG	Internal registers test	Console
TONE[1]	Audio output	Service
D_LOOP	Internal digital loopback	Service
A_LOOP	Internal analog loopback	Console
INT	Interrupt test	Console
DMA	DMA	Console
RECORD[1]	Record	Service
PLAYBACK[1]	Playback of recorded message	Service
REPEAT[1]	Immediate playback of message	Service
?	List subtests	

[1]Requires headset to perform diagnostics.

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 Chapter 14.	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. See Chapter 1 for further details.

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 is TC#.

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

A TURBOchannel option located in slot 2 has 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).
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 it is an object script and will fail if selected.

Obtaining Script Listing

If an asterisk (*) is at the end of a script, then it is an 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

The next example obtains a script listing.

>>> **T TC1 ls** Return

Running Default Test Scripts

The following command (>>>T TC# pst-t) 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 fails. If failure occurs, then enter the following:

>>> **T [dev_name] ls** Return

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

>>> **T[EST] [device_name]** Return

Example

The next example executes the default test scripts.

>>> **T TC1** Return

Running Single Test Scripts

To execute single diagnostic test scripts, enter the following:

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

Example

The next 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

The next example initializes TURBOchannel option 1.

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

Additional Commands

The following are additional commands that support the TEST command:

Command	Description
T [dev_name] [cnfg]	Displays configuration on TC option
T [dev_name] [init]	Initializes option in TC slot
T [dev_name] [cat scriptname]	Lists contents of a script

5

Troubleshooting

Overview

Chapter Overview

This chapter contains the following topics:

- LED codes
- Troubleshooting tables for problems with:
  - System
  - Monitor
  - Mouse/tablet
  - Keyboard
  - Drives
  - Network
  - Audio
  - Console
  - Firmware

Introduction

The troubleshooting techniques described in this section neither identify all possible problems, nor do the suggested corrective actions remedy all problems. Call the Digital Service Center or your service representative if you encounter other problems.

The loopbacks you need to execute diagnostics are supplied with each DEC 3000 Model 600/600S AXP.

Before You Start

Before performing any procedures, verify cable, terminators, cable connections, 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 display corresponds to a hexadecimal code and indicates what diagnostic is currently being executed when the unit is first powered on. If an error occurs before the system enters the console mode, then the failed test is identified by a binary display of two 4-bit hexadecimal numbers at the rear of the system.

Use the diagnostic LEDs to help diagnose problems when the system is unable to set up the console. This portion of the testing does not appear on the monitor.

Use Table 5–1 and Table 5–2 together to diagnose and correct problems. Table 5–1 describes the actions to take. Table 5–2 identifies the LED display and hex code and the order in which to perform the actions.

Note

In the tables containing LED codes, • indicates that an LED is on. o indicates that an LED is off.

Table 5–1 Serial ROM LED Codes Action Table

Solution	Action
1	Ensure that a good connection is made between the system module and I/O module.

(continued on next page)

Table 5–1 (Cont.) Serial ROM LED Codes Action Table

Solution	Action
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.

Table 5–2 Serial ROM LED Codes

LED Display	HEX Code	Solution	Then Replace...	Finally Replace...
●●●●●●●●	FF	2	3	—
●●●●●●●o	FE	2	3	—
●●●●●●o●	FD	2	3	—
●●●●●●oo	FC	2	3	—
●●●●●o●●	FB	Informational only, never stops here.		
●●●●●o●o	FA	2	5	3
●●●●●oo●	F9	2	5	3
●●●●●ooo	F8	2	5	3
●●●●o●●●	F7	2	5	3
●●●●o●●o	F6	Informational only, never stops here.		
●●●●o●o●	F5	Informational only, never stops here.		
●●●●o●oo	F4	1	4	—
●●●●oo●●	F3	Informational only, never stops here.		
●●●●oo●o	F2	1	4	—
●●●●ooo●	F1	Informational only, never stops here.		
●●●●oooo	F0	1	4	—
oo●ooooo	20	2	5	—

Chapter 14 describes each code, the corresponding test, and possible reasons for test failure.

ASIC LED Codes

The ASIC LED codes represent continued power-on testing. If an error occurs during this testing sequence, then a hexadecimal code appears with FRU and error code information on the monitor screen.

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

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–3 and then perform the specified steps in Table 5–4 to isolate the failed FRU.

Table 5–3 ASIC LED Codes

LED Display	HEX Code	Solution	Then Replace...	Finally Replace...
oo●●oooo	30	1	2	3[1]
oo●●ooo●	31	1	2	3
oo●●oo●o	32	1	2	3
oo●●oo●●	33	1	2	3
oo●●o●oo	34	1	2	3
oo●●o●o●	35	1	2	3
oo●●o●●o	36	1	2	3
oo●●o●●●	37	1	2	3
oo●●●ooo	38	1	2	3
oo●●●oo●	39	1	2	3

[1] If replacing the system module fixes the system, then try reinstalling the original I/O module.

Table 5–4 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 appears with FRU and error code information on the monitor screen.

If the system enters console mode, then execute the MEMORY diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4

If the system does not enter console mode (>>>) or hex code DD is not displayed on the LEDs, then replace the failing SIMM.

LED Display	HEX Code	Description
oo●ooooo	20	Machine Check
oo●oooo●	21	CELL Fill mem with test pattern data
oo●ooo●o	22	CELL Forward Rd/Compare /Complement/Wr
oo●ooo●●	23	CELL Reverse Rd/Compare /Complement/Wr
oo●oo●oo	24	ADDR Fill mem with addresses as data
oo●oo●o●	25	ADDR Read/Compare data = address
oo●oo●●o	26	Reserved
oo●oo●●●	27	Reserved
oo●o●ooo	28	Reserved
oo●o●oo●	29	Reserved
oo●o●o●o	2A	Reserved
oo●o●o●●	2B	LLSC load-locked/store-conditional tests

LED Display	HEX Code	Description
oo●o●●oo	2C	BCTP Bcache Tag Parity detection
oo●o●●o●	2D	ECC detection
oo●o●●●o	2E	Reserved
oo●o●●●●	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 appears with FRU and error code information on the monitor screen.

If the system enters console mode (>>>), then execute NVR diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–5 and then perform the specified steps in Table 5–6 to isolate the failed FRU.

Table 5–5 NVR LED Codes

LED Display	HEX Code	Solution	Then Replace...
oo●●●o●o	3A	1	2
oo●●●o●●	3B	1	2
oo●●●●oo	3C	1	2
oo●●●●o●	3D	1	2
oo●●●●●o	3E	1	2

Table 5–6 NVR LED Codes Action Table

Step	Action
1	Reseat I/O module.
2	Replace I/O module.

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 appears with FRU and error code information on the monitor screen.

If the system enters console mode, then execute SCC diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–7 and then perform the specified steps in Table 5–8 to isolate the failed FRU.

Note

If a DEC 3000 Model 600S AXP system is the one being tested, then the console command SERVER is required to be set to ON (SET SERVER ON).

Table 5–7 SCC LED Codes

LED Display	Hex Code	Solution	Then Replace...	Finally Replace...
o●oooooo	40	Informational Only — never stops here.		
o●ooooo●	41	Informational Only — never stops here.		

(continued on next page)

Table 5–7 (Cont.) SCC LED Codes

LED Display	Hex Code	Solution	Then Replace...	Finally Replace...
o●oooo●o	42	1	5	—
o●oooo●●	43	2	5	—
o●ooo●oo	44	1	5	—
o●ooo●o●	45	1	5	—
o●ooo●●o	46	1	5	—
o●ooo●●●	47	4	7	5[1]
o●oo●ooo	48	3	6	5
o●oo●oo●	49	Reserved	—	—
o●oo●o●o	4A	Reserved	—	—
o●oo●o●●	4B	Reserved	—	—
o●oo●●oo	4C	Reserved	—	—
o●oo●●o●	4D	Reserved	—	—
o●oo●●●o	4E	Reserved	—	—
o●oo●●●●	4F	Informational Only — never stops here.		

[1]If replacing the I/O module fixes the system, then try reinstalling the original keyboard.

Table 5–8 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.

(continued on next page)

Table 5–8 (Cont.) SCC LED Codes Action Table

Step	Action
7	Replace keyboard.

NI LED Codes

The NI LED codes represent continued power-on testing. If an error occurs during this testing sequence, then a hexadecimal code appears with FRU and error code information on the monitor screen.

If the system enters console mode, then execute NI diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–9 and then perform the specified steps in Table 5–10 to isolate the failed FRU.

Table 5–9 NI LED Codes

LED Code	HEX Code	Solution	Then Replace...
o●o●oooo	50	1	2
o●o●ooo●	51	1	2
o●o●oo●o	52	1	2
o●o●oo●●	53	1	2
o●o●o●oo	54	1	2
o●o●o●o●	55	1	2
o●o●o●●o	56	1	2
o●o●o●●●	57	1	2
o●o●●ooo	58	1	2

(continued on next page)

Table 5–9 (Cont.) NI LED Codes

LED Code	HEX Code	Solution	Then Replace...
o●o●●oo●	59	1	2
o●o●●o●o	5A	1	2
o●o●●o●●	5B	1	2
o●o●●●oo	5C	1	2
o●o●●●o●	5D	1	2
o●o●●●●o	5E	1	2
o●o●●●●●	5F	1	2

Table 5–10 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 appears with FRU and error code information on the monitor screen.

If the system enters console mode, then execute ISDN diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–11 and then perform the specified steps in Table 5–12 to isolate the failed FRU.

Table 5–11 ISDN LED Codes

LED Display	HEX Code	Solution	Then Replace...
o●●●oooo	70	1	2
o●●●ooo●	71	1, 3, 4	2, Audio module
o●●●oo●o	72	1	2
o●●●oo●●	73	1	2
o●●●o●oo	74	1	2
o●●●o●o●	75	1	2

Table 5–12 ISDN LED Codes Action Table

Step	Action
1	Reseat I/O module and system module.
2	Replace I/O module.
3	Make sure a handset is connected.
4	Make sure that the audio module cable is connected to the 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 appears with FRU and error code information on the monitor screen.

If the system enters console mode, then execute SCSI diagnostics and interpret the error information using the:

- SHOW ERROR command
- Diagnostic information in Chapter 4
- Diagnostic error messages in Chapter 14

If the system does not enter console mode (>>>) or if hex code DD is not displayed on the LEDs, then use Table 5–13 and then perform the specified steps in Table 5–14 to isolate the failed FRU.

Table 5–13 SCSI LED Codes

LED Display	HEX Code	Solution	Then Replace...
o●●ooooo	60	1	2
o●●oooo●	61	1	2
o●●ooo●o	62	1	2
o●●ooo●●	63	1, then 3	2, then 4
o●●oo●oo	64	1, then 3	2, then 4
o●●oo●o●	65	1, then 3	2, 4, then 5
o●●oo●●o	66	Reserved for future use	–
o●●oo●●●	67	Reserved for future use	–
o●●o●ooo	68	Reserved for future use	–
o●●o●oo●	69	Reserved for future use	–
o●●o●o●o	6A	Reserved for future use	–
o●●o●o●●	6B	Reserved for future use	–
o●●o●●oo	6C	Reserved for future use	–
o●●o●●o●	6D	Reserved for future use	–
o●●o●●●o	6E	Reserved for future use	–
o●●o●●●●	6F	Reserved for future use	–

Table 5–14 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 hex code DD for console entry.

If the system does not enter console mode, then use Table 5–15 and perform the specified steps in Table 5–16 to isolate the failed FRU.

No information appears other than the console (>>>) prompt or the DD hex code to indicate that console mode has been entered.

Table 5–15 Console LED Codes

LED Display	HEX Code	First Replace...	Then Replace...
●●●o●●●●	EF	Informational only — never stops here.	
●●●o●●●o	EE	Informational only — never stops here.	
●●●o●●o●	ED	Informational only — never stops here.	
●●●o●●oo	EC	1	2
●●●o●o●●	EB	1	2
●●●o●o●o	EA	1	2
●●●o●oo●	E9	1	2

(continued on next page)

Table 5–15 (Cont.) Console LED Codes

LED Display	HEX Code	First Replace...	Then Replace...
●●●o●ooo	E8	1	2
●●●oo●●●	E7	1	2
●●●oo●●o	E6	1	2
●●●oo●o●	E5	1	2
●●●oo●oo	E4	1	2
●●●ooo●●	E3	1	2
●●●ooo●o	E2	1	2
●●●oooo●	E1	1	2
●●●ooooo	E0	Informational only — never stops here.	
●●o●●●●●	DF	1	2
●●o●●●●o	DE	1	2
●●o●●●o●	DD	Console entry >>>	–
oooooooo	00	Console is about to be exited.	–

Table 5–16 Console LED Codes Action Table

Step	Action
1	Replace I/O module.
2	Replace system module.

84 Fail

Overview

The message 84 Fail on your monitor 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 also appears. Disregard the 84 Fail message and rely on the error code information.

- 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 information to help you troubleshoot a DEC 3000 Model 600/600S AXP system. The tables are organized as follows:

- System Problems
- Monitor Problems
- Mouse Problems
- Keyboard Problems
- Drive Problems
- Network Problems
- Audio Problems
- Console Secure Problems
- Firmware Upgrade Problems

Using the Tables

Each troubleshooting table contains symptoms, possible causes, and suggested actions. If more than one action is suggested, perform them in the order listed.

System Problems

Table 5–17 lists the symptoms, possible causes, and suggested actions you can take to troubleshoot system problems.

Table 5–17 System Problems

Symptom	Possible Cause	Corrective Action
DC OK LED is off.	Defective power supply.	Replace the power supply.
No LEDs are on.	Possible bad I/O module and cable or system module.	Reseat the I/O module. If the problem persists, then replace the I/O module and then the system module. See Chapter 3 for location and procedure.
Power-on display does not appear and the LEDs indicate 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.
No screen display.	Brightness and contrast controls adjusted incorrectly.	Adjust the monitor brightness and contrast controls.
	Loose or broken cable.	Verify the monitor cable/video connections are secure.
	Monitor fuse is blown.	See the monitor guide for fuse replacement instructions.

(continued on next page)

Table 5–17 (Cont.) System Problems

Symptom	Possible Cause	Corrective Action
	The alternate console switch is not 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.
	Default recovery action is set to halt.	In console mode (>>>), enter the SHOW AUTO_ ACTION command for proper setting. Modify using the SET AUTO_ACTION command. See Chapter 13 for further information.
	Incorrect boot device was specified.	See Chapter 13 for further information.
	In console mode (>>>), enter the SHOW BOOTDEF_DEV command for proper setting. Modify using the SET BOOTDEF_DEV command.	See Chapter 13 for further information.
	Boot device is not properly configured.	Enter the SHOW DEVICE command to verify that all devices are configured properly. If they are not, then verify IDs and cables.

(continued on next page)

Table 5–17 (Cont.) System Problems

Symptom	Possible Cause	Corrective Action
	Faulty boot device.	Run diagnostic/utilities for faulty devices. See Chapter 4.

Monitor Problems

Table 5–18 lists the symptoms, causes, and suggested actions for monitor problems. If the suggested actions listed do not correct the problem, then verify that all cable connections are secure. If cable connections are correct, verify the graphics option by executing the T TCx command.

Table 5–18 Monitor Problems

Symptoms	Possible Cause	Corrective Action
There is no monitor display.	Alternate console is enabled.	Verify that the alternate console switch setting is in the up position. Verify that the monitor power LED and system are on.
The monitor screen is unstable.	Monitor needs alignment.	Refer to the monitor reference material for adjustment procedures.
No screen display.	Brightness and contrast controls adjusted incorrectly.	Adjust the monitor brightness and contrast controls.

Mouse Problems

Table 5–19 lists the symptoms, causes, and suggested actions for mouse problems. If the suggested actions listed do not correct the problem, then verify that all cable connections are secure. If cable connections are correct, then execute the SCC diagnostics. See Chapter 4 for further information.

Table 5–19 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 (>>>), 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

Table 5–20 lists the symptoms, causes, and suggested actions for keyboard problems. If the suggested actions listed do not correct the problem, then verify that all cable connections are secure. If cable connections are correct, then execute the SCC diagnostics. See Chapter 4 for further information.

Table 5–20 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.
	The keyboard cable is loose or not connected.	Verify that the keyboard cable is securely connected.

Drive Problems

Table 5–21 lists the symptoms, causes, and suggested actions for drive problems. If the suggested actions listed do not correct the problem, then verify that all cable connections are secure. If cable connections are correct, then 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 eliminates any external problems.

Table 5–21 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 console mode. Reset the SCSI IDs to a unique number. Make sure that all installed devices are present.
	The cables are loose.	Verify that all cables are securely connected.
	The drive is defective.	Run diagnostics to isolate the fault. Replace the FRU.
	Cables are terminated incorrectly.	Verify that the last device is correctly terminated.

Network Problems

Table 5–22 lists the symptoms, causes, and suggested actions for network problems. If the suggested actions listed do not correct the problem, then verify that all cable connections are secure. If cable connections are correct, then execute the ASIC and NI diagnostics while in service mode (for extended testing capabilities). See Chapter 4.

Table 5–22 Network Problems

Symptom	Possible Cause	Corrective Action
NI error message appears when verifying Ethernet.	No thickwire/10BASE-T terminator or cable was installed.	Attach appropriate terminator.

(continued on next page)

Table 5–22 (Cont.) Network Problems

Symptom	Possible Cause	Corrective Action
	Cable connection is loose.	Verify that all connections on the Ethernet segment are secure.
Cannot boot from the network.	There is a local network problem. The problem is most likely caused by the customer server system or the network.	Contact system manager.
	NI interface is defective.	Run diagnostics (TEST NI command) with terminators attached. Replace faulty FRU if test fails.

Audio Problems

To isolate audio problems, you must execute the ISDN diagnostics while in service mode (for extended testing capabilities). See Chapter 4 for details.

Console Secure Problems

Refer to Chapter 2 for procedures to:

- Enable console security
- Reset console password
- Enter the privileged state

Firmware Upgrade Problems

If you have encountered problems trying to upgrade the flash EEPROMs, refer to Table 5–23 to isolate the problem.

Table 5–23 Firmware Upgrade Problems

Symptom	Possible Cause	Corrective Action
Unable to perform the upgrade.	ROM update jumpers on the I/O module are not set to the on position.	See Chapter 2.

Part II

DEC 3000 Model 800/800S AXP Specific Information

Part II provides information specific to the DEC 3000 Model 800/800S AXP system. This part includes the following chapters:

Chapter	Title
6	System Overview
7	System Configuration
8	Removal and Replacement Procedures
9	Diagnostic Testing
10	Troubleshooting
11	Rackmount Installation for the IEC RS–310 Cabinet
12	Rackmount Installation for the H9A00–AJ Cabinet

6

System Overview

Overview

Introduction

The DEC 3000 Model 800/800S AXP system is a high-performance deskside workstation and server. The system can also be rackmounted in a standard 47.5-centimeter (19-inch) cabinet.

System Components

The DEC 3000 Model 800/800S AXP system includes the following components:

- System module
- Audio module
- I/O Module
- Memory subsystem
- Power supply

The DEC 3000 Model 800/800S AXP system provides support for:

- Up to four internal SCSI disk drives
- Two 13-centimeter (5.25-inch), half-height, removable SCSI devices
- Up to seven external SCSI devices
- Up to six TURBOchannel options

System Module

The system module includes the following components:

- 200 MHz DECchip 21064 (CPU)
- 8 KB serial ROM
- 2 MB backup cache
- Main memory controller
- Controller for the TURBOchannel I/O bus
- 256 Kbyte Flash ROM (system ROM)
- Three TURBOchannel option slots

I/O Module

The I/O module includes the following components:

- TOY/NVR Controller chip
- Two serial line controllers
- ISDN Interface with audio I/O
- Two SCSI controllers
- Ethernet controller
- 256 KB of flash ROM
- Three TURBOchannel option slots

The DEC 3000 Model 800/800S AXP system provides interfaces to:

- Serial lines
- Ethernet
- Fast SCSI
- ISDN
- Audio in/out
- Battery backed-up TOY
- High-performance two- and three-dimensional graphics subsystem
- FDDI

Addresses generated by DMA devices in the I/O system may be translated by a scatter/gather map. The scatter/gather map can map 32 KB pages. This translation is optional, enabled on a device-by-device basis.

Serial Lines: The serial line interface supports the following equipment:

Equipment	Connections
Keyboard	Connects to a 15-pin D-sub connector.
Mouse	Shares 15-pin D-sub connector with keyboard.
Printer	Connects to a 6-pin MMJ and is DEC–423 compliant.
Communication port	Connects to a 25-pin D-sub connector and supports full modem control.

Ethernet Interface: The Ethernet interface can connect to the local area network (LAN) by using an attachment unit interface (AUI, or thickwire) or 10BASE-T twisted-pair cable. The selection (thickwire or twisted pair) is software-controllable.

SCSI Interface: The SCSI interface consists of two separate channels using two SCSI-2 controller chips (53CF94). These controller chips connect to the TURBOchannel through an ASIC. The ASIC buffers data to and from the SCSI controllers, providing 16-longword DMA bursts across the TURBOchannel for increased bus efficiency.

ISDN and Audio In/Out: An AMD 79C30A controller chip provides an ISDN interface and telephone-quality audio input and output. Jacks and connectors in the front of the unit provide connections for a microphone and headphones.

Battery Backed-Up TOY: A battery backed-up time-of-year (TOY) chip provides a time reference when the unit is turned off. The TOY also provides 50 bytes of non-volatile RAM (NVR) for system parameters.

Memory Subsystem

The memory subsystem includes the following:

- Four memory motherboards (MMB) that mount on the system module. To have an operational memory subsystem, all four MMBs must be present.
- The memory arrays are spread among the four MMBs. Each bank of memory consists of eight memory modules, two on each MMB.

  The memory subsystem supports up to 1 gigabyte (GB) of memory.

The DEC 3000 Model 800/800S AXP system contains a high-performance memory subsystem that uses ECC logic. Memory can be configured with up to 256 MB using 1M×4 DRAMs or up to 1 GB using 4M×4 DRAMs.

CPU/Cache

The DEC 3000 Model 800/800S AXP system contains a single chip processor and floating point running at 5.0 ns. The processor is a superscalar, superimplementation of the Alpha AXP architecture.

The DEC 3000 Model 800/800S AXP system contains the following direct-mapped caches:

- Icache (instruction cache)
- Dcache (data cache)

The system uses a second-level cache to help minimize the performance penalty of misses and write-throughs to the primary cache. This second-level cache is a 2 MB, direct-mapped, write-back cache with a block size of 32 bytes.

The cache is implemented on the system module using 128 KB × 8 static RAMs. The read bandwidth between the processor and the second level cache is approximately 640 MB and the write bandwidth is 420 MB.

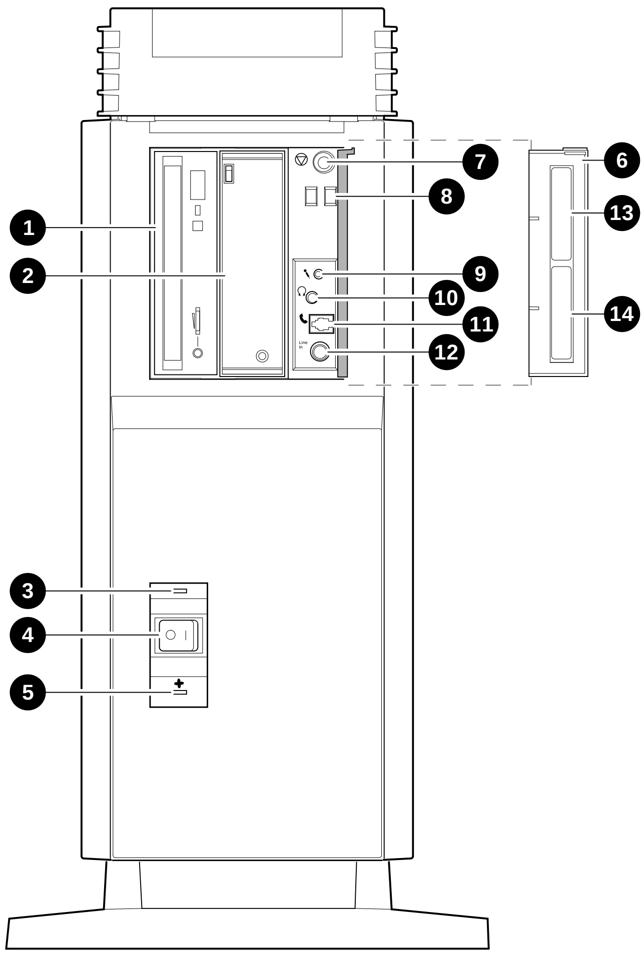
Front View

Front View

Figure 6–1 shows the controls, lights, and devices on the front of the DEC 3000 Model 800/800S AXP system. Table 6–1 describes their functions.

Front View

Figure 6–1 Front View



MLO-007553

Table 6–1 DEC 3000 Model 800/800S AXP System (Front)

This Feature...	Lets You...
❶ and ❷ Removable media device slots	Access devices that use removable storage media, such as diskettes, compact disks, cassette tapes, or cartridge tapes.
❸ DC OK light	Check that all dc voltages are present on the power supply.
❹ On/Off switch	Turn the system unit on (|) and off (0).
❺ Fan failure indicator light	Check whether a fan has failed.
❻ Front access door	Cover the controls and lights.
❼ Halt button	Put the system in console mode.
❽ Diagnostic display	View error codes that indicate potential system problems.
❾ Microphone input jack	Connect a microphone.
❿ Speaker output jack	Connect a speaker or headphone for audio output.
⓫ Telephone jack	Connect a telephone handset.
⓬ Audio input jack	Connect an audio input line.
⓭ Model and serial number label	Find the model and serial number of your system.
⓮ Network label position	Place optional network label that is included in the system's accessory kit.

Rear View

Rear View

Figure 6–2 shows the switches, connectors, and modules on the rear of the DEC 3000 Model 800/800S AXP system. Table 6–2 describes their function.

Figure 6–2 Rear View

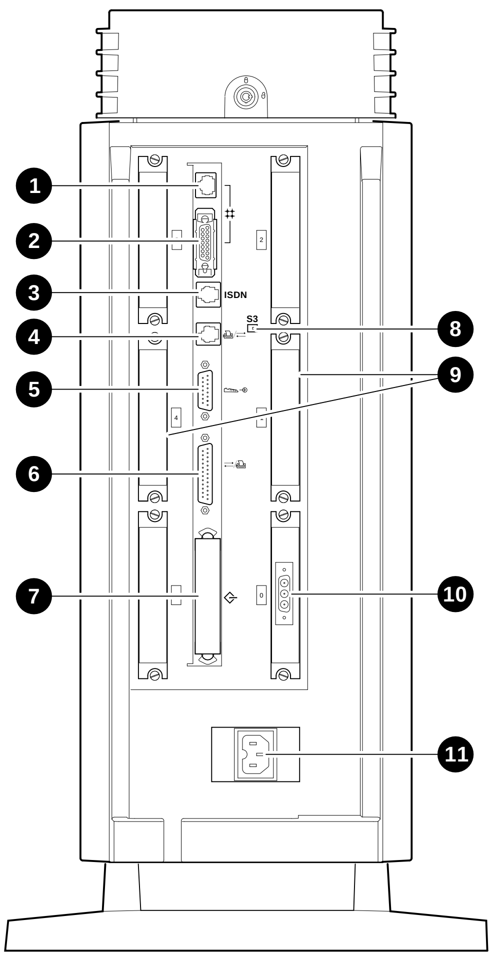


Table 6–2 DEC 3000 Model 800/800S AXP System (Rear)

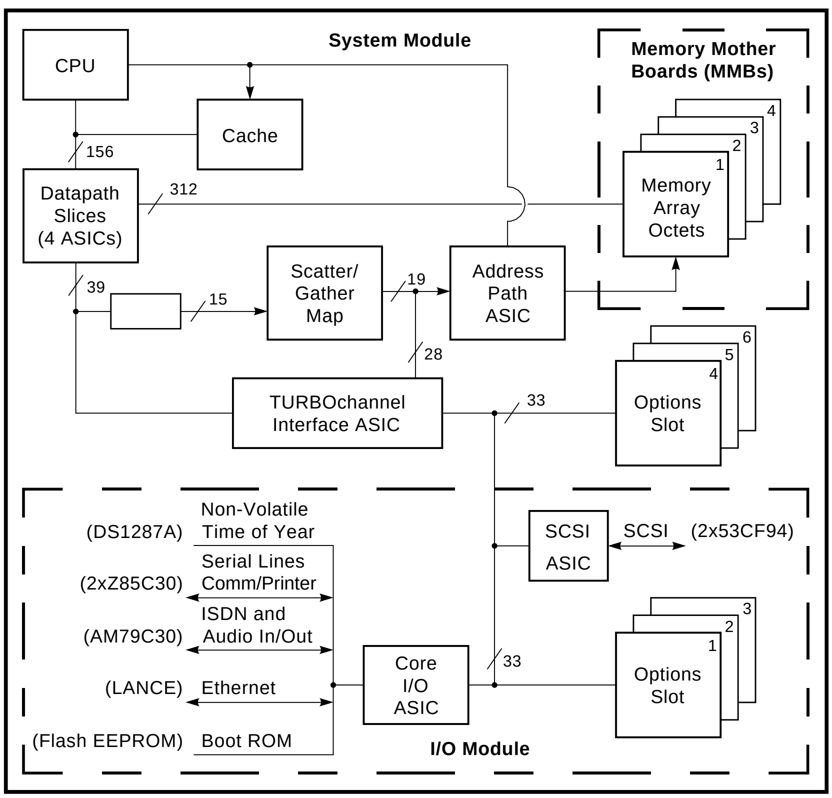
This Feature...	Lets You...
❶ 10BASE-T Port	Connect a 10BASE-T Ethernet network cable.
❷ AUI Port	Connect an Attachment Unit Interface (AUI) Ethernet network cable (sometimes referred to as standard or thickwire Ethernet).
❸ ISDN Port	Connect an Integrated Services Digital Network (ISDN) cable.
❹ Alternate console/printer port	Connect a terminal as an alternate console, or a printer.
❺ Keyboard/mouse port	Connect the keyboard/mouse extension cable.
❻ Synchronous /asynchronous communications port	Connect a communications device such as a printer, plotter, modem, or console terminal.
❼ External SCSI port	Connect Small Computer System Interface (SCSI) peripheral devices. The SCSI port has the SCSI terminator shipped in place.
❽ Alternate console switch	Direct console output to a monitor (switch right) or to an alternate console such as a terminal (switch left).
❾ TURBOchannel slots	Connect TURBOchannel options, such as 2D or 3D graphics modules, SCSI adapters, and Ethernet adapters. There are six slots.
❿ Monitor video port	Connect the monitor video cable.
⓫ System power port	Connect the system unit power cord.

System Block Diagram

System Block Diagram

Figure 6–3 shows the interaction of all system components.

Figure 6–3 System Block Diagram



MLO-010994

7

System Configuration

Overview

Chapter Overview

This chapter covers the following topics:

- Jumper Locations
- I/O Module Jumpers
- Console Security
- Storage Devices
  - Configuring Storage Devices
- Internal Cable Routing
- Memory Configuration
  - Memory Configuration Rules
  - Identifying the SIMMs

General Rules

Before upgrading or replacing storage devices or memory, follow these general rules:

- If replacing storage devices, then set storage devices to the same SCSI ID as the previously removed drive.
- If upgrading storage devices, then enter the console command SHOW CONFIG to see all current SCSI address settings.
- If upgrading or replacing memory, make sure all memory modules are of same type for each memory bank and that each bank is fully populated.

Commands

Use the following commands to verify compliance with the general rules and the results of configuration procedures:

- SHOW CONFIGURATION
- SHOW MEMORY
- SHOW DEVICE

Jumper Locations

System Module Jumper Locations

Figure 7–1 shows the location of jumpers and the serial ROM on the system module. Table 7–1 describes each location.

Figure 7–1 System Module Jumper Locations

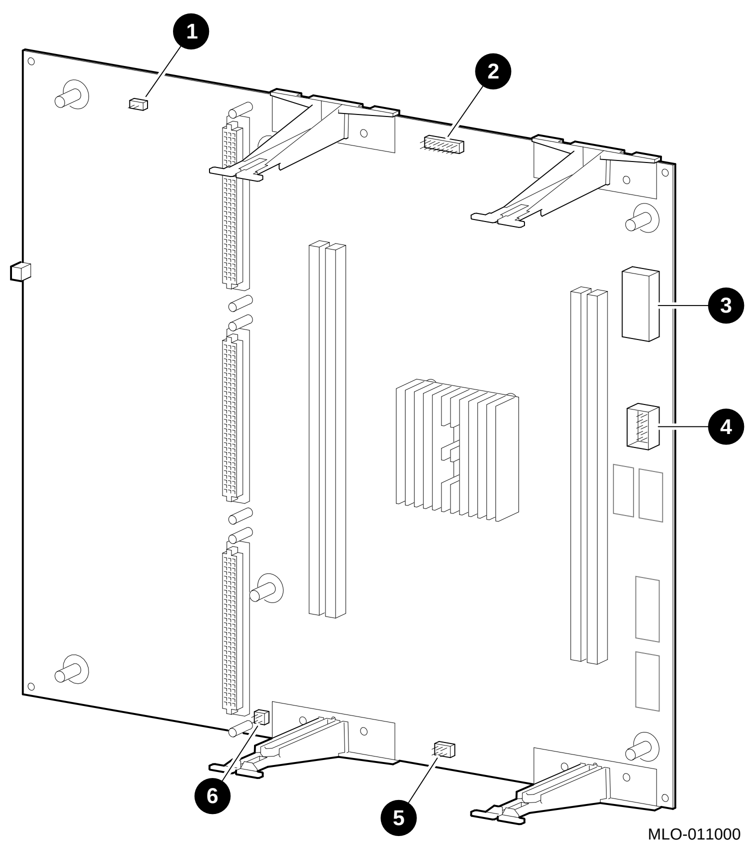


Table 7–1 System Module Jumpers

Feature	Description	Comments	Default Setting
❶	Test pins	Used by engineering.	–
❷	Serial ROM jumpers	Jumper location 0 only.	Installed.
❸	Serial ROM	–	–
❹	Serial ROM test port	–	–
❺	Clock divider jumpers	–	Installed.
❻	Flash ROM update jumper	Enable and park positions.	Enabled.

I/O Module Jumpers

Figure 7–2 shows the location of the jumpers, Enet address ROM chip, TOY/NVR chip, and flash ROM on the I/O module. Table 7–2 describes each location.

Figure 7–2 I/O Module Jumper Locations

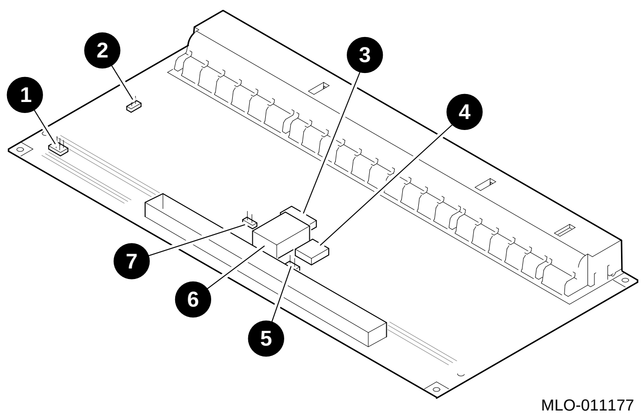


Table 7–2 I/O Module Jumpers

Feature	Description	Comments	Default Setting
❶	Park location	Used to store unused jumpers.	–
❷	Active terminator enable	In = Enabled (terminator ON), Out = Disabled.	Enabled.
❸	Enet address ROM chip	Socketed	–
❹	Flash ROM	–	–
❺	Flash ROM jumper	In = Enabled, Out = Disabled.	Enabled.
❻	TOY/NVR chip	Socketed	–
❼	Console secure jumper	In = Enabled, Out = Disabled.	Disabled.

Console Security

Secure Jumper

To secure the console, perform the following steps. Use Figure 7–2 and Table 7–2 for reference.

1. Power down the system.
2. Remove the I/O module and install the secure jumper. See Chapter 8 for details.
3. Reinstall the I/O module.
4. Power up the system and enter console mode. The console prompt (>>>) appears.
5. Enter a 16-character hexadecimal password. You can use the characters 0 to 9 and A to F.
6. Set the environment variable SECURE to ON.

The system prompts you to enter the old password once and the new password twice. The passwords are not echoed or displayed.

The DEC 3000 Model 800/800S AXP system has a password-protected console security feature that prevents unauthorized users from accessing all the console commands. Authorized users can access the console commands by using the following privileged commands:

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

- TEST

The unprivileged commands are:

- BOOT (no parameters)
- LOGIN
- CONTINUE
- HELP

Example

This example shows when the password is set.

```
>>>SET PASSWORD Return
PSWD1> ENTER_NEW_PASSWORD
PSWD2> ENTER_NEW_PASSWORD
```

Entering the Privileged State

To enter the privileged state on a secured console, enter the LOGIN command as follows:

```
>>> LOGIN {password} RETURN
```

Use the password you set with the **SET PASSWORD** command. The password is not echoed or displayed.

Exiting the Privileged State

The following commands allow you to exit the privileged state:

- BOOT
- CONTINUE
- HALT

Disabling Console Security

To disable console security, do the following:

1. In console mode, set the SECURE variable to OFF.
2. Remove the secure jumper on the I/O module.

Restoring the Console Password

If you forget the console password, you can enter a new password as follows:

1. Shutdown the system.
2. Power down the unit.
3. Remove the I/O module.
4. Remove the secure jumper from the I/O module.
5. Reinstall the I/O module with the secure jumper disabled.
6. Power up the unit.
7. Enter the following DEPOSIT command:

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

8. Power down the unit.
9. Remove the I/O module and install the secure jumper.
10. Reinstall the I/O module.
11. Power up the unit.
12. Enter the new password.

Storage Devices

Configuring Storage Devices

Whne you replace a SCSI device, you must configure the new device to match the old device.

Replacing SCSI Drives

Configure a new device as follows:

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

   >>> **SHOW DEVICE** Return

2. Remove the device, following the procedures in Chapter 8.

3. Set all jumpers and switches on the new device to match the removed device.
4. Install the new device.
5. At the console prompt, enter SHOW DEVICE to verify the replacement.

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

6. Run the disk verifier diagnostic (Chapter 14).

Adding SCSI Drives

When you add a SCSI drive, you must configure the device.

Configure the new drive as follows:

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

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

2. Set the SCSI address. See Table 7–3 for the SCSI jumper settings for particular devices.
3. Mount the device (Chapter 8).
   - See Figure 7–3 for internal cable routing.
   - Figure 7–4 for the factory-default SCSI ID settings.
   - Figure 7–5 for power cable routing.
4. At the console prompt, enter SHOW DEVICE to verify that the replacement was correct.
5. Run the disk verifier diagnostic (Chapter 14).

Table 7–3 lists the recommended SCSI jumper settings. See Chapter 13 for information about SCSI utilities.

Table 7–3 Recommended SCSI Jumper Settings

Drive	Recommended SCSI Address	2	1	0
RZ2x	0	Out	Out	Out
RZ2x	1	Out	Out	In
RZ2x	2	Out	In	Out
Factory-installed RZ2x	3	Out	In	In
RRD42	4	In	Out	Out
RX26, TZK1x, TLZ06, TZ30	5	In	Out	In
(Open ID)	6	In	In	In
SCSI controller	7	In	In	Out

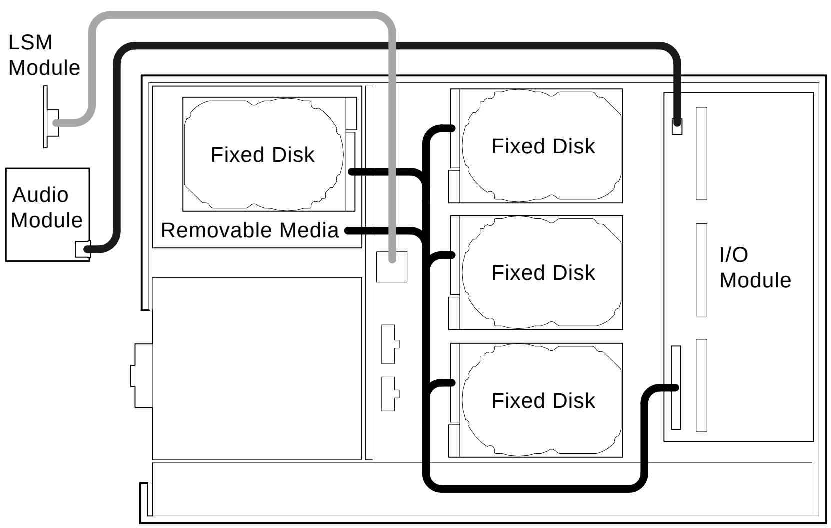
Out = Removed.
In = Attached.

Internal Cable Routing

Cable Connections

Figure 7–3 shows the cable connections between modules and disks in the DEC 3000 Model 800/800S AXP system.

Figure 7–3 Internal Cable Routing

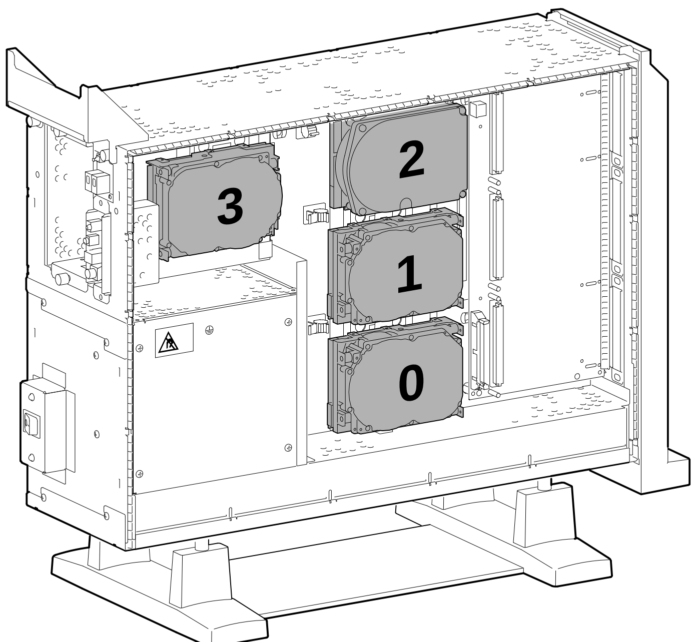


LSM is the lights and switch module.

Disk Configuration

Figure 7–4 shows the default SCSI ID setting assigned to each drive location in the DEC 3000 Model 800/800S AXP system.

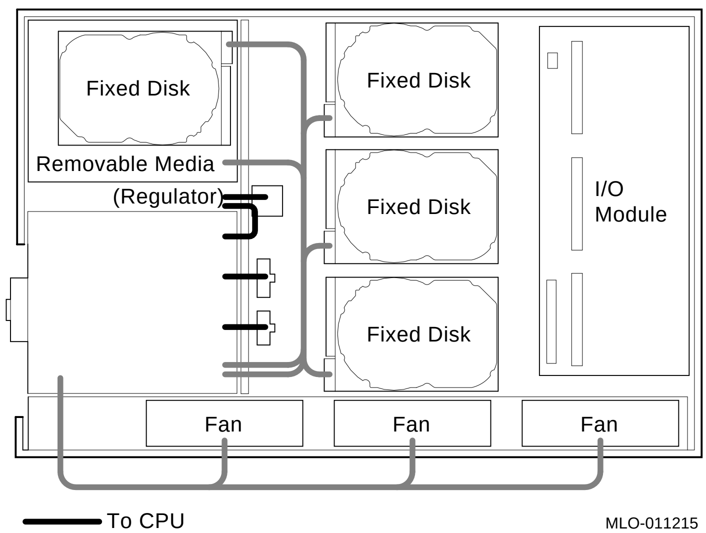
Figure 7–4 Factory-Default SCSI ID Settings for Drives



Power Cable Routing

Figure 7–5 shows the internal power cable connections and routing.

Figure 7–5 Power Cabling



Memory Configuration

Banks and Slots

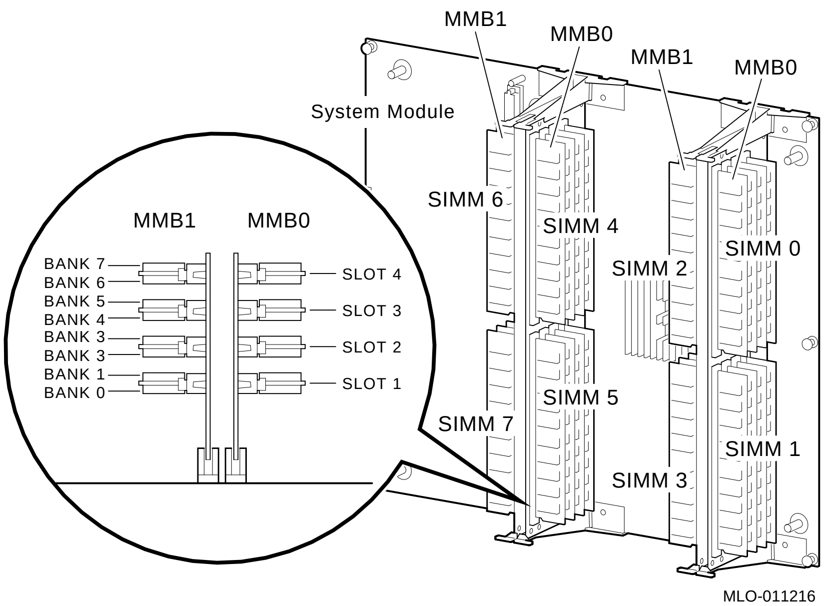
A bank represents the eight memory arrays (memory modules 0 through 7) as shown in Figure 7–6. A slot consists of two banks because every memory array can be populated on both sides as shown.

Example

The following example shows a memory configuration and the relationship between banks and memory module size. For the DEC 3000 Model 800/800S AXP system, the banks are numbered 0 through 7, with 0 being closest to the CPU module.

Figure 7–6 shows a layout of memory banks.

Figure 7–6 Memory Bank Layout




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

DEC 3000 - M800 Memory: 144 Mbytes
------------------------------------------
BANK #      MEMORY_SIZE        START_ADDRESS
------      -----------        -------------
0            008 Mbytes        0x08000000
1            008 Mbytes        0x08800000
2            032 Mbytes        0x00000000
3            032 Mbytes        0x02000000
4            032 Mbytes        0x04000000
5            000 Mbytes        0x00000000
6            032 Mbytes        0x06000000
7            000 Mbytes        0x00000000

 >>>
```

Memory Configuration Rules

When installing memory, follow these configuration rules:

- Each memory bank must be filled in sets of eight memory modules.
- The eight memory SIMMs in a bank must be of equal size.
- The eight memory SIMMs in a bank must be of the same type. They must all be single- or double-sided.

Note

If you violate the rules, the memory size displayed by a SHOW MEMORY command is of lowest value memory module.

Identifying the SIMMs

The following table lists the part numbers for 2, 4, 8, 16, and 32 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
54–22389–AA	16 MB Memory SIMM
54–22389–BA	32 MB Memory SIMM

8

Removal and Replacement Procedures

Overview

Chapter Overview

This chapter covers the following topics:

- Locating Field Replaceable Units
- System Cover
- Front Bezel
- Side Panels
- Rear Bezel
- Audio Module Assembly
- Lights and Switch Module
- Power Supply
- RZ~ Disk Drives
- Regulator Module
- I/O Module
- Fans
- Memory Mother Board
- Memory Module
- System Module
- System Cable and Power Routing

Caution

Always follow antistatic procedures when handling drives and other static-sensitive items.

Before You Start

Before removing or replacing defective parts, the customer must prepare the system by doing the following:

1. If the system is in working condition, back up all data files.
2. Shut down the software.
3. Record the present system configuration. Refer to the SHOW CONFIG command for the procedure.
4. Record environmental values.
5. Power down the system and start the removal/replacement procedure.

Antistatic Precautions

Anytime you remove or replace a module in the DEC 3000 Model 800/800S AXP system, you must take antistatic precautions. 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 system power supply.
3	Remove the part or module that you want to remove or replace.

Caution: Power Source

Before removing the cover to access the system, you must power down the system and disconnect the power cable from the power source.

Locating Field Replaceable Units

Using the Exploded View

To locate a particular FRU, refer to Table 8–1 and Figure 8–1 or Figure 8–2. Table 8–1 lists each FRU and the associated number showing the location in Figure 8–1 and Figure 8–2.

Table 8–1 FRU Table

FRU	Figure Reference
Front bezel	❶ Figure 8–1
Audio assembly	❷
Lights and switch module (LSM)	❸
Disks	❹
I/O Module	❺
Rear bezel	❻
Fan assembly	❼
Left side panel	❽ Figure 8–2
Memory modules	❾
Memory motherboard (MMB)	❿
System module	⓫
Top cover	⓬
Right side panel	⓭
Power supply	⓮
Regulator (3.45 V)	⓯

Figure 8–1 shows the FRUs on the right side of the DEC 3000 Model 800/800S AXP system.

Figure 8–1 FRU Locations (Right Side)

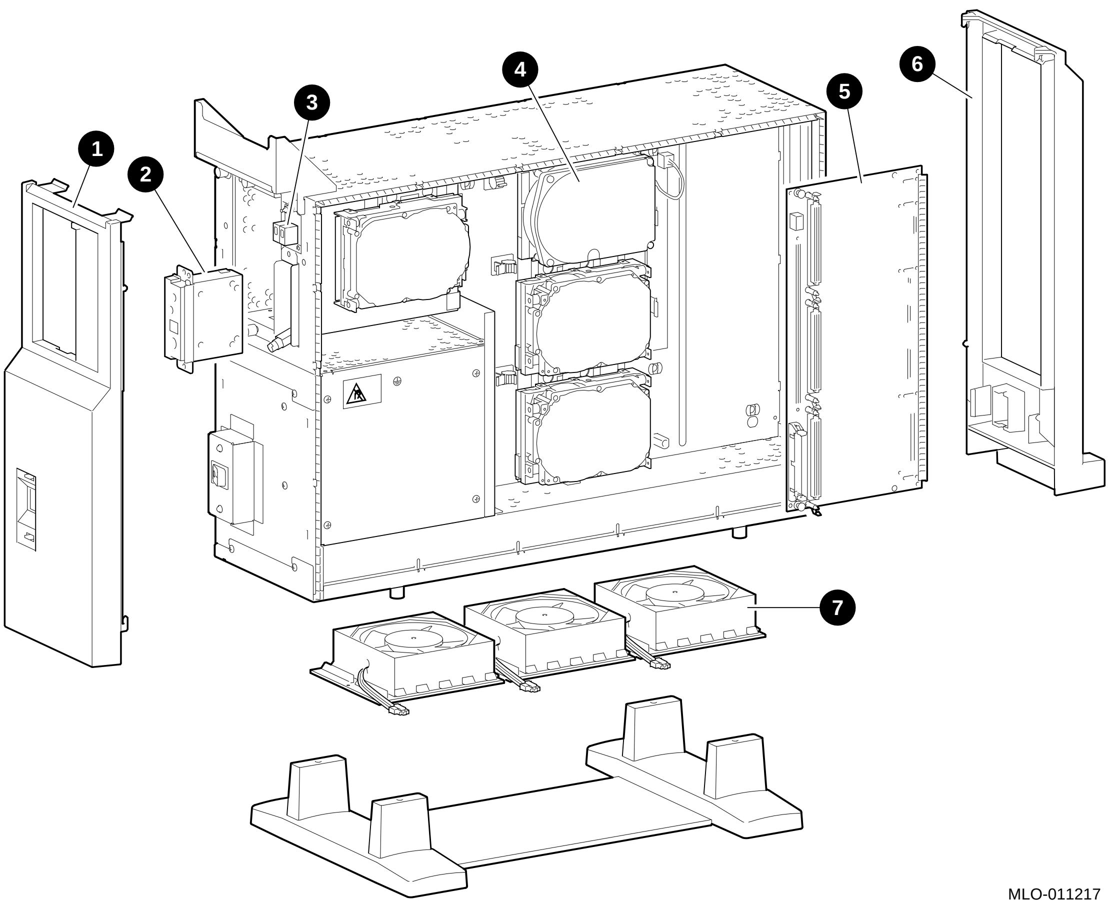
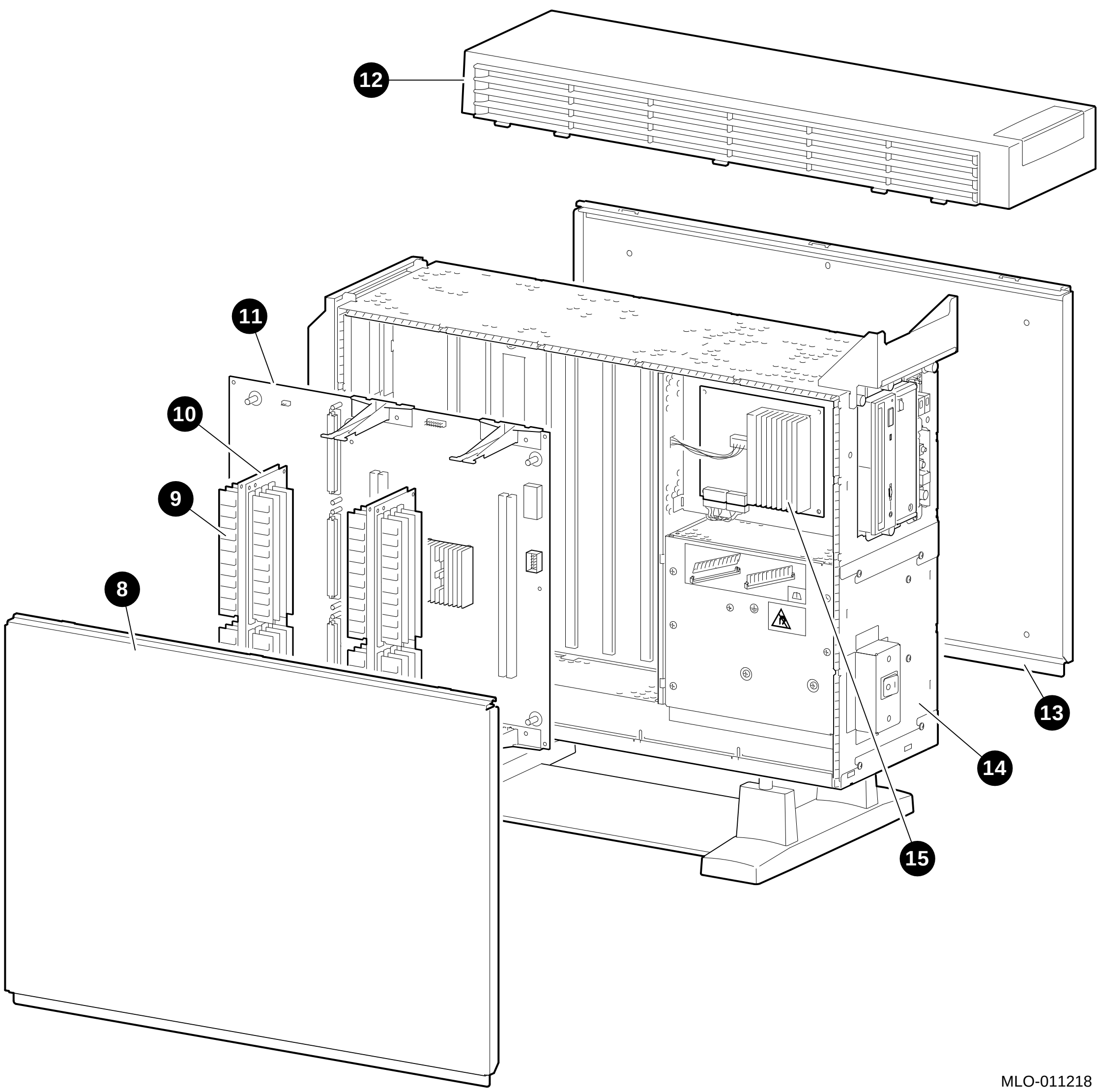


Figure 8–2 shows the FRUs on the left side of the DEC 3000 Model 800/800S AXP system.

Figure 8–2 FRU Locations (Left Side)



System Cover

Keylock Security

If the system is locked, the customer must supply keys to the Digital service representative to open the system cover.

Before leaving the site, the Digital service representative must return all keys to the customer or inform the customer that the system is locked.

Digital service personnel are not responsible for lost keys and will not provide keys. It is the responsibility of customers to ensure that the system is secured. They must record the key numbers stamped on the keys.

If the system is locked and keys are lost, then the customer must call a locksmith to open the system.

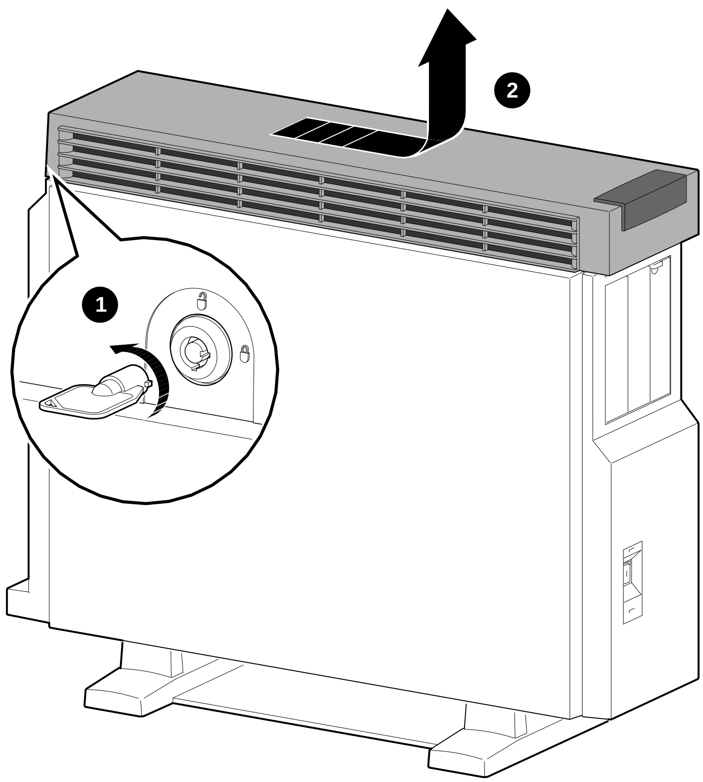
To remove the top cover, use the next procedure.

Step	Action	Refer to Figure 8–3
1	Shutdown the system.	–
2	Power down the unit.	–
3	Unlock the top cover.	❶
4	Slide the cover forward and up off the system.	❷

Part Number

Part	Part Number	Quantity
Top cover	70–30266–01	1

Figure 8–3 Removing the Top Cover



Replacement

To install the top cover, reverse the removal steps.

Front Bezel

Removal

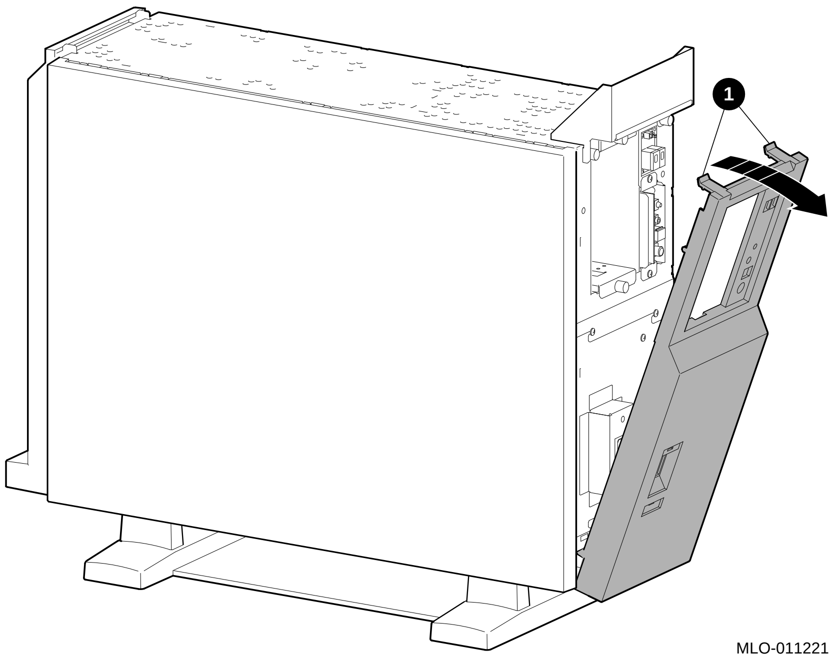
To remove the front bezel, use the next procedure.

Step	Action	Refer to Figure 8–4
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Release the two tabs.	❶
5	Tilt the front bezel forward and down off the system.	–

Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Front bezel	74–43830–01	1

Figure 8–4 Removing the Front Bezel



Replacement

To install the front bezel, reverse the removal steps.

Side Panels

Removal

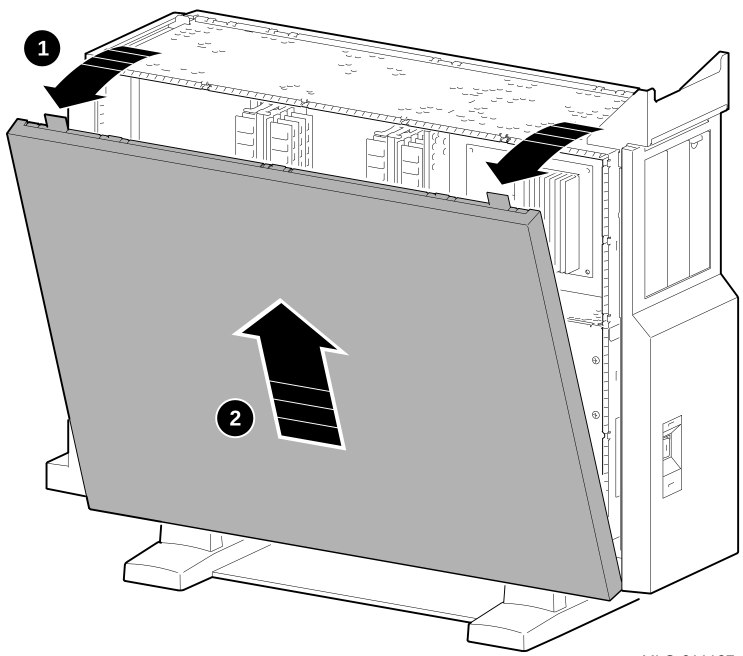
To remove either side panel, use the next procedure.

Step	Action	Refer to Figure 8–5
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Pull the panel towards you by grabbing the metal tabs.	❶
5	Lift up and remove the panel.	❷

Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Side panel (pedestal)	70–29563–01	1
Side panel (rackmount)	70–29564–01	1

Figure 8–5 Removing the Side Panel



Replacement

To install the side panel, reverse the removal steps.

Rear Bezel

Removal

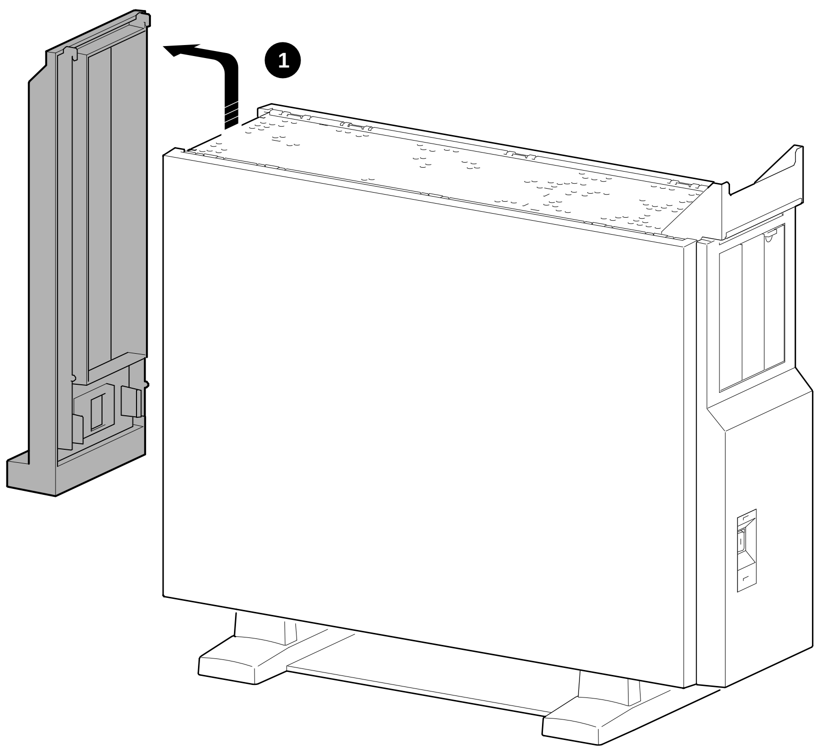
To remove the rear bezel, use the next procedure.

Step	Action	Refer to Figure 8–6
1	Shutdown the system.	–
2	Power down the unit.	–
3	Disconnect the cables from rear.	–
4	Remove the top cover.	–
5	Lift the bezel up and out of the system.	❶

Part Numbers

Part	Part Number	Quantity
Top cover	70-30266-01	1
Rear bezel	74-44072-01	1

Figure 8–6 Removing the Rear Bezel



Replacement To install the rear bezel, reverse the removal steps.

Audio Module Assembly

Removal

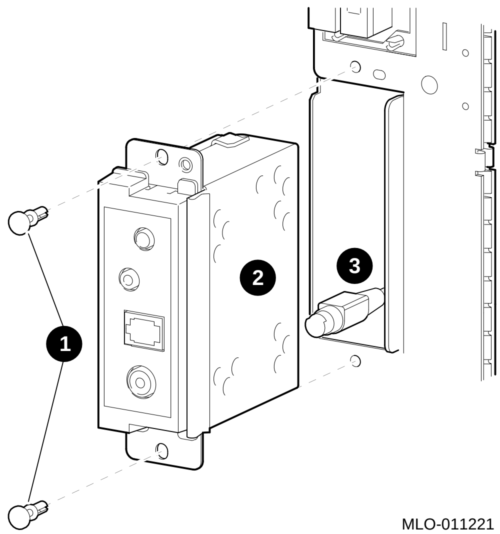
To remove a failed or damaged audio module assembly, use the next procedure.

Step	Action	Refer to Figure 8–7
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the front bezel.	–
5	Remove the two removable rivets.	❶
6	Slide the audio module assembly out.	❷
7	Disconnect the audio cable from the rear of the audio module assembly and remove the assembly.	❸

Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Front bezel	74–43830–01	1
Removable rivets	12–36064–01	2
Audio assembly	70–29562–01	1
Audio cable	17–03502–01	1

Figure 8–7 Removing the Audio Module Assembly



Replacement

To install the audio module assembly, reverse the removal steps.

Lights and Switch Module

Removal

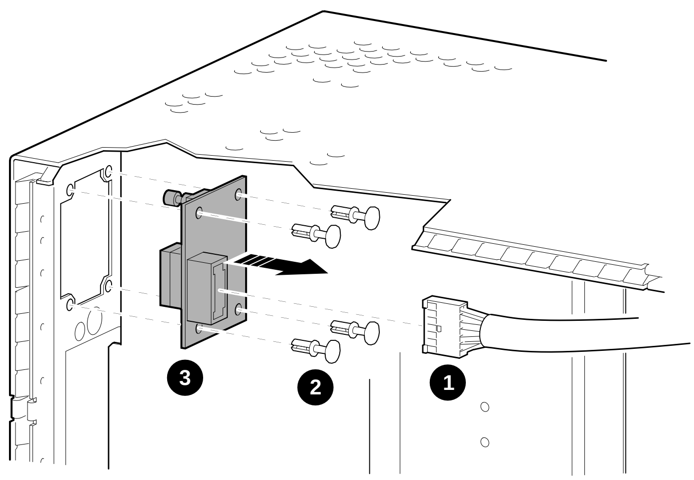
To remove a failed or damaged lights and switch module (LSM), use the next procedure.

Step	Action	Refer to Figure 8–8
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the right side panel.	–
5	Disconnect the LSM cable.	❶
6	Remove the four removable rivets.	❷
7	Remove the LSM module.	❸

Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Front bezel	74–43830–01	1
LSM cable	17–03501–01	1
Removable rivets	12–36064–01	4
LSM module	54–21145–02	1

Figure 8–8 Removing the LSM Module



Replacement

To install the LSM module, reverse the removal steps.

Power Supply

Removal

To remove a failed or damaged power supply:

Step	Action	Refer to Figure
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the front bezel.	–
5	Remove both side panels.	–
6	Disconnect the five power cables at the rear of power supply.	❶ Figure 8–9
7	Disconnect the regulator cables.	❷
8	Lower the access panel and disconnect the ac power cord and fan connector.	❸ Figure 8–10
9	Loosen the four mounting screws.	❹
10	Remove the power supply.	❺

Figure 8–9 shows the power supply cabling for the DEC 3000 Model 800/800S AXP system.

Figure 8–9 Power Supply Cabling

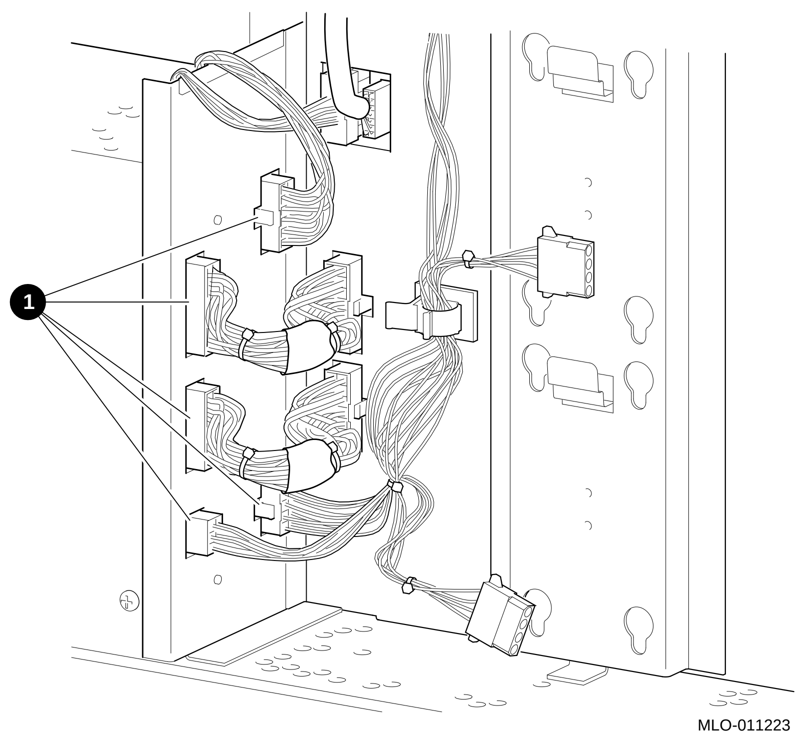
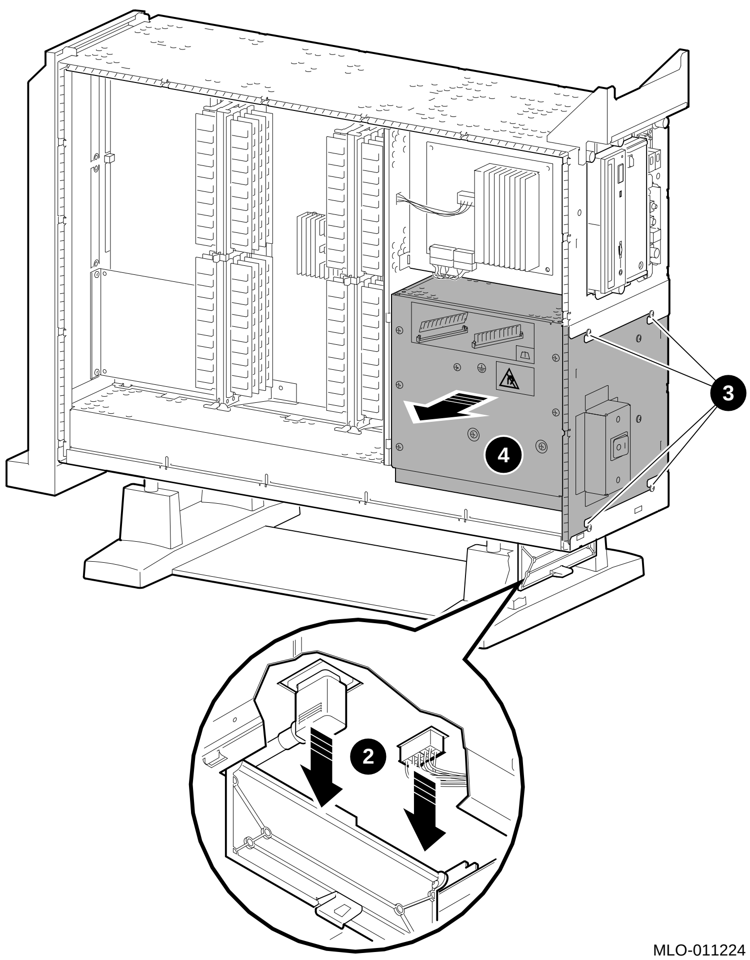


Figure 8–10 Removing the Power Supply



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Side panels	70–29563–01	2
Power cable	17–03395–01	1
Mounting screws	–	4
Power supply	H7883–YA	1
Regulator cable	17-03817-01	1
Regulator cable	17-03814-01	1
Regulator cable	17-03320-03	1

Replacement

To install the power supply, reverse the removal steps.

RZ*xx* Disk Drives

Overview

This section describes how to remove the following RZ disk drives:

RZ24L-E
RZ25-E
RZ25L-E
RZ26-E
RZ26L-E
RZ28-E

Removal

To remove a failed or damaged RZxx disk, use the next procedure.

Step	Action	Refer to Figure
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the right side panel.	–
5	Disconnect the power/SCSI interface cables.	❶ and ❷ Figure 8–11
6	Press the release tab.	❸
7	Slide the RZxx drive up and lift it out of the system.	❹
8	Record the SCSI ID setting, for use on the replacement drive.	Figure 8–12

Note

If you are adding disk drives, refer to Chapter 16.

Figure 8–11 shows the removal of an RZ*xx* disk drive from the DEC 3000 Model 800/800S AXP system.

Figure 8–11 Removing an RZ*xx* Drive

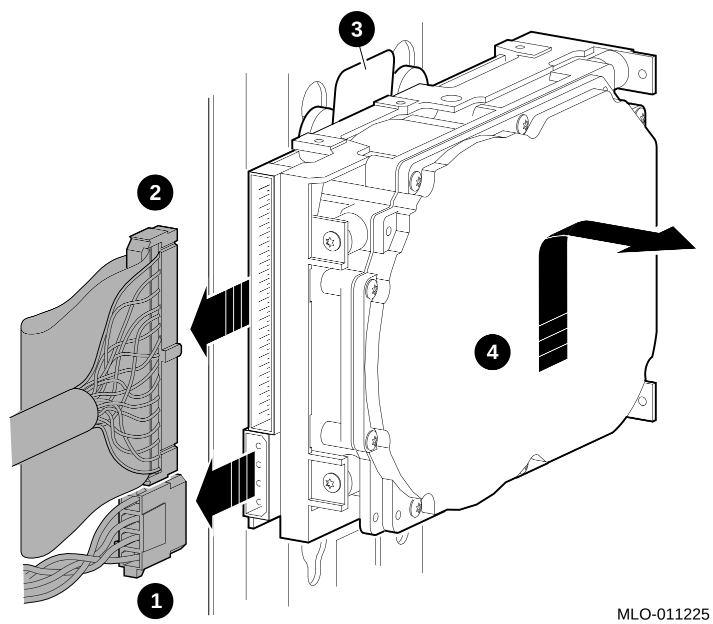
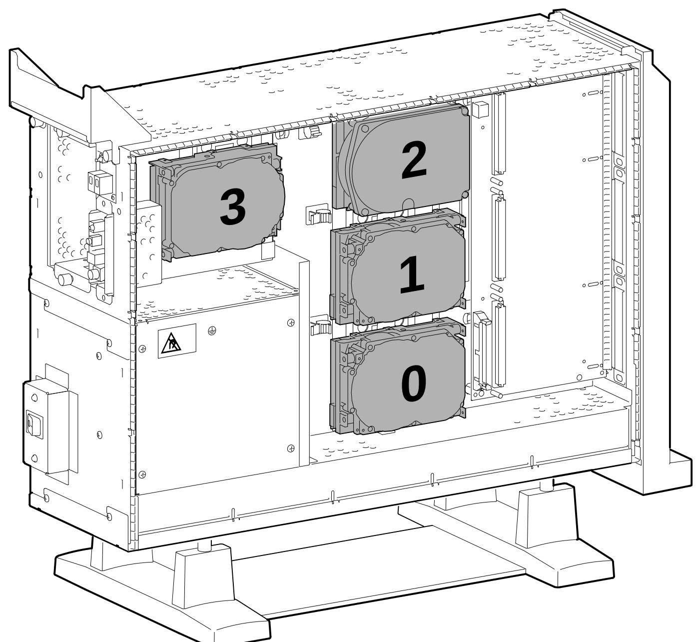


Figure 8–12 shows the default SCSI ID settings for disk drives in the DEC 3000 Model 800/800S AXP system.

Figure 8–12 Default SCSI ID Settings



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Right side panel	70–29563–01	1
Disk drive	RZ2x–E	Up to 4 drives

Replacement

To install an RZ*xx* disk drive, reverse the removal steps.

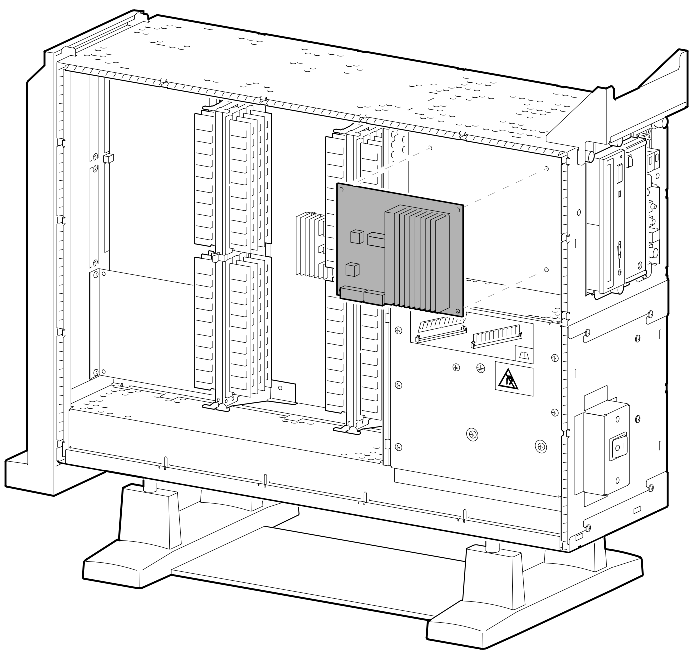
Regulator Module

Removal

To remove a failed or damaged regulator module, use the next procedure.

Step	Action	Refer to Figure 8–13
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the right side panel.	–
5	Disconnect all connections to the regulator module.	–
6	Remove the four slot screws that hold the module in place.	–
7	Remove the regulator module.	–

Figure 8–13 Removing the Regulator Module



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Right side panel	70–29563–01	1
Regulator module	54–23128–01	1
Regulator module cable	17–03814–01	1
Regulator module cable	17–03815–01	1
Regulator module cable	17–03816–01	1
Regulator module cable	17–03817–01	1
Regulator module cable	17–03320–02	1
Slot screw	12–30934–01	2

Replacement

To install the regulator module, reverse the removal steps.

I/O Module

Removal

To remove a failed or damaged I/O module, use the next procedure.

Step	Action	Refer to Figure 8–14 and Figure 8–15
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the right panel.	–
5	Disconnect all I/O bulkhead connections.	❶
6	Remove any TURBOchannel modules.	❷
7	Disconnect the audio cable from the I/O module.	❸
8	Remove the SCSI I/O module cables.	❹
9	Release the two removable rivets (top and bottom).	❺
10	Release the tabs.	❻
11	Remove the I/O module by pulling it out.	

Figure 8–14 I/O Module Cable Connections

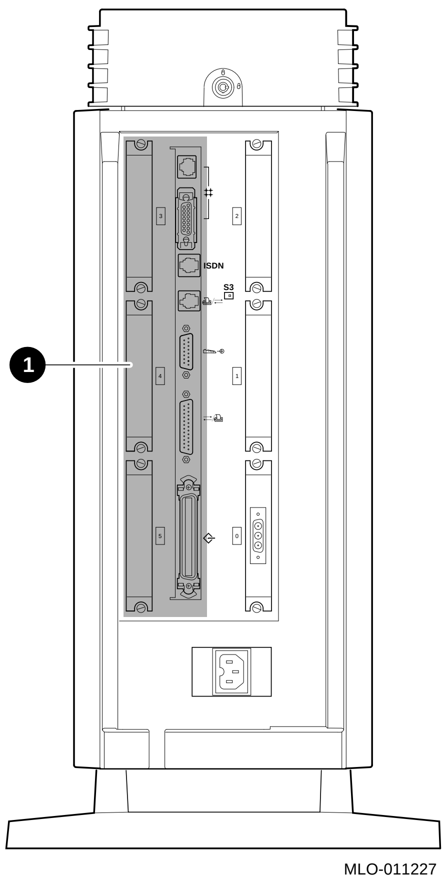
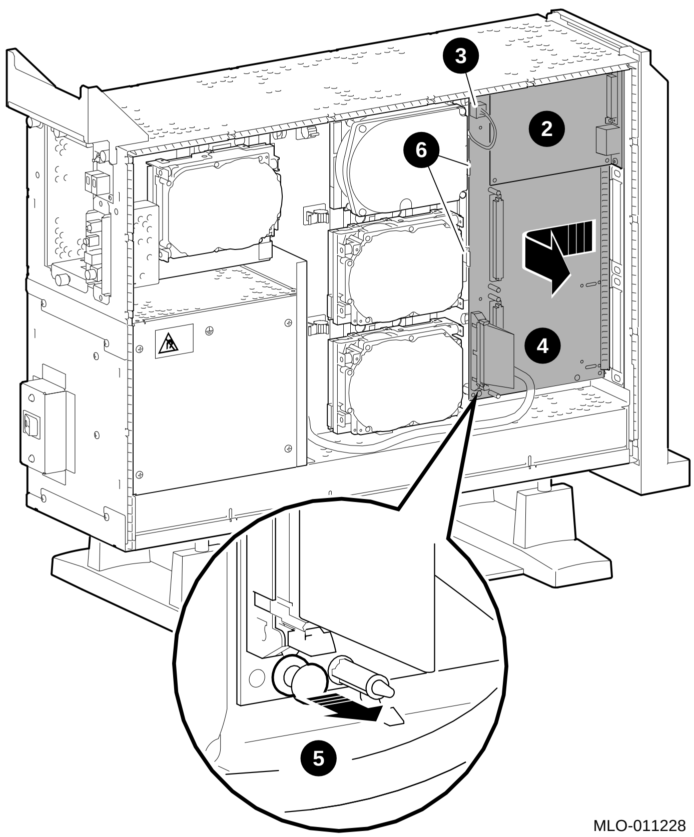


Figure 8–15 Removing the I/O Module (Side View)



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Right side panel	70–29563–01	1
TURBOchannel modules	xx–xxxxx–xx[1]	Up to 6
Removable rivets	12–36064–01	4
I/O Module	54–21147–02	1

[1]See the *DEC 3000 Model 800/800S AXP Options Installation Guide*.

Replacement

Before installing the new I/O module, ensure that

- The console secure jumper is set to the same setting as the failed module.
- The flash ROM jumper is set to the same setting as the failed module.
- Swap the ENET and DALLAS chips.

To install the I/O module, reverse the installation steps.

Figure 8–16 shows the I/O module jumper locations. Table 8–2 briefly describes each jumper.

Figure 8–16 I/O Module Jumper Locations

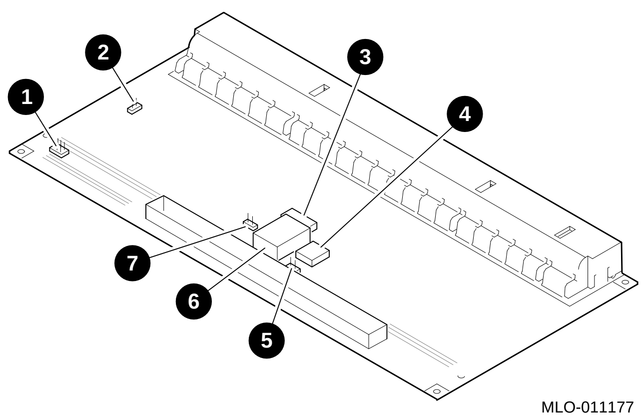


Table 8–2 I/O Module Jumper Locations

Location	Description	Comments	Default Setting
❶	Park location	Used to store unused jumper.	–
❷	Console secure jumper	In = enabled. Out = disabled.	Disabled
❸	Enet address chip	–	–
❹	TOY/NVR chip	–	–
❺	Flash ROM	–	–
❻	Flash ROM jumper	In = enabled. Out = disabled.	Enabled
❼	Active terminator enable	In = enabled (terminator ON). Out = disabled.	Enabled

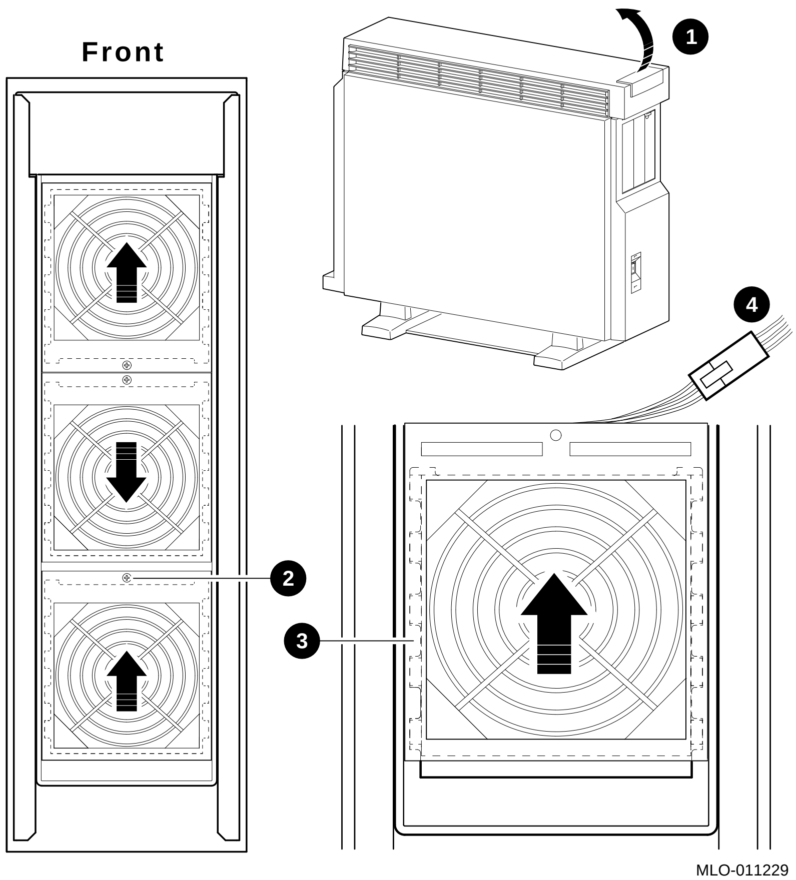
Fans

Removal

There are three system fans on the bottom of the unit, as shown in Figure 8–17. To remove a failed or damaged system fan, use the next procedure.

Step	Action	Refer to Figure 8–17
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove all bulkhead cables from rear.	–
4	Face the front of the unit. Carefully tilt the unit back, so it is resting on its rear panel.	❶
5	Remove the fan screw.	❷
6	Slide the fan boot as shown.	❸
7	Disconnect the fan cable.	❹
8	Remove the fan.	

Figure 8–17 Removing a Fan



Part Number

Description	Part Number	Quantity
Fan assembly	12–23609–12	3

Replacement

To install the system fan, reverse the removal steps.

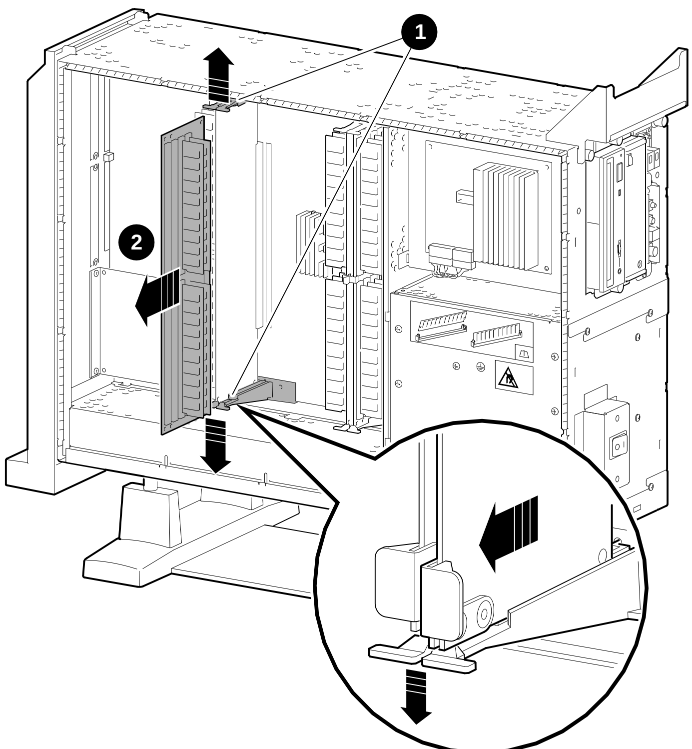
Memory Mother Board

Removal

To remove a failed or damaged memory mother board (MMB), use the next procedure.

Step	Action	Refer to Figure 8–18
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove the left side panel.	–
5	Remove the plastic module spacer which holds the two adjacent MMBs together.	–
6	Release the module guide catch releases at the top and bottom of the module.	❶
7	Remove the MMB.	❷
8	Remove all memory modules on a failed MMB.	–

Figure 8–18 Removing a Memory Mother Board



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Left side panel	70–29563–01	1
Memory mother board	54–21141–01	2
Module spacer	74–45215–01	2

Replacement

To install the memory mother board, reverse the removal steps.

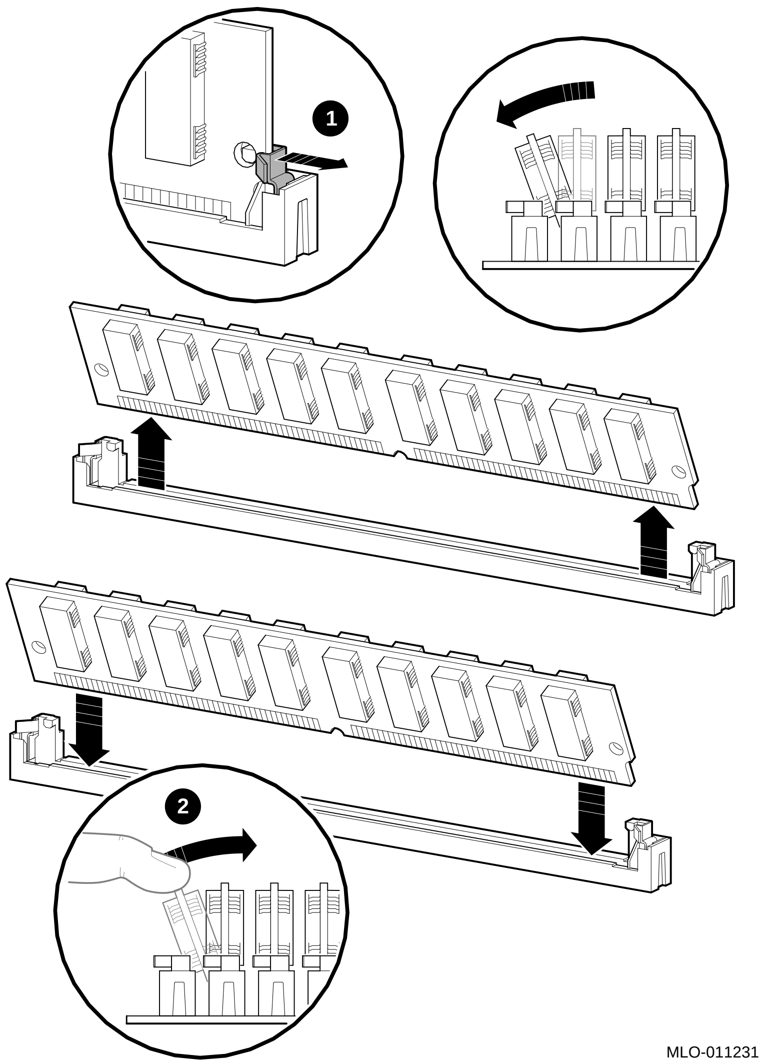
Memory Module

Removal

Use the next procedure to remove a SIMM.

Step	Action	Refer to Figure 8–19
1	Shutdown the system.	–
2	Power down the unit.	–
4	Remove the left side panel.	–
5	Remove the memory mother board and place on an antistatic mat.	–
6	Release the connector latches and remove the SIMM.	❶

Figure 8–19 Removing SIMMs



Part Numbers

Part	Part Number	Quantity
Left side panel	70–29563–01	1
Memory mother board	54–21141–01	1
4 MB memory module	54–21139–CA	–
8 MB memory module	54–21139–DA	–

Replacement

To replace a SIMM, perform the following steps:

Step	Action	Refer to Figure 8–19
1	Insert the SIMM at a 30-degree angle and carefully push forward until it locks in place.	❷
2	Repeat the removal steps in reverse order.	–

System Module

Removal

To remove a failed or damaged system module, use the next procedure.

Step	Action	Refer to Figure 8–20 through Figure 8–22
1	Shutdown the system.	–
2	Power down the unit.	–
3	Remove the top cover.	–
4	Remove both side panels.	–
5	Disconnect the power and LSM cables from rear of the power supply.	❶
6	Disconnect the TURBOchannel cables (three) from the rear of unit.	❷
7	Remove the TURBOchannel modules	❸
8	Remove the memory mother board (MMB). Do not remove the memory modules from the memory mother boards.	–
9	Release the seven captive rivets.	❹
10	Remove the system module.	❺

Figure 8–20 shows the system module power connections for the DEC 3000 Model 800/800S AXP system.

Figure 8–20 System Module Power Connections

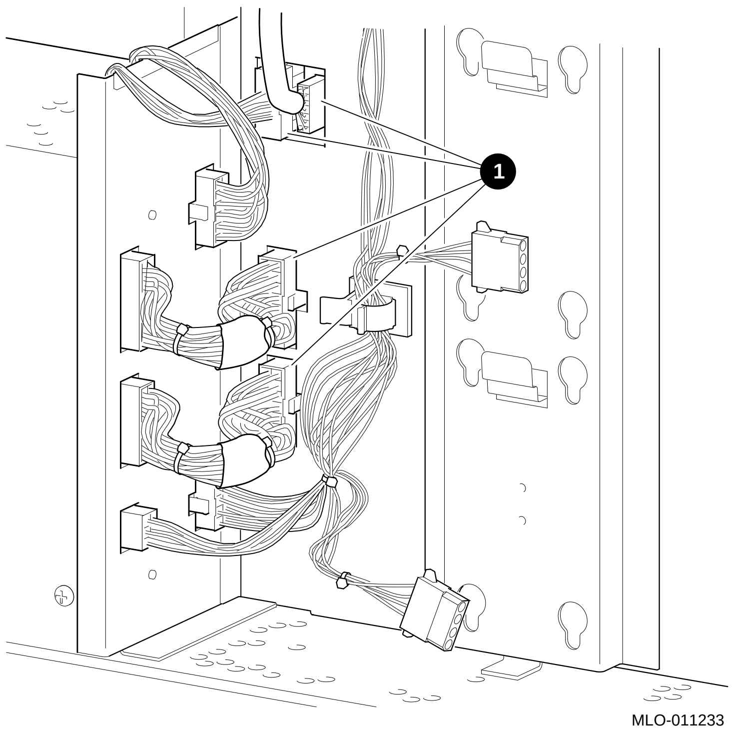


Figure 8–21 shows the TURBOchannel connections for the DEC 3000 Model 800/800S AXP system.

Figure 8–21 TURBOchannel Connections

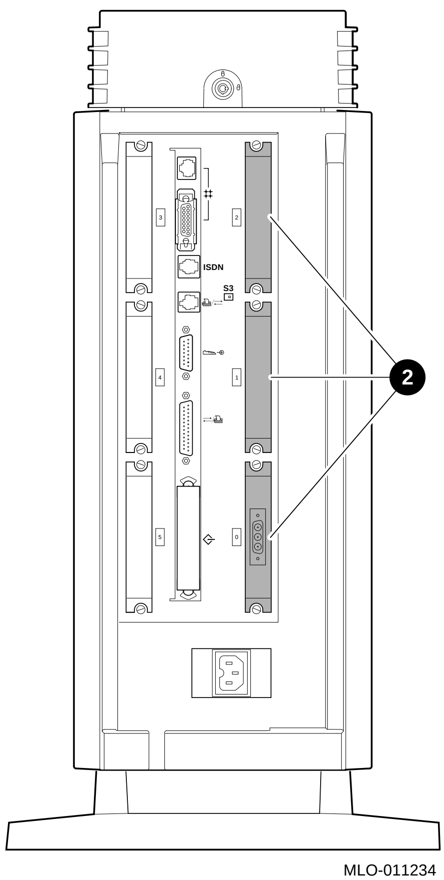
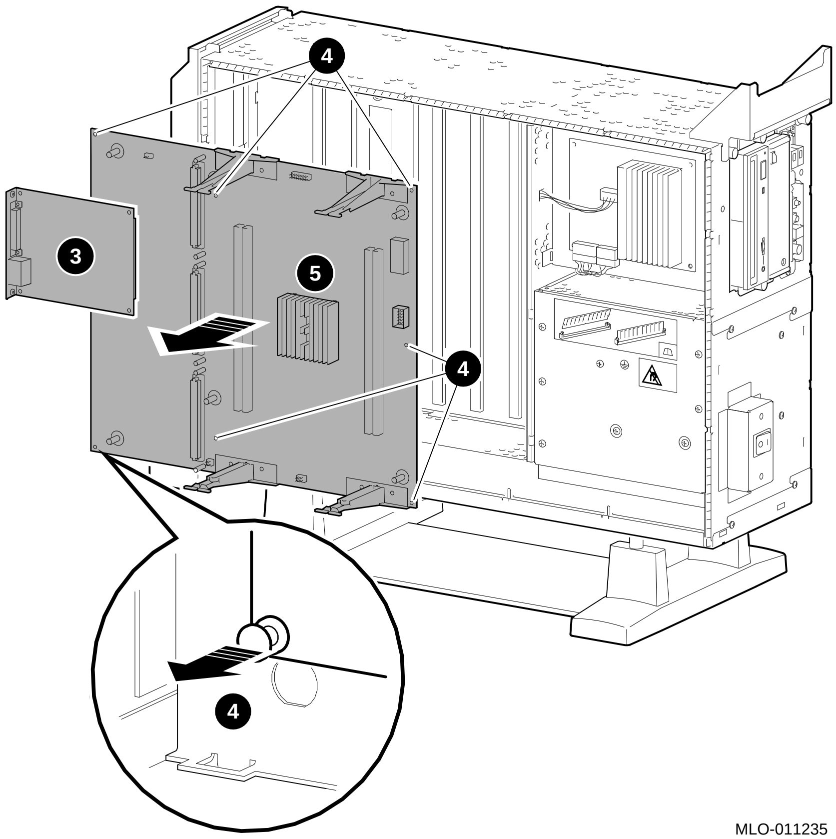


Figure 8–22 shows the removal of the system module from the DEC 3000 Model 800/800S AXP.

Figure 8–22 Removing the System Module



Part Numbers

Part	Part Number	Quantity
Top cover	70–30266–01	1
Right side panel	70–29563–01	1
Left side panel	70–29563–01	1
TURBOchannel	xx–xxxxx–xx[1]	Up to 3

[1]See the *DEC 3000 Model 800/800S AXP Options Installation Guide.*

Part	Part Number	Quantity
Memory mother board (MMB)	54–21141–01	2
Captive rivets	12–36064–01	7
System module	54–23153–01	1

Replacement

To install the system module, reverse the removal steps.

See Figure 8–23 for system module jumper locations and Table 8–3 for a description of the jumpers.

Note

Make sure that all captive rivets are in the out position and that the setting for the flash ROM jumper is the same as on the failed FRU before replacing the module. Also make sure that the system module jumpers are located in the same positions as the replacement module.

Figure 8–23 shows the locations of the jumpers on the system module.

Figure 8–23 System Module Jumper Locations

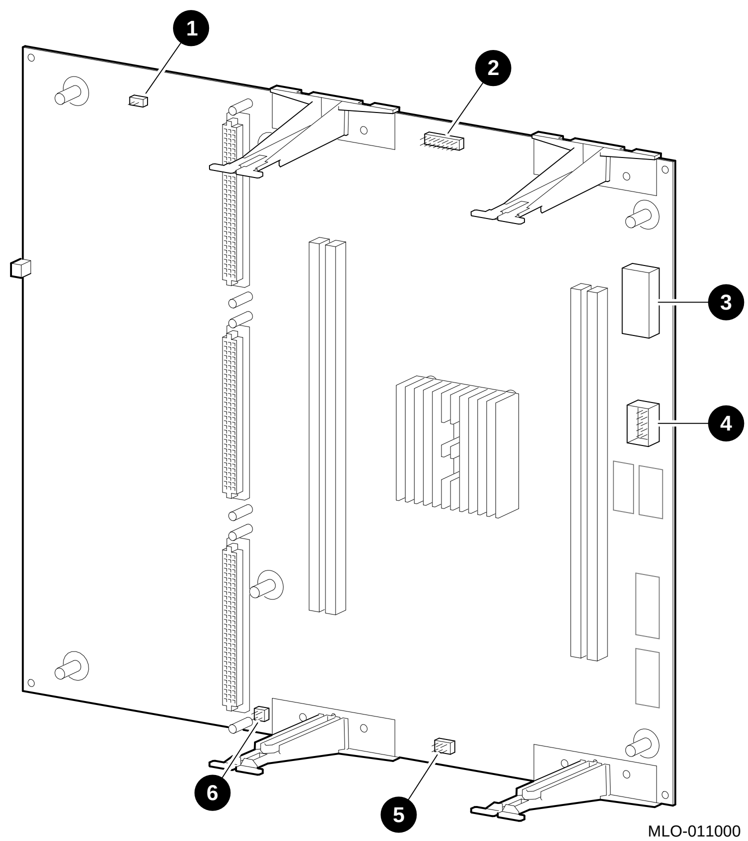


Table 8–3 describes the system module jumpers.

Table 8–3 System Module Jumper Locations

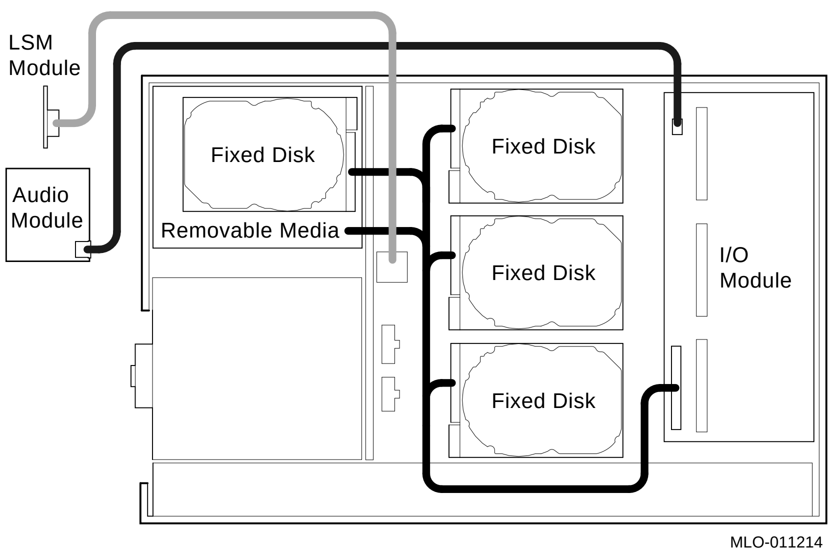
Location	Description	Comments	Default Setting
❶	Test pins	Used by engineering.	–
❷	Serial ROM jumpers	Jumper location 0 only.	Installed.
❸	Serial ROM	–	–
❹	Serial ROM test port	–	–
❺	Clock divider jumpers	–	Installed.
❻	Flash ROM update jumper	Enable and park positions.	Enabled.

System Cable and Power Routing

Internal Cable Routing

Figure 8–24 shows the cable connections between modules and disk drives in the DEC 3000 Model 800/800S AXP system.

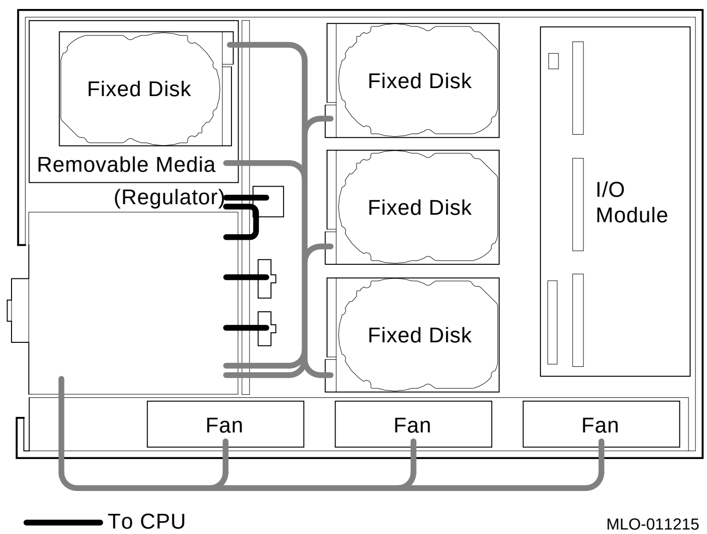
Figure 8–24 Internal Cabling



Power Cable Routing

Figure 8–25 shows the power connections between the power supply, disk drives, and the system module.

Figure 8–25 Power Cabling



9

Diagnostic Testing

Overview

Chapter Overview

This chapter covers the following topics:

- FRU Code Table
- Available Diagnostics
- Running Diagnostic Tests
- Entering and Exiting Console and Service Mode
- Diagnostics:
  - ASIC Diagnostic
  - NVR Diagnostic
  - Memory Diagnostic
  - SCSI Diagnostic
  - NI Diagnostic
  - SCC Diagnostic
  - ISDN Diagnostic
- TURBOchannel Testing

FRU Code Table

System Device FRU Codes

Table 9–1 lists the system device FRU codes.

Table 9–1 System Device FRU Codes

FRU Code	Device (Most Probable FRU)
000	Unknown or diagnostic does not support FRU reporting.
001	System module
002	I/O Module
003	LK Keyboard
004	Mouse/pointing device
005	Audio module
006	Reserved

TURBOchannel Option FRU Codes

Table 9–2 lists the TURBOchannel FRU codes.

Table 9–2 TURBOchannel FRU Codes

FRU Code	TURBOchannel Option (Most Probable FRU)
010	0
011	1
012	2
013	3
014	4
015	5
016–FF	Reserved

SCSI Device FRU Codes

Table 9–3 lists the SCSI device FRU codes.

Table 9–3 SCSI FRU Codes

FRU Code	Device
1*TL*	SCSI device on bus A (internal), target *T*, logical unit number *L*. For example, the FRU code for device DKA0 is 100.
2*TL*	SCSI device on bus B (external), target *T*, logical unit number *L*.

Diagnostic Listing

Available Diagnostics

The following diagnostics are available:

ASIC
NVR
MEM
SCSI
NI
SCC
ISDN
TURBOchannel (See the "TURBOchannel Testing " section in this chapter.)

To obtain a list of subtests from any of the selected diagnostics, use the TEST command as follows:

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

Example

The following example shows the subtests for the diagnostic NVR.

>>> **T NVR ?** Return

```
T NVR INIT
T NVR NVR
T NVR TOY
T NVR INTERRUPT
T NVR ?
```

Running Diagnostic Tests

Before You Begin

You must take the following actions before running diagnostics:

Step	Action	Refer to...
1	Enter console mode.	Entering Console Mode section (this chapter)
2	Attach loopbacks if required.	Table 9–4
3	Select the diagnostic environment.	Table 9–4

Diagnostic Environment

Table 9–4 describes the diagnostic environments and how they can be accessed.

Table 9–4 Diagnostics Environments

Environment	To Access	Requirements
Console	Enter the following command: >>> **SET DIAG_SECTION 1** Return	Installation of the system.
Service	Enter the following command: >>> **SET DIAG_SECTION 2** Return	Requires loopbacks but provides a more comprehensive test. The key utilities must be run in this environment.

Running a Single Diagnostic Test

To run a single test, enter the following command:

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

Example

The next example executes the NVR diagnostic:

```
>>> T NVR Return
```

When you select a test without specifying subtests, the diagnostic runs all associated subtests.

Running Diagnostic Subtests

To run a diagnostic subtest, enter the following command:

>>> **T[EST]** [Return]

Example

The next example selects the TOY subtest of the NVR diagnostic. NVR testing is performed *only* on those areas defined by the TOY subtest.

>>> **T NVR TOY** [Return]

Running Multiple Diagnostic Tests

You can specify different combinations of diagnostics, depending on your needs. The system performs tests one at a time, in the order you specify on the command line. Some diagnostics require

- Service mode
- Loopback connectors

You can specify individual tests or ranges of tests, as follows:

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

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

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

Examples

The following example runs the MEM and NVR diagnostics. When specifying individual tests, separate the device names with a comma.

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

The following example runs a range of tests, 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]

Note

If you select SCSI, NI, and SCC diagnostics in service mode, you need loopback connectors and the SCSI terminator mounted. Otherwise, an error occurs.

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

The following example runs the range of diagnostics from the ASIC diagnostic to the MEMORY diagnostic, then continues with the SCC diagnostic:

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

Running Tests Continuously

You can use the console REPEAT command to run all or selected diagnostics continuously. The diagnostics run until you press Ctrl C at the console prompt or until an error occurs.

Examples

This example runs the MEMORY diagnostic continuously until you press Ctrl C at the console prompt:

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

This example runs the memory diagnostic and the NVR diagnostic continuously until you press Ctrl C at the console prompt:

```
>>> R T MEM,NVR Return
```

Entering and Exiting Console and Service Mode

Entering Console Mode

To enter console mode, perform one of the following actions:

Note

Perform a system shutdown before pressing the Halt button.

---

1. Press the Halt button.

2. Enter SET DIAG_SECTION 1 command while in service mode.
3. Enter the SET AUTO_ACTION HALT command. See the command description in Chapter 13.

Exiting Console Mode

To exit console mode and enter program mode, enter one of the following commands at the console prompt:

- BOOT

  The BOOT command initiates a system bootstrap operation. See Chapter 13.
- CONTINUE

  The CONTINUE command clears the RC State Flag bit and resumes processor execution. This command does not restart the system if you have to shut it down. See Chapter 13.

To exit console mode and enter service mode, enter the following command:

- SET DIAG_SECTION 2

  See Chapter 13.

Entering Service Mode

Some diagnostics require that the system be in service mode. To enter service mode, you must first enter console mode. At the console prompt, enter the following command:

```
>>> SET DIAG_SECTION 2 Return
```

Exiting Service Mode

To exit service mode and enter program mode, enter one of the following console commands:

- BOOT

  The BOOT command initiates a system bootstrap operation. See Chapter 13.
- CONTINUE

  The CONTINUE command clears the RC State Flag bit and resumes processor execution. This command does not restart the system if you have to shut it down. See Chapter 13.

To exit service mode and enter console mode, enter the following command:

- SET DIAG_SECTION 1

  See Chapter 13.

ASIC Diagnostic

Overview

The ASIC diagnostics test the Scatter/Gather Map registers.

The diagnostics also initialize all TURBOchannel and Core I/O ASIC registers by placing all registers in a known state.

The system performs the ASIC diagnostic when you:

- Power up the unit.
- Enter console mode and select the ASIC diagnostic.

The diagnostic isolates faults to the FRU level.

Running ASIC Diagnostics

To run the ASIC diagnostic and subtests, use the TEST command.

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

Subtests

Table 9–5 lists ASIC diagnostic subtests.

Table 9–5 ASIC Diagnostic Subtests

Subtests	Description
INIT	Runs the INIT test.
SGMAP	Tests the Scatter/Gather Map register.
?	Lists available subtests

Example

This example runs the ASIC diagnostic.

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

This example runs the ASIC diagnostic and SGMAP subtest.

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

Error Reporting Format

The diagnostic reports any errors that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T ASIC
?? 001 ASIC xxxxxxxx
```

Table 9–6 lists ASIC diagnostic error messages and identifies which FRU to replace.

Table 9–6 ASIC Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	001	ASIC	See Chapter 14	System module
??	002	ASIC	See Chapter 14	I/O Module

NVR Diagnostic

Overview

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

The NVR diagnostic tests 50 bytes of nonvolatile RAM and performs an NVR register test/initiation sequence.

The TOY test verifies that the time-of-year clock has been set. If it has been set, then the test verifies the clock's operation. If the time is not set, then all registers used by the time-of-year clock are tested.

The register test verifies that each TOY register can hold all possible values.

The system performs the NVR diagnostic when you:

- Power up the unit.
- Enter console mode and select the NVR diagnostic.

The diagnostic isolates faults to the FRU level.

Running NVR Diagnostics

To run the NVR diagnostic and subtests, use the TEST command.

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

Subtests

Table 9–7 lists NVR subtests.

Table 9–7 NVR Diagnostic Subtests

Subtests	Description
TOY	Runs the following: • Clock test • Test to ensure that the clock is ticking • Clock re-entry test
NVR	Runs the following: • Check battery test • NVR Register test
INTERRUPT	Runs the Interrupt test.
INIT	Runs the Initialization test.
?	Lists available diagnostics.

Example:

The next example runs the NVR diagnostic.

```
>>> T NVR Return
```

The next example runs the TOY subtest of the NVR diagnostic.

```
>>> T NVR TOY Return
```

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T NVR
?? 002 NVR xxxxxxxx
```

Table 9–8 lists NVR diagnostic error messages and identifies which FRU to replace.

Table 9–8 NVR Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	002	NVR	See Chapter 14	NVR sock-eted

Note

If the NVR error persists, replace the I/O module.

Memory Diagnostic

Overview

The memory diagnostic detects address and data-stuck-at faults. The diagnostic also performs ECC testing of memory.

The system performs the memory diagnostic when you:

- Power up the unit.
- Enter console mode and select the memory diagnostic.

During power-up, the memory diagnostic

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

The *only* time a complete memory test is performed during power-up is when the memory configuration has changed.

In console mode, the diagnostic exercises all memory except for the first 2 MB. The first 2 MB of memory are reserved and tested by the serial ROM (SROM) code before the console is loaded.

The diagnostic isolates faults to the FRU level.

Running Memory Diagnostics

To run the memory diagnostic and subtests, use the TEST command.

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

Subtests

Table 9–9 lists memory diagnostic subtests.

Table 9–9 Memory Diagnostic Subtests

Subtests	Description
ALL	Performs all tests.
CELL	Memory cell test.
ADDR	Address lines and refresh test.
LLSC	ldx_l/stx_c
INIT	Sets all memory to zero.
?	Provides a list of available diagnostics.

The subtests have default values for the starting and ending address and other values. You can modify the values. The diagnostic uses the default values if the values you enter are invalid or exceed their ranges. Table 9–10 lists the memory options.

Table 9–10 Memory Test Options

Option	Default	Description
-l:*xxxxxxxx*	002000000 (2 MB)	Starting address
-h:*xxxxxxxx*	Top of memory	Ending address
-n:*xx*	0	Number of retries[1]
-x[-]	On	Stop on error ON [OFF]
-i[-]	On	Initialize memory after tests ON [OFF]

[1]Must be a hexadecimal value.

Examples

The next example runs the memory diagnostic.

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

The next example runs the memory diagnostic and the CELL subtest.

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

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T MEM
?? 8xy MEM xxxxxxxx
```

Table 9–11 explains the 8*xy* memory error code.

Table 9–11 Memory Error Identification

Code	Description
8	Extended error code prefix.
x	Bank number (0 through 7).
y	Memory module number (0 to 7), if there are data errors in one module. A value of 8 to B indicates data errors in both modules:

Code	Memory Modules
8	0,1
9	2,3
A	4,5
B	6,7

Example:

The next example shows a sample memory error message.

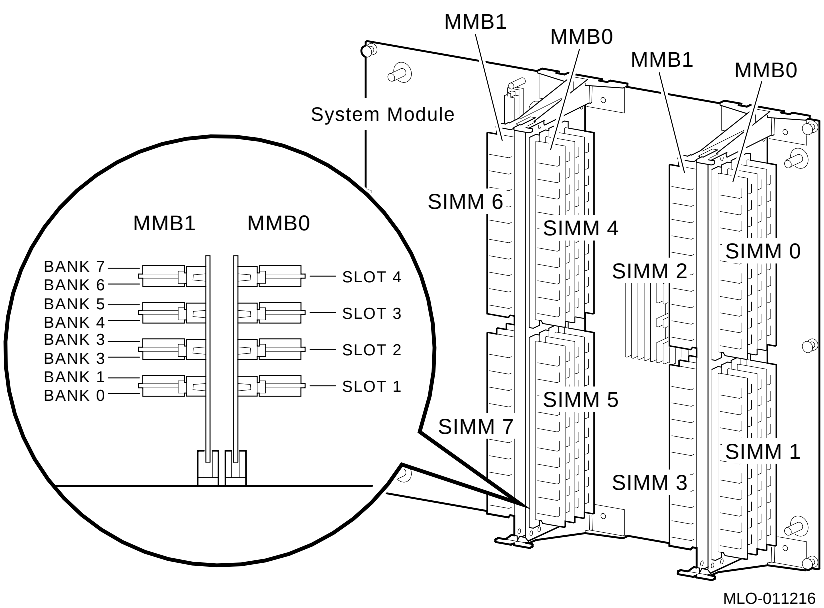
```
>>> T MEM Return
```

```
T-STS-MEM - LLSC Test Addr 00200000
T-STS-MEM - Cell Test 00200000 <-> 10000000
T-STS-MEM -      Wr AAAAAAAA Addr 0FFFFFFC
T-STS-MEM -      FWD - Rd AAAAAAAA Wr 55555555 Addr 0D000000
MCHK: logout frame address = 00088000
1st quadw: 00000000 000001D8 exc_addr: 00000000 0006D59E  ID:00000000
 00000019
fill_addr: 00000000 0D13C780 biu_addr: 00000000 0D13C780  va:00000000
 0000038D
fill_synd: 00000000 00000075 biu_stat: 00000000 00000340 dc_stat:00000000
 0006F0
   mm_csr: 00000000 000050f0   bc_tag: 00000000 00000000

? T-ERR-MEM - Addr = 0D13C780 Exp = AAAAAAAA Rec = 2AAAAAAA retries = 0
? T-ERR-MEM - Bad page = 689E  page count = 7F00  test count = 7EFF
T-ERR-MEM - 1 Errors
?? 860          MEM 0x0002

>>>
```

The error message `?? 860 MEM 0x0002` indicates that the error is in bank 6, memory module 0.

See Figure 9–1 for the location of the failed SIMM.

Figure 9–1 Memory Bank Layout



SCSI Diagnostic

Overview

The SCSI diagnostic verifies several areas of the SCSI subsystem, including:

- SCSI Controller chips
- Dual SCSI ASIC
- SCSI Bus problems
- Verification of the DMA path in physical and virtual modes

The system performs the SCSI diagnostic when you:

- Power up the unit.

- Enter console mode and select the SCSI diagnostic.

  In console mode, the diagnostic exercises the following data paths:

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

- Enter service mode and select the SCSI diagnostic.

  Service mode testing includes all tests performed in console mode, plus a map error test and minimal device test.

Utilities

Utilities perform the following tasks:

- Provide status information on SCSI devices.
- Spin up, erase, and format hard disks.
- Erase and format floppy diskettes.
- Perform disk verifier testing.

Utilities do not run at power-up. They require user interaction. See Chapter 13.

Running SCSI Diagnostics

To run the SCSI diagnostic and subtests, use the TEST command.

Note

You must use a terminator (H8574–A) if no external drives are connected. See Figure 6–2, feature ❼.

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

Subtests

Table 9–12 lists the SCSI diagnostic subtests.

Table 9–12 SCSI Diagnostic Subtests

Subtest	Description	Mode
ASIC[1]	Tests dual SCSI ASIC registers and two SCSI DMA buffers.	Console
REGISTER[1]	Tests both sets of SCSI controller registers (on SCSI A/B).	Console
INTERRUPT[1]	Tests the interrupt logic (SCSI A/B).	Console
TRANSFER	Tests SCSI A/B bus data transfers.	Console
MAP[2]	Tests for map and parity errors.	Service
DEVICE[3]	Tests SCSI devices.	Service

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

[2]This test runs only on the first device that responds to the TRANSFER test.

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

Examples

The next example runs the SCSI diagnostic.

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

The next example runs the SCSI diagnostic and the REGISTER subtest.

```
>>> T SCSI REGISTER [Return]
```

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

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

Table 9–13 lists the SCSI diagnostic error messages and identifies the FRU to replace.

Table 9–13 SCSI Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	001	SCSI	Chapter 14	System module
??	002	SCSI	Chapter 14	I/O Module
??	1xy[1]	SCSI	Chapter 14	SCSI controller A
??	2xy[1]	SCSI	Chapter 14	SCSI controller B

[1]x = SCSI ID.
y = logical unit number.

NI Diagnostic

Overview

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

The system performs the NI diagnostic when you:

- Power up the unit.

  When you power up the unit, the NI diagnostic performs limited testing. You should run the complete NI diagnostic in service mode.

- Enter console mode and select the NI diagnostic.
- Enter service mode and select the NI diagnostic.

Testing in service mode provides a full complement of patterns, rather than a single pattern. Additionally, the full addressing range is tested for DMA read/write access.

Running NI Diagnostics

Before testing, you *must* either connect the thickwire loopback connector (12-22196-01) to the AUI Ethernet port or connect the port directly to the network. You must also verify that Thickwire has been selected. Failure to do so results in an external loopback failure. See Figure 6–2, feature ❷ for the port's location and Table 6–2 for a description.

To run the NI diagnostic and subtests, use the TEST command.

>>> **T[EST] NI [subtest]** Return

Subtests

Table 9–14 lists the NI diagnostic subtests.

Table 9–14 NI Diagnostic Subtests

Subtests	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]	Tests internal loopback with CRC check
RX_MISS_BUFF[1]	Tests internal loopback with MISS error
COLLISION[1]	Tests internal loopback with collision
FILTER[1]	Tests internal loopback with address filter checking
INIT	Initializes the NI chip
TX_BUFF[1]	Tests internal loopback with transmit buffer error

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

Examples

The next example runs the NI diagnostic:

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

The next example runs the NI diagnostic and the NAR subtest:

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

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T NI
?? 001 NI xxxxxxxx
```

Table 9–15 describes the NI diagnostic error messages and identifies which FRU to replace.

Table 9–15 NI Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	001	NI	See Chapter 14	System module
??	002	NI	See Chapter 14	I/O Module

SCC Diagnostic

Overview

The serial communication controller (SCC) diagnostic performs a functional test of the following:

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

- Printer and communication ports, using DMA transfers

The diagnostic tests the SCC chips only in asynchronous mode.

The system performs the diagnostic when you:

- Power up the unit in server mode (SET SERVER 1 console command).
- Enter console mode and select the SCC diagnostic.
- Enter service mode and select the SCC diagnostic.

Running SCC Diagnostics

To run the SCC diagnostic and subtests, use the TEST command.

```
>>> T[EST] SCC [subtest] Return
```

Subtests

Note

You must connect the modem loopback to run the MODEM subtest, or a failure occurs. See Figure 6–2, feature ❻ for the location of the modem port.

Table 9–16 lists the SCC diagnostic subtests.

Table 9–16 SCC Diagnostic Subtests

Subtests	Description
INIT	Performs a reset on both SCC controllers.
POLLED	Tests SCC controllers using polled I/O.
INTERRUPT	Tests SCC controllers, using interrupt-driven I/O.
DMA	Tests SCC controllers, using DMA transfers.
LK401	Tests for the presence of a keyboard.
MOUSE	Tests for the presence of a mouse.
MODEM[1]	Tests modem control signals.

[1]Requires a modem loopback. Run the test in service mode.

Examples

The next example runs the SCC diagnostic.

```
>>> T SCC Return
```

The next example runs the SCC diagnostic and the LK401 subtest.

```
>>> T SCC LK401 Return
```

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T SCC
?? 003 SCC xxxxxxxx
```

Table 9–17 lists the SCC diagnostic error messages and which FRU to replace.

Table 9–17 SCC Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	002	SCC	See Chapter 14	I/O Module
??	003	SCC	See Chapter 14	Keyboard
??	004	SCC	See Chapter 14	Mouse

ISDN Diagnostic

Overview

The ISDN diagnostic ensures that the 79C30A chip is fully functional by testing, generating, verifying, and disable interrupting the following:

- 79C30A Internal registers
- Internal digital loopback
- Internal analog loopback

- Tone output
- DMA

The system runs the diagnostic when you:

- Power up the unit.
- Enter console mode and select the ISDN diagnostic.
- Enter service mode and select the ISDN diagnostic.

Running ISDN Diagnostics

To run the ISDN diagnostic and subtests, use the TEST command.

```
>>> T[EST] ISDN [subtest] Return
```

Subtests

Table 9–18 lists the ISDN diagnostic subtests.

Table 9–18 ISDN Diagnostic Subtests

Subtest	Description	Mode
INIT	Initialize test	Console
REG	Internal registers test	Console
TONE	Audio output	Service
D_LOOP	Internal digital loopback test	Service
A_LOOP	Internal analog loopback test	Console
INT	Interrupt test	Console
DMA	DMA	Console
RECORD[1]	Record test	Service
PLAYBACK[1]	Playback	Service
REPEAT[1]	Repeat test	Service

[1]Requires a headset to perform the test correctly.

Examples

The next example runs the ISDN diagnostic.

```
>>> T ISDN Return
```

The next example runs the ISDN diagnostic and the REGISTER subtest:

```
>>> T ISDN REGISTER [Return]
```

Error Reporting

The diagnostic reports any error that it finds. Error messages include a hexadecimal longword of data and a FRU code to identify the failing FRU.

```
>>> T ISDN
?? 002 ISDN xxxxxxxx
```

Table 9–19 describes the ISDN diagnostic error messages and identifies which FRU to replace.

Table 9–19 ISDN Error Identification

Test Failure Code	FRU Code	Failing Test	Error Code	Replace...
??	002	ISDN	See Chapter 14	I/O Module

TURBOchannel Testing

MIPS Emulator Overview

The MIPS emulator performs the following tests 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

Before You Begin

Before testing, enter console mode and use the SHOW CONFIG command to display the name of the installed TURBOchannel device names. Identify and record the TURBOchannel device you want to test. The command lists TURBOchannel options by their slot number:

TC*n*

The *n* is the TURBOchannel option slot number. For example, a TURBOchannel option in slot 2 has a device name of TC2.

Running Default Test Scripts

The following command runs the pst-t test script, which performs a string of diagnostic test scripts for the selected device.

>>> **T[EST] [device_name]** Return

If no pst-t script is present, then the test fails. If there is a failure, you can display a list of scripts and run single test scripts.

Example:

The next example runs the default test script on the TURBOchannel option in slot 2.

>>> **T TC2** Return

Displaying a List of Scripts

The following command displays a list of available diagnostic test scripts.

An asterisk (*) indicates an object script. Object scripts are not executable; they fail if selected.

>>> **T {device_name} ls**

Example:

The next example display a list of scripts for the TURBOchannel option in slot 2.

>>>**T TC2 ls** Return

Running Single Test Scripts

To run diagnostic test scripts, enter the following:

>>> **T {device_name} {script_name}**

Example:

The next example runs script pst-m on the TURBOchannel option in slot 2.

```
>>> T TC2 pst-m [Return]
```

Initializing a TURBOchannel Option

To initialize a selected TURBOchannel option, enter the following command:

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

Example:

The next example initializes the TURBOchannel option in slot 3.

```
>>> T TC3 INIT [Return]
```

Additional Commands

Other TEST commands used with TURBOchannel options are:

Command	Description
>>> T {dev_name} {cnfg}	Display configuration on TC option slot.
>>> T {dev_name} {cat scriptname}	List contents of a script.

10

Troubleshooting

Overview

Chapter Overview

This chapter covers the following topics:

- System Device FRU Codes
- LED Codes
- 84 Fail Message
- Troubleshooting tables for problems with:
  - System
  - Monitor
  - Mouse/tablet
  - Keyboard
  - Drives
  - Network
  - Audio
  - Console
  - Firmware

Introduction

The troubleshooting techniques described in this section neither identify all possible problems, nor do the suggested corrective actions remedy all problems. Call the Digital Service Center or your service representative if you encounter other problems.

The loopbacks you need to execute diagnostics are supplied with each DEC 3000 Model 800/800S AXP.

Before You Start

Before performing any procedures, verify cable, terminators, cable connections, loopbacks, and proper termination. Replace the most probable FRU as reported by diagnostics. Refer to Chapter 9.

System Device FRU Codes

System Device FRU Codes

Table 10–1 lists the system device FRU codes. A code appears on your screen when a FRU fails.

Table 10–1 System Device FRU Codes

Code	FRU
000	Unknown, or diagnostic does not support FRU reporting
001	System module
002	I/O Module
003	LK Keyboard
004	Mouse/pointing device
005	Audio module
006	Reserved

LED Codes

Successful Power-Up Display

The following example shows the display for a successful power-up sequence:

```
DEC 3000 - M800
Digital Equipment Corporation
System conducting power up tests

Devnam        Devstat
CPU           OK KN17-AA
MEM           OK 144MB
NVR           OK
SCC           OK PTR(0)= Present Keybd(2)= Present
NI            OK Ethernet Address: 08-00-2B-2A-1F-82, THICK
SCSI          OK
ISDN          OK
TC0           OK - PMAGB-BA

System power up OK
Enter B to boot software from DKB0
>>>
```

If You See An Error

The LED codes described in this section provide information on a power-up sequence failure. Note the LED code displayed and go to the appropriate section.

Serial ROM LED Codes

LED codes indicate what diagnostic is currently being executed when the unit is first powered on. If an error occurs before the system enters console mode, then the failed test is identified by a binary LED display of two 4-bit hexadecimal numbers. The LED display is located on the front panel.

Use these diagnostic LEDs to help diagnose problems when the system is unable to enter console mode. This portion of the testing does not appear on the monitor.

Table 10–2 lists the serial ROM LED error codes. For each LED code that appears, either the system module or the I/O module is the faulty FRU. Take the following action in the order listed.

1. Verify that there is a secure connection between the system module and the I/O module.
2. Verify that all memory modules are properly installed. Reseat the MMBs and SIMMs if necessary.
3. Verify that all power cables are connected correctly.

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

Table 10–2 Serial ROM LED Error Codes

LED HEX Codes		
00	FF	FE
FD	FC	FB
FA	F9	F8
F7	F6	F5
F4	F3	F2
F1	F0	20

ASIC LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, the system hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the ASIC diagnostics and interpret the error information using:

- The SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then the failed FRU is either the system module or the I/O module. Take the following action:

1. Reseat the module.

2. Replace the system module.
3. If the error persists, replace the I/O module.

The LED code is 35.

Memory LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, the system hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the MEMORY diagnostics and interpret the error information using:

- The SHOW ERROR command.
- Diagnostic information (Chapter 9).

The next table lists the LED codes. For each LED code that appears, take the following action in the order listed.

1. Verify that all memory modules are properly installed. Reseat the MMBs and SIMMs if necessary.
2. Verify that all power cables are connected correctly.

LED 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
26-2A	Reserved
2B	LLSC load-locked/store-conditional tests
2C	BCTP Bcache Tag Parity detection
2D	ECC Detection
2E	Reserved
2F	Clear memory to zeros

NVR LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, a hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the NVR diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then use Table 10–3 to isolate the failed FRU. Take the following action in the order listed.

1. Verify that there is a secure connection between the I/O module and the system module.
2. Replace the NVR.
3. Verify that all memory modules are properly installed. Reseat the MMBs and SIMMs if necessary.
4. Verify that all power cables are connected correctly.

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

Table 10–3 NVR LED Error Codes

LED Codes		
3A	3B	3C
3D	3E	

SCC LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, a hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the SCC diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then use Table 10–4 to isolate the failed FRU. Take the following action in the order listed.

1. Reseat the I/O module.
2. Reseat the modem loopback.
3. Reseat the mouse connection.
4. Reseat the keyboard connection.

Note

When testing a DEC 3000 Model 800S AXP system, the console command SERVER must be set to ON (SET SERVER ON) for this diagnostic.

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

Table 10–4 SCC LED Error Codes

LED Codes		
40	41	42
43	44	45
46		

LED code 47 is for the keyboard and I/O module. LED code 48 is for the mouse. LED codes 49 through 4E are reserved.

NI LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, the system hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the NI diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then use Table 10–5 to isolate the failed FRU. Take the following action in the order listed.

1. Reseat the I/O module and system module.
2. If thickwire is selected, you must use a thickwire loopback connector, or the system must be connected to the network through the Thickwire port. If 10BASET is selected and the diagnostic environment is service mode, you must connect a 10BASET loopback connector, or the system must be connected to the network through the 10BASET port.

Table 10–5 NI LED Error Codes

LED Codes		
50	51	52
53	54	55
56	57	58
59	5A	

ISDN LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, the system hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the ISDN diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then use Table 10–6 to isolate the failed FRU. Take the following action in the order listed.

1. Reseat the I/O module and system module.
2. Make sure a handset (microphone/speaker) is connected.

3. Make sure the audio module cable is connected to the I/O module.

Table 10–6 ISDN LED Error Codes

LED Codes		
70	71	72
73	74	75

SCSI LED Codes

The following LED codes represent continued power-up testing. If an error occurs during this testing sequence, the system hexadecimal code plus FRU and error code information appear on the screen.

If the system enters console mode, then run the SCSI diagnostics and interpret the error information using:

- SHOW ERROR command
- Diagnostic information (Chapter 9)
- Diagnostic error messages (Chapter 14)

If the system does not enter console mode (>>>), or if the hex code DD is not displayed on the LEDs, then use Table 10–7 to isolate the failed FRU. Take the following action in the order listed.

1. Reseat the I/O module and system module.
2. Check SCSI cables and SCSI ID setting.
3. All disk devices with removable media must have the media installed.

Table 10–7 SCSI LED Error Codes

LED Codes		
60	61	62
63	64	65

Console LED Codes

This section lists error codes that may appear in the last test sequence before entering the console program.

If the power-up sequence is successful, the diagnostic LEDs DD hex code and the console (>>>) prompt appear. These are the only indications that the system has entered console mode.

If the system does not enter the console program, use Table 10–8 to isolate the failed FRU and reseat the system module.

Table 10–8 Console LED Error Codes

LED Codes		
EF	EE	ED
EC	EB	EA
E9	E8	E7
E6	E5	E4
E3	E2	E1
E0	DF	DE

84 Fail Message

Overview

The message `84 Fail` is a general-purpose failure message that can appear under two conditions:

- Using the TEST command

  If an `84 Fail` message occurs during a TEST command, a diagnostic error code appears on the screen also. Disregard the `84 Fail` message and rely on the error code information.

- Using the BOOT command

  If an `84 Fail` message occurs during a BOOT command, the probable cause for the failure is one of the following:

  – Boot device is not present.

  – Boot device is present, but there is no media installed.

– Boot block is not found on the media.

Troubleshooting Tables

Overview

The following tables contain information to help you troubleshoot a DEC 3000 Model 800/800S AXP system. The tables are organized as follows:

- System Problems
- Monitor Problems
- Mouse Problems
- Keyboard Problems
- Drive Problems
- Network Problems
- Firmware Upgrade Problems

Using the Tables

Each troubleshooting table contains symptoms, possible causes, and suggested actions. If more than one action is suggested, perform them in the order listed.

System Problems

Table 10–9 covers general system power-up problems.

Table 10–9 System Problems

Symptom	Possible Cause	Corrective Action
Fan not running	A fan failed.	Check the red fan failure LED. • If the LED is on, a fan has failed; replace the fan. • If the LED is off, the fans are OK.
	The three fan connections are not connected.	Reseat the connectors. If needed, replace the harness.
	The power supply failed.	Replace the power supply.
The DC OK LED is off.	No system power.	Check the power outlet and cord.
	System power supply failure.	Replace the power supply.[1]
	3.4V regulator failure.	Replace the regulator.[1]
	Incorrect power supply harness connection.	Check the harness connectors. Replace them as required.
All LEDs do not work.	The LSM module/cable or system module failed.	See Chapter 8 for module locations.
The monitor is blank, and the diagnostic LEDs display 00.	The SROM jumper setting is incorrect.	See Chapter 7. Reset the jumper.
		Reseat the I/O module.
		Reseat memory motherboards.
The power-up display does not appear and the diagnostic LEDs DD code is on.	The monitor is turned off.	Turn on the monitor.

[1]It is recommended that the regulator is changed first, as its failure can turn off the power supply. If this does not work, the power supply must be tried next. All cables need to be connected to the system module, otherwise the power supply may not turn on.

(continued on next page)

Table 10–9 (Cont.) System Problems

Symptom	Possible Cause	Corrective Action
	The monitor brightness and contrast controls are too dark to see the screen display.	Adjust the monitor brightness and contrast controls.
		Check the monitor cable and video connections.
	The monitor fuse is blown.	See the monitor's documentation for fuse replacement instructions.
The system does not boot at power-up.	Software is not installed. The alternate console switch is in the wrong position.	Install the system software. See the software documentation for installation instructions. Set the console switch in the correct position.
	Default recovery action is set to halt.	In console mode, enter the SHOW AUTO_ACTION command to find the proper setting. Use the SET AUTO_ACTION command to change the setting. See Chapter 13 for command descriptions.
	Incorrect boot device was specified.	In console mode, enter the SHOW BOOTCMD_DEV command to find the proper setting. Use the SET BOOTCMD_DEV command to change the setting. See Chapter 13 for command descriptions.
	Boot device is not configured properly.	Use the SHOW DEVICE command to verify that all devices are configured properly. If not, verify that all SCSI ID settings and SCSI cables are correct.

(continued on next page)

Table 10–9 (Cont.) System Problems

Symptom	Possible Cause	Corrective Action
	Faulty boot device	Run SCSI diagnostic utilities (Chapter 9).

Monitor Problems

Table 10–10 describes monitor problems. If the corrective actions do not correct a problem, verify that all cable connections are correct and secure. If they are, and the TURBOchannel grapahics option is installed, run the diagnostics in (Chapter 9).

Table 10–10 Monitor Problems

Symptom	Possible Cause	Corrective Action
The screen is blank.	The alternate console is enabled.	Disable the alternate console.
	Brightness and contrast controls adjusted incorrectly.	Adjust the monitor brightness and contrast controls.
The screen display is unstable.	The display needs alignment.	Refer to the monitor's documentation for adjustment procedures and Chapter 14 for alignment pattern diagnostics.

Mouse or Tablet Problems

Table 10–11 describes mouse and tablet problems. If the corrective actions do not correct a problem:

1. Verify that all cable connections are correct and secure.
2. If the connections are okay, run the SCC diagnostics (Chapter 9).

Table 10–11 Mouse Problems

Symptom	Possible Cause	Corrective Action
The system boots, but the mouse or optional tablet pointer does not appear on the screen, or the monitor does not respond to pointing device commands.	The pointing device cable is installed incorrectly or is loose.	Turn off the system. Reseat the cable. Turn on the system.
	The system is halted. The pointer does not appear on the screen.	If in console mode (>>>), boot the system.
The pointer does not appear on screen or does not respond.	Pointer mode is disabled.	Press Ctrl F3 to enable the pointer.

Keyboard Problems

Table 10–12 describes keyboard problems. If the corrective actions do not correct a problem:

1. Verify that all cable connections are correct and secure.
2. If the connections are okay, run the SCC diagnostics (Chapter 9).

Table 10–12 Keyboard Problems

Symptom	Possible Cause	Corrective Action
System does not respond when keys are pressed.	The Hold Screen key is active. The hold screen light on the keyboard is on.	Press the Hold Screen key to release the screen display.
	The keyboard cable is loose or disconnected.	Check the keyboard cable connection at both ends.

Drive Problems

Table 10–13 describes drive problems. If the corrective actions do not correct a problem:

1. Verify that all cable connections are correct and secure.

2. If connections are okay, you must run the SCSI diagnostic (Chapter 9) or utilities (Chapter 13) to isolate a media or controller problem.

   See Chapter 7 for information on specific storage devices. Figure 7–3 shows internal cable routing, and Figure 7–5 shows power cable routing. Figure 7–4 shows recommended SCSI ID settings and drive placement.

Table 10–13 Drive Problems

Symptom	Possible Cause	Corrective Action
Drive does not work.	Two SCSI identifiers are set to the same ID number.	In console mode, enter the SHOW DEVICE command to check current settings. Reset each SCSI ID to a unique number.
	A cable is loose.	Verify that all cables connections are correct and secure.
	A drive is defective.	Run diagnostics to isolate the fault to a FRU. Replace the FRU.

Network Problems

Table 10–14 describes network problems. If the corrective actions do not correct a problem:

1. Verify that all cable connections are correct and secure.
2. Run NI diagnostics in service mode (for extended testing capabilities). See Chapter 9.

Table 10–14 Network Problems

Symptom	Possible Cause	Corrective Action
An NI error message appears when verifying the Ethernet.	A thickwire/10BASET terminator or cable was not installed.	Attach an appropriate Ethernet terminator.

(continued on next page)

Table 10–14 (Cont.) Network Problems

Symptom	Possible Cause	Corrective Action
	Ethernet setting in console is wrong.	You may have a 10BASET cable plugged in, but the Ethernet is set to THICK.
	A cable is loose.	Secure all cable connections on the Ethernet segment.
The system cannot boot from the network.	Local network is faulty. The problem is most likely caused by the server system or the network.	Contact your system manager.
	Defective NI interface.	Run the NI diagnostics (TEST NI command) with terminators attached. If a test fails, replace the faulty FRU.

Audio Problems

To isolate audio problems, run the ISDN diagnostics service mode (for extended testing capabilities). See Chapter 9.

Console Security Problems

To isolate console security problems, see Chapter 7 for procedures to:

- Enable console security.
- Reset the console password.
- Enter the privileged state.

Firmware Upgrade Problems

Table 10–15 describes problems when trying to upgrade the flash EEPROMs.

Table 10–15 Firmware Upgrade Problems

Symptom	Possible Cause	Corrective Action
Unable to complete firmware upgrade.	Jumpers on the system module and I/O module are not set correctly.	See Chapter 14.

11

Rackmount Installation for the IEC RS–310 Cabinet

Installation Procedure

Overview

This chapter describes how to install a DEC 3000 Model 800 AXP (PE50A–B9) or Model 800S AXP (PE50A–D9) rackmount system in an IEC RS–310 (RETMA) cabinet.

Note

The configurations that this procedure supports do not require a power controller.

Cabinet Location

When a location for the cabinet is identified, perform the following steps:

Steps	Action
1	Move the cabinet to the selected location.
2	Use an open end (spanner) wrench to adjust the cabinet leveler feet.
3	Place a spirit level on the cabinet base to ensure that the cabinet is level.
4	Readjust the leveler feet, if necessary, until the cabinet is level.
5	Slide out the stabilizer bar to support the weight of the system being installed.

Determine the Installation Area in the Cabinet

To determine the installation area for the system in an IEC RS-310 cabinet, perform the following steps at the front and rear cabinet rails. See Figure 11–1.

Warning

Digital does not recommend installing the system in the top area of the cabinet, for stability reasons.

The space between mounting holes in the cabinet rails follows a pattern of 1.27 cm (0.50 inches), 1.59 cm (0.625 inches), and 1.59 cm (0.625 inches). This pattern is repeated for the length of the rails.

Steps	Action
1	Select a section of the cabinet rail where there is a 1.27 cm (0.50 inch) space between two holes.
2	Make a mark between the holes. This is your starting point.
3	Count up or down three holes. This is one *set* and equals 4.45 cm (1.75 inches).
4	Count up or down nine sets and make a mark. The area between the marks is the *installation area*.

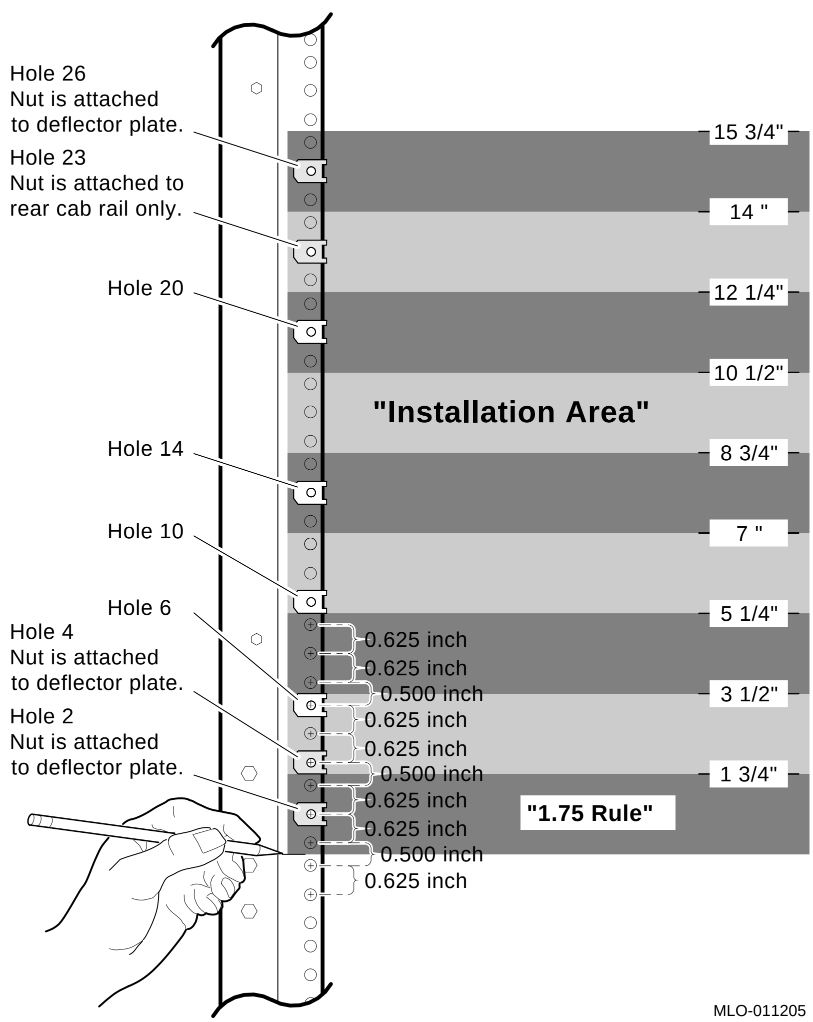
The total installation area is 40.01 cm (15.75 inches). The equation for calculating the total area is:

4.45 cm (1.75 inches) $\times$ 9 sets = 40.01 cm (15.75 inches)

Note

The hole count described in this section will install the system in any predetermined 40.01 cm (15.75-inch) area.

Figure 11–1 Determining the Installation Area



Assemble the Top Air Deflector and Baffle Subassembly

Required materials:

- Six 6/32 screws
- Top air baffle (PN 74–46195–01)
- Top air deflector (PN 74–46196–01)

Assemble the top air deflector and baffle subassembly (Figure 11–2) as follows:

Step	Action
1	Align the holes in the deflector ❶ with the holes in the baffle ❷.
2	Insert and tighten the six screws to secure the baffle to the deflector.

Install the Top Air Deflector Assembly

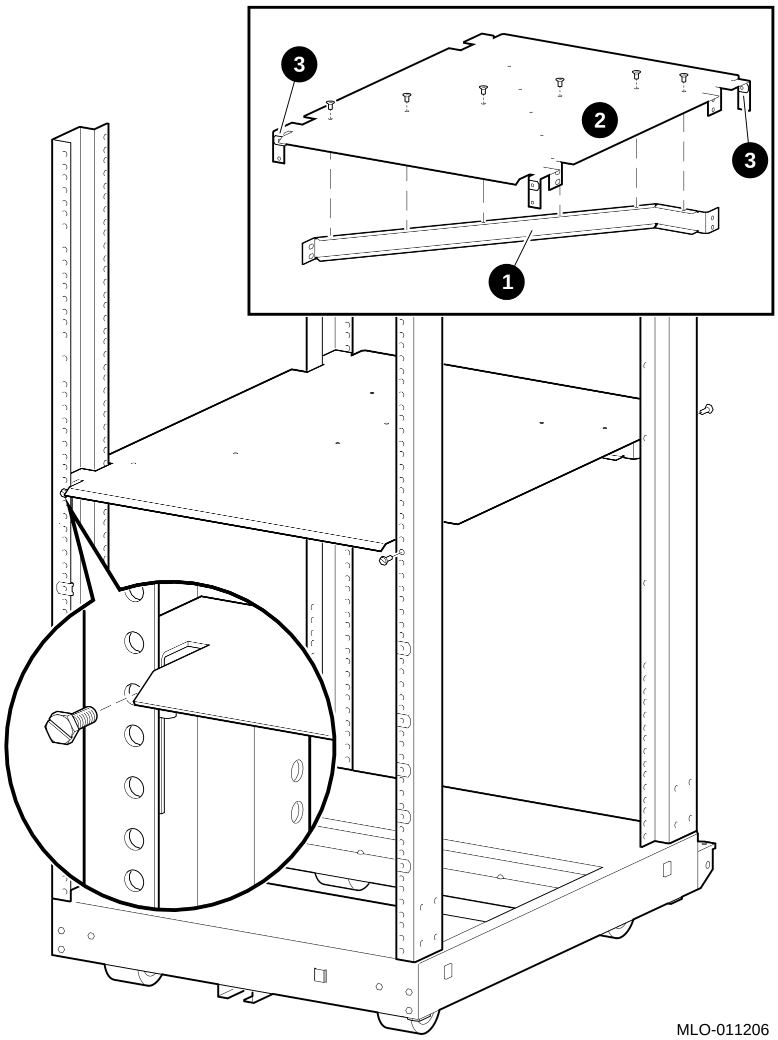
Required materials:

- Four 10/32 screws with integral washers
- Six clip nuts (PN 90-07786-00)
- Top air deflector assembly (assembled in previous section)

Install the top air deflector assembly (Figure 11–2) as follows:

Steps	Action
1	Attach clip nuts to each tab ❸ on the deflector as shown.
2	Count up 26 holes from the bottom of the installation area on the front and rear cabinet rails, as shown in Figure 11–1.
3	Use the four 10/32 screws to secure the top air deflector assembly to the cabinet rails.

Figure 11–2 Installing the Top Air Deflector



Assemble the Bottom Air Deflector and Baffle Subassembly

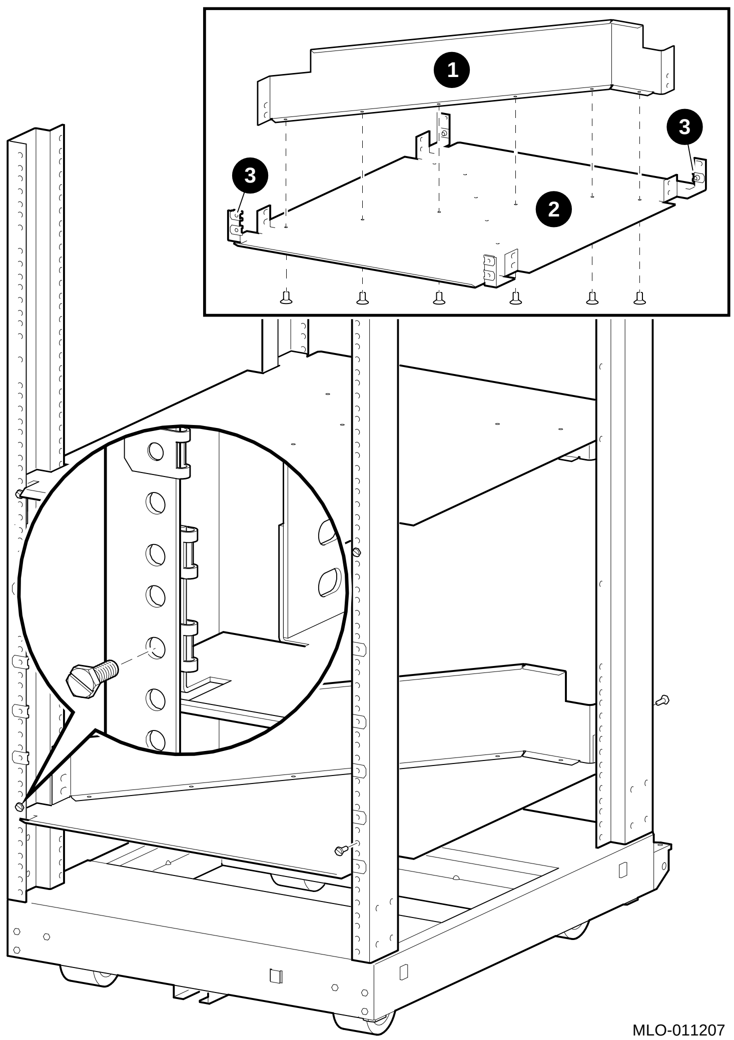
Required materials:

- Six 6/32 screws
- Bottom air baffle (PN 74–46195–01)
- Bottom air deflector (PN 74–46208–01)

Assemble the bottom air deflector and baffle subassembly (Figure 11–3) as follows:

Steps	Action
1	Align the holes in the deflector ❶ with the holes in the baffle ❷.
2	Insert and tighten the six screws to secure the baffle to the deflector.

Figure 11–3 Installing the Bottom Air Deflector Assembly



Install the Bottom Air Deflector Assembly

Required materials:

- Four 10/32 screws with integral washers
- 14 clip nuts (PN 90-07786-00)
- Bottom air deflector assembly (assembled in the previous section)

Install the bottom air deflector assembly (Figure 11–3) as follows:

Steps	Action
1	Attach clip nuts to each tab ❸ on the deflector as shown.
2	Count up four holes from the bottom of the installation area at the front of the cabinet and two holes at the rear of the cabinet.
3	Use the four 10/32 screws to secure the bottom air deflector assembly to the cabinet rails.
4	Install clip nuts in holes 6, 10, 14, and 20 on the front cabinet rails. Install clip nuts in holes 6, 10, 20, and 23 on the rear cabinet rails. See Figure 11–1.

Assemble the Right Side Chassis Slide Subassembly

Required materials:

- Eight 8/32 screws
- Eight nuts
- Two slide mounting brackets (PN 74–46197–01)
- Chassis slide (PN 12–18166–02)
- Slide mounting angle brace (PN 74–45548–02)

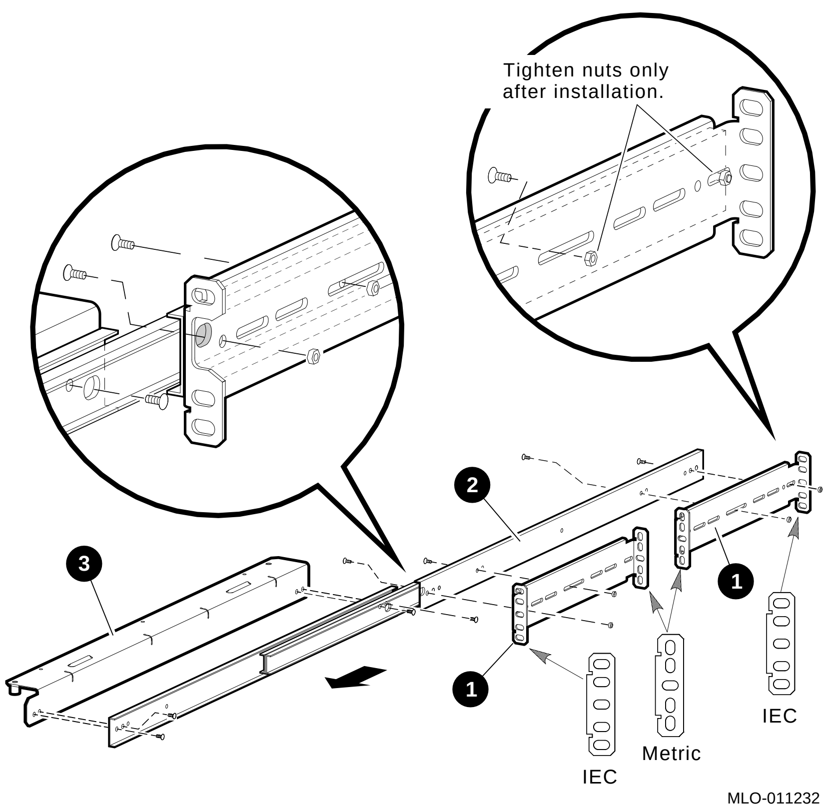
Note

The slide mounting brackets have two mounting ends. One end is for IEC mounting, and the other is for metric mounting. See Figure 11–4.

Assemble the right side chassis slide subassembly (Figure 11–4) as follows:

Steps	Action
1	Orient the slide mounting bracket ❶ so the IEC end is facing out.
2	Use four 8/32 screws to secure the slide mounting brackets to the chassis slide ❷. Do not tighten the two screws at the rear slide mounting bracket.
3	Use four 8/32 screws to secure the slide mounting angle brace ❸ to the chassis slide.

Figure 11–4 Assembling the Right Side Chassis Slide Subassembly



Install the Right Side Chassis Slide Assembly

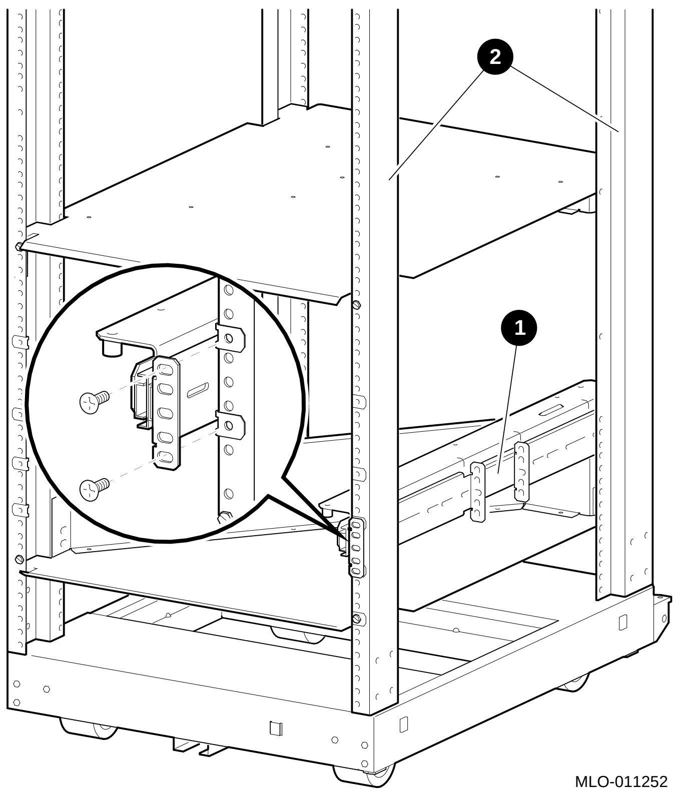
Required materials:

- Right side chassis slide assembly (assembled in the previous section)
- Two 10/32 screws

Install the right side chassis slide assembly (Figure 11–5) as follows:

Steps	Action
1	Count up 6 holes from the bottom of the installation area on the front and rear cabinet rails.
2	Count up 10 holes from the bottom of the installation area on the front and rear cabinet rails.
3	Align the chassis slide assembly ❶ to the sixth and tenth hole, then secure the assembly to the cabinet rails ❷.
4	Tighten the two screws on the rear slide mounting bracket.

Figure 11–5 Installing the Right Side Chassis Slide Assembly



Assemble the Left Side Chassis Slide Subassembly

Required materials:

- Eight 8/32 screws
- Eight nuts
- Two slide mounting brackets (PN 74–46197–01)
- Chassis slide (PN 12–18166–02)
- Slide mounting angle brace (PN 74–45548–01)

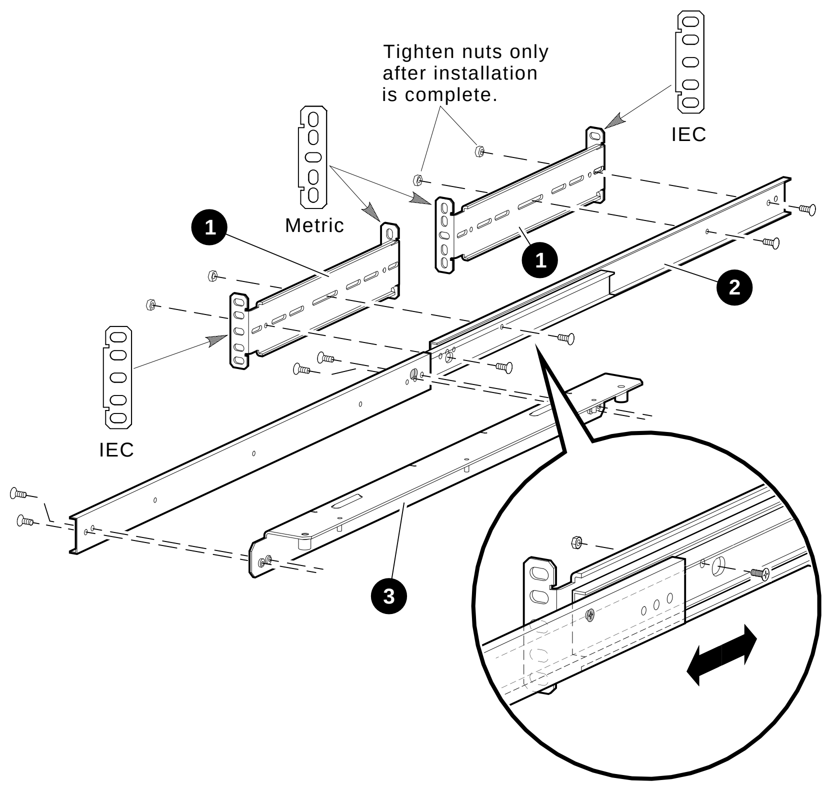
Note

The slide mounting brackets have two mounting ends. One end is for IEC mounting, and the other is for metric mounting. See Figure 11–6.

Assemble the left side chassis slide subassembly (Figure 11–6) as follows:

Steps	Action
1	Orient the slide mounting bracket ❶ so the IEC end is facing out.
2	Use four 8/32 screws to secure the slide mounting brackets to the chassis slide ❷. Do not tighten the two screws at the rear slide mounting bracket.
3	Use four 8/32 screws to secure the slide mounting angle brace ❸ to the chassis slide.

Figure 11–6 Assembling the Left Side Chassis Slide Subassembly



Install the Left Side Chassis Slide Assembly

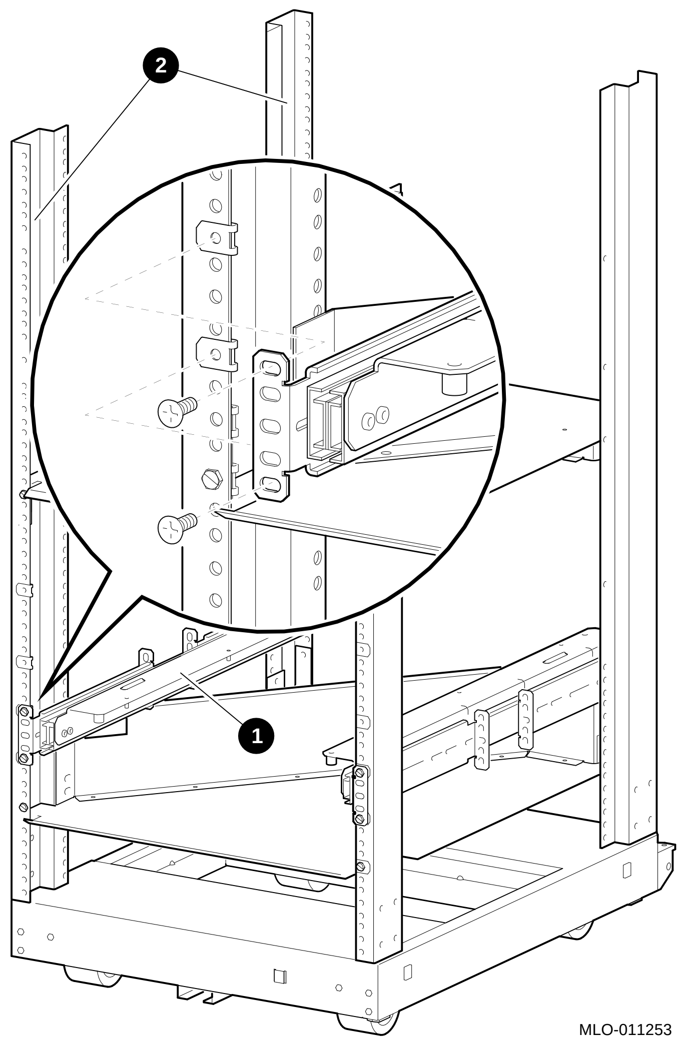
Required materials:

- Left side chassis slide assembly (assembled in the previous section)
- Two 10/32 screws

Install the left side chassis slide assembly (Figure 11–7) as follows:

Steps	Action
1	Count up 6 holes from the bottom of the installation area on the front and rear cabinet rails.
2	Count up 10 holes from the bottom of the installation area on the front and rear cabinet rails.
3	Align the chassis slide assembly ❶ to the sixth and tenth hole, then secure the assembly to the cabinet rails ❷.
4	Tighten the two screws at the rear slide mounting bracket.

Figure 11–7 Installing the Left Side Chassis Slide Assembly



Install the Chassis Slide Support Brackets

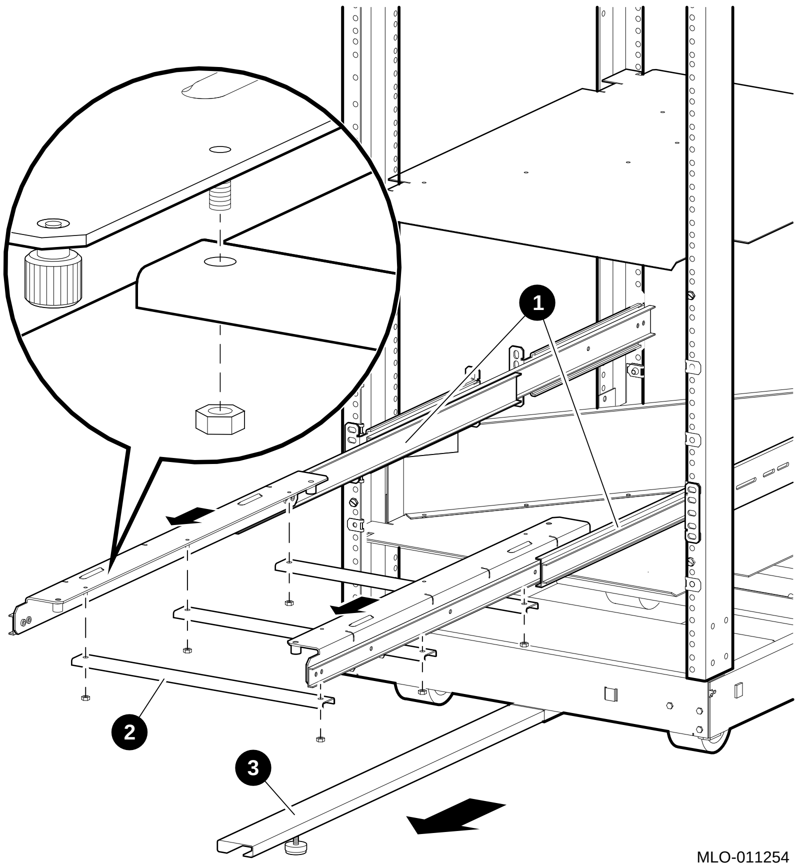
Required materials:

- Three support brackets (PN 74–45547–01)
- Six nuts

Install the chassis slide support brackets (Figure 11–8) as follows:

Steps	Action
1	Slide out the stabilizer bar ❸ to support the weight of the system being installed.
2	Fully extend both chassis slide assemblies ❶.
3	Use the six nuts to secure the three support brackets ❷ to the chassis slide assemblies. Do not tighten the nuts.

Figure 11–8 Installing the Chassis Slide Support Brackets



Secure the System Unit to the Chassis Slide Assembly

WARNING

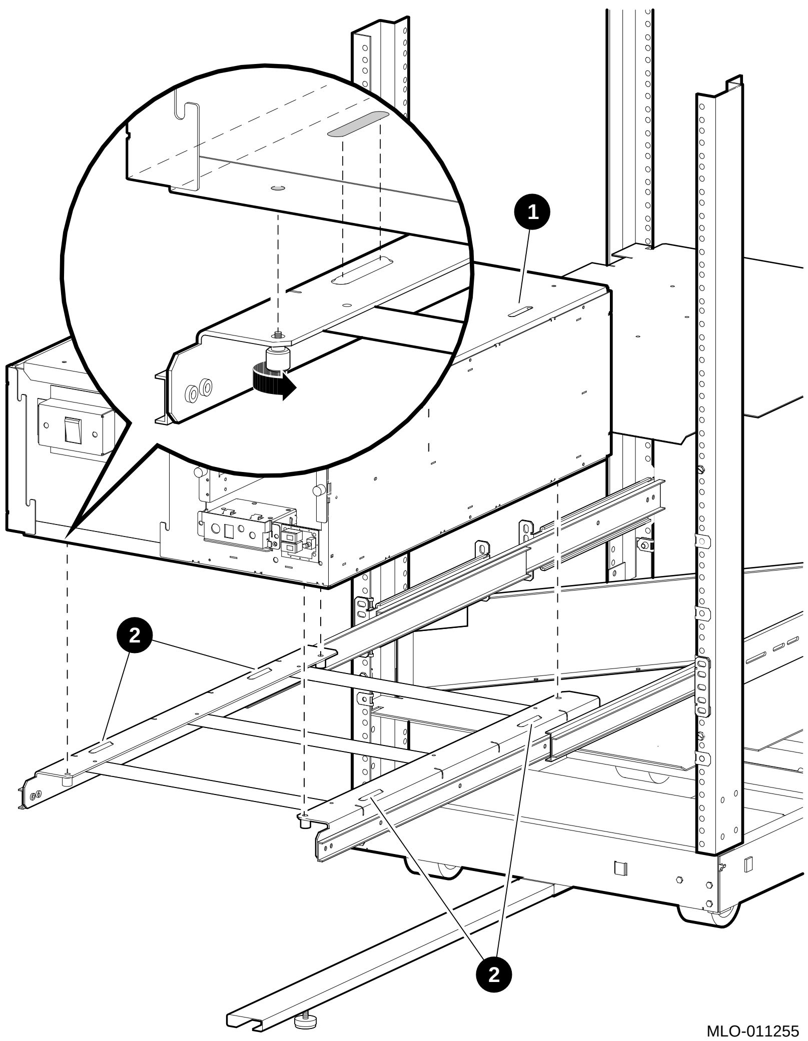
Two people are required to install the system. Failure to do so could cause personal injury.

Digital does not recommend installing the system unit in the top area of the IEC RS–310 (RETMA) cabinet, for stability reasons.

Secure the system unit to the chassis slide assembly (Figure 11–9) as follows:

Steps	Action
1	Slide out the stabilizer bar (if not already out) to support the weight of the system being installed.
2	Slide out both chassis slide assemblies ❷ (if not already out) until they are fully extended.
3	Use two people to carefully lift the system unit ❶ and place it on the extended chassis slide assemblies ❷.
4	Secure the system unit to the assemblies, using the four thumb screws at the bottom of the assemblies.
5	Tighten the six nuts securing the chassis slide support brackets to the assemblies.
6	Do not push the system unit into the cabinet.

Figure 11–9 Securing the PE50A–B9/D9 Unit to the Chassis Slide Assembly



Install the Faceplate Mounting Brackets

Required materials:

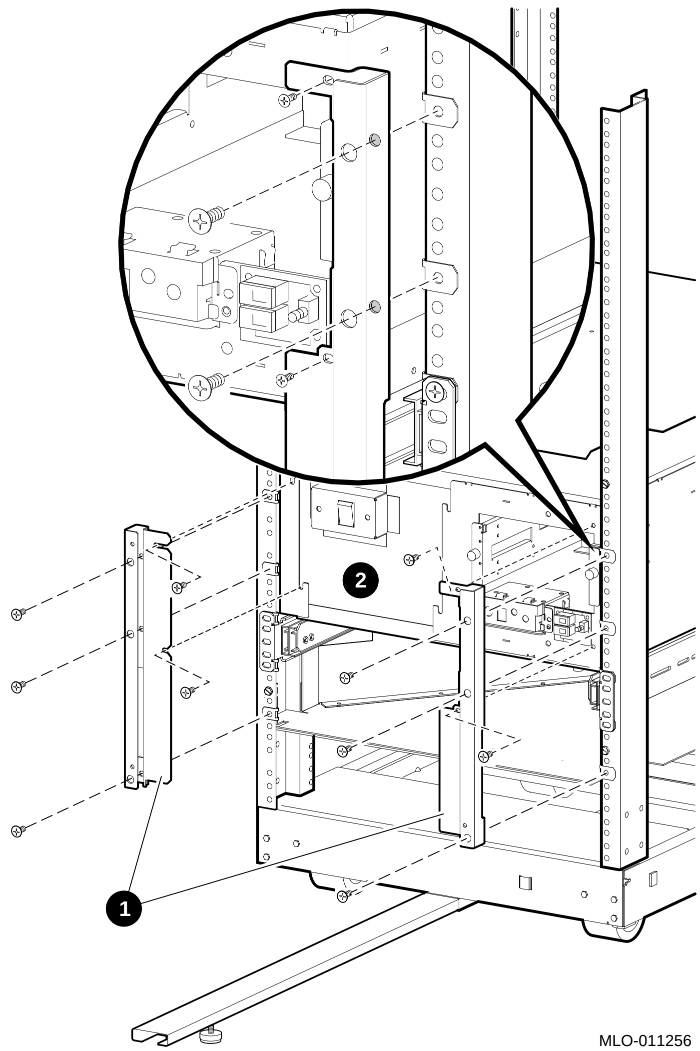
- Two 6/32 screws
- Six 10/32 screws
- Right mounting bracket (PN 74–45544–01)

- Left mounting bracket (PN 74–45543–01)

Install the faceplate mounting brackets Figure 11–10) as follows:

Steps	Action
1	Use the two 6/32 screws to secure the right faceplate mounting brackets ❶ to the system ❷. Secure the left faceplate bracket using screws that are already in place on the power supply.
2	Count up 2 holes, 14 holes, and 20 holes from the bottom of the installation area on the front cabinet rails.
3	Install clip nuts at the locations determined in step 2 (if not already installed).
4	Push the system unit into the cabinet.
5	Use the six 10/32 screws to secure the faceplate mounting brackets ❶ to the cabinet.

Figure 11–10 Installing the Faceplate Mounting Brackets



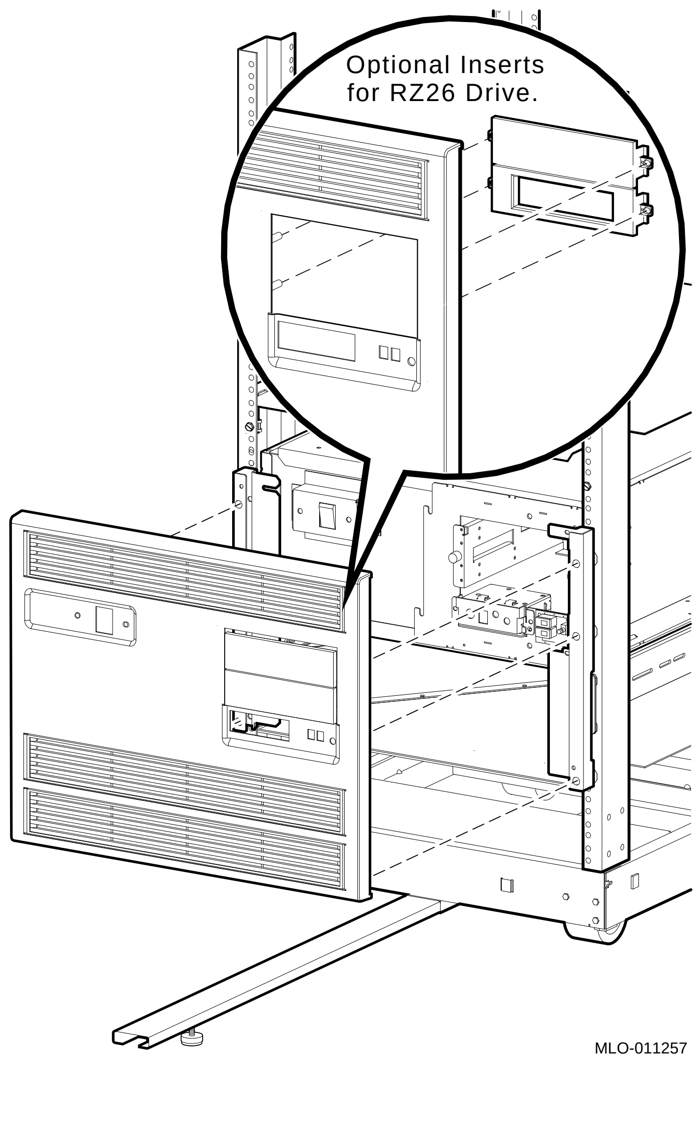
Install the System Faceplate

To install the faceplate (PN 70–30322–01), snap the faceplate onto the tabs at the front of the system (Figure 11–11).

Note

In Figure 11–11, the faceplate has two option inserts. The bottom insert is for an RZ26 drive. The top insert is a blank, used when no other drive is installed with the RZ26.

Figure 11–11 Installing the Faceplate



Install the Rear Support Bracket

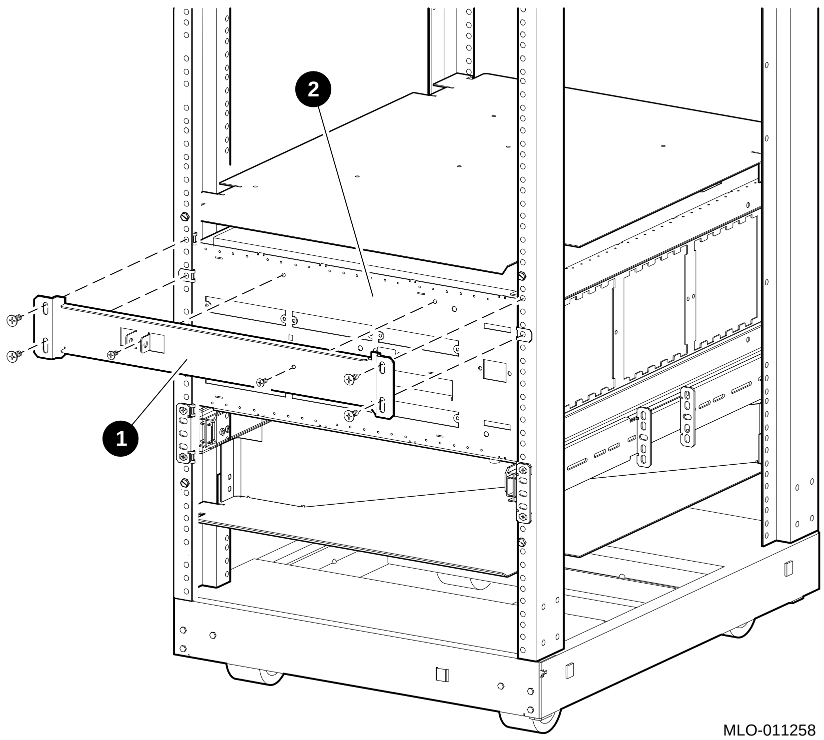
Required materials:

- Two 6/32 screws
- Rear support bracket (PN 74–45545–02)
- Four 10/32 screws

Install the rear support bracket (Figure 11–12) as follows:

Steps	Action
1	On the rear cabinet rails, count up 20 holes and 26 holes from the bottom of the installation area. Install clip nuts on these holes, if not already installed.
2	Use the two 6/32 screws to secure the rear support bracket ❶ to the rear of the system unit ❷.
3	Use the four 10/32 screws to secure the rear support bracket to the rear of the cabinet.

Figure 11–12 Installing the Rear Support Bracket



Power and Cabling

Figure 11–13 shows the rear connectors, switches, and option slots on the DEC 3000 Model 800/800S AXP system. Table 11–1 describes these items.

Figure 11–14 shows the front switches, lights, jacks, and removable media slots. Table 11–2 describes these items.

Connect the system cables (Figure 11–13) as follows:

Steps	Action
1	Connect the keyboard/mouse cable ❺.
2	Connect the monitor cable ⓫.
3	Connect power cord. There is no power controller.
4	Connect any other necessary cables.

Figure 11–13 Rear View of the System

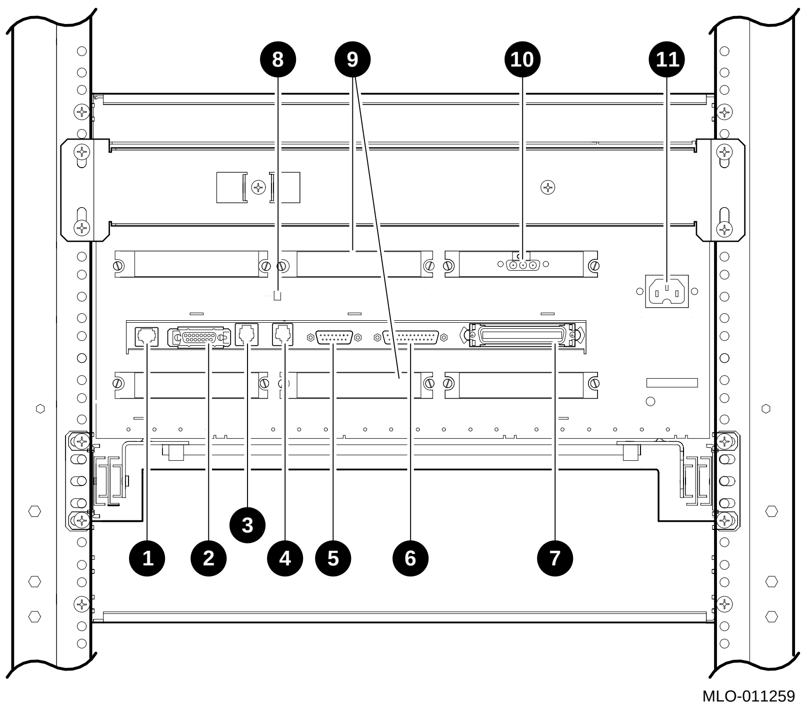


Table 11–1 DEC 3000 Model 800/800S AXP System (Rear)

This Feature...	Lets You...
❶ 10BASE-T Port	Connect a 10BASE-T (twisted-pair) Ethernet network cable.
❷ AUI Ethernet port	Connect an AUI (thickwire) Ethernet network cable.
❸ ISDN Port	Connect an ISDN network cable.
❹ Printer/alternate console port	Connect a printer or an alternate console.
❺ Keyboard/mouse port	Connect the keyboard/mouse cable.
❻ Synch/asynch communications	Connect to a communication device, such as a modem.
❼ External SCSI port	Connect Small Computer System Interface (SCSI) peripheral devices.
❽ Printer/alternate console switch	Select the function of the printer /alternate console port.
❾ Six TURBOchannel slots	Install TURBOchannel option modules. (There are three designated slots for the I/O module and three slots for the system module.)
❿ Video refresh switch	Choose the correct video refresh rate (66 Hz or 72 Hz) for the monitor.
⓫ Monitor port	Connect the monitor video cable.
⓬ System power port	Connect the system power cord. (The port is keyed.)

Figure 11–14 Front View of the System

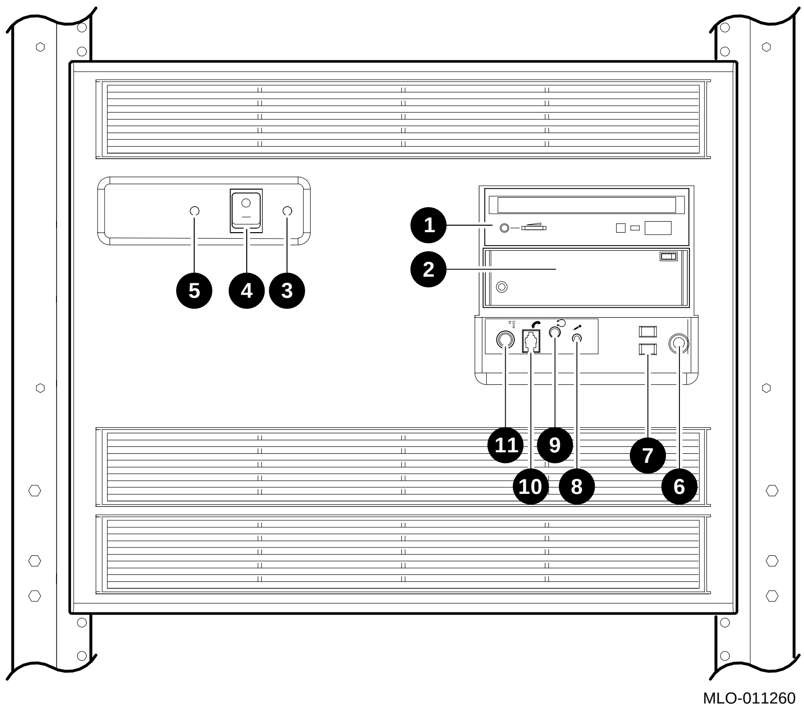


Table 11–2 DEC 3000 Model 800/800S AXP System (Front)

This Feature...	Lets You...
❶ and ❷ Removable-media area	Access devices that use removable storage media such as diskettes, compact discs, cassette tapes, or cartridge tapes.
❸ DC OK light	Check that all dc voltages are present on the power supply.
❹ On/Off switch	Turn the system on (|) and off (0).
❺ Fan indicator light	Check whether a fan has failed.
❻ Halt button	Put the system in console mode.
❼ Diagnostic display	View error codes that may indicate potential problems with the system.
❽ Microphone input jack	Connect a microphone to the system.
❾ Speaker output jack	Connect a speaker or headphone for audio output.
❿ Telephone jack	Connect a telephone handset.
⓫ Audio input jack	Connect an audio input line.

12

Rackmount Installation for the H9A00–AJ Cabinet

Installation Procedure

Overview

This chapter describes how to install the DEC 3000 Model 800 AXP (PE50A–B9) or Model 800S AXP (PE50A–D9) rackmount system in an H9A00-AJ cabinet.

Note

The configurations that this procedure supports do not require a power controller.

Cabinet Location

When a location for the cabinet is identified, perform the following steps:

Steps	Action
1	Move the cabinet to the selected location.
2	Use an open end (spanner) wrench to adjust the cabinet leveler feet.
3	Place a spirit level on the cabinet base to ensure that the cabinet is level.
4	Readjust the leveler feet (if necessary) until the cabinet is level.
5	Slide out the stabilizer bar to support the weight of the system being installed.

Determine the Installation Area in the Cabinet

To determine the installation area for the system unit in a H9A00–AJ cabinet, perform the following steps at the front and rear cabinet rails. See Figure 12–1.

WARNING

Digital does not recommend installing the system in the top area of the cabinet, for stability reasons.

The space between mounting holes in the cabinet rails follows a pattern of 1.27 cm (0.50 inches), 1.59 cm (0.625 inches), and 1.59 cm (0.625 inches). This pattern is repeated for the length of the rails.

Steps	Action
1	Select a section of the cabinet rail where there is a 1.27 cm (0.50 inch) space between two holes.
2	Make a mark between the holes. This is your starting point.
3	Count up or down three holes. This is one *set* and equals 4.45 cm (1.75 inches).
4	Count up or down 10 sets and make a mark. The area between the marks is the *installation area.*

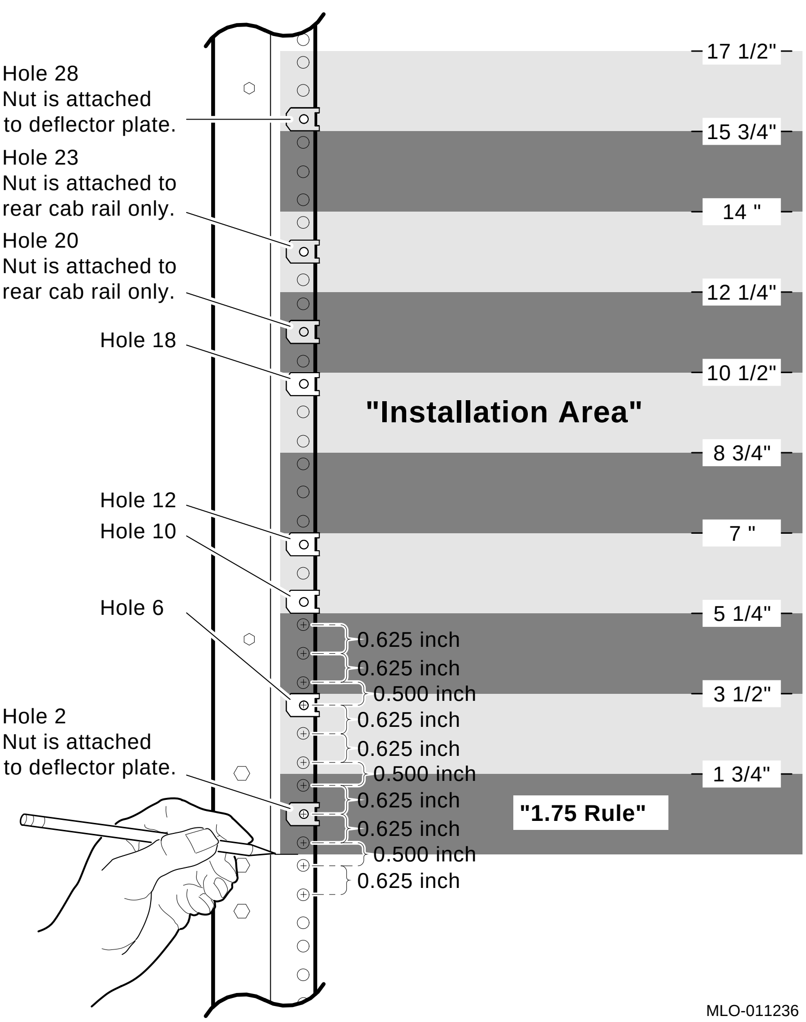
The total installation area is 44.45 cm (17.50 inches). The equation for calculating the total area is

4.45 cm (1.75 inches) $\times$ 10 sets = 44.45 cm (17.50 inches)

Note

The hole count described in this section will install the system in any predetermined 44.45 cm (17.50-inch) area.

Figure 12–1 Determining the Installation Area



Assemble the Top Air Deflector and Baffle Subassembly

Required materials:

- Six 6/32 screws
- Top air baffle (PN 74–46159–01)
- Top air deflector (PN 74–46157–01)

Assemble the top air deflector and baffle subassembly (Figure 12–2) as follows:

Steps	Action
1	Align the holes in the deflector ❶ with the holes in the baffle ❷.
2	Insert and tighten the six screws to secure the baffle to the deflector.

Install the Top Air Deflector Assembly

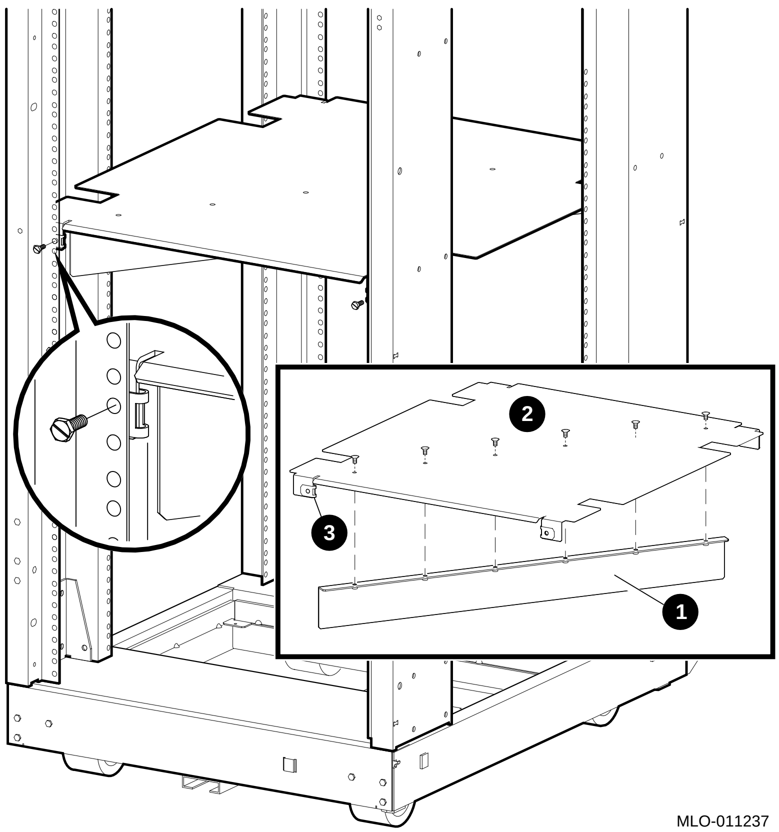
Required materials:

- Four 10/32 screws with integral washers
- Four clip nuts (PN 90–07786–00)
- Top air deflector assembly (assembled in the previous section)

Install the top air deflector assembly (Figure 12–2) as follows:

Steps	Action
1	Attach one clip nut to each tab ❸ on the deflector.
2	Count up 28 holes from the bottom of the installation area on the front and rear cabinet rails, as shown in Figure 12–1.
3	Use the four 10/32 screws to secure the top air deflector assembly to the cabinet rails.

Figure 12–2 Installing the Top Air Deflector



Assemble the Bottom Air Deflector and Baffle Subassembly

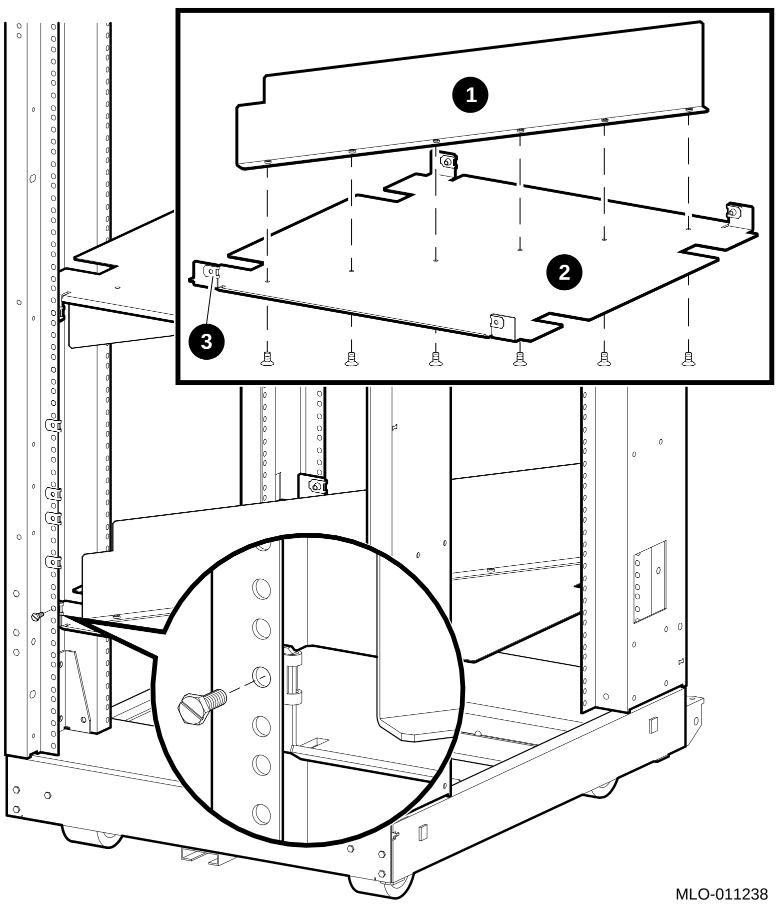
Required materials:

- Six 6/32 screws
- Bottom air baffle (PN 74–46159–01)
- Bottom air deflector (PN 74–46158–01)

Assemble the bottom air deflector and baffle subassembly (Figure 12–3) as follows:

Steps	Action
1	Align the holes in the deflector ❶ to the holes in the baffle ❷.
2	Insert and tighten the six screws to secure the baffle to the deflector.

Figure 12–3 Installing the Bottom Air Deflector Assembly



Install the Bottom Air Deflector Assembly

Required materials:

- Four 10/32 screws with integral washers

- 12 clip nuts (PN 90–07786–00)
- Bottom air deflector assembly (assembled in the previous section)

Install the bottom air deflector assembly (Figure 12–3) as follows:

Steps	Action
1	Attach one clip nut to each tab ❸ on the deflector, as shown in Figure 12–3.
2	Count up two holes from the bottom of the installation area on the front and rear cabinet rails.
3	Use the four 10/32 screws to secure the bottom air deflector assembly to the cabinet rails.
4	Install clip nuts in holes 6, 10, 12, and 18 on the front cabinet rails. Install clip nuts in holes 6, 10, 20, and 23 on the rear cabinet rails. See Figure 12–1.

Assemble the Right Side Chassis Slide Subassembly

Required materials:

- Eight 8/32 screws
- Eight nuts
- Two slide mounting brackets (PN 74–46197–01)
- Chassis slide (PN 12–18166–02)
- Slide mounting angle brace (PN 74–45548–02)

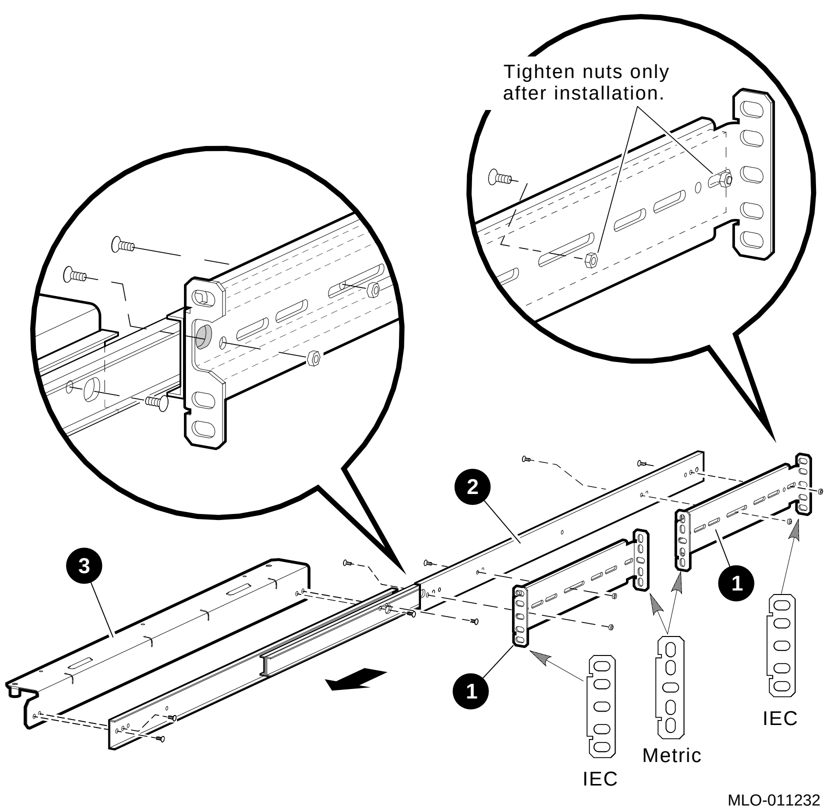
Note

The slide mounting brackets have two mounting ends. One end is for IEC mounting, and the other is for metric mounting. See Figure 12–4.

Assemble the right side chassis slide subassembly (Figure 12–4) as follows:

Steps	Action
1	Orient the slide mounting bracket ❶ so the IEC end is facing out.
2	Use four 8/32 screws to secure the slide mounting brackets to the chassis slide ❷. Do not tighten the two screws at the rear slide mounting bracket.
3	Use four 8/32 screws to secure the slide mounting angle brace ❸ to the chassis slide.

Figure 12–4 Assembling the Right Side Chassis Subassembly



Install the Right Side Chassis Slide Assembly

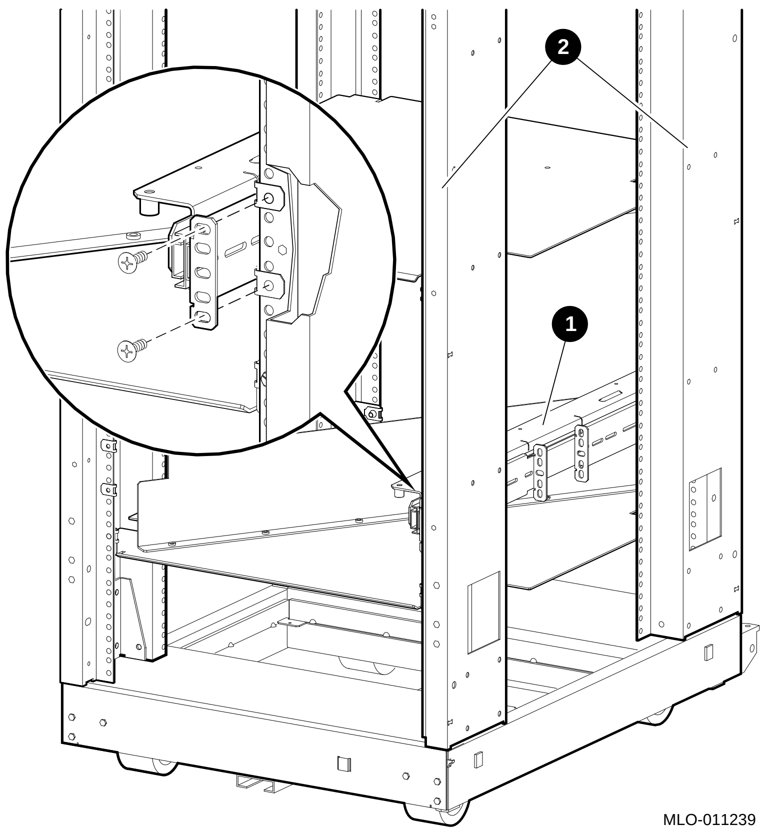
Required materials:

- Right side chassis slide assembly (assembled in the previous section)
- Two 10/32 screws

Install the right side chassis slide assembly, (Figure 12–5):

Step	Action
1	Count up 6 holes from the bottom of the installation area on the front and rear cabinet rails.
2	Count up 10 holes from the bottom of the installation area on the front and rear cabinet rails.
3	Align the chassis slide assembly ❶ to the sixth and tenth hole, then secure the assembly to the cabinet rails ❷.
4	Tighten the two screws at the rear slide mounting bracket.

Figure 12–5 Installing the Right Side Chassis Slide Assembly



Assemble the Left Side Chassis Slide Subassembly

Required materials:

- Eight 8/32 screws
- Eight nuts
- Two slide mounting brackets (PN 74–46197–01)
- Chassis slide (PN 12–18166–02)
- Slide mounting angle brace (PN 74–45548–01)

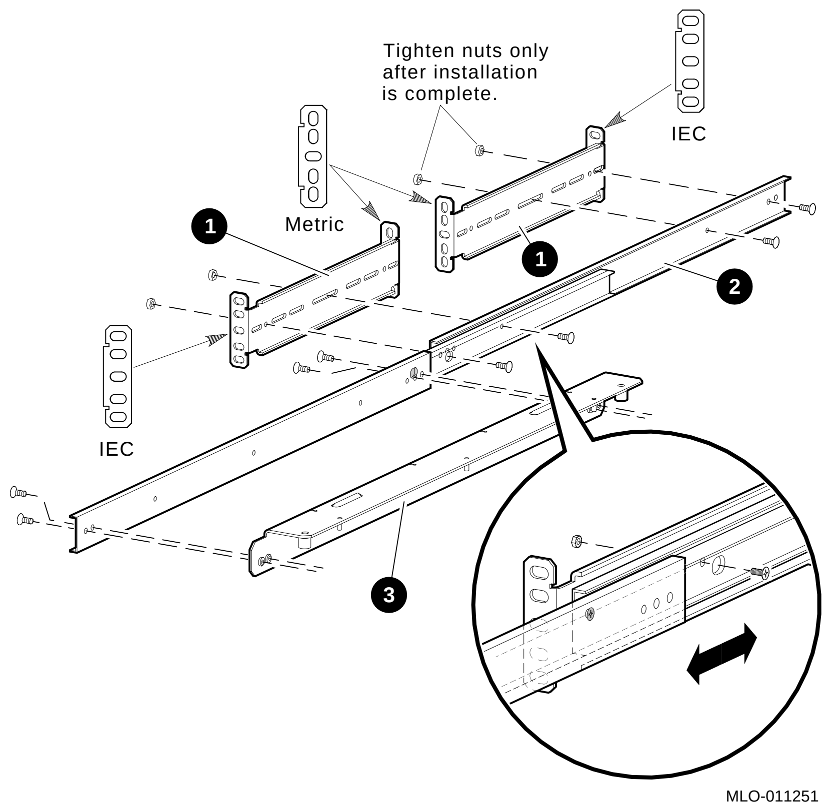
Note

The slide mounting brackets have two mounting ends. One end is for IEC mounting, and the other is for metric mounting. See Figure 12–6.

Assemble the left side chassis slide subassembly (Figure 12–6) as follows:

Steps	Action
1	Orient the slide mounting bracket ❶ so the IEC end is facing out.
2	Use four 8/32 screws to secure the slide mounting brackets to the chassis slide ❷. Do not tighten the two screws at the rear slide mounting bracket.
3	Use four 8/32 screws to secure the slide mounting angle brace ❸ to the chassis slide.

Figure 12–6 Assembling of the Left Side Slide Subassembly



Install the Left Side Chassis Slide Assembly

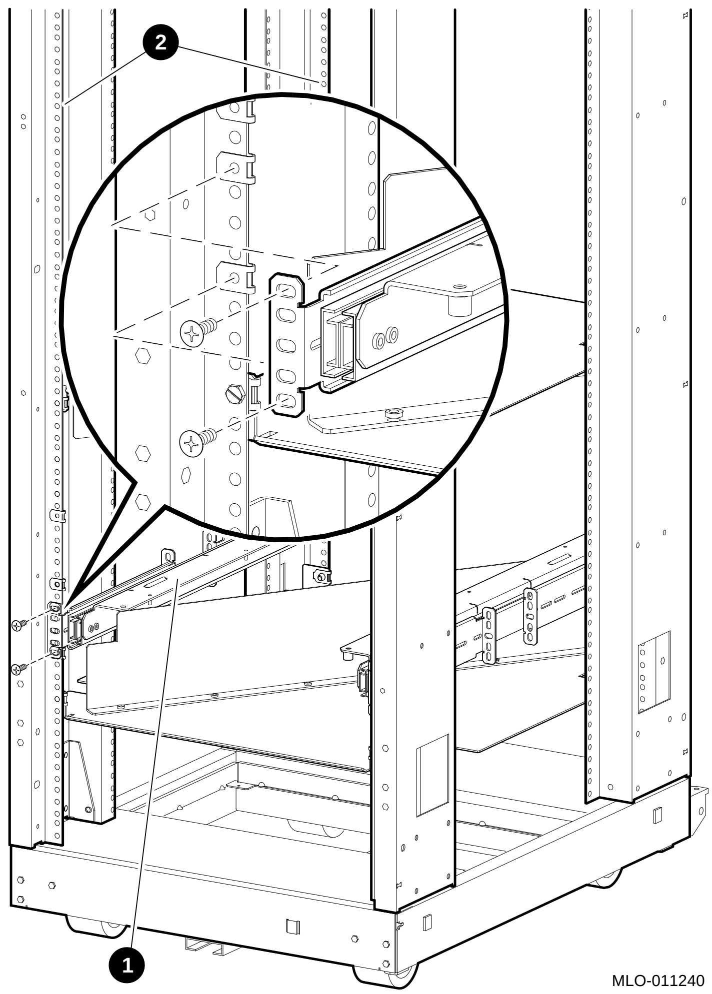
Required materials:

- Left side chassis slide assembly (assembled in the previous section)
- Two 10/32 screws

Install the left side chassis slide assembly (Figure 12–7) as follows:

Steps	Action
1	Count up 6 holes from the bottom of the installation area on the front and rear cabinet rails.
2	Count up 10 holes from the bottom of the installation area on the front and rear cabinet rails.
3	Align the chassis slide assembly ❶ to the sixth and tenth hole, then secure the assembly to the cabinet rails ❷.
4	Tighten the two screws at the rear slide mounting bracket.

Figure 12–7 Installing the Left Side Chassis Slide Assembly



Install Chassis Slide Support Brackets

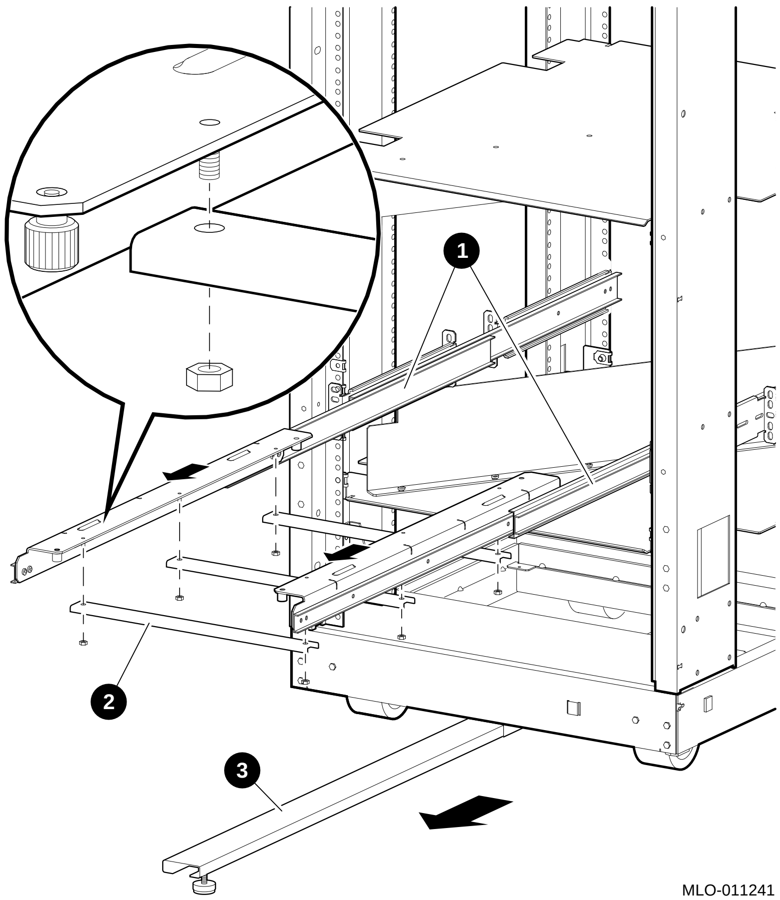
Required materials:

- Three support brackets (PN 74–45547–01)
- Six nuts

Install the chassis slide support brackets (Figure 12–8) as follows:

Steps	Action
1	Slide out the stabilizer bar ❸ to support the weight of the system being installed (if not already out).
2	Fully extend both chassis slide assemblies ❶.
3	Use the six nuts to secure the three support brackets ❷ to the chassis slide assembly. Do not tighten the nuts.

Figure 12–8 Installing the Chassis Slide Support Brackets



Secure the PE50A–B9/D9 Unit to the Chassis Slide Assembly

WARNING

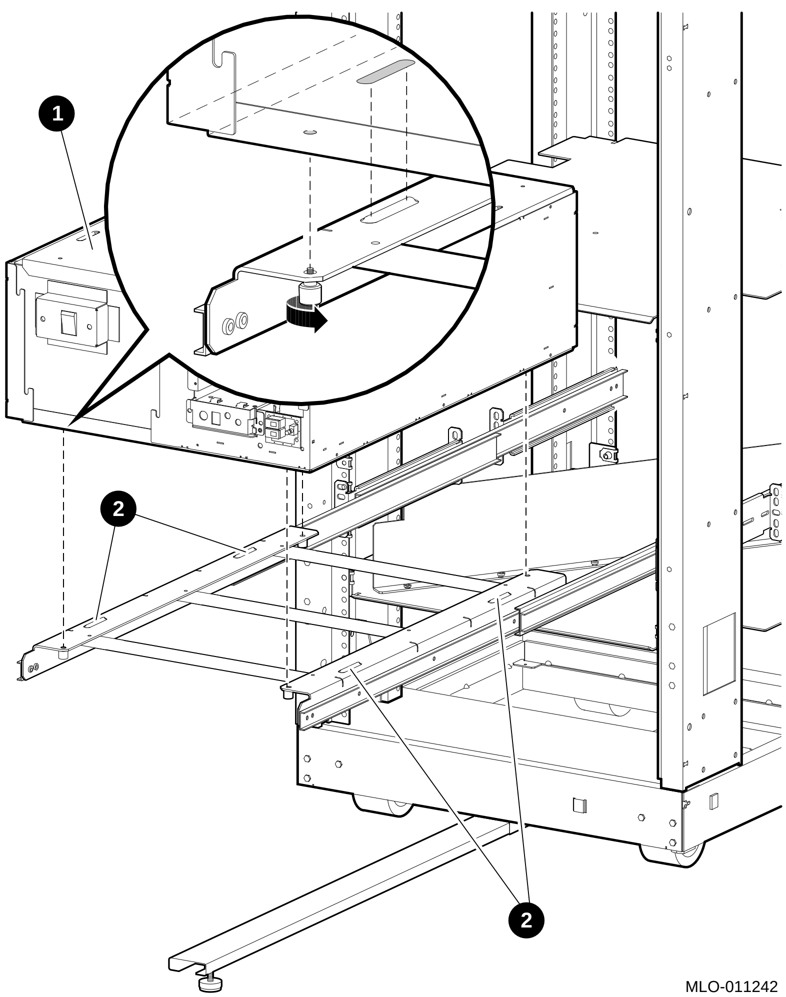
Two people are required to install the system. Failure to do so could cause personal injury.

Digital does not recommend installing the system unit in the top area of the H9A00–AJ cabinet, for stability reasons.

Secure the system to the chassis slide assembly (Figure 12–9) as follows:

Steps	Action
1	Slide out the stabilizer bar (if not already out) to support the weight of the system being installed.
2	Slide out both chassis slide assemblies ❷ until they are fully extended.
3	Use two people to carefully lift the system unit ❶ and place it on the extended chassis slide assemblies ❷.
4	Secure the system unit to the assemblies, using the four thumb screws at the bottom of the assemblies.
5	Tighten the six nuts securing the chassis slide support brackets to the assemblies.
6	Do not push the system unit into the cabinet.

Figure 12–9 Securing the PE50A–B9/D9 Unit to the Chassis Slide Assembly



Install the Faceplate Mounting Brackets

Required materials:

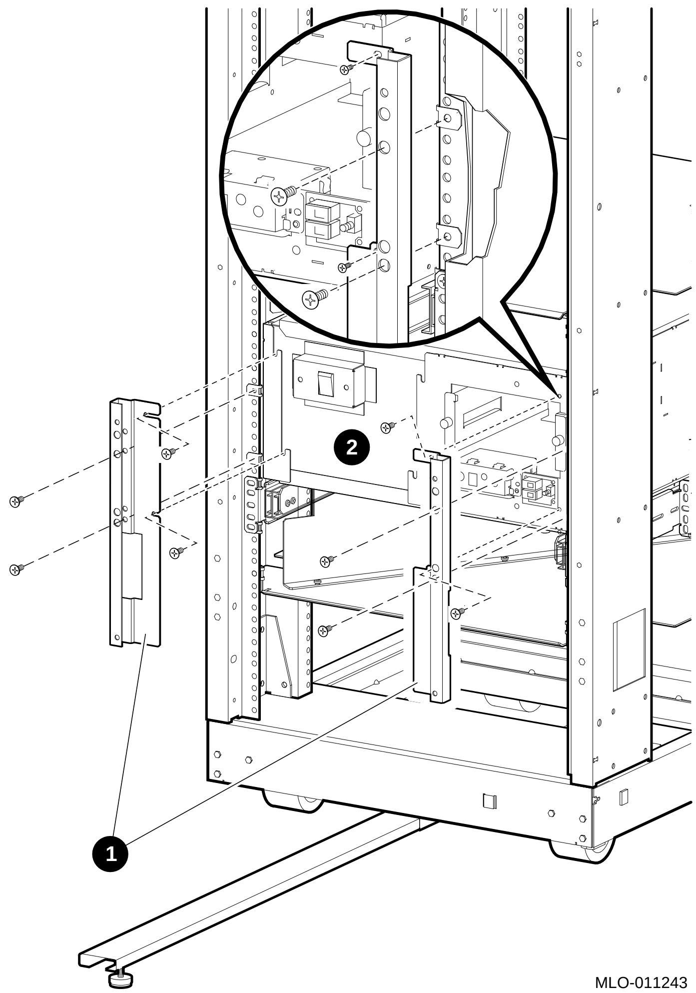
- Two 6/32 screws
- Four 10/32 screws
- Right mounting bracket (PN 74–45544–01)

- Left mounting bracket (PN 74–45543–01)

Install the faceplate mounting brackets (Figure 12–10) as follows:

Steps	Action
1	Use the two 6/32 screws to secure the right faceplate mounting brackets ❶ to the system ❷. Secure the left faceplate bracket using the screws that are already in place on the power supply.
2	Count up 12 holes and 18 holes from the bottom of the installation area on the front cabinet rails.
3	Insert clip nuts at the locations determined in step 2 (if not already installed).
4	Push the system unit into the cabinet.
5	Use the four 10/32 screws to secure the faceplate mounting brackets ❶ to the cabinet.

Figure 12–10 Installing the Faceplate Mounting Brackets



Install the Faceplate

Required materials:

- Faceplate (PN 70–30304–01)
- Four 10/32 screws

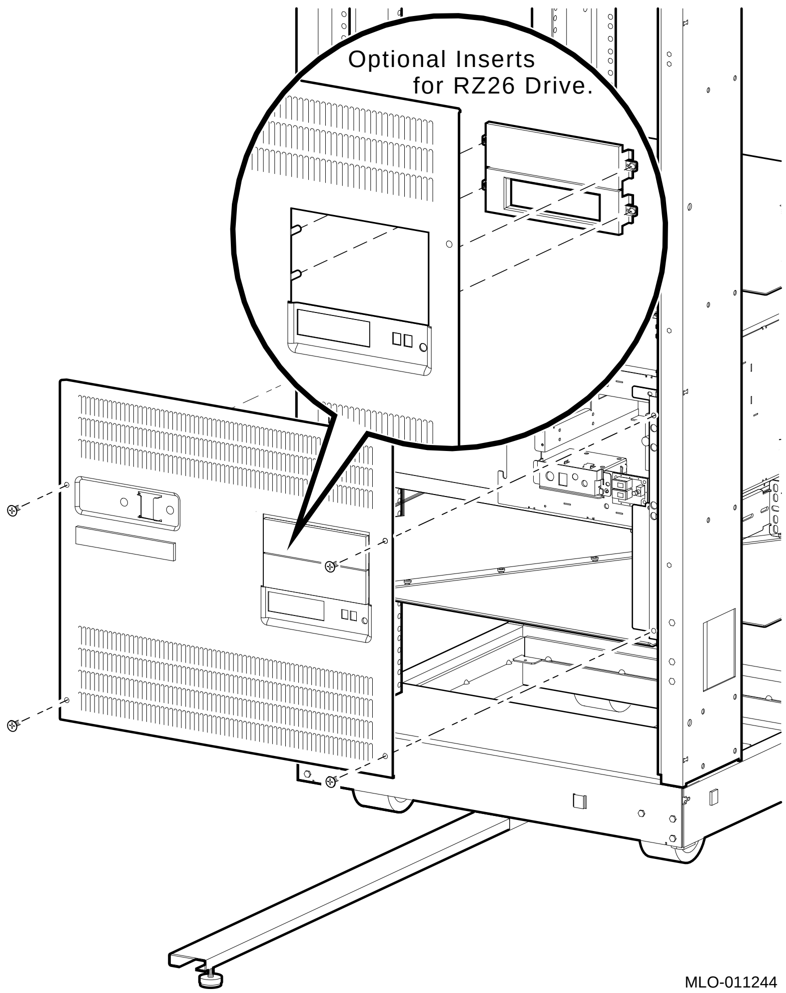
To install the faceplate (Figure 12–11):

Step	Action
1	Align the face with the holes at the front of the cabinet.
2	Secure the faceplate to the front of the cabinet with the four 10/32 screws.

Note

In Figure 12–11, the faceplate has two option inserts. The bottom insert is for an RZ26 drive. The top insert is a blank, used when no other drive is installed with the RZ26.

Figure 12–11 Installing the Faceplate



Install the Rear Support Bracket

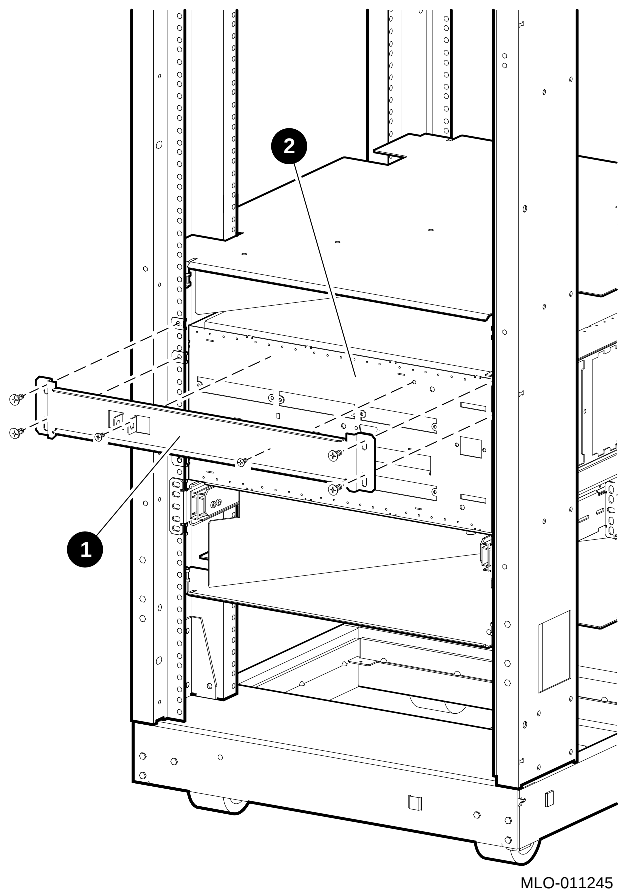
Required materials:

- Two 6/32 screws
- Rear support bracket (PN 74–45545–01)
- Four 10/32 screws

Install the rear support bracket (Figure 12–12) as follows:

Steps	Action
1	At the rear cabinet rails, count up 20 holes and 23 holes from the bottom of the installation area. Install clip nuts on these holes, if not already installed.
2	Use the two 6/32 screws to secure the rear support bracket ❶ to the rear of the system unit ❷.
3	Use the four 10/32 screws to secure the rear support bracket to the rear of the cabinet.

Figure 12–12 Installing the Rear Support Bracket



Power and Cabling

Figure 12–13 shows the rear connectors, switches, and option slots on the DEC 3000 Model 800/800S AXP system. Table 12–1 describes these items.

Figure 12–14 shows the front switches, lights, jacks, and removable media slots. Table 12–2 describes these items.

To connect the system cables (Figure 12–13):

Steps	Action
1	Connect the keyboard/mouse cable ❺.
2	Connect the monitor cable ⓫.
3	Connect power cord. There is no power controller
4	Connect any other necessary cables.

Figure 12–13 Rear View of the System

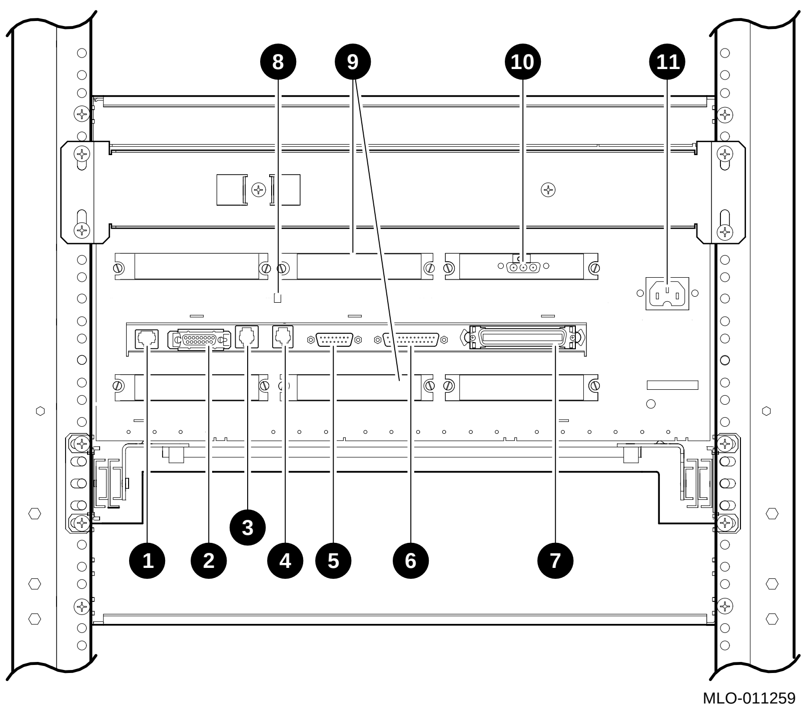


Table 12–1 DEC 3000 Model 800/800S AXP System (Rear)

This Feature...	Lets You...
❶ 10BASE-T Port	Connect a 10BASE-T (twisted-pair) Ethernet network cable.
❷ AUI Ethernet Port	Connect an AUI (thickwire) Ethernet network cable.
❸ ISDN Port	Connect an ISDN network cable.
❹ Printer/alternate console port	Connect a printer or an alternate console.
❺ Keyboard/mouse port	Connect the keyboard/mouse cable.
❻ Synch/asynch communications	Connect to a communication device, such as a modem.
❼ External SCSI port	Connect small computer system interface (SCSI) peripheral devices.
❽ Printer/alternate console switch	Select the function of the printer /alternate console port.
❾ Six TURBOchannel slots	Install TURBOchannel option modules. (There are three designated slots for the I/O module and three slots for the system module.)
❿ Video refresh switch	Choose the correct video refresh rate (66 Hz or 72 Hz) for the monitor.
⓫ Monitor port	Connect the monitor video cable.
⓬ System power port	Connect the system power cord. (The port is keyed.)

Figure 12–14 Front View of the System

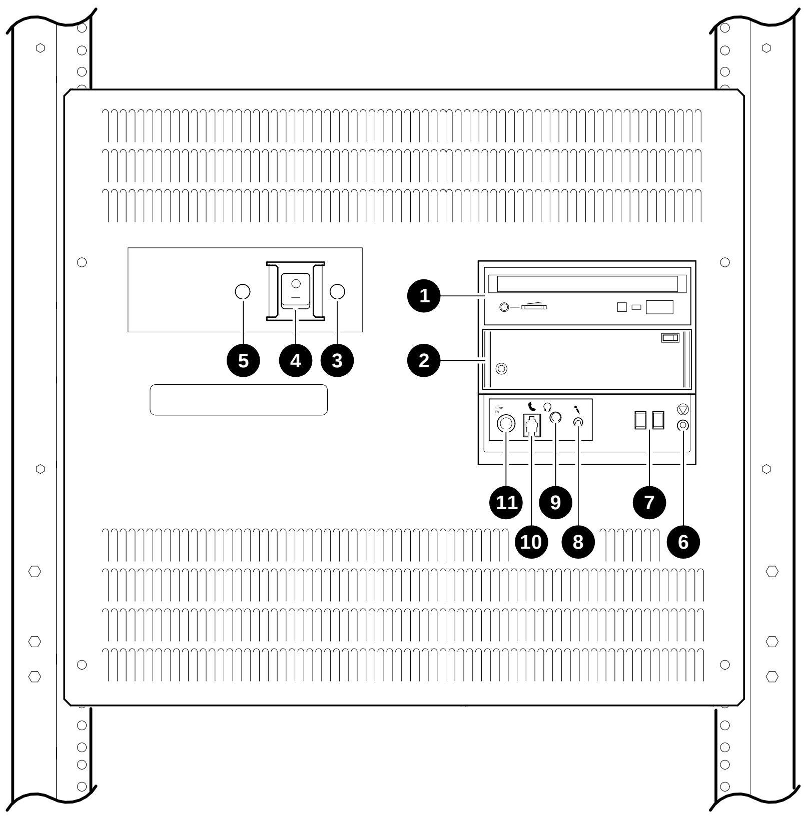


Table 12–2 DEC 3000 Model 800/800S AXP System (Front)

This Feature...	Lets You...
❶ and ❷ Removable-media area	Access devices that use removable storage media such as diskettes, compact discs, cassette tapes, or cartridge tapes.
❸ DC OK Light	Check that all dc voltages are present on the power supply.
❹ On/Off switch	Turn the system on (|) and off (0).
❺ Fan indicator light	Check whether a fan has failed.
❻ Halt button	Put the system in console mode.
❼ Diagnostic display	View error codes that may indicate potential problems with the system.
❽ Microphone input jack	Connect a microphone to the system.
❾ Speaker output jack	Connect a speaker or headphone for audio output.
❿ Telephone jack	Connect a telephone handset.
⓫ Audio input jack	Connect an audio input line.

Part III

Common System Information

Part III provides information common to both the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems. This part includes the following chapters:

Chapter	Title
13	Using the Console and Utilities Commands
14	LED Codes and Status/Error Messages
15	Recommended Spares List
16	SCSI ID Settings for Drives

13

Using the Console and Utilities Commands

Overview

Chapter Overview

This chapter contains the following topics:

- Console Commands List
- Alternate Consoles
- SCSI Utilities

Console Commands List

Each console command description contains a brief description of the command, its format, at least one example, and associated parameters and qualifiers.

The following table lists the console commands and their function.

Console Commands	Function
BOOT	Initiates the bootstrap process
CONTINUE	Changes operating system from console to program mode
DEPOSIT	Writes to memory, I/O, and register locations

Console Commands	Function
EXAMINE	Displays specific memory, I/O, and register locations
HALT	Halts the current program and changes 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.

Format

To execute the BOOT command, enter the following:

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

Environmental Variables

The environment variables required when you use the BOOT command are described in the next section. All parameter names are listed in alphabetical order and qualifiers are listed within that particular parameter.

BOOT Command Parameters

device_name

A device from which the firmware attempts to boot.

Note

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

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

OpenVMS AXP Device Identifiers	DEC OSF/1 AXP Device Identifiers	Device Type
DK	RZ	Fixed or removable disk
MK	TZ	Tape
ES	–	Ethernet, MOP protocol
–	EZ	Ethernet, BOOTP protocol

OpenVMS AXP Device Naming Convention: The device naming convention for the OpenVMS AXP operating system is `ddiunn`. The device naming convention for the DEC OSF/1 AXP operating system is `ddiu`. See Table 13–1 for a description of the OpenVMS AXP and DEC OSF/1 AXP device naming conventions.

Table 13–1 OpenVMS AXP and DEC OSF/1 AXP Device Naming Conventions

OpenVMS AXP Convention	DEC OSF/1 AXP 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

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

```
DKA600
```

Note

BOOT commands can either be in OpenVMS AXP or DEC OSF/1 AXP format when the system is operating under either OpenVMS AXP or DEC OSF/1 AXP. Two command syntaxes are available so as to match the current OpenVMS AXP and DEC OSF/1 AXP syntaxes.

Qualifiers

-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. Note that the filename must be in quotes.

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

Examples

The next example uses the default boot specification.

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

The next example boots from a disk device on SCSI controller A with a SCSI ID of 6 and an LUN of 0 and using the default flag values stored in the environment variable BOOTDEF_DEV.

```
>>> BOOT DKA600 [Return]
```

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

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

The next example performs a MOP boot to device ESA0 from filename E_BOOT.CMD.

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

The next example performs an OSF boot command from filename SENVMUNIX.

```
>>> BOOT -FI "SENVMUNIX" RZ3A [Return]
```

CONTINUE

Description

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

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

Processor initialization is not performed.

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

Format

To execute the CONTINUE command, enter the following:

>>> **C[ONTINUE]** Return

Example

The next example changes the operating system from console mode to the program mode.

>>> **CONTINUE** Return

DEPOSIT

Description

The DEPOSIT command is used to write to memory, I/O, and register 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)

Data Size (option)	Description
-L	Longword (32 bits) (default)
-Q	Quadword (64 bits)

The following qualifiers specify address type options:

Address Type (option)	Description
-VM	Virtual memory address
-PM	Physical memory address
PS[1]	Processor Status register (PS). The data size is always quadword.
-R	General Purpose register set, R0 through R31. The data size is always quadword.
-FR	Floating Point register set, F0 through F31. The data size is always quadword.
-U	Access to console private memory is allowed.
PC[1]	Program counter. The data size is always quadword.
SP[1]	Stack pointer. The data size is always quadword.

[1]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.

Examples

The next example deposits 01234567 into location 00400000 and five subsequent locations:

>>> **D -PM -N:5 400000 01234567** Return

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

>>> **E -PM -N:5 400000** 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
>>>
```

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

>>> **D -R -N:1F 0 0123456789ABCDEF** Return

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
```

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

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

To verify that the deposit was successful, 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.

Qualifiers_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 memory address
-PM	Physical memory address
-I	Internal Processor register
-U	Unprotects a protected memory location.
PS[1]	Processor Status register (PS). The data size is always quadword.
-R	General Purpose register set, R0 through R31. The data size is always quadword.
-FR	Floating Point register, F0 through F31. The data size is always quadword.
PC[1]	Program counter. The data size is always quadword.
SP	Stack pointer. The data size is always quadword.

[1]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.

Miscellaneous Options	Description
-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

The next 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.

>>> **DEPOSIT -PM -N:5 00100000 01234567** Return

>>> **EXAMINE -PM -N:5 001000000** Return

Result:

```
PMEM: 00000000.00100000 01234567
PMEM: 00000000.00100004 01234567
PMEM: 00000000.00100008 01234567
PMEM: 00000000.0010000C 01234567
PMEM: 00000000.00100010 01234567
PMEM: 00000000.00100014 01234567
```

The next example examines and displays byte data.

>>> **E -B 1000000** Return

Result:

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

The next example examines the word data size option.

>>> **E -W 1000000** Return

Result:

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

The next example examines the longword.

```
>>> E -L 1000000 Return
```

Result:

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

The next example examines the quadword.

```
>>> E -Q 1000000 Return
```

Result:

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

The next 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
>>>
```

The next example examines physical memory.

```
>>> E -PM 1000000 Return
```

Result:

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

The next example examines the physical memory longword.

```
>>> E -L -PM  1000000 Return
```

Result:

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

The next example examines the contents of the General Purpose register 0.

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

Result:

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

The next example examines the contents of the Processor Status register.

>>> **E PS** Return

Result:

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

The next example examines the contents of the stack pointer.

>>> **E SP** Return

Result:

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

The next example examines the contents of the program counter.

>>> **E PC** Return

Result:

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

HALT

Description

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

If the processor halts before 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
```

Sample result:

```
>>> ?2E HLTED
```

HELP

Description

The HELP command displays a brief list of commands, parameters, and qualifiers. If you specify a topic, then information for only that topic appears.

Format

To execute the HELP command, enter the following:

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

Examples

The next example displays a list of HELP topics.

```
>>> 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
```

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] {FAST_SCSI_A | FAST_SCSI_B} <{OFF | 0} | {ON | 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}>
```

The next 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         |
       FAST_SCSI_A   | FAST_SCSI_B | LANGUAGE      |
       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

The next 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.

Format

To execute the LOGIN command, enter the following:

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

Example

The next example shows a successful LOGIN command with the password feature enabled.

```
>>> LOGIN Return

PSWD0>>>
```

The next example shows an unsuccessful LOGIN command when the password feature is disabled.

```
>>> LOGIN Return
```

Result:

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

REPEAT

Description

The REPEAT command causes the console program to execute any specified tests until you terminate them.

To terminate the REPEAT command, press Ctrl C.

Format

To execute the REPEAT command, enter the following:

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

Examples

The next example shows the test ASIC being repeated.

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

The next example shows specific tests being repeated.

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

The next example shows a range of tests being repeated.

```
>>> 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 has three functions.

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

Format

To execute the SET command, enter the following:

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

Example

The next 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] {FAST_SCSI_A | FAST_SCSI_B} <{OFF | 0} | {ON | 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

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 are listed within that particular parameter.

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[1]		Description
1	Restart	A restart is executed.
2	Boot	A boot is executed.
3	Halt	A halt is executed.

[1]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

The next example sets the auto action to restart.

```
>>> SET AUTO_ACTION RESTART Return
```

Result:

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

The next example sets the auto action to reboot.

```
>>> SET AUTO_ACTION BOOT Return
```

Result:

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

The next example sets the auto action to halt.

```
>>> SET AUTO_ACTION 3 Return
```

Result:

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

BOOTDEF_DEV

The BOOTDEF_DEV parameter defines the default device that the operating system bootstraps. 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:

OpenVMS AXP Device Identifiers	DEC OSF/1 AXP 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.

Example

The next example sets the BOOT default device to DKA100.

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

Result:

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

In the next example, the system tries booting from ESA0 first and then booting from DKA600 if ESA0 fails.

```
>>> SET BOOTDEF_DEV ESA0, DKA600 Return
```

Result:

```
BOOTDEF_DEV = ESA0,DKA600
>>>
```

BOOT_OSFLAGS

The BOOT_OSFLAGS parameter defines additional default boot flags, which may be overridden 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

The next example sets the default BOOT_OSFLAGS value.

>>> **SET BOOT_OSFLAGS 0,0** Return

Result:

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

The next example sets up the CDROM update conversational boot.

>>> **SET BOOT_OSFLAGS 0,80** Return

Result:

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

BOOT_RESET

The BOOT_RESET parameter determines whether the console initializes 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[1]		Description
1	ON	Enables the system to be initialized before booting
0	OFF	Disables the system initialization before booting

[1]The qualifier can take the form of either a number or the actual qualifier name.

Example

The next example enables the system to be initialized before booting.

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

Result:

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

The next example disables system initialization before booting.

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

Result:

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

DIAG_LOE

The DIAG_LOE parameter allows a diagnostic to loop on an error (non-TURBOchannel devices only). All output is 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[1]		Description
1	ON	Enables loop on error feature
0	OFF	Disables loop on error feature

[1]The qualifier can take the form of either a number or the actual qualifier name.

Example

The next example sets the loop on error feature.

```
>>>SET DIAG_LOE ON [Return]
```

Result:

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

The next example also sets the loop on error feature.

```
>>>SET DIAG_LOE 0 [Return]
```

Result:

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

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[1]		Description
1	ON	Quick verify testing
0	OFF	Normal testing

[1]The qualifier can take the form of either a number or the actual qualifier name.

Example

The next example sets the quick verify testing.

>>> **SET DIAG_QUICK ON** Return

Result:

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

The next example sets the normal testing.

>>> **SET DIAG_QUICK 0** Return

Result:

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

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

The next example sets the diagnostic environment to the console mode.

>>> **SET DIAG_SECTION 1** Return

Result:

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

ENABLE_AUDIT

The ENABLE_AUDIT parameter defines whether 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[1]		Description
1	ON	Enables boot audit trail
0	OFF	Disables boot audit trail

[1]The qualifier can take on the form of either a number or the actual qualifier name.

Example

The next example enables the boot audit trail.

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

Result:

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

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

The next example selects a Thickwire network.

```
>>> SET ETHERNET THICK Return
```

Result:

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

The next example selects a 10BASE-T network.

```
>>> SET ETHERNET TENBT Return
```

Result:

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

FAST_SCSI_A and FAST_SCSI_B

The FAST_SCSI_A and FAST_SCSI_B console commands initialize the SCSI controllers. The variable FAST_SCSI_A is for bus A devices and FAST_SCSI_B is for bus B devices. When fast SCSI devices are connected and FAST_SCSI_A/B is set to ON, the SCSI firmware operates in fast SCSI mode. If both slow and fast SCSI devices are connected to the same bus and the FAST_SCSI_A/B command is ON, the firmware differentiates between devices.

Note that the recommended maximum bus length is 4 meters for slow SCSI devices and 3 meters for fast SCSI devices. When these limits are exceeded, the SCSI bus is likely to have errors. If your total bus length, including internal and external cables, is greater than 3 meters, you must set the FAST_SCSI_A/B command for that bus OFF.

Available Settings

You can set FAST_SCSI_A and FAST_SCSI_B to ON or OFF.

- ON to operate in slow and fast SCSI mode, device dependent
- OFF to operate in slow SCSI mode

Default Settings

The default settings for the FAST_SCSI_A and FAST_SCSI_B commands are OFF. Therefore, the SCSI controllers are initialized to operate in slow SCSI mode.

Command Example

To set the FAST_SCSI_A and FAST_SCSI_B commands, enter the appropriate command. The system responds as shown.

```
>>> SET FAST_SCSI_A ON Return
```

```
FAST_SCSI_A = ON
>>>
```

Using the ON parameter changes the default setting.

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
2) Deutsch (Schweiz)	German/Swiss
3) North American English	Default setting
4) English (British/Irish)	British/Irish
5) Español	Spanish
6) Français	French
7) Français (Canadian)	Canadian
8) Français (Suisse Romande)	Swiss French
9) Italiano	Italian
10) Nederlands	Netherlands
11) Norsk	Norwegian
12) Portugues	Portuguese
13) Suomi	Finnish
14) Svenska	Swedish

Qualifier	Description
15) Vlaams	Flemish

Example

The next example is executed from a graphic display. This command shows the default language, which is English. If you press Return, you 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 (Canadian)        15) Vlaams

3 >>>

LANGUAGE = 3
>>>
```

The next 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
>>>
```

MOP

The Maintenance Operations Protocol (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[1]	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.

[1]Default setting

Examples

The next example enables the network listener.

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

Result:

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

The next example disables the network listener.

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

Result:

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

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 (Model 600/600S AXP) or Chapter 7 (Model 800/800S AXP) for more information.

Format

To set the console password, enter the following:

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

Example

The next example sets the console password.

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

Result:

```
PSWD0>ENTER_OLD_PASSWORD [Return]
        (if one has been set)
PSWD1>ENTER_NEW_PASSOWRD [Return]
PSWD2>ENTER_NEW_PASSWORD [Return]
>>>
```

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[1]		Description
1	ON	Security feature enabled
0	OFF	Security feature disabled

[1]The qualifier can take the form of either a number or the actual qualifier name.

Example

The next example enables the security features.

```
>>> SET SECURE ON Return
```

Result:

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

The next example disables the security features.

```
>>> SET SECURE OFF Return
```

Result:

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

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

The next example sets the base address to a decimal base address.

```
>>> SET RADIX 10 Return
```

Result:

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

SCSI_A

The SCSI_A parameter sets the SCSI host ID. The default value is 7.

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

The next example sets the SCSI_A host ID to 6.

```
>>> SET SCSI_A 6 Return
```

Result:

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

SCSI_B

The SCSI_B parameter sets the host ID. The default value is 7.

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

The next example sets the SCSI B host ID to 6.

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

Result:

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

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

The next example sets a time delay of 4.

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

Result:

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

SERVER

The SERVER parameter modifies the SCC power-up diagnostics when the configuration is a server.

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 DEC 3000 Model 600 or 800 AXP or Model 600S or 800S AXP configuration, enter the following:

>>> **SET SERVER {qualifier}** Return

Qualifier

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

Qualifier[1]		Description
1	ON	When configuration is a server (Model 600S or 800S AXP)
0	OFF	When configuration is a workstation (Model 600 or 800 AXP) (default setting)

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

Examples

The next example sets the configuration to a server.

>>> **SET SERVER ON** Return

Result:

```
SERVER = ON
```

The next example sets the configuration to a non-server.

>>> **SET SERVER OFF** Return

Result:

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

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[1]		Description
1	ON	Enables trigger
0	OFF	Disables trigger

[1]The qualifier can take on the form of either a number or the qualifier name.

Example

The next example enables the trigger.

>>> **SET TRIGGER ON** Return

Result:

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

The next example disables the trigger.

>>> **SET TRIGGER 0** Return

Result:

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

SHOW

Description

The SHOW command displays information about:

- Environmental variable
- Console options
- Hardware configuration

Format

To execute the SHOW command, enter the following:

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

Example

The next example displays the current values for environmental variables.

```
>>> SHOW Return
```

Result:

```
AUTO_ACTION = HALT
BOOTDEF_DEV = ESA0,DKA600
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
FAST_SCSI_A = OFF
FAST_SCSI_B = OFF
LANGUAGE = 3
MOP = ON
SECURE = OFF
RADIX = 0
SCSI_A = 7
SCSI_B = 7
SERVER = OFF
TRIGGER = ON
>>>
```

Note

DIAG_LOE is available for loadable diagnostics only.

SHOW Command Parameters

Overview

The information in this section provides the environmental variables required when you use the SHOW command. All parameter names are listed in the far left margin in alphabetical order and qualifiers are listed within that particular parameter.

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 appears on the screen.

Function	Description
Restart	A restart is executed
Boot	A boot is executed
Halt	A halt is executed

Example

The next example shows the current setting of AUTO ACTION.

```
>>> SHOW AUTO_ACTION Return
```

Result:

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

BOOTDEF_DEV

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

Format

To execute the SHOW BOOTDEF_DEV command, enter the following:

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

Example

The next example shows booting from the ESAO, DKA600 device.

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

Result:

```
BOOTDEF_DEV = ESA0,DKA600
>>>
```

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

The next example displays the current OSFLAGS.

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

Result:

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

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 appears on the screen.

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

Example

The next example shows the BOOT RESET set to ON.

```
>>> SHOW BOOT_RESET Return
```

Result:

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

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

The next example shows the system configuration and device status.

```
>>> SHOW CONFIG Return

DEC 3000 - M600
Digital Equipment Corporation
VPP PAL X5.41-82000101/OSF PAL X1.28-82000201 - Built on 25-JUN-1993 09:54
```

```
TCINFO   DEVNAM    DEVSTAT
------   --------  --------
           CPU      OK KN17-xA - V3.0-S4A3-I077-sV2.0 - DECchip 21064 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 X5.41-82000101	VAX PALcode revision
OSF PAL X1.28-82000102	OSF PALcode revision
KN17-xA	Identifies the system type
V3.0	Identifies the system firmware revision
S4A3	Identifies the system ROM edit revision
I077	Identifies the I/O ROM EDIT firmware revision
sV2.0	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

DEVICE

The DEVICE parameter displays SCSI and Ethernet device information.

Format

To execute the SHOW DEVICE command, enter the following:

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

Example

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

```
>>> SHOW DEVICE
  BOOTDEV    ADDR    DEVTYPE   NUMBYTES  RM/FX   WP   DEVNAM   REV
  -------    ----    -------   --------  -----   --   ------   ---
  ESA0       08-00-2B-1A-38-31 , THICK
 ..HostID..  A/7     INITR
 ..HostID..  B/7     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

DIAG_LOE

The DIAG_LOE parameter displays whether the diagnostic loop on error feature is selected.

Format

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

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

Example

The next example shows that the current setting of DIAG_LOE is OFF.

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

Result:

```
DIAG_LOE = OFF
```

One of the following settings appears on the screen.

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

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 appears on the screen.

Diagnostic Setting	Description
ON	Quick verify testing
OFF	Normal testing

Example

The next example shows that the diagnostic mode is set to quick verify testing.

```
>>> SHOW DIAG_QUICK Return
```

Result:

```
DIAG_QUICK = ON
```

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 appears 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

The next example shows that the current diagnostic mode is in console mode.

```
>>> SHOW DIAG_SECTION Return
```

Result:

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

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 appears on the screen.

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

Example

The next example displays that the boot audit trail has been enabled.

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

Result:

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

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

The next example shows an error caused by a missing loopback connector.

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

Result:

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

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
>>>
```

LANGUAGE

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

Format

To execute the SHOW LANGUAGE command, enter the following:

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

Examples

The next example shows language from a graphics option.

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

Result:

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

The next example shows language from an alternate console.

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

Result:

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

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

The next example shows the memory status information for a DEC 3000 Model 600/600S AXP system.

```
SHOW MEMORY

DEC 3000 - M600  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 MB per SIMM card maximum (32 MB on each side).
Banks 0 and 1	Occupy slot 1. Two-sided SIMMs consisting of 64 MB.
Banks 2 and 3	Occupy slot 2. Single-sided SIMMs consisting of 16 MB.

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 appears on the screen.

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

Example

The next command enables examining the current MOP status, 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
>>>
```

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 appears on the screen.

SECURE Setting	Description
ON	Security features enabled
OFF	Security features disabled

Example

The next example shows the current SECURE value.

```
>>> SHOW SECURE Return
```

Result:

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

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 appears on the screen.

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

Example

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

```
>>> SHOW RADIX Return
```

Result:

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

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 appears on the screen.

Example

The next example shows the SCSI A for the system is 6.

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

Result:

```
SCSI_A = 6
```

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 appears on the screen.

Example

The next example shows the SCSI B for the system is 6.

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

Result:

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

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 appears on the screen.

Example

The next example shows that the current value of the SCSI reset is 4.

>>> **SHOW SCSI_RESET** Return

Result:

```
SCSI_RESET = 4
```

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 appears on the screen:

Setting	Description
ON	When configuration is a server (Model 600S or 800S AXP)
OFF	When configuration is a workstation (Model 600 or 800 AXP) (default setting)

Example

The next example shows the current SERVER configuration set to OFF.

>>> **SHOW SERVER** Return

Result:

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

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 appears 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

The next 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

For a list of diagnostic tools see Chapter 4 (for Model 600/600S AXP) or Chapter 9 (for Model 800/800S AXP).

Example

The next example runs the ASIC diagnostic.

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

Alternate Consoles

Overview

The system provides an alternate console for server configurations and in the event of a graphics subsystem failure. Console commands may be entered on a terminal connected to the printer port or from a network connection.

Printer Port Console

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.
- The alternate console switch located on the rear of the unit is in the up position when the 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 system is powered down and then powered up again. You may also change from the alternate graphics console using the SET CONSOLE command.

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 terminate because the commands use the network device, or they cause a connection timeout at the remote node.

To access the network console:

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

Once the system 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. Enter 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
```

Command	Meaning
$MC NCP	Enters the Network Control Program (NCP)
NCP> SHOW KNOWN CIRCUITS	Shows available circuits to which you can connect.
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. You must enter the correct password 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 causes the console to hang and you will have to power off the system.

SCSI Utilities

Table 13–2 lists each SCSI utility and a description of each one.

Table 13–2 SCSI Utility Options

Utility Name	Description
SHOW DEV	Displays SCSI device information.
ERASE	Hard disk eraser.
FORMAT	Diskette formatter.
VERIFY	Disk verifier.

Show Device Utility

The show device utility displays information about all SCSI devices attached to the SCSI bus.

The show device utility provides the following:

- Issues an inquiry command to obtain device types and device names
- Spins up disks
- Device capacity of disks
- Write-protection information
- Print information:

  ID, controller, logical unit number (LUN)
  OpenVMS or OSF 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 command:

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

Hard Disk Eraser Utility

The hard disk eraser utility spins up a disk and erases it.

Format

To erase a hard disk, enter the following command and respond to the prompts as described in Table 13–3.

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

Table 13–3 Erasing a Hard Disk

At this Prompt...	Enter...
SCSI_bus(A,B)>>>	A (internal bus) or B (external bus)

(continued on next page)

Table 13–3 (Cont.) Erasing a Hard Disk

At this Prompt...	Enter...
SCSI_id(0-7)>>>	SCSI ID Number
SCSI_lun(0-7)>>>	Logical unit number
DKA100 OK?	OK, if device listed is correct

Example

The next example erases device DKA100.

```
>>> 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
  >>>
```

Error Reporting

See Chapter 14.

Diskette Formatter Utility

The diskette formatter utility formats a diskette. After the utility starts, *do not terminate the utility or halt the machine*; this corrupts the device being tested, and you will have to run the utility again.

Format

To format a diskette, enter the following command and respond to the prompts as described in Table 13–4:

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

Table 13–4 Formatting a Diskette

At the Prompt...	Enter...
SCSI_bus(A,B)>>>	A (internal bus) or B (external bus)
SCSI_id(0-7)>>>	SCSI ID Number
SCSI_lun(0-7)>>>	Logical unit number

Example

The next example formats the device DKA500.

```
>>> T SCSI FORMAT [Return]
SCSI_bus(A,B)>>>A
SCSI_id(0-7)>>>5
SCSI_lun(0-7)>>>0
```

Error Reporting

See Chapter 14.

Disk Verifier Utility

The disk verifier utility verifies that all blocks on a disk can be read.

Format

To verify a disk, enter the following command and respond to the prompts as described in Table 13–5:

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

Table 13–5 Verifying a Disk

At the Prompts...	Enter...
SCSI_bus(A,B)>>>	A (internal bus) or B (external bus)
SCSI_id(0-7)>>>	SCSI ID Number
SCSI_lun(0-7)>>>	Logical unit number

Example

The next example verifies device DKA100.

```
>>> 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
 >>>
```

Error Reporting

See Chapter 14.

14

LED Codes and Status/Error Messages

Overview

Overview

This chapter contains the following topics:

- LED Codes
- Console Error Messages
- Console Halt Messages
- ASIC Diagnostic 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
- 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 Status Messages

LED Codes

Serial ROM LED Codes

The system displays a series of hexadecimal codes at the beginning of the power-up test. The codes, the corresponding test description, and possible reasons for a test failure are described in Table 14–1.

Note

See Table 5–2 for a list of the LED displays and corresponding hex codes for the DEC 3000 Model 600 /600S AXP system.

Table 14–1 Power-Up Test Serial ROM Codes

LED Code	Test Description	Reason for Failure
FF	Set all 8 Multiplexer Control Registers (MCRs) to 128M.	MCR did not read back as expected (fatal error, branches to SROM miniconsole).
FE	Mapping out an MCR per macrocoders manual (only appears if an error occurs).	MCR did not read back as expected (fatal error, branches to SROM miniconsole).
FD	Memory sizing completed.	All MCRs mapped out (no memory detected - fatal error, branches to SROM miniconsole).
FC	Mapping an MCR.	Only MCR did not read back as expected (fatal error, branches to SROM miniconsole).
FB	Memory configuration completed.	Should never stop here.
FA	Memory test with non-BCACHE bit SET, Dcache OFF, and mchk enabled	If read as .NE. write, send error dump to SROM port and branch to SROM miniconsole.

(continued on next page)

Table 14–1 (Cont.) Power-Up Test Serial ROM Codes

LED Code	Test Description	Reason for Failure
F9	Memory test with non-BCACHE bit CLEAR, Dcache OFF, and mchk enabled.	If read as .NE. write, send error dump to SROM port and branch to SROM miniconsole.
F8	Memory test with non-BCACHE bit SET, Dcache ON, and mchk enabled.	If read as .NE. write, send error dump to SROM port and branch to SROM miniconsole.
F7	Memory test with non-BCACHE bit CLEAR, Dcache ON, and mchk enabled.	If read as .NE. write, send error dump to SROM port and branch to SROM miniconsole.
F6	tc register test and initialization	Should never stop here. If read as .NE. write, send error dump to SROM port.
F5	Coreio register test and initialization	Should never stop here. If read as .NE. write, send error dump to SROM port.
F2	Look for I/O ROM manfacturing data.	Read of I/O ROM manfacturing data did not return data expected. Send error dump to SROM port and branch to SROM miniconsole.
F1	Completed load of I/O ROM into memory.	Should never stop here.
30	SROM code execution completed normally.	Should never stop here.
20	Machine check.	Send mchk dump to SROM port and to SROM miniconsole.

If a failure occurs during this portion of the power-up procedure, perform the following steps:

1. Verify that there is a good connection between the system module and I/O module.
2. Verify that all memory modules are properly installed. You may need to reseat memory modules.

3. Initiate the power-up sequence. If a failure occurs, replace the following FRUs and verify that the system is operating correctly:
   - System module
   - I/O Module

ASIC LED Codes

The following LED codes represent ASIC power-up tests. If an error occurs during one of these tests, the screen displays a FRU code and error code.

LED Code	Description
35	Scatter/Gather Map (SGMAP) 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, the screen displays a FRU code and error code.

LED 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 to 2A	Reserved
2B	LLSC load-locked/store-conditional tests
2C	BCTP Bcache Tag Parity detection
2D	ECC Detection
2E	Reserved
2F	Clear memory to zeros

NVR LED Codes

The following LED codes represent NVR diagnostic tests. If an error occurs during one of these tests, the screen displays a FRU code and error code.

LED Code	Description
3A	Check Battery test
3B	Tests NVR registers
3C	Assure Clock is Ticking test
3D	Test TOY registers
3E	Interrupt test
3F	All tests passed

SCC LED Codes

The following LED codes represent SCC diagnostic tests. If an error occurs during one of these tests, the screen displays a FRU code and error code.

LED Code	Description
40	SCC Self-test starting
41	SCC Self-test is connecting to driver
42	SCC Reset/Init test
43	SCC Modem test
44	SCC Polled test
45	SCC Interrupt test
46	SCC DMA test
47	SCC LK401 test
48	SCC Mouse test
49-4E	Reserved
4F	SCC Test complete

NI LED Codes

The following LED codes represent NI diagnostic tests. If an error occurs during one of these tests, the screen displays a FRU code and error code.

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
56	Test LANCE MISS and BUFF Errors test
57	Test LANCE Collision detection test
58	LANCE Address filtering test

LED Code	Description
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, the screen displays a FRU code and error code.

LED Code	Description
70	Register test
71	Tone test
72	Digital loop test
73	Analog loop test
74	Interrupt test
75	DMA Test
77	Record utility test
78	Repeat test
79	Playback test
7A	ISDN Init
7F	All tests passed

SCSI LED Codes

The following LED codes represent SCSI diagnostic tests. If an error occurs during one of these tests, the screen displays a FRU code and error code.

LED Code	Description
60	Dual SCSI ASIC register test
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

At the end of the power-up sequence, the diagnostic LEDs should display the DD hex code for console entry.

If the sequence halts at any code from EF to DE, then reseat the system module and run the power-up sequence again.

LED Code	Description
EF	Entry
EE	Powerup
ED	Powerup and saved state is 2 (put a hex 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 >>>
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, the screen displays a FRU code and error code.

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.

LED Code	Description
98	ROM object called halt.
99	Invalid callback called.
9A	Unsupported callback called; callback cuurently not in this release.

Console Error Messages

Console Error Messages

The following table lists console error messages for improperly entered commands:

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 found by parser.
? 25 LTL	Too many characters entered on command line.
? 26 ILL ADDR	Invalid address 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.

Message	Description
? 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.
? 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 example shows the results when you enter a halt sequence. The next table lists the console halt messages that result from the sequence.

```
?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 mode entered because the external halt button was pressed.

nn	Message	Meaning
06	HLT INST	Console mode entered because a HALT instruction was executed.
08	KSP INVAL	Console mode entered because PALcode detected an invalid kernel stack pointer while building a stack frame.
18	HW MCHK	Console mode entered because PALcode detected a nonrecoverable machine check.
20	SCBB BAD	Console mode 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 values are in hexadecimal.

If the diagnostic fails, reseat the system and I/O module.

Run the ASIC diagnostic to verify system operation. If a failure reoccurs, replace the system module and run the ASIC diagnostic to ensure that the failure has been corrected.

Error Code	Description	Replace
18	ASIC$K_SG_PASS1_FAILED	System module
1A	ASIC$K_SG_PASS2_FAILED	System module
1C	ASIC$K_SG_PARITY_FAILED	System module

NVR Diagnostic Error Codes

NVR Diagnostic Error Codes

The following table contains the error codes produced by the NVR diagnostic.

All values are in hexadecimal.

If the diagnostic fails, reseat the system and I/O module.

Run the NVR diagnostic to verify system operation. If a failure reoccurs, then replace the FRU listed for that error. Except for the last one, only one FRU should be replaced. Run the NVR diagnostic after replacing the FRU to determine if the 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 Module, system module[1]

[1]Replace the I/O module, then run the NVR diagnostic. If the diagnostic fails, then replace the system module.

ISDN Diagnostic Error Codes

ISDN Error Codes

The following table lists the error codes produced by the ISDN diagnostic.

All values are in hexadecimal.

If the diagnostic fails, then perform the following steps:

1. Reseat the audio cable between the audio module and the I/O module.
2. Reseat the system module and I/O module connection.
3. Run the ISDN diagnostic to verify system operation. If a failure reoccurs, then replace the FRU listed for that error. Replace FRUs one at a time, running the ISDN diagnostic after replacing each one to determine if the failure has been corrected.
    a. Audio cable
    b. Audio module
    c. 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
10	Data miscompare testing Main Audio Processor Mode register 1

Error Code	Description
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
24	Data miscompare testing internal digital loopback using MCR2
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 values are in hexadecimal.

If the diagnostic fails, then perform the following steps:

1. Check all loopback connectors.
2. Reseat the keyboard connection.
3. Reseat the mouse connection.
4. Reseat the system module and I/O module connection.

5. Run the SCC diagnostic to verify system operation. If a failure reoccurs, then replace the FRU listed for that error. Replace FRUs one at a time, running the ISDN diagnostic after replacing each one to determine if the failure has been corrected.

Error Code	Description	Replace
10	SCC reset test 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 failed due to transfer timeout.	I/O Module
32	SCC polled test failed due to parity error on receive.	I/O Module
34	SCC polled test failed due to framing error on receive.	I/O Module
36	SCC polled test failed due to overrun error in receive.	I/O Module
38	SCC polled test 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 failed due to transfer timeout.	Keyboard, I/O Module
52	SCC LK401 Test 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 with which to test.	

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 lists error codes produced by the SCSI diagnostic.

All values are in hexadecimal.

If the diagnostic fails, then perform the following steps:

1. Make sure the SCSI device is properly connected to the system.
2. Reseat the system module and I/O module connection.
3. Run the SCSI diagnostic to verify system operation. If a failure reoccurs, then replace the FRU listed for that error. Replace FRUs one at a time, running the SCSI diagnostic after replacing each one to determine if the failure has been corrected.

Error Code	Description	Replace
02	SCSI ASIC Register test failed testing bus A.	System module, I/O Module
04	SCSI Controller register test failed testing bus A.	System module, I/O Module
06	SCSI Interrupt test failed testing bus A.	System module, I/O Module

Error Code	Description	Replace
08	SCSI Data transfer test failed testing bus A.	SCSI A Device, I/O Module, system module
0A	SCSI Map error test failed testing bus A.	SCSI A Device, I/O Module, system module
0C	SCSI Minimal device test failed testing bus A.	SCSI A Device, I/O Module, system module
52	SCSI ASIC Register test failed testing bus B.	SCSI B Device, I/O Module, system module
54	SCSI Controller register test failed testing bus B.	SCSI B Device, I/O Module, system module
56	SCSI Interrupt test failed testing bus B.	SCSI B Device, I/O Module, system module
58	SCSI Data transfer test failed testing bus B.	SCSI B Device, I/O Module, system module
5A	SCSI Map error test failed testing bus B.	SCSI B Device, I/O Module, system module
5C	SCSI Minimal device test failed testing bus B.	SCSI B Device, I/O Module, system module

NI Diagnostic Error Codes

NI Error Codes

The following table lists error codes produced by the NI diagnostic.

All values are in hexadecimal.

If the diagnostic fails, then perform the following steps:

1. Reseat the loopback connector (for error codes A0 to AC).

2. Reseat the system module and I/O module connection.
3. Run the NI diagnostic to verify system operation. If a failure reoccurs, then replace the FRU listed for that error. Replace FRUs one at a time, running the NI diagnostic after replacing each one to determine if the failure has been corrected.
   - Loopback connector (for error codes A0 to AC)
   - System module
   - 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.
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.

Error Code	Description
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.
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.

Error Code	Description
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 initialization.
E8	LANCE DMA: DMA failed during transmit.
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 lists error codes produced by the memory diagnostic.

All values are in hexadecimal.

If the diagnostic fails, reseat the memory modules.

Error Code	Description	Replace
02	CELL data did not equal pattern expected on forward pass.	Memory module
04	CELL data did not equal pattern expected on reverse pass.	Memory module
10	ADDR data does not equal address as expected.	Memory module
20	LLSC load-locked/store-conditional failure.	Memory module

ASIC Diagnostic Status/Error Messages

ASIC Status/Error Messages

The ASIC disagnostic displays the following status/error information when an error occurs:

```
T-STS-ASIC - ASIC$SG_MAP TEST
          ? T-ERR-ASIC - SCATTER/GATHER MAP REGISTER  DATA MISMATCH
          ? T-ERR-ASIC - TNF - %s
```

NVR Diagnostic Status/Error Messages

NVR Status/Error Messages

The NVR diagnostic displays the following status/error information 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

            ? T-ERR-NVR - TNF - %s
```

ISDN Diagnostic Status/Error Messages

ISDN Status/Error Messages

The ISDN diagnostic displays the following status/error information when an error occurs.

The failed FRU for all error messages is the I/O module.

Before replacing the I/O module, *first* reseat the module and run the ISDN diagnostic to see if the failure is cleared.

```
T-STS-ISDN - REGISTER
    ? T-ERR-ISDN - LIU_REG DATA MISCOMPARE
    failing address  =  (indirect address of LIU register)
    data read        =  (data read)
    data expected    =  (data expected)

    ? T-ERR-ISDN - REGISTER - DATA MISCOMPARE
    failing address = (indirect address of failing register)
    data read       = (data read)
    data expected   = (data expected)

T-STS-ISDN - TONE
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
    ? T-ERR-ISDN - DIGITAL_LOOP - DATA MISCOMPARE

T-STS-ISDN - ANALOG_LOOP
    ? T-ERR-ISDN - ANALOG_LOOP - DATA MISCOMPARE

T-STS-ISDN - INTERRUPT
    ? 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-ERR-ISDN - HAVEN'T RECEIVED ALL INTERRUPTS

     ? T-ERR-ISDN - TNF - %s

T-STS-ISDN - DMA
    ? T-ERR-ISDN - TIME OUT
    ? T-ERR-ISDN - INVALID INTERRUPT RECEIVED
      data read  = (current value of System Interrupt register)
      data exp   = (interrupt expected)
    ? T-ERR-ISDN - DMA NEVER OCCURRED

    ? T-ERR-ISDN - DATA MISMATCH
      fail addr  = (sparse address of mis-matched data)
      data read  = (data read)
      data exp   = (data expected)

T-STS-ISDN - RECORD: 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: Allows user to speak and hear their message
             simultaneously
T-STS-ISDN - PLAYBACK: Play back what was recorded using the RECORD utility
```

SCC Diagnostic Status/Error Messages

SCC Diagnostic Status Messages

The following table lists the SCC diagnostic status messages and their meanings.

Message	Meaning
T-STS-SCC - Reset/Init Test	SCC Reset test is running.
T-STS-SCC - Modem Test	SCC Modem test is running.
T-STS-SCC - Poll test	SCC POLLED Mode test is running. The polled test currently runs only in internal loopback mode.
T-STS-SCC - Intrpt Test	SCC Interrupt test is running.
T-STS-SCC - DMA test	SCC DMA Test is running. The printer port is tested only when the console is not attached to it.
T-STS-SCC - LK401 test	LK401 Test is running.
T-STS-SCC - Mouse test	Mouse test is running.

SCC Diagnsotic Error Messages

The following table lists the SCC diagnostic error messages and their meanings.

Note

All MODEM error messages require a modem loopback and use of service mode (DIAG_SEC 2) or an error will occur.

Message	Meaning
? T-ERR-SCC-MODEM - CTS bit Exp = 0 Rec = 1	Modem test expected the CTS bit to be set to 0 but it was read as a 1.
? T-ERR-SCC-MODEM - CTS bit Exp = 1 Rec = 0	Modem test expected the CTS bit to be set, but it is clear.
? T-ERR-SCC-MODEM - DSR bit Exp = 0 Rec = 1	Modem test expected the DSR bit to be set to 0, but it was read as a 1.
? T-ERR-SCC-MODEM - DSR bit Exp = 1 Rec = 0	Modem test expected the DSR bit to be set, but it is clear.
? T-ERR-SCC-MODEM - DCD bit Exp = 0 Rec = 1	Modem test expected the DCD bit to be set to 0, but it was read as a 1.
? T-ERR-SCC-MODEM - DCD bit Exp = 1 Rec = 0	Modem test expected the DCD bit to be set, but it is clear.
? T-ERR-SCC-MODEM - RI bit Exp = 0 Rec = 1	Modem test expected the RI bit to be set to 0, but it was read as a 1.
? T-ERR-SCC-MODEM - RI bit Exp = 1 Rec = 0	Modem test expected the RI bit to be set, but it is clear.
? T-ERR-SCC - POLLED test - Transfer timed out	Transfer has not completed. This usually indicates that transmitted characters were not received.
? T-ERR-SCC-DMA - Xfer tmout, Line x	DMA Transmit has not completed on line x.
? T-ERR-SCC-DMA - Unexp ints, Line x; T-STS-SCC - Exp = %x Rec = %x	System did not receive the expected interrupts.
? T-ERR-SCC-DMA - Data buf miscomp, Line x; T-STS-SCC - Addr = %x Exp = %x Rec = %x	Data received by the DMA WRITE was not the same as the data transmitted on line x.
? T-ERR-SCC-LK401 - %x char rcvd	Response received from the LK401 was less than the number of characters expected.
? T-ERR-SCC-LK401 - ill resp rcvd	Response received from the LK401 was not the correct response.
? T-ERR-SCC-Mouse - %x char rcvd	Response received from the mouse was less than the number of characters expected.
? T-ERR-SCC-Mouse - ill resp rcvd	Mouse has failed its power-up self-test.
? T-ERR-SCC-CCR - Parity error	Character received contains a parity error.
? T-ERR-SCC-CCR - Framing error	Character received contains a framing error.
? T-ERR-SCC-CCR - Overrun error	Character received contains an overrun error.
? T-ERR-SCC-CCR - rec (%x) != exp (%x)"	Character received does not equal the character transmitted.
? T-ERR-SCC-INTR - SCC%x not set at COREIO	SCC bit %x is not set at COREIO.

Message	Meaning
? T-ERR-SCC-INTR - Not set in TCASIC	COREIO interrupt is not set at the TURBOchannel ASIC.
? T-ERR-SCC-INTR - Not set at CPU	Message is not set at the DECchip 21064 CPU.
? T-ERR-SCC - TNF - %s	Message is printed out when the user requests a test that does not exist. The test name the user enters is placed where the %s is placed.

SCSI Diagnostic Status/Error Messages

SCSI Status Messages

The following are 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.

Note

The following error messages could indicate an I/O module failure. Before replacing the module, try reseating the module.

```
? 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) - SCSI Ctrl Register test - Parity Error

? 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

The following error messages could indicate a SCSI device or I/O module failure. Before replacing the device or module, try reseating them.

```
   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 - inondma inq

? T-ERR-SCSI (bus) - Data Trans test - dma inq

? 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)
  T-ERR-SCSI TNF   - %s
```

Note

The following error messages could indicate a system module failure. Before replacing the module, try reseating the module.

```
? 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)

? 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

The following error messages could indicate a SCSI device or I/O module failure. Before replacing the device or module, try reseating them.

```
? 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)
```

Message	Meaning
address	Sparse address of failing location.
exp data	Expected data.
actual data	Actual data.
bus	A or B.
device id	SCSI ID number.
logical unit number	Logical unit number of device.
info	Informational value from following table.
actcmd	Original command that was sent to SCSI bus.
curcmd	Actual command that failed.
status	SCSI controller Status register contents at time of error.
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 two values are printed out when a request sense command is executed.

Message	Meaning
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 Control Status register.
02	Gross error bit clear in Control Status register.

Information	Description
03	Interrupt bit clear in Control Status register.
04	Bus service bit clear in Control Status register.
05	Disconnect bit clear in Control Interrupt register.
06	Disconnect bit set in Control Interrupt register.
07	Illegal command bit clear in Control Interrupt register.
08	Illegal command bit set in Control 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.
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 did not drop off bus.
26	Illegal phase.

Information	Description
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 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.
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 will not clear.
36	Control Interrupt register contents different from expected.
37	Control Status register 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.

Information	Description
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.
A3	Console function error.
A4	Illegal floppy drive.
A5	Illegal floppy media.

NI Diagnostic Status/Error Messages

Status Messages

The following are 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

Note

The following messages may indicate a failing I/O module. Before replacing the module, first verify that the loopback connector is installed and try reseating the module.

```
? T-ERR-NI - NVR err

? 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 - 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)

? 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)
```

Message	Meaning
error code	Error code from NI error codes section.
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.
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.

Message	Meaning
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 are 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)
```

Error Messages

The following are the memory diagnostic error messages.

Note

The following messages may indicate a failed memory motherboard or memory module. Before replacing, try reseating the board and modules.

```
? 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)
```

Note

The following messages may indicate a failed system module. Before replacing, try reseating the module.

```
? 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
```

Message	Meaning
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.

Message	Meaning
ERR-MIPS - DID NOT FIND ROM IN SLOT <N>	No ROM was found at TURBOchannel slot N.
ERR-MIPS - UNRECOGNIZED COMMAND	An unrecognized command was passed to the MIPS emulator.
ERR-MIPS - REX COMMAND NOT SUPPORTED	The REX command passed to the emulator is not supported at this time.
ERR-MIPS - COULD NOT LOAD ROM OBJECT <object_name>	The object called <object_name> was not found in the option ROM.
ERR-MIPS - ROM OBJECT REPORTED A SEVERE ERROR	A TURBOchannel ROM has returned a severe error code to the emulator.

15

Recommended Spares List

Spares List for the DEC 3000 Model 600/600S AXP

Spares List

Table 15–1 lists the recommended spare parts for the DEC 3000 Model 600/600S AXP system.

Table 15–1 DEC 3000 Model 600/600S AXP Spares List

Part	Part Number
I/O Board	54-21813-02
System board	54-23153-03
MMB	54-21815-01
Power supply	H7816-AA
SIMM, 2 MB	54-21139-BA
SIMM, 4 MB	54-21139-CA
SIMM, 8 MB	54-21139-DA
SIMM, 16 MB	54-21139-EA
SIMM, 32 MB	54-21139-FA
Drive power cable	17-03489-01
SCSI Cable, long	17-03487-01

(continued on next page)

Table 15–1 (Cont.) DEC 3000 Model 600/600S AXP Spares List

Part	Part Number
SCSI Cable, short	17-03488-01
TURBOchannel FRUs	
TC Dual DMA SCSI	54-21833-01
TC NVRAM (1 MB)	54-21856-01
Loopbacks and Terminators	
Printer port loopback	12-25083-01
Thickwire Ethernet loopback	12-22196-01
SCSI Terminators	12-30552-01
Fast SCSI terminators	12-41296-01
10BASE-T Ethernet loopback	H4082-AA
Modem port loopback	29-24795

DEC 3000 Model 600/600S AXP TURBOchannel Options Parts List

Options Part Numbers

Table 15–2 lists the part numbers for the TURBOchannel options.

Table 15–2 DEC 3000 Model 600/600S AXP TURBOchannel Options List

Option	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 1280 x 1024, 72 HZ 1280 x 1024, 66 HZ (HX)	PMAGB-BA	54-21143-01
Smart frame buffer 1280 x 1024, 72 HZ 1024 x 864, 60 HZ (HX)	PMAGB-BC	54-21143-02
Smart frame buffer 1280 x 1024, 72 HZ 1024 x 768, 72 HZ (HX)	PMAGB-BE	54-21143-03
2D Graphics accelerator (PX)	PMAG-CA	54-20314-01
True color frame buffer 66 HZ (TX)	PMAG-JA	30-35790-01
True color frame buffer 72 HZ (TX)	PMAGB-JA	30-35790-02

(continued on next page)

Table 15–2 (Cont.) DEC 3000 Model 600/600S AXP TURBOchannel Options List

Option	Option Number	Part Number
True color frame buffer picture-in-picture board		30-35788-01
Lo 3D graphics accelerator 66 HZ (PXG)	PMAG-DA	54-20185-01
Lo 3D graphics accelerator 72 HZ (PXG+)	PMAGB-DA	54-20185-02
Lo 3D graphics accelerator 66 HZ (PXG+)	PMAGB-DC	54-20185-04
Mid 3D graphics accelerator 66 HZ (PXG)	PMAG-EA	54-20185-02
Lo 3D graphics accelerator 72 HZ with Z-buffer (PXG+)	PMAGB-EA	54-20185-05
Lo 3D graphics accelerator 66 HZ with Z-buffer (PXG+)	PMAGB-EC	54-20185-06
Hi 3D graphics accelerator 66 HZ (PXG turbo)	PMAG-FA	54-20114-01
Hi 3D graphics accelerator 72 HZ (PXG turbo+)	PMAGB-FA	54-20114-02
Fast SCSI	PMAZC	
8-Bit Z-buffer		54-20410-AA
16-Bit Z-buffer		54-20352-AA
8-Plane video SIMM		54-20116-AA

Recommend Spares List for the DEC 3000 Model 800/800S AXP

Spares List

Table 15–3 lists the recommended spare parts and part numbers for the DEC 3000 Model 800/800S AXP system.

Table 15–3 DEC 3000 Model 800/800S AXP Spares List

Part Number	Description	Comment
54–21139–C	4-MB Memory module	Half-populated module
54–21139–D	8-MB Memory module	Full-populated module
54–21141–01	Memory motherboard	
54–21145–01	Lights and switch module	Rackmount unit only
54–21145–02	Lights and switch module	Pedestal mount only
54–21147–02	I/O Module	
54–23153–01	DEC 3000 Model 800 AXP CPU	
54–23203–01	Regulator module (3.45 V)	
H3103	Printer port loopback	
H4082–AA	Twisted pair loopback	10BASE-T
H7883–YA	Power supply	
12–23609–12	Fan	

(continued on next page)

Table 15–3 (Cont.) DEC 3000 Model 800/800S AXP Spares List

Part Number	Description	Comment
12–25083–01	Serial line loopback	
12–22196–01	Ethernet Thickwire loopback	
12–30552–01	SCSI Terminator	
12–36064–01	Removable rivets	Used on modules
17–03314–01	Removable media tray SCSI data cable	
17–03315–01	Internal SCSI data cable	
17–03316–01	Internal 20-conductor power cable	
17–03317–01	Internal fan power cable	
17–03318–01	Internal 16-conductor power cable	
17–03319–01	Internal 14-conductor power cable	
17–03320–03	Internal 12-conductor power cable	
17–03344–01	Removable tray power cable	
17–03395–01	Internal ac power cable	
17–03501–01	LSM Data cable	
17–03502–01	Audio cable	
17–00083–43	Power cord	
17–02640–02	Desktop mouse and keyboard cable	
70–29562–01	Audio assembly	
70–29563–01	Side panel	Pedestal mount

(continued on next page)

Table 15–3 (Cont.) DEC 3000 Model 800/800S AXP Spares List

Part Number	Description	Comment
70–2956–01	International power cord	
70–30266–01	Top cover assembly	
74–43810–01	Fan boot	Same for all three fans
74–43830–01	Front bezel	
74–44072–01	Rear bezel	
74–44073–01	Top cover	
74–44141–01	Audio module cover	
74–44142–01	Audio box	
74–44487–02	Removable media bezel	
74–44620–01	LSM Door	
74–44649–01	Audio bezel cover	

16

SCSI ID Settings for Drives

Setting a Unique SCSI Address

Overview

Each internal drive has a SCSI address that must be unique. If more than one drive is set to the same SCSI address, the system cannot communicate with the drives.

When your drive arrives from the factory, all SCSI jumpers may be attached so that they are not lost during shipment. If this is the case, the address is set to 7 and must be changed.

TURBOchannel modules and memory modules do not have SCSI addresses.

This chapter contains an illustration for each of the drives supported on the DEC 3000 Model 600/600S AXP and DEC 3000 Model 800/800S AXP systems.

Selecting SCSI Address

There are six possible SCSI ID settings (SCSI ID setting 7 is reserved for the controller). Table 16–1 contains the settings that Digital recommends.

Table 16–1 SCSI ID Settings

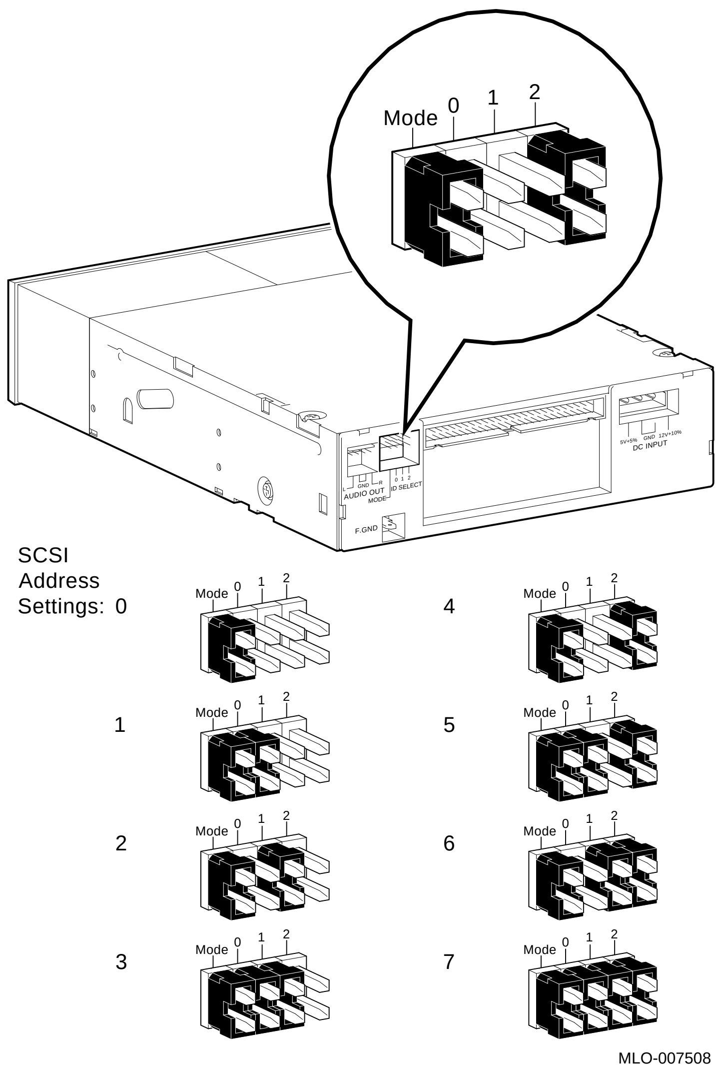
Drive Type	SCSI ID Setting
Fixed disk drive	0, 1, 2, 3
Compact disc drive	4
Tape or diskette drive	5
Tape or diskette drive	6

Changing the Setting

Follow these steps to change a SCSI ID setting:

Jumpers:	Jumpers are removable electrical connectors. Carefully remove or replace jumpers using tweezers or another small tool. Save any SCSI jumpers you remove; you may need them later.
Switches:	Carefully set the switches using a small pointed instrument, such as the tip of a ball-point pen. Do not use a pencil to set the SCSI switches; graphite particles can damage switches.

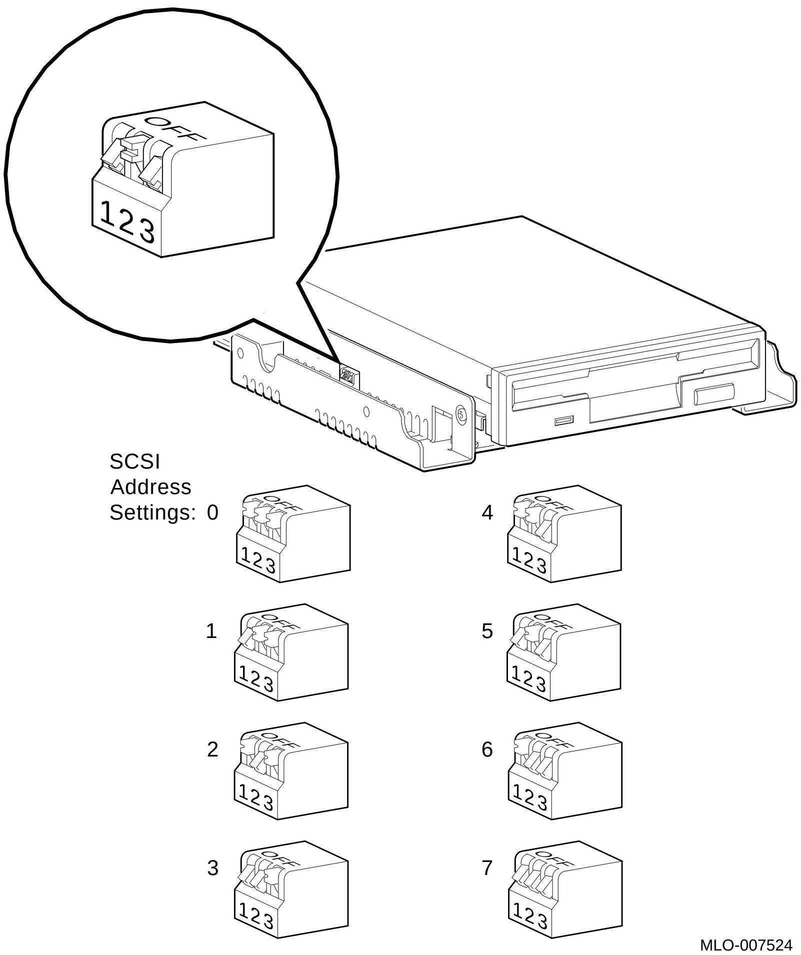
Figure 16–1 RRD42 Compact Disc Drive SCSI ID Settings



Mode Jumper

The mode jumper allows the drive to work with your operating system. The jumper must be in place for both the OpenVMS AXP and DEC OSF/1 AXP operating systems.

Figure 16–2 RX26 Diskette Drive SCSI ID Settings



Setting the Unit Select Switch

Verify that the unit select switch is set to 2, as shown in Figure 16–3.

Figure 16–3 RX26 Unit Select Switch

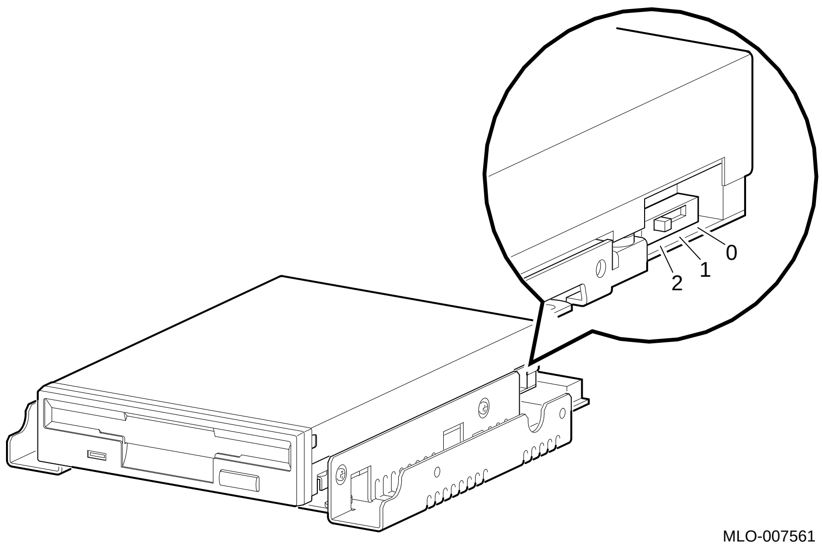
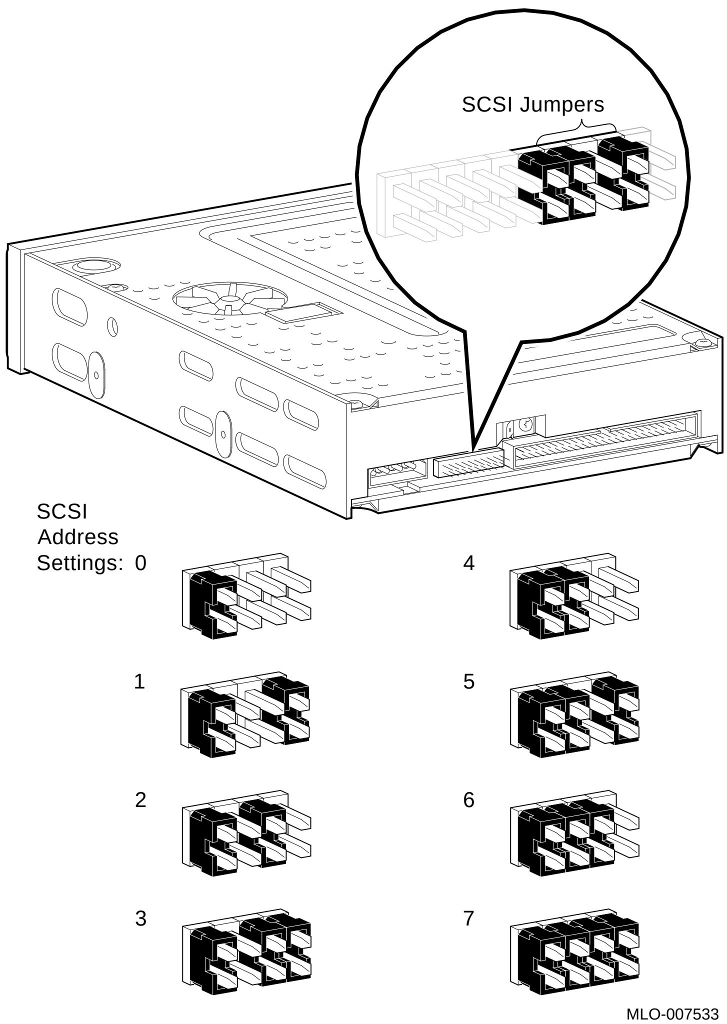


Figure 16–4 TZK10/TZK11 Tape Drive SCSI ID Settings



The DADS Jumper

Before using the TZK10/11 drive, the DADS jumper is set for the desired operating system. The DADS jumper is the fifth jumper from the right side, and must be in place for both the OpenVMS AXP and DEC OSF/1 AXP operating systems.

Figure 16–5 TZ30 SCSI Switches

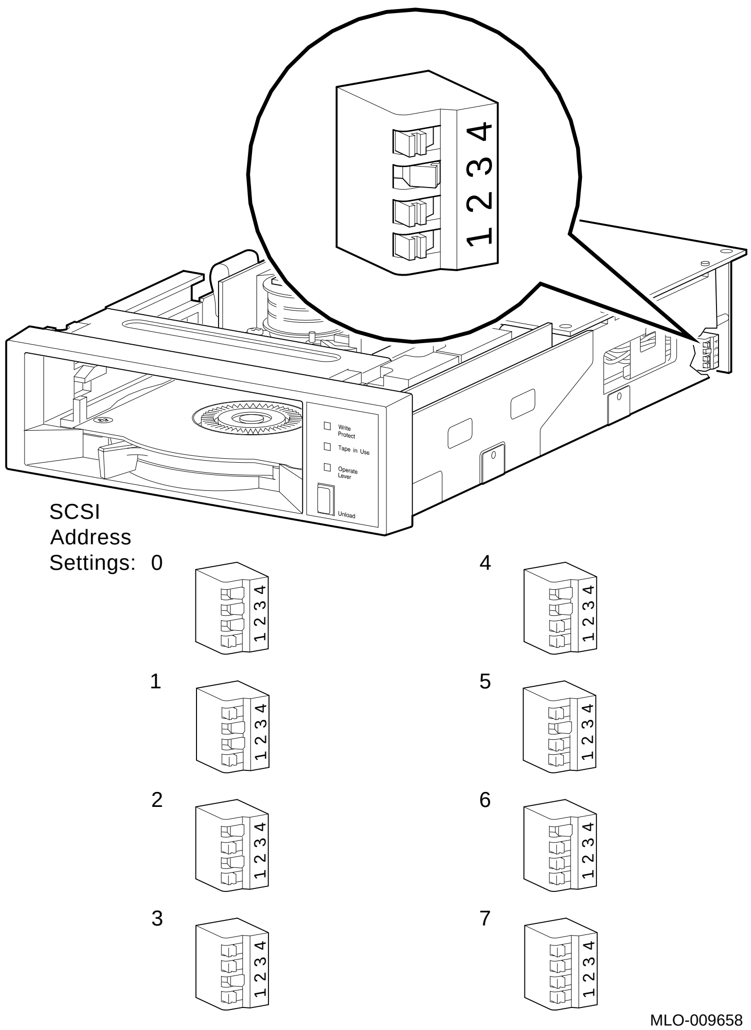
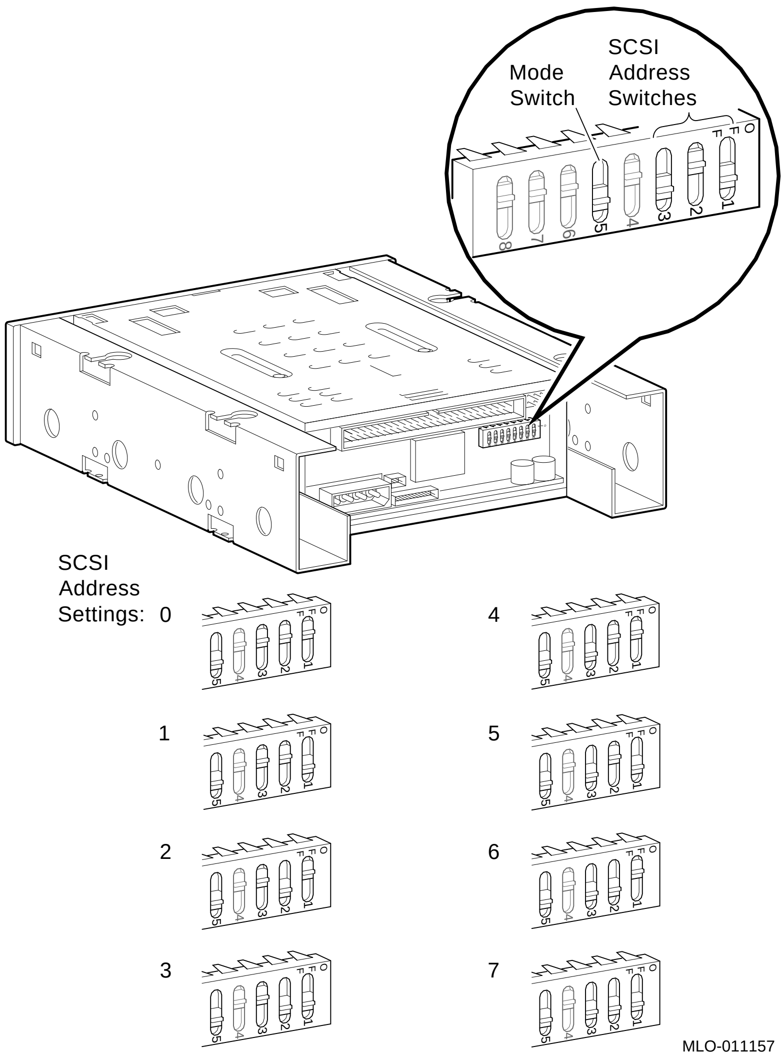


Figure 16–6 TLZ06 Tape Drive SCSI ID Settings



Mode Switch

Switch 5 (Mode) allows the drive to work with your operating system, and must be set in the down position for both the OpenVMS AXP and DEC OSF/1 AXP operating systems.

Figure 16–7 RZ24L Fixed Disk Drive SCSI ID Settings

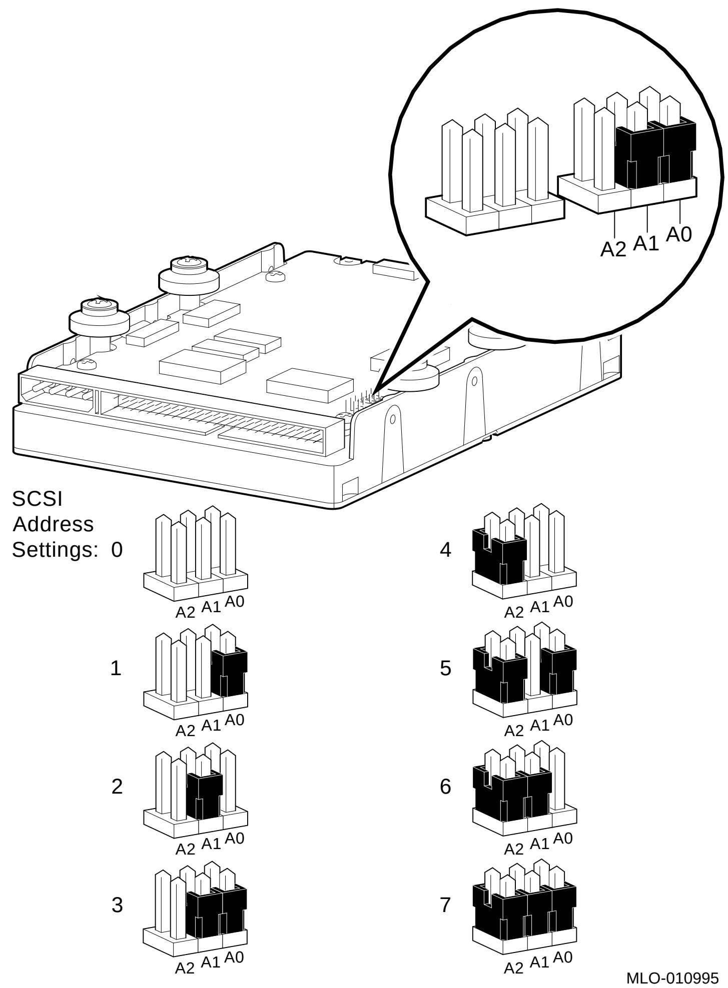
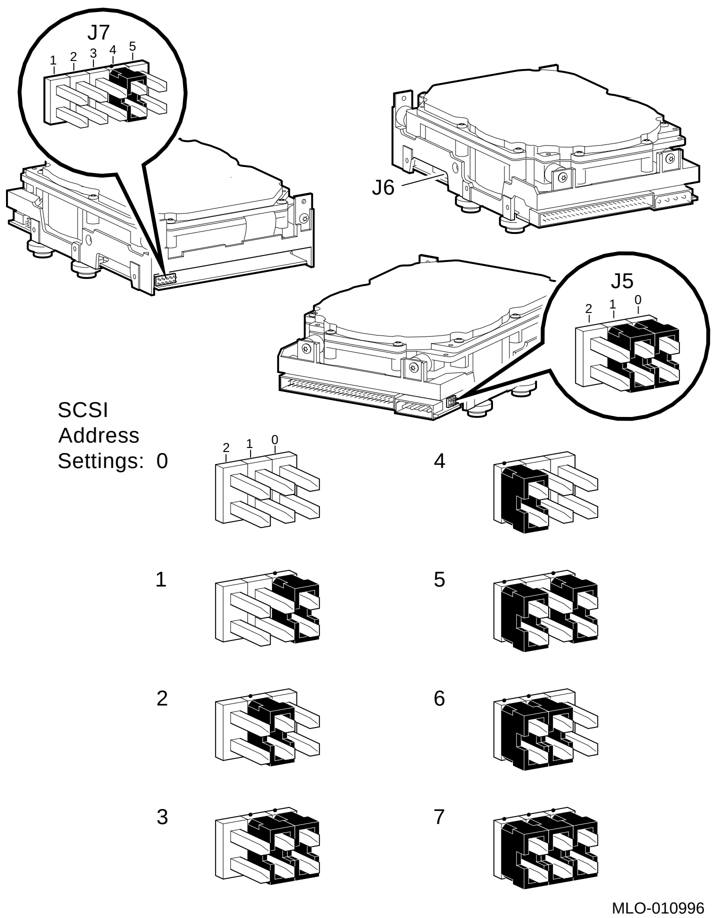


Figure 16–8 RZ25 Fixed Disk Drive SCSI ID Settings



Remote SCSI Address Jumpers

The SCSI address for the RZ25 drive is designed to be set either manually or automatically. The automatic setting is not applicable to the systems, therefore, you need to make sure that the first three jumpers on the left of this secondary port are removed, as shown in Figure 16–9. Be careful to remove *only* the SCSI address jumpers; do not remove any others.

Figure 16–9 RZ25 Secondary SCSI Address Port

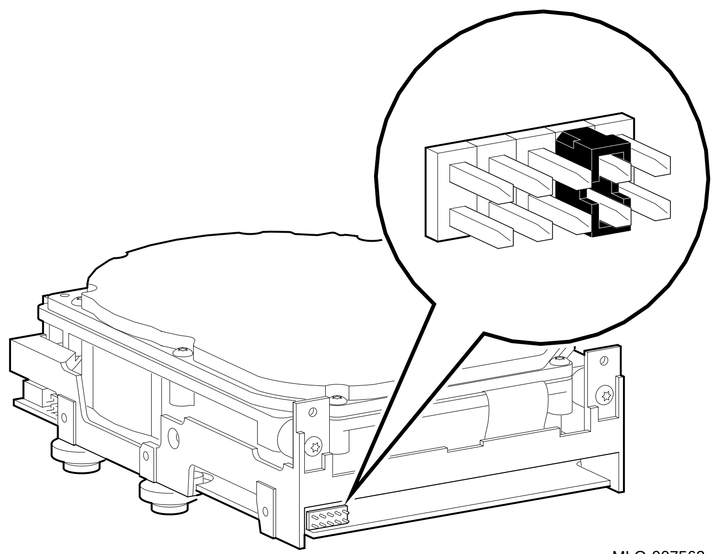


Figure 16–10 RZ25L Fixed Disk Drive SCSI ID Settings

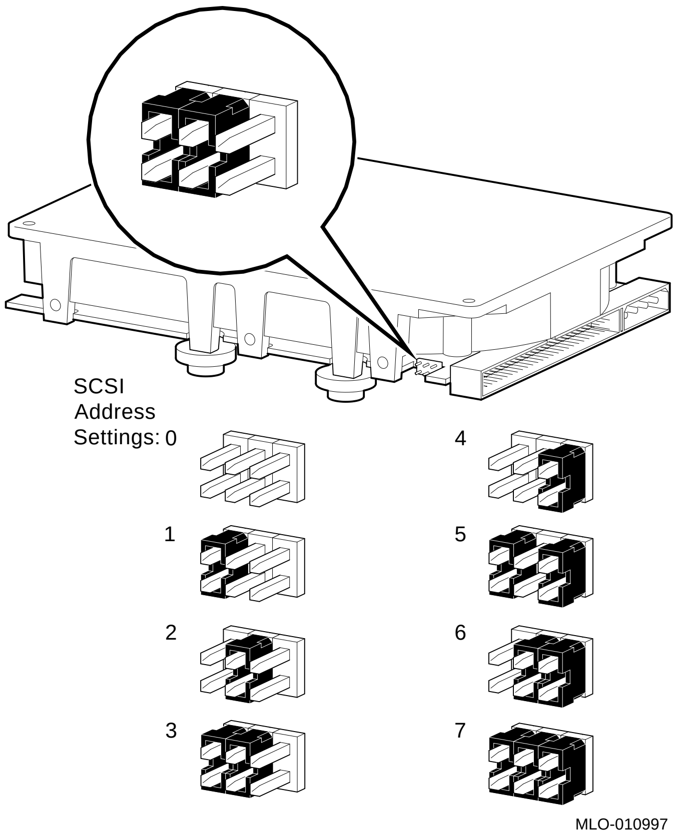


Figure 16–11 RZ26 Fixed Disk Drive SCSI ID Settings

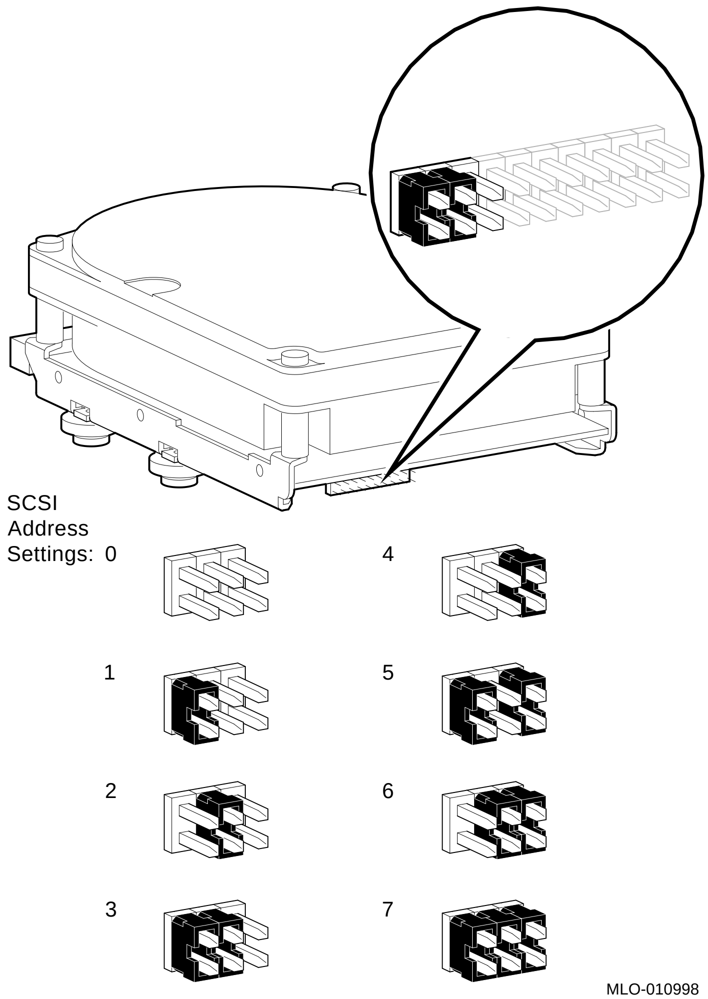


Figure 16–12 RZ26L Fixed Disk Drive SCSI ID Settings

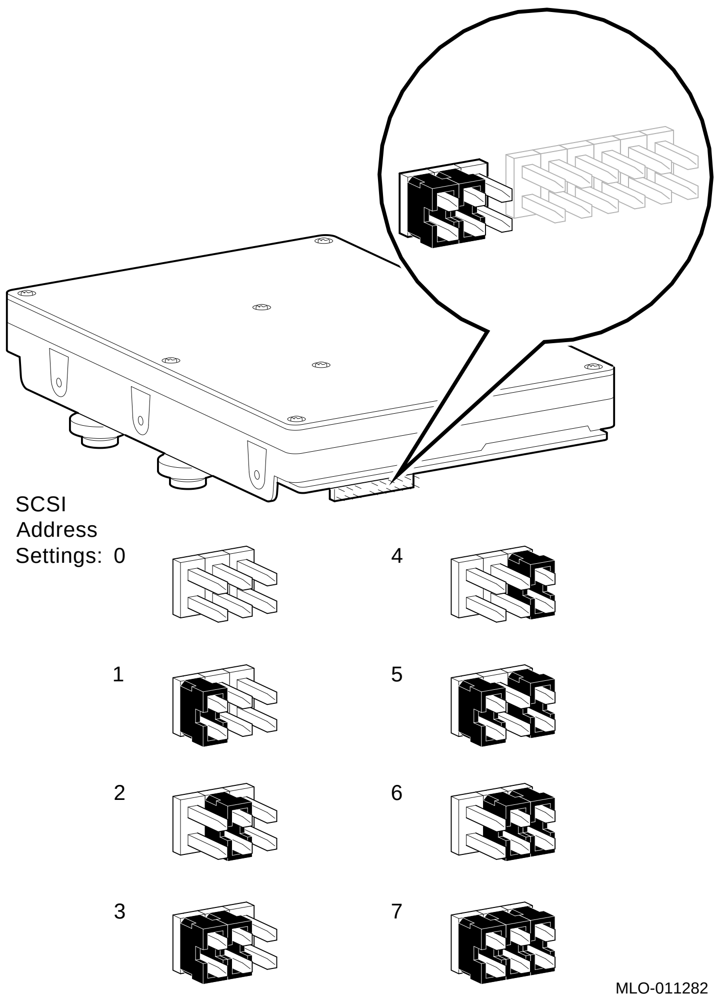
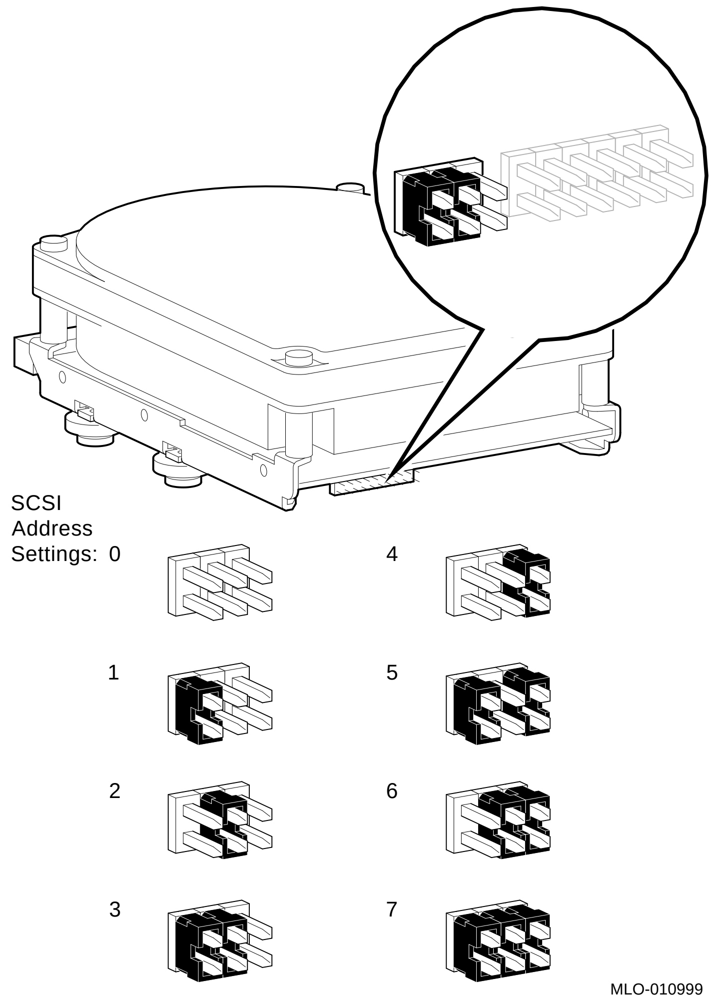


Figure 16–13 RZ28 Fixed Disk Drive SCSI ID Settings



Part IV

System Upgrading Information

Part IV provides information for upgrading a DEC 3000 Model 400/400S AXP to the current system. This part includes the following chapter:

Chapter	Title
17	Upgrading a DEC 3000 Model 400/400S AXP to a Model 600/600S AXP

17

Upgrading a DEC 3000 Model 400/400S AXP to a Model 600/600S AXP

Overview

Chapter Overview

This chapter contains the following topics:

- Digital Support Centers
- Upgrade Kit Contents
- Performing the Upgrade
- Completing the Upgrade

Options Supported

Internal Options

Internal options that can move to the DEC 3000 Model 600/600S AXP are listed in Table 17–1:

Table 17–1 Supported Internal Options

Fixed Disk Drives	
RZ23L–EJ	121-MB Drive
RZ24–EJ	209-MB Drive
RZ24L–EJ	245-MB Drive supported as working second disk only
RZ25–EJ	426-MB Drive
RZ25L–EJ	535-MB Drive (minimum system disk supported)
RZ26B–EJ	(OpenVMS AXP only)
RZ26L–EJ	1.05-GB Drive
RZ28–EJ	2.1-GB Drive
Removable-Media Drives	
TLZ04–MF	1.2-GB DAT drive
TLZ06–MF	4-GB 4 mm DAT drive
RX26–FH	2.8-MB Diskette drive
TKZ08–MF	Tape drive (DEC OSF/1 AXP only)
TZK10–MF	QIC Tape drive
TZK11–MF	QIC Tape drive
RRD42–HM	600-MB CDROM
TZ30-HG	95-MB Cartridge tape drive

(continued on next page)

Table 17–1 (Cont.) Supported Internal Options

Memory	
MS15–BA	16-MB ECC memory
MS15–CA	32-MB ECC memory
MS15–DA	64-MB ECC memory
MS15–EA	128-MB ECC memory
MS15–FA	256-MB ECC memory
TURBOchannel Graphics Options	
PMAGB–BE	HX 2D accelerator, 72 Hz (for multi-head)
PMAGB–DB	PXG+, 8-plane, 3D accelerator, 72 Hz
PMAGB–EB	PXG+, 24-plane, 3D accelerator, Z buffer, 72 Hz
PMAGB–FB	PXG+, 24-plane, 3D accelerator, Z buffer, 72 Hz
PMAG–GB	PXG+ 8- to 24-plane upgrade
PMAG–HA	PXG+ 24-bit Z buffer upgrade
PMAGB–JB	TX, 24-plane frame buffer, 72 Hz (DEC OSF/1 AXP only)
Kubota	
AV300–AA	JV2 Multimedia

(continued on next page)

Table 17–1 (Cont.) Supported Internal Options

Other TURBOchannel Options	
PMAD–AA	AUI Ethernet option card
PMAZC–AA	Dual SCSI option card (10 MB/sec SCSI)
DEFTA–FA	DEC FDDI Controller 700 (fiber-optic)
DEFZA–FA	DEC FDDI Controller (DEC OSF/1 AXP only)
DJ–30APS–AA	PrestoServe option card (DEC OSF/1 AXP only)

External Options

External options that you can use in the DEC 3000 Model 600/600S AXP are listed in Table 17–2.

Table 17–2 External Supported Options

Expansion Boxes	
BA350–KA	StorageWorks deskside expansion unit, includes BA350–SA basic shelf, BA35X–HA universal ac power supply, pedestal mounting kit, 120-V power cord
BA353–AA	StorageWorks desktop expansion unit
BA353–AF	BA353 with RRD42 and two empty 3.5 inch half-height slots
BA353–AH	BA353 with TZ30 and two empty 3.5 inch half-height slots
SZ03	Single drive expansion box
SZ12	Desktop expansion box
SZ16	Desktop expansion box
BA350 and BA353 Supported Drives	
TLZ06–VA	3.5-inch, 4-GB, 4 mm DAT
TZK10–VA	5.25-inch, 525-MB QIC tape (BA350 only)
RRD42–VA	5.25-inch, 600-MB CDROM (BA350 only)
RZ25–VA	3.5-inch, 426-MB Disk
RZ26–VA	3.5-inch, 1.05-GB Disk
RZ28–VA	3.5-inch, 2.1-GB Disk (BA350 only)
RZ74–VA	5.25-inch, full-height, 3.57-GB Disk (BA350 only)

(continued on next page)

Table 17–2 (Cont.) External Supported Options

TURBOchannel Extender Box	
PMTCE–AA	TcE, No options, no disks
PMTCE–LA	TcE, PXG+, Two RZ25s, one RRD42
PMTCE–MA	TcE, PXG Turbo+, Two RZ25s, one RRD42
TURBOchannel Extender Box Supported Drives	
RZ25–FL	535-MB Disk drive
RZ26–FL	1.05-GB Disk drive
RX26–AA	2.8-MB Diskette drive
TLZ06–FL	4-GB, 4 mm DAT drive
TZK10–FL	525-MB QIC tape drive
RRD42–FL	600-MB CDROM
External Table-top Drives	
RRD42–FA	600-MB CDROM
TLZ06–FA	4.0-GB Tape drive
RWZ01–AA	Read/Write optical drive
TKZ09–BA	8-mm helical, 5-GB Tape drive
2R–TKZ60–BC	
TSZ07–CA	SCSI Magtape drive
TZ85	2.6-GB, 5.25-inch cartridge tape drive
TZ86	6.0-GB, 5.25-inch tape drive
SZ100–AA	18-GB TZ85 loader
SZ106–AA	42-GB TZ86 loader

(continued on next page)

Table 17–2 (Cont.) External Supported Options

Monitors	
VRC16–HA/H4	16-inch color, 1024x768, 1280x1024, 72 Hz
VRM17–HA/H4	17-inch monochrome, 1280x1024, 72 Hz
VR319–DA/D4	19-inch monochrome, 1280x1024, 72 Hz
VR320–CA/DA	19-inch color, 1280x1024, 66/72 Hz
VRT16–HA/H4	16-inch color (Trinitron), 1280x1024, 66/72 Hz
VRT19–HA/H4	19-inch color (Trinitron), 1280x1024 66/72 Hz

Other Supported Options

Other supported options that you can use in the DEC 3000 Model 600/600S AXP are listed in Table 17–3.

Table 17–3 Other Supported Options

VSXXX–AA/FA	Mouse
VSXXX–AB	Graphics tablet
VSXXX–JA	Audio Headset
DETTR–BA/BB	10 BT to AUI adapter
BA47X–AA	Vertical floor stand
DECXM–AA	ThinWire Ethernet station adapter
LK401–**	Keyboard
LK421–**	UNIX Keyboard
VSX10–AA/A3	Combination lighted programmable function keyboard and programmable function dials package, 120 V/240 V
VSX20–AA/A3	Lighted programmable function keyboard package, 120 V/240 V
VSX30–AA/A3	Programmable function dials package, 120 V/240 V

Upgrade Kit Contents

Your upgrade kit contains the following items:

- I/O Board
- Power supply
- Product conversion label
- System board

Performing the Upgrade

Static Discharge

Attach an antistatic wrist strap before you begin this upgrade. As you remove modules from the system, place them on an antistatic mat.

Overview of Steps

Refer to Chapter 3 for detailed instructions on removing the devices in steps 3 through 12.

1. Shut down the system software and power down the system.
2. Disconnect the power cord from the power source.
3. Disconnect all cables from the back of the system unit.
4. Remove the system unit cover.
5. Remove the upper drive tray.
6. Remove the TURBOchannel options.
7. Remove the memory mother boards (MMBs)
8. Remove the power connectors from the system board.
9. Remove the standoffs on each side of the I/O module.
10. Remove the I/O module.
11. Remove the screws from the system board, and lift out the board.

12. Remove the power supply.

Installing components

Reverse the steps to install the upgrade components to the system. Use the power supply, I/O board, and system board from the upgrade kit. The memory, TURBOchannel options, and graphics option are the same.

Completing the Upgrade

Do the following to complete the upgrade:

1. Attach the product conversion label to the system unit.
2. Update the customer service contract to reflect the DEC 3000 Model 600/600S AXP system upgrade.

Index

A

About this document
  Conventions, xvii
  Intended audience, xv
  Purpose, xv
Adapter
  TURBOchannel I/O, 1–7
Adding SCSI devices, 2–8
Additional reference materials, xviii
Alpha AXP Architecture, 1–1
Architecture
  Alpha AXP, 1–1
ASIC diagnostic, 9–8
  error codes, 14–10
  LED codes, 10–4, 14–4
  status/error messages, 14–20
Audio, 1–7
  assembly
    location, 8–3
    removal, 8–14
  ISDN, 9–22
  troubleshooting, 10–17
Audio input jack, 6–7
Audio interface, 6–3
AUI Ethernet port, 6–10

B

Bank, 2–12
10BASE-T, 1–6
10BASE-T port, 6–10
BOOT command, 13–2
  84 Fail message, 10–10
  parameters, 13–2
  qualifiers, 13–2

C

Cables
  routing
    internal cables, 7–11
    power cables, 7–12
Cache, 1–6
Commands, console
  BOOT, 13–2
  CONTINUE, 13–5
  DEPOSIT, 13–6
  EXAMINE, 13–10
  HALT, 13–15
  HELP, 13–15
  INITIALIZE, 13–17
  LOGIN, 13–18
  REPEAT, 13–19
  SET, 13–20
  SET AUTO_ACTION, 13–21
  SET BOOTDEF_DEV, 13–23
  SET BOOT_OSFLAGS, 13–24
  SET BOOT_RESET, 13–25
  SET DIAG_QUICK, 13–27
  SET DIAG_SECTION, 13–27
  SET ENABLE_AUDIT, 13–28
  SET ETHERNET, 13–29
  SET LANGUAGE, 13–31
  SET MOP, 13–32
  SET PASSWORD, 13–33
  SET RADIX, 13–35

Commands, console (cont'd)
SET SCSI_A, 13–36
SET SCSI_B, 13–36
SET SECURE, 13–34
SET TRIGGER, 13–39
SHOW, 13–39
SHOW AUTO_ACTION, 13–41
SHOW BOOTDEF_DEV, 13–41
SHOW BOOT_OSFLAGS, 13–42
SHOW BOOT_RESET, 13–42
SHOW CONFIG, 13–43
SHOW DEVICE, 13–45
SHOW DIAG_QUICK, 13–46
SHOW DIAG_SECTION, 13–46
SHOW ENABLE_AUDIT, 13–47
SHOW ERROR, 13–48
SHOW ETHERNET, 13–48
SHOW LANGUAGE, 13–49
SHOW MEMORY, 13–49
SHOW MOP, 13–50
SHOW RADIX, 13–52
SHOW SCSI_A, 13–53
SHOW SCSI_B, 13–53
SHOW SECURE, 13–51
SHOW TRIGGER, 13–55
START, 13–55
TEST, 13–56
Communications port, 6–10
Components
System, 1–2
Configuration, 2–1, 7–1
commands, 7–2
disk, 7–11
memory, 7–13
rules, 7–15
rules, 7–2
storage devices, 7–8
Connectors
front, 6–5
rear, 6–8
Console
error messages, 14–8
halt messages, 14–9
LED codes, 10–10, 14–6
Console commands, 13–1
BOOT, 13–2
CONTINUE, 13–5
DEPOSIT, 13–6
EXAMINE, 13–10
HALT, 13–15
HELP, 13–15
INITIALIZE, 13–17
list, 13–1
LOGIN, 13–18
REPEAT, 13–19
SET, 13–20
SET AUTO_ACTION, 13–21
SET BOOTDEF_DEV, 13–23
SET BOOT_OSFLAGS, 13–24
SET BOOT_RESET, 13–25
SET DIAG_QUICK, 13–27
SET DIAG_SECTION, 13–27
SET ENABLE_AUDIT, 13–28
SET ETHERNET, 13–29
SET LANGUAGE, 13–31
SET MOP, 13–32
SET PASSWORD, 13–33
SET RADIX, 13–35
SET SCSI_A, 13–36
SET SCSI_B, 13–36
SET SECURE, 13–34
SET TRIGGER, 13–39
SHOW, 13–39
SHOW AUTO_ACTION, 13–41
SHOW BOOTDEF_DEV, 13–41
SHOW BOOT_OSFLAGS, 13–42
SHOW BOOT_RESET, 13–42
SHOW CONFIG, 13–43
SHOW DEVICE, 13–45
SHOW DIAG_QUICK, 13–46
SHOW DIAG_SECTION, 13–46
SHOW ENABLE_AUDIT, 13–47
SHOW ERROR, 13–48
SHOW ETHERNET, 13–48
SHOW LANGUAGE, 13–49
SHOW MEMORY, 13–49
SHOW MOP, 13–50
SHOW RADIX, 13–52
SHOW SCSI_A, 13–53

Console commands (cont'd)
SHOW SCSI_B, 13–53
SHOW SECURE, 13–51
SHOW TRIGGER, 13–55
START, 13–55
TEST, 13–56
Console LED Codes, 5–13
Console mode
entering and exiting, 9–6
halt button, 6–7
Console security, 7–6
disabling, 7–7
password, 7–6
restoring, 7–8
privileged state, 7–7
exiting, 7–7
CONTINUE command, 13–5
Controls
front, 6–5
rear, 6–8
Conventions in document, xvii
CPU, 6–4
cache, 6–4

D

DC OK light, 6–7
DEC 3000 Model 800/800S AXP system
cable routes
internal cables, 7–11
power cables, 7–12
overview, 6–1
DECwindows Motif, 1–7
DEPOSIT command, 13–6
Diagnostic
LED codes, 10–2
Diagnostics, 4–1, 9–1
ASIC, 9–8
error codes, 14–10
status/error messages, 14–20
FRU code table, 9–2
ISDN, 9–22
error codes, 14–12
status error messages, 14–21
lights, 6–7
list, 9–3
Diagnostics (cont'd)
memory, 9–11
error codes, 14–20
error messages, 14–35
status messages, 14–34
MIPS emulator
status messages, 14–36
NI, 9–18
error codes, 14–16
error messages, 14–32
status messages, 14–31
NVR, 9–9
error codes, 14–11
status/error messages, 14–21
running, 9–4
continuous tests, 9–6
individual tests, 9–4
multiple tests, 9–5
subtests, 9–5
SCC, 9–20
error codes, 14–13
status/error messages, 14–23
SCSI, 9–15
error codes, 14–15
error messages, 14–25
status messages, 14–25
TURBOchannel options, 9–24
Disk drive
location, 8–3
RZ model
removal, 8–22
Disk verifier utility, 13–61
Diskette formatter utility, 13–60
Documentation
organization of, xv
Documents
Additional, xviii
Reference, xviii
Drive
troubleshooting, 10–15

E

Enet address ROM chip, 7–5
Error codes, 14–1
  84 Fail, 10–10
  lights, 6–7
  power-up, 10–2
Ethernet interface, 6–3
EXAMINE command, 13–10
Expansion
  Memory, 1–6

F

84 Fail error message, 10–10
Fan
  fan failure light, 6–7
  location, 8–3
  removal, 8–34
Firmware
  upgrading
    problems, 10–17
Flash ROM, 7–5
Front access door, 6–7
Front bezel
  location, 8–3
  removal, 8–8
FRU
  device codes, 10–2
  locations, 8–4
  part numbers, 15–1

G

General rules, 2–1

H

Halt button, 6–7
HALT command, 13–15
Hard disk eraser utility, 13–59
HELP command, 13–15
Highlights
  System, 1–6

I

I/O Adapter
  TURBOchannel, 1–7
I/O module, 1–2, 1–3
  jumpers, 7–5, 8–33
  location, 8–3
  overview, 6–2
  removal, 8–29
Indicators
  front, 6–5
Informational Values, 14–28
INITIALIZE command, 13–17
ISDN, 1–6
ISDN diagnostic, 9–22
  error codes, 14–12
  LED codes, 10–8, 14–6
  status/error messages, 14–21
  troubleshooting, 10–17
ISDN interface, 6–3
ISDN LED Codes, 5–10
ISDN port, 6–10

J

Jumpers
  I/O module, 7–5
  system module, 7–3

K

Keyboard/mouse port, 6–10

L

LED Codes, 14–1, 14–2
  ASIC, 10–4, 14–4
  console, 10–10, 14–6
  Console, 5–13
  ISDN, 5–10, 10–8, 14–6
  memory, 10–5, 14–4
  MIPS emulator, 14–7
  NI, 5–9, 10–7, 14–5
  NVR, 5–6, 10–5, 14–4
  power-up, 10–2

LED Codes (cont'd)
SCC, 5–7, 10–6, 14–5
SCSI, 5–11, 10–9, 14–6
serial ROM, 14–2
Lights and switch module
location, 8–3
removal, 8–16
LOGIN command, 13–18

M

Mass storage shelf, 1–2
Memory
bank, 7–13
configuration, 7–13
rules, 7–15
diagnostic, 9–11
diagnostics
LED codes, 10–5
error codes, 14–20
error messages, 14–35
Expansion, 1–6
Identifying the SIMM Modules, 2–13
LED codes, 14–4
memory modules, 7–15
rules, 2–12
status messages, 14–34
subsystem, 6–4
Memory module
installing, 8–42
location, 8–3
removal, 8–40
Memory mother board, 1–2, 1–5
location, 8–3
removal, 8–37
Microphone jack, 6–7
MIPS emulator, 9–24
LED codes, 14–7
status messages, 14–36
MMB, 1–2
See also Memory mother board
Model and serial number label, 6–7
Module
I/O, 1–2, 1–3
System, 1–2, 1–3
Monitor
troubleshooting, 10–14
Monitor video port, 6–10
Motif
DECwindows, 1–7
Mouse
troubleshooting, 10–14

N

Network
troubleshooting connections, 10–16
Network interface diagnostic, 9–18
Network label position, 6–7
NI diagnostic, 9–18
error codes, 14–16
error messages, 14–32
LED codes, 10–7, 14–5
status messages, 14–31
NI LED Codes, 5–9
NVR diagnostic, 9–9
error codes, 14–11
LED codes, 10–5, 14–4
status/error messages, 14–21
NVR LED Codes, 5–6

O

On/off switch, 6–7
Operating systems, 1–7
Options
External, 1–6
Internal, 1–6

P

Part numbers, 3–1, 8–1, 15–1
Password, 1–7
Power supply, 1–2
cables, 8–19
routing, 7–12
location, 8–3
removal, 8–18

Power-up sequence, 10–2
system problems, 10–12
Printer/alternate console port, 6–10
Printer/alternate console switch, 6–10
Problems
troubleshooting, 5–1, 10–1

R

Rear bezel
location, 8–3
removing, 8–12
Reference materials, xviii
Regulator
location, 8–3
Regulator module
removal, 8–27
REPEAT command, 13–19
Replacing
storage devices, 7–8
Replacing SCSI devices, 2–8
RRD42 compact disc drive
SCSI address selection, 16–3
RX26 diskette drive
SCSI address selection, 16–5
unit select switch, 16–6
RZ disk drive
removal, 8–22
RZ24L fixed disk drive
SCSI address selection, 16–10
RZ25 fixed disk drive
SCSI address selection, 16–11
secondary SCSI address, 16–12
RZ25L fixed disk drive
SCSI address selection, 16–13
RZ26 fixed disk drive
SCSI address selection, 16–14
RZ26L fixed disk drive
SCSI address selection, 16–15
RZ28 fixed disk drive
SCSI address selection, 16–16

S

Scatter/gather map, 6–3
SCC diagnostic, 9–20
error codes, 14–13
LED codes, 10–6, 14–5
status/error messages, 14–23
SCC LED Codes, 5–7
SCSI
Configuring Drives, 2–8
SCSI address, selecting
for RRD42, 16–3
for RX26, 16–5
for RZ24L, 16–10
for RZ25, 16–11
for RZ25L, 16–13
for RZ26, 16–14
for RZ26L, 16–15
for RZ28, 16–16
for TLZ06, 16–9
for TZK10, 16–7
for TZK11, 16–7
SCSI device
Adding, 2–8
configuring drives, 7–8
jumper settings, 7–10
Replacing, 2–8
SCSI ID settings, 8–25
system connector, 6–8, 6–10
SCSI diagnostic, 9–15
error codes, 14–15
error messages, 14–25
LED codes, 10–9, 14–6
status messages, 14–25
utilities for testing, 13–58
SCSI interface, 6–3
SCSI LED Codes, 5–11
SCSI settings
for TZ30, 16–8
SCSI switches
TZ30 tape drive, 16–8
SCSI utilities
disk verifier, 13–61
diskette formatter, 13–60

SCSI utilities (cont'd)
hard disk eraser, 13–59
list, 13–58
show device, 13–59
Security
keys, 8–6
Password, 1–7, 2–3, 7–6
Self test
Running continuously, 4–9
example, 4–10
Running multiple Diagnostic tests, 4–8
Running single diagnostic test, 4–7
Self-test
running individual tests, 9–4
Serial communication controller
diagnostic, 9–20
Serial lines, 6–3
Serial ROM
LED codes, 14–2
Service mode
entering and exiting, 9–7
SET command, 13–20
AUTO_ACTION, 13–21
BOOTDEF_DEV, 13–23
BOOT_OSFLAGS, 13–24
BOOT_RESET, 13–25
DIAG_QUICK, 13–27
DIAG_SECTION, 13–27
ENABLE_AUDIT, 13–28
ETHERNET, 13–29
LANGUAGE, 13–31
MOP, 13–32
parameters, 13–21
PASSWORD, 13–33
qualifiers, 13–21
RADIX, 13–35
SCSI_A, 13–36
SCSI_B, 13–36
SECURE, 13–34
TRIGGER, 13–39
Shelf
Mass storage, 1–2
SHOW command, 13–39
AUTO_ACTION, 13–41
BOOTDEF_DEV, 13–41
SHOW command (cont'd)
BOOT_OSFLAGS, 13–42
BOOT_RESET, 13–42
CONFIG, 13–43
DEVICE, 13–45
DIAG_QUICK, 13–46
DIAG_SECTION, 13–46
ENABLE_AUDIT, 13–47
ERROR, 13–48
ETHERNET, 13–48
LANGUAGE, 13–49
MEMORY, 13–49
MOP, 13–50
parameters, 13–41
qualifiers, 13–41
RADIX, 13–52
SCSI_A, 13–53
SCSI_B, 13–53
SECURE, 13–51
TRIGGER, 13–55
Side panels
location, 8–3
removal, 8–10
Spares list, 15–1
Speaker jack, 6–7
START command, 13–55
Status messages, 14–1
Storage devices
location, 6–5
replacing, 7–8
Storage shelf
Mass storage, 1–2
Switches
See SCSI switches
System components, 1–2
System Features, 1–6
System module, 1–2, 1–3
installing, 8–47
jumpers, 7–3
location, 8–3
overview, 6–2
removal, 8–43
System overview, 1–2, 6–1
block diagram, 1–4, 6–11

System power port, 6–10
System unit, 1–2
Systems
Operating, 1–7

T

Telephone jack, 6–7
terms
Bank, 2–11
Slot, 2–12
Terms, 2–11
TEST command, 13–56
84 Fail message, 5–14, 10–10
Testing, 4–1, 9–1
See also Diagnostics
Tests
diagnostics
list, 4–7, 9–3
utilities, 13–58
Thickwire port, 6–10
TLZ06 tape drive
mode select, 16–9
SCSI address selection, 16–9
Top cover
location, 8–3
removal, 8–6
TOY chip, 6–3
TOY/NVR chip, 7–5
Troubleshooting, 5–1, 10–1
problem symptoms, 10–11
TURBOchannel I/O Adapter, 1–7
TURBOchannel options
initializing, 9–26
module slots, 6–8, 6–10
testing, 9–24
Twisted pair, 1–6
TZ30 tape drive
SCSI settings, 16–8
TZK10 tape drive
DADS, 16–7
SCSI address selection, 16–7
TZK11 tape drive
DADS, 16–7
SCSI address selection, 16–7

U

Upgrading, 17–1
Utilities, 13–58

V

Views, 1–7
Front, 1–7 to 1–8
Rear, 1–9 to 1–11