DEC 2000 Model 500 AXP

Customer Technical Information

Order Number: EK-A0676-TM.001

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This manual describes how to use the system firmware and how to test, troubleshoot, and upgrade the DEC 2000 Model 500 AXP system.

Revision Information: This is a new manual.

Safety Warnings

WARNING

Make sure that the system unit on/off switch is in the off position and that the system power cords are disconnected before removing the outside cover.

ADVARSEL

Det bør sikres, at on/off kontakten (tænd/sluk) på systemenheden er i stillet på off, før låget tages af Kontrollér, at der er slukket for kontakten til systemenheden, og at netledningen er trukket ud inden kabinettet fjernes.

WARNUNG

Vergewissern Sie sich, daß der Netzschalter an der Systemeinheit ausgeschaltet ist und daß die Kabel nicht angeschlossen sind, bevor Sie die äußere Abdeckung entfernen.

AVISO

Asegúrese de que la unidad del sistema está apagada y que los cables eléctricos están desconectados antes de retirar la cubierta exterior .

AVERTISSEMENT

Vérifiez que le système est hors tension et que les câbles d'alimentation sont débranchés avant de retirer le boîtier.

This document was prepared using VAX DOCUMENT Version 2.1.

Safety Warnings (continued)

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Preface

Purpose of This Manual

This manual describes how to upgrade and test the DEC™ 2000 Model 500 AXP™ system. It contains information on using the system firmware, troubleshooting, running diagnostics and working with option boards, internal SCSI devices, memory, and the nonvolatile random-access memory (NVR) battery. It also includes information on system specifications and connector port pin specifications.

Audience

This manual is intended for people with some experience of using or upgrading computer systems. If you do not have sufficient experience to complete the tasks described in this document, ask your system manager for help or contact your Digital™ service representative.

Structure of This Manual

This manual is divided into twelve chapters, five appendixes, and an index:

- Chapter 1 describes how to use the system firmware.

- Chapter 2 describes how to use the Windows NT™ firmware menu items.

- Chapter 3 describes how to manage the Windows NT boot selections.

- Chapter 4 describes how to use the EISA configuration utility.

- Chapter 5 describes how to use the OpenVMS™ and OSF/1® console commands and utilities.

- Chapter 6 describes how to troubleshoot the system.

- Chapter 7 describes how to run diagnostics.

- Chapter 8 describes how to report problems to your Digital service representative and connect terminators, if requested to do so.

- Chapter 9 describes how to remove system unit covers, remove or install the system unit feet, and how to reassemble the system.

- Chapter 10 describes how to install, move, or remove option boards.

- Chapter 11 describes how to install or remove internal storage devices.

- Chapter 12 describes how to install or remove the NVR battery or memory options.

- Appendix A describes how to set jumpers and switches on the internal storage devices.

- Appendix B describes the precautions that you must take when handling internal system components.

- Appendix C describes how to use the fail-safe booter to recover the system firmware.

- Appendix D lists the system unit connector pin specifications.

- Appendix E lists the system hardware specifications.

Additional Information

See the *DEC 2000 Model 500 AXP User Information* manual for the list of associated and related documents.

Conventions   The following conventions are used in this manual:

Convention	Description
Ctrl/*x*	Ctrl/*x* indicates that you hold down the Ctrl key while you press another key (indicated here by *x*).
MONOSPACE	Text displayed on the screen and menu item names are shown in monospace type.
boldface type	Boldface type in examples indicates user input.
italic type	Italic type emphasizes important information and indicates complete titles of manuals.
nn nnn.nnn nn	A space character separates digits in numerals with 5 or more digits. For example, *10 000* equals *ten thousand*.
n.nn	A period in numerals signals the decimal point indicator. For example, *1.75* equals *one and three-fourths*.
UPPERCASE	Words in uppercase indicate a command, file name, or environment variable name.
n	A lowercase italic *n* indicates the generic use of a number. For example, 19*nn* indicates a 4-digit number in which the last 2 digits are unknown.
x	A lowercase italic *x* indicates the generic use of a letter. For example, *xxx* indicates any combination of three alphabetic characters.
Note	A note contains information of special importance to the reader.
Caution	A caution contains information to prevent damage to the equipment.
Warning	A warning contains information to prevent personal injury.

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Using the System Firmware

Introduction   This chapter describes how to use the system firmware. The system firmware consists of two components: the OpenVMS and OSF/1 console and the Windows NT firmware. The system uses both components to complete different tasks. This chapter describes the system firmware, describes how to switch between the two components, and describes how to get help.

In This Chapter   This chapter contains the following sections:

- OpenVMS and OSF/1 Console Description

- Switching from the OpenVMS and OSF/1 Console to the Windows NT Firmware

- Windows NT Firmware Description

- Switching from the Windows NT Firmware to the OpenVMS and OSF/1 Console

- Getting Help on the Windows NT Firmware

- Getting Help on the OpenVMS and OSF/1 Console

OpenVMS and OSF/1 Console Description

Summary

This section describes the OpenVMS and OSF/1 console.

Environment Variables Affecting the Console

The following subsections refer to two of the system environment variables to describe particular system start-up conditions. The following table lists these environment variables and briefly describes them.

Environment Variable	Description
AUTO_ACTION	The AUTO_ACTION environment variable specifies the system default power-up action. It has three possible values: RESTART, HALT, and BOOT. The AUTO_ACTION environment variable applies only to the OpenVMS and OSF/1 operating systems. It does not affect the operation of the Windows NT operating system.
OS_TYPE	The OS_TYPE environment variable specifies the system default operating system setting. It has three possible values: VMS, OSF, and NT. Depending on the value, the system either boots or restarts the specified operating system, or halts in the specified firmware component. You can modify the value of this environment variable from both firmware components.

See the following sections for more information on these environment variables.

OpenVMS and OSF/1 Console Uses

The OpenVMS and OSF/1 Console is command-line based. You can use it to troubleshoot and perform tests on the system. You can also use this console to perform the following tasks:

- Boot the OpenVMS or OSF/1 operating systems

- Deposit and examine data in specified system memory or register locations

- Initialize the system unit

- Display the system configuration

- Display the system storage devices

- Set and display environment variables that are specific to OpenVMS and OSF/1

- Set and display environment variables that are common to OpenVMS, OSF/1, and Windows NT

- Test the system unit devices

- Run the EISA configuration utility (ECU)

- Switch the system console device from VGA to a terminal on the serial line and vice versa

- Display the system status

Entering the OpenVMS and OSF/1 Console

The system enters and remains in the OpenVMS and OSF/1 console under the following conditions:

- When AUTO_ACTION is set to HALT and OS_TYPE is set either to VMS or to OSF.

- When power-up tests fail. If OS_TYPE is set to VMS or to OSF, the system automatically enters the OpenVMS and OSF/1 console. If OS_TYPE is set to NT, the system displays a prompt asking whether you want to continue. If you enter N, the system enters the OpenVMS and OSF/1 console.

Console Security

The OpenVMS and OSF/1 console provides a security feature that allows you to set a security password. Users must enter the security password before using most console commands. See Chapter 5 for more information on the console security feature.

Switching from the OpenVMS and OSF/1 Console to the Windows NT Firmware

Summary   This section describes how to switch from the OpenVMS and OSF/1 console to the Windows NT firmware.

Procedure   The following table lists the steps that you must follow to switch from the OpenVMS and OSF/1 console to the Windows NT firmware:

Step	Action	Result
1	If necessary, enter the OpenVMS and OSF/1 console by turning the system on or shutting down the operating system following the procedure described in the operating system documentation.	The system displays the console prompt (>>>).
2	Enter the command shown (❶) at the console prompt.	This command causes the system to enter the Windows NT firmware and to display the Boot menu.
3	Press Ctrl/P or use the Halt key on the intelligent front panel (IFP), then wait approximately 10 seconds.	These keys send a halt signal to the system. If the system did not fail any power-up or self tests, it initializes the firmware. After the system initializes the firmware, it enters the Windows NT firmware and displays the Windows NT firmware Boot menu.
4	If the system displays the AUTOLOAD countdown sequence (❷) and you do not want to boot the Windows NT operating system, press the up arrow key or down arrow key.	The system cancels the AUTOLOAD countdown and remains in the Windows NT firmware.

Example   The following example shows the command that you must enter
in the OpenVMS and OSF/1 console to switch to the Windows
NT firmware:

```
>>> SET OS_TYPE NT ❶

OS_TYPE = NT
>>>
```

Result   The following example shows the Windows NT firmware Boot
menu:

```
ARC Multiboot DEC Version n.nn
Copyright (c) 1993 Microsoft Corporation
Copyright (c) 1993 Digital Equipment Corporation

Boot menu:

   Boot Windows NT
   Boot an alternate operating system
   Run a program
   Supplementary menu...

Use the arrow keys to select, then press Enter.
Seconds until auto-boot, select another option to override: 10 ❷
```

Windows NT Firmware Description

Summary   This section describes the Windows NT firmware.

Environment   The following subsections refer to two of the system environment
Variables   variables to describe particular system start-up conditions. The
Affecting the   following table lists these environment variables and briefly
Firmware   describes them.

Environment Variable	Description
AUTOLOAD	The AUTOLOAD environment variable specifies whether the Windows NT operating system should boot. It does not affect the OpenVMS or OSF/1 operating systems. It has two values: YES and NO. If the value is YES, the Windows NT firmware boots the system after the COUNTDOWN time-limit expires. If the value is NO, the system halts at the Windows NT firmware Boot menu.
COUNTDOWN	The COUNTDOWN environment variable specifies the time limit within which you can stop the Windows NT operating system from booting if AUTOLOAD is set to YES. The time limit is specified in seconds and the default value is 10. When you turn on the system or reinitialize the firmware, the system displays the seconds remaining before the operating system boots automatically. To stop the system from booting automatically, you must press the up arrow key or down arrow key.
OS_TYPE	The OS_TYPE environment variable specifies the system default operating system setting. It has three possible values: VMS, OSF, and NT. Depending on the value, the system either boots or restarts the specified operating system, or halts in the specified firmware component. You can modify the value of this environment variable from both firmware components.

See the following sections for more information on these
environment variables.

Windows NT Firmware Uses

The Windows NT firmware is menu based. You can use it to boot Windows NT, install firmware updates, run the EISA configuration utility (ECU), and set environment variables that are specific only to Windows NT. You can use the firmware to perform the following tasks:

- Boot the Windows NT operating system

- Switch to the OpenVMS and OSF/1 console

- Run the ECU

- Run a program

- List Windows NT device names and supported SCSI and graphics option boards

- Change Windows NT boot configurations and environment variables

Entering the Windows NT Firmware

The system enters and remains in the Windows NT firmware under the following conditions:

- When power-up tests fail. If OS_TYPE is set to NT, the system displays a prompt asking whether you want to continue. If you enter Y, the system enters the Windows NT firmware.

Note

Booting the Windows NT operating system after the system fails the power-up tests can result in operating system errors.

- When OS_TYPE is set to NT and AUTOLOAD is set to NO

- When AUTOLOAD is set to YES and you press the up arrow key or down arrow key before the COUNTDOWN time limit expires

Switching from the Windows NT Firmware to the OpenVMS and OSF/1 Console

Summary   This section describes how to switch from the Windows NT firmware to the OpenVMS and OSF/1 console.

Procedure   The following table lists the steps that you must follow to switch from the Windows NT firmware to the OpenVMS and OSF/1 console:

Step	Action	Result
1	If necessary, enter the Windows NT firmware by shutting down the operating system following the procedure described in the operating system documentation. Turn the system off and then on.	The system displays the Windows NT firmware Boot menu.
2	Choose the `Supplementary menu...` item on the Boot menu.	The system displays the Supplementary menu.
3	Choose the `Set up the system...` menu item on the Supplementary menu.	The system displays the Setup menu.
4	Choose the `Switch to OpenVMS or OSF console` menu item on the Setup menu and press Enter.	The system displays the reboot selection menu.
5	Choose either the `Switch to OpenVMS` or the `Switch to OSF` menu item on the reboot selection menu (see the example) and press Enter.	The system sets the OS_TYPE environment variable and displays the new current reboot selection.
6	Choose the `Setup menu...` menu item and press Enter.	The system displays an information message.
7	Follow the instructions in the message, then set the on/off switch on all peripherals and on the system unit to the off position.	
8	Wait approximately 15 seconds.	Waiting allows electrostatic charges in the power supply and on the system module to dissipate.

Step	Action	Result
9	Set the on/off switch on all peripherals and on the system unit to the on position.	When you turn the system on, it either halts or starts to boot. When the system halts, it displays the console prompt (>>>).
10	If the system starts to boot, press Ctrl/P or use the Halt key on the IFP.	The system displays the console prompt.

Example   The following example shows the Reboot selection menu:

```
Which operating system console should be launched at the next power-cycle?

Boot selection is currently NT.

     Switch to NT
     Switch to OpenVMS
     Switch to OSF
     Setup menu...

Use the arrow keys to select, then press Enter.
```

Getting Help on the Windows NT Firmware

Summary   This section describes how to get help on the Windows NT firmware.

Windows NT Firmware Help   The Windows NT firmware has a menu-based interface. It does not provide help on all the menu items contained in its menus. However, it does provide general help on using the Setup menu.

Procedure   The following table lists the steps that you must follow to display the Setup menu help screen:

Step	Action	Result
1	If necessary, enter the Windows NT firmware by shutting down the operating system following the procedure described in the operating system documentation. Turn the system off and then on.	The system displays the Windows NT firmware Boot menu.
2	Choose the `Supplementary menu...` item on the Boot menu.	The system displays the Supplementary menu.
3	Choose the `Set up the system...` menu item on the Supplementary menu.	The system displays the Setup menu.
4	Choose the `Help` menu item on the Setup menu and press Enter.	The system displays the Setup menu help screen.

Setup Menu Example

The following example shows the Setup menu:

```
ARC Multiboot DEC Version n.nn            Thursday, 6-10-1993   9:49:50 PM
Copyright (c) 1993  Microsoft Corporation
Copyright (c) 1993  Digital Equipment Corporation

Setup menu:

        .
        .
        .

     Reset system to factory defaults

     Help
     Switch to OpenVMS or OSF console
     Supplementary menu, and do not save changes...

Use the arrow keys to select, then press Enter.
```

Help Example

The following example shows the Setup menu help screen:

```
Do the following steps, in this order, to set up the system:

1. Set system time.
2. Set default environment variables.
3. Set default configuration.
4. Create at least one boot selection.
5. Setup autoboot.
6. Run the EISA configuration utility.

-> A menu item with an arrow represents a section of the NVRAM with a
   problem.  Select these items (in top to bottom order) to repair
   the NVRAM before attempting to boot or install Windows NT.

"Reset system to factory defaults" does steps 2 -- 5 for a typical
system.

Home, End, Delete, and Backspace will help you edit strings.
The ESCape key returns from a menu and aborts a sequence.

The firmware automatically reboots if the configuration is changed.

 Press any key to continue...
```

Getting Help on the OpenVMS and OSF/1 Console

Summary
This section describes how to get help on the OpenVMS and OSF/1 console.

OpenVMS and OSF/1 Console Help
The OpenVMS and OSF/1 console provides the following help commands:

- HELP
- HELP ADVANCED
- HELP SET
- HELP SHOW

HELP Command
The following example shows how to use the HELP command and the resulting display:

```
>>> HELP

  BOOT
  HELP ADVANCED
  INIT
  RUNECU
  SET <envar> <value>
  SHOW <envar>
  TEST
```

HELP ADVANCED Command

The following example shows how to use the HELP ADVANCED command and the resulting display:

```
>>> HELP ADVANCED

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

Getting Help on the OpenVMS and OSF/1 Console, *continued*

HELP SET and HELP SHOW Commands

The following example shows how to use the HELP SET and HELP SHOW commands and the resulting displays:

```
>>> HELP SET

  SET AUTO_ACTION <{RESTART | 1} | {BOOT | 2 } | {HALT | 3}>
  SET BOOTDEF_DEV <ddau>
  SET BOOT_OSFLAGS <bflg>
  SET DIAGENV <1 | 2 | 3 >
  SET KEYBOARD < DANSK      | DEUTSCH     | SCHWEIZ >
               < US         | UK          | ESPANOL >
               < FRANCAIS   | CANADIAN    | SUISSE >
               < ITALIANO   | NEDERLANDS  | NORSK >
               < PORTUGUES  | SUOMI       | SVENSKA >
               < VLAAMS >
  SET PASSWORD
  SET PSE
  SET SCSI_{A | B | C | D} <0 - 7>
  SET OS_TYPE <{NT | 1} | {VMS | 2} | {OSF | 3}>
  SET CONSOLE <{SERIAL | 1} | {VGA | 2}>

>>>
>>> HELP SHOW

  SHOW { AUTO_ACTION  | BOOTDEF_DEV  | BOOT_OSFLAGS  |
         CONFIG       | DEVICE       | DIAGENV       |
         ENVIRONMENT  | ERROR        | KEYBOARD      |
         MEMORY       | SCSI_{A|B|C|D}| OS_TYPE      |
         PSE          | BOX_SETUP }

>>>
```

2

Using the Windows NT Firmware

Introduction　　This chapter describes how to use the Windows NT firmware.

In This Chapter　　This chapter contains the following sections:

- Windows NT Firmware Introduction
- Accessing the Boot Menu
- Booting the Default Windows NT Boot Selection
- Booting an Alternative Windows NT Boot Selection
- Running a Program
- Accessing the Supplementary Menu
- Updating the Firmware
- Accessing the Setup Menu
- Listing Windows NT Firmware Device Names
- Setting the System Date and Time from the Windows NT Firmware
- Setting the Default System Partition
- Configuring the System Diskette Drives and Keyboard
- Setting the System to Boot Automatically
- Editing the System Environment Variables
- Default Windows NT Firmware Environment Variables
- Resetting the System to Factory Defaults
- Saving the System Set-Up or Quitting the Setup Menu
- Other Setup Menu Functions

Windows NT Firmware Introduction

Summary   The Windows NT firmware is menu based. It has three primary
menus: the Boot menu, the Supplementary menu, and the Setup
menu.

**Boot Menu
Functions**   The Boot menu contains menu items that allow you to perform
the following tasks:

- Boot the default boot selection

- Boot an alternative boot selection

- Run a program

- Access the Supplementary menu

**Supplementary
Menu
Functions**   The Supplementary menu contains menu items that allow you to
perform the following tasks:

- Install new firmware

- Install Windows NT from a compact disc

- Access the Setup menu

- List the Windows NT firmware device names for the installed
  devices and list the supported SCSI and graphics option
  boards

- Return to the Boot menu

**Setup Menu
Functions**   The Setup menu contains menu items that allow you to perform
the following tasks:

- Set the system time

- Set the default system partition

- Configure the system diskette drives and keyboard

- Manage the Windows NT boot selections

- Set the system to boot automatically

- Run the EISA configuration utility

- Edit the system environment variables

- Reset the system to factory defaults

- Set the default operating system and system firmware

- Return to the Supplementary menu, with or without saving Setup menu changes

Key Functions   The following table lists the functions of the keyboard and equivalent terminal keys that you use with the Windows NT firmware:

Keyboard Key	Terminal Key	Function
Left arrow or right arrow	Left arrow or right arrow	Moves the cursor one space to the left or right
Up arrow or down arrow	Up arrow or down arrow	Chooses menu items or recalls values at prompts
Enter	Enter or Return	Selects a menu item or enters a value
Escape (Esc)	Ctrl/[	Cancels a screen or returns you to the previous menu
Backspace	Ctrl/H	Deletes the character to the left of the cursor
Delete		Deletes the character highlighted by the cursor and subsequent characters to the right
Home		Moves the cursor to the start of a line
End		Moves the cursor to the end of a line

Accessing the Boot Menu

Summary This section describes how to access the Windows NT firmware Boot menu.

Procedure The following table lists the steps that you must follow to access the Window NT firmware Boot menu from different system states:

Step	Action	Result
1	If necessary, shut down the operating system following the instructions in the operating system documentation.	The system enters either the OpenVMS and OSF/1 console or the Windows NT firmware.
2	If the system was running OpenVMS or OSF/1, halt the reboot if necessary, and enter the SET OS_TYPE NT command to select the Windows NT firmware.	This command causes the system to enter the Windows NT firmware when you turn it off and then turn it on again.
3	Turn the system off, then turn it on again.	The system completes the power-up tests, checks the EISA configuration, then displays the Boot menu.

Boot Menu Example The following example shows a sample Boot menu:

```
ARC Multiboot DEC Version n.nn
Copyright (c) 1993  Microsoft Corporation
Copyright (c) 1993  Digital Equipment Corporation

Boot menu:

    Boot Windows NT
    Boot an alternate operating system
    Run a program
    Supplementary menu...

Use the arrow keys to select, then press Enter.
```

Booting the Default Windows NT Boot Selection

Summary

This section describes how to boot the default Windows NT boot selection on the system. When the system is shipped, the default boot selection is set to Windows NT.

Procedure

The following table lists the steps that you must follow to boot the default boot selection on the system:

Step	Action	Result
1	If necessary, access the Windows NT firmware Boot menu.	The system displays the Boot menu.
2	Choose the first menu item and press Enter. The first menu item takes the form `Boot <boot selection name>`. Usually, the boot selection name is Windows NT.	The system displays boot messages as it boots Windows NT or displays an error message if the boot selection is incorrectly defined.

If Errors Occur

See Chapter 3 if the system displays an error message when you attempt to boot the default boot selection.

Example

The following example shows the Windows NT firmware Boot menu:

```
ARC Multiboot DEC Version n.nn
Copyright (c) 1993  Microsoft Corporation
Copyright (c) 1993  Digital Equipment Corporation

Boot menu:
   Boot Windows NT
   Boot an alternate operating system
   Run a program
   Supplementary menu...

Use the arrow keys to select, then press Enter.
```

Booting an Alternative Windows NT Boot Selection

Summary   This section describes how to boot an alternative Windows NT boot selection on the system.

Procedure   The following table lists the steps that you must follow to boot an alternative boot selection on the system:

Step	Action	Result
1	If necessary, access the Windows NT firmware Boot menu.	The system displays the Boot menu.
2	Choose the `Boot an alternate operating system` menu item and press Enter.	The system displays a selection menu listing the system boot selections.
3	Choose the boot selection that you want to boot and press Enter.	The system displays boot messages as it boots the chosen boot selection or displays an error message if the boot selection is incorrectly defined.

If Errors Occur   See Chapter 3 if the system displays an error message when you attempt to boot the system using an alternative boot selection.

Boot Menu

The following example shows the Windows NT firmware Boot menu:

```
Boot menu:

    Boot the default operating system
    Boot an alternate operating system
    Run a program
    Supplementary menu...

Use the arrow keys to select, then press Enter.
```

Boot Selection Menu

The following example shows the boot selection menu:

```
Boot menu:

    Boot Windows NT  (Default)
    Boot Windows NT 2


Use the arrow keys to select, then press Enter.
```

Running a Program

Summary
This section describes how to run a program using the `Run a program` menu item.

Valid Programs
Digital supplies specially compiled and linked programs that you can run from the Windows NT firmware to perform various tasks. You can run these programs from any file allocation table (FAT) or NT file system (NTFS) formatted device. This facility allows you to install new firmware or configure your EISA and ISA options by running the firmware update utility or ECU from a disk drive partition rather than compact disc or diskette.

Procedure
The following table lists the steps that you must follow to run a program from the Windows NT firmware Boot menu:

Step	Action	Result
1	Access the Windows NT firmware Boot menu.	The system displays the Boot menu.
2	Choose the `Run a program` menu item and press Enter.	The system displays a prompt asking you to enter the name of the program.
3	Enter the name of the program, giving the complete device, path, and program name (see the subsection entitled Example).	The system searches the device and path that you specify for the program. If it finds the program, it executes it. When you exit the program, the system displays the Boot menu again.

Device Names
The Windows NT device names are listed in the Available hardware devices display. See the section entitled Listing Windows NT Firmware Device Names for information on displaying the Available hardware devices display and for an explanation of the device name format.

The following example shows the device name for a SCSI disk drive with SCSI ID 0 on SCSI bus A:

```
scsi(0)disk(0)rdisk(0)
```

To specify partition 1 on this device, you must specify the following device name:

```
scsi(0)disk(0)rdisk(0)partition(1)
```

───────────────── **Note** ─────────────────

You can use an existing CD: environment variable to run programs from a CD-ROM drive, or the CD-ROM drive with the lowest SCSI ID if you have more than one installed.

──

Alternatively, you can define an environment variable to represent the device name, for example:

```
A:=eisa()disk()fdisk()
```

See the section entitled Editing the System Environment Variables for information on defining environment variables.

Path and Program Names

The path and program names use the full Windows NT file and directory names, for example:

```
\os\nt\osloader.exe
```

See the operating system documentation for information on file and directory names.

Example

The following example shows how to run a program called ECU.EXE from a directory called ECU on partition 1 of a disk with SCSI ID 0:

Program to run: **scsi()disk()rdisk()partition(1)\ecu\ecu.exe**

Alternatively, if you have an environment variable defining C: as the same partition on the disk drive, you can use the following program name:

Program to run: **C:\ecu\ecu.exe**

Accessing the Supplementary Menu

Summary   This section describes how to access the Supplementary menu in the Windows NT firmware.

Procedure   The following table lists the steps that you must follow to access the Supplementary menu:

Step	Action	Result
1	If necessary, access the Windows NT firmware Boot menu.	The system displays the Boot menu.
2	Choose the `Supplementary menu...` menu item and press Enter	The system displays the Supplementary menu.

Supplementary   The following example shows the Supplementary menu:
Menu Example

```
ARC Multiboot DEC Version n.nn
Copyright (c) 1993  Microsoft Corporation
Copyright (c) 1993  Digital Equipment Corporation

Supplementary menu:

   Install new firmware
   Install Windows NT from CD-ROM
   Set up the system...
   List available devices
   Boot menu...

Use the arrow keys to select, then press Enter.
```

Updating the Firmware

Summary   This section describes how to update the system firmware from diskette, compact disc, or another location.

Important Safety Rules   Follow these rules when you are upgrading the firmware:

- If the new firmware is on compact disc, copy the JNUPDATE.EXE file from the compact disc to a diskette.

- Make sure that you do not switch the system off once the firmware update procedure begins. If you accidentally switch off the system, if the power fails during the update procedure, or if the update fails, see Appendix C for information on using the fail-safe booter to recover the system firmware.

Procedure   The following table lists the steps that you must follow to update the system firmware:

Step	Action	Result
1	If necessary, access the Supplementary menu.	The system displays the Supplementary menu.
2	Insert the diskette or compact disc containing the firmware update.	
3	Choose the `Install new firmware` menu item and press Enter.	The system searches the diskette drive and CD-ROM drive for the firmware update utility (JNUPDATE.EXE). When it finds the firmware update utility, it asks you to confirm your intention to continue.
4	Press Y on the keyboard to continue, or any other key to abort the update.	If you press Y, the system displays the update file location menu. If you press any other key, the system returns to the Supplementary menu.

Step	Action	Result
5	Choose the location of the update file (JENSFW.BIN) and press Enter.	If you choose the Floppy or CD-ROM menu items, the system locates, reads, and verifies the update file. If the system fails to locate, read, or verify the update file, the system aborts the update. If the system does not fail to complete these actions, it asks you to confirm your intention twice. Go to step 6 for information on completing the update if the update file passes the verification test.
6	If you chose the Other location menu item, enter the update file device and path name, then press Enter.	The system locates, reads and verifies the update file. If the system fails to locate, read, or verify the update file, the system aborts the update. If the system does not fail to complete these actions, it asks you to confirm your intention twice.
7	Press Y both times to continue, or press any other key at either prompt to abort the update.	If you press Y both times, the system begins updating the firmware.

Alternative Method You can run the firmware update utility (JNUPDATE.EXE) from a device other than the diskette drive or the CD-ROM drive using the Run a program menu item on the Boot menu. Follow the instructions listed in the section entitled Running a Program , then complete the steps listed in the previous table, starting at step 3.

Example   The following example shows a partial display of a successful
                firmware update:

```
Select location of update file.

Use the arrow keys to select, then press Enter.
Hit Escape to abort.

    Floppy #0\jensfw.bin
    CD-ROM\jensfw.bin
    Other location
    Exit

Please enter the location of the firmware update file.  You can use "a:"
for floppy #0, "cd:" for the first CD-ROM on the first SCSI bus, or a
valid ARC string for any device.  (For example, cd:\foo\bar\update.bin or
eisa()disk()fdisk()update.bin.)

Location of update file: a:jensfw.bin

Locating the update file...
Reading the update file...
Verifying the update file...

The update file is good!
The name of this firmware update is...:

V1.1 Firmware - 29-SEP-1993. Copyright (c) 1993 Digital Equipment Corporation.

 Press the "Y" key to continue with the update.
Hit any other key to abort.

 Are you *really* sure?
 Press the "Y" key to continue with the update.
 Hit any other key to abort.


Firmware ROM type: 0.
Updating these blocks:
    0   1   2   3   4   5   6   7
    8   9  10  11  12  13  14  15

The update has succeeded.  Power-cycle the machine to see the changes.

 Press any key to continue...
```

Accessing the Setup Menu

Summary   This section describes how to access the Setup menu.

Procedure   The following table lists the steps that you must follow to access
                     the Setup menu:

Step	Action	Result
1	If necessary, access the Supplementary menu.	The system displays the Supplementary menu.
2	Choose the Set up the system... menu item and press Enter.	The system displays the Setup Menu.

Identifying and   The system can detect setup errors that may prevent the system
Correcting   from booting. When you access the setup menu, it indicates the
Setup Errors   menu item that you must choose to correct the error with an
                      arrow symbol (->). There are two methods that you can use to
                      correct these errors, as follows:

- Choose each menu item that indicates an error, starting from
  the top of the menu, and correct the errors.

- Choose the Reset system to factory defaults menu item.

  See the section entitled Resetting the System to Factory
  Defaults for more information on this menu item.

Setup Menu Example

The following example shows the Setup menu:

```
Setup menu:

     Set system time
     Set default environment variables
   ->Set default configuration
     Manage boot selection menu...
     Setup autoboot

     Run EISA configuration utility from floppy
     Edit environment variables
     Reset system to factory defaults

     Help
     Switch to OpenVMS or OSF console
     Supplementary menu, and do not save changes...
     Supplementary menu, and save changes...

Use the arrow keys to select, then press Enter.
```

Listing Windows NT Firmware Device Names

Summary   This section describes how to display the Available hardware
devices display. The Available hardware devices display lists the
Windows NT firmware device names of the hardware devices
installed in the system. This display also lists the installed SCSI
and graphics option boards.

Procedure   The following table lists the steps that you must follow to display
the Available hardware devices display and the installed SCSI
and graphics options display:

Step	Action	Result
1	If necessary, access the Setup menu.	The system displays the Setup menu.
2	Choose the `List available devices` menu item and press Enter.	The system displays the Available hardware devices display.
3	Press any key.	The system displays the names of the installed SCSI and graphics option boards.

Device Names   The following table describes the meaning of the Windows NT
firmware device names:

_____ **Note** _____

The Available hardware devices display does not list tape
drive or network devices.

_____

Name	Description
multi(0)key(0)keyboard(0) multi(0)serial(0) multi(0)serial(1)	The multi() devices are located on the system module. These devices include the keyboard port and the serial line ports.

Name	Description
eisa(0)video(0)monitor(0) eisa(0)disk(0)fdisk(0)	The eisa() devices are provided by devices on the EISA bus. These devices include the monitor and the diskette drive.
scsi(0)cdrom(4)fdisk(0) scsi(1)disk(0)rdisk(0)	The scsi() devices are SCSI disk or CD-ROM devices. These examples represent SCSI devices on SCSI bus A (scsi(0)) and SCSI bus B (scsi(1)). The CD-ROM drive is set to SCSI ID 4 (cdrom(4)) and the disk drive is set to SCSI ID 0 (disk(0)). The last part of the device name indicates the device type and logical unit number, rigid disk drives (rdisk(0)) and removable (floppy) disk devices (fdisk(0)). Both devices have logical unit numbers of 0.

Example   The following example shows a sample Available hardware devices display and a SCSI and graphics option boards display:

```
Available hardware devices:

eisa(0)video(0)monitor(0)
multi(0)key(0)keyboard(0)
eisa(0)disk(0)fdisk(0)
scsi(0)disk(0)rdisk(0)
scsi(0)cdrom(4)fdisk(0)
multi(0)serial(0)
multi(0)serial(1)

Press any key to continue...

Supported disk and video cards:

Adaptec AHA-174x
Compaq QVision
Number Nine GXE

 Press any key to continue...
```

Setting the System Date and Time from the Windows NT Firmware

Summary

This section describes how to set the system date and time from the Windows NT firmware.

Important Information

———————— **Caution** ————————

This procedure sets the time in the correct format for Windows NT. The OpenVMS and OSF/1 operating systems use different time formats. You must check the time setting each time you switch between operating systems.

Procedure

The following table lists the steps that you must follow to set the system date and time:

Step	Action	Result
1	If necessary, access the Setup menu.	The system displays the Setup menu.
2	Choose the Set system time menu item and press Enter.	The system displays a prompt that asks you to enter the date and indicates the date format that it expects (month, day, year).
3	Enter the date in the required format and press Enter.	The system saves the date that you set in the nonvolatile random-access memory (NVRAM). It then displays a prompt that asks you to enter the time and indicates the time format that it expects (hours, minutes, seconds).
4	Enter the time in the required format and press Enter.	The system saves the time that you set in the NVRAM, returns to the Setup menu, and displays the new day, date, and time at the top of the screen.

Setting the System Date and Time from the Windows NT Firmware

Example   The following example shows how to set the system time to 10:30 AM, March 15, 1994.

```
                            Monday, 09-20-1993   12:13:33 AM
Enter the new date (mm-dd-yy) :  03-15-94
Enter time (hh:mm:ss) :  10:30:00
```

Setting the Default System Partition

Summary   This section describes how to set the default system partition.

Definition: The system partition is the partition that contains the operating
System Partition   system loader (OSLOADER.EXE for Windows NT).

Procedure   The following table lists the steps that you must follow to set the
                       default system partition:

Step	Action	Result
1	If necessary access the Setup menu.	The system displays the Setup menu.
2	Choose the Set default environment variables menu item and press Enter.	The system displays a list of three device types: SCSI Hard Disk, Floppy Disk, and CD-ROM.
3	Select one of the device types and press Enter.	The system displays different prompts depending on the device that you selected.
4	If you chose the SCSI Hard Disk menu item, specify the SCSI bus number (A = 0 and so on), the SCSI ID, and the partition number, then press Enter.	The firmware holds the values you specify in memory. See step 7 for information on saving these values.
5	If you chose the Floppy Drive menu item, specify the diskette drive number and press Enter.	The firmware holds the values you specify in memory. See step 7 for information on saving these values.
6	If you chose the CD-ROM menu item, specify the SCSI bus number (A = 0 and so on) and SCSI ID, then press Enter.	The firmware holds the values you specify in memory. See step 7 for information on saving these values.
7	If you have finished making changes in the Setup menu, see the section entitled Saving the System Set-Up or Quitting the Setup Menu .	The system saves the changes only when you exit from the Setup menu.

Example   The following example shows how to set up the default system
partition as partition 1 on a SCSI disk drive with SCSI ID 1 on
SCSI bus 0 (SCSI bus A):

```
 Enter location of default system partition:
      Select media:
    Scsi Hard Disk
    Floppy Disk
    CD-ROM

      Enter SCSI bus number: 0
      Enter SCSI ID: 1
      Enter partition (must be FAT or NTFS) : 1
```

**Effects of This
Procedure**   The following table describes how this procedure affects other
system settings and the actions that you must take as a result of
using the procedure:

Effect	Suggested Action
Sets the SYSTEMPARTITION environment variable value	None.
Sets the FWSEARCHPATH environment variable to the same value as the SYSTEMPARTITION environment variable	None.
Clears the diskette drive information in the default system configuration	See the section entitled Configuring the System Diskette Drives and Keyboard for information on setting the diskette drive information in the system configuration.
Clears all boot selection environment variables except SYSTEMPARTITION	See Chapter 3 for information on adding a boot selection before you try to boot Windows NT.
Clears the AUTOLOAD and COUNTDOWN environment variables	See the section entitled Setting the System to Boot Automatically for information on setting the AUTOLOAD and COUNTDOWN environment variables.

Configuring the System Diskette Drives and Keyboard

Summary
This section describes how to configure the system diskette drives and keyboard.

Procedure
The following table lists the steps that you must follow to configure the system diskette drives and keyboard:

Step	Action	Result
1	If necessary access the Setup menu.	The system displays the Setup menu.
2	Choose the `Set default configuration` menu item and press Enter.	The system displays a prompt asking you to choose the diskette drive capacity.
3	Choose the diskette drive capacity and press Enter.	The firmware holds a value indicating the diskette drive capacity in memory. It then displays a prompt asking you to specify whether there is a second diskette drive.
4	If the system does not contain a second diskette drive, choose no and press Enter.	The firmware holds the value N in memory, then displays the Setup menu.
5	If the system contains a second diskette drive, choose yes and press Enter.	The system displays a prompt asking you to choose the diskette drive capacity.
6	Choose the diskette drive capacity and press Enter.	The system holds a value indicating the diskette drive capacity in memory, then displays the Setup menu.
7	Choose the keyboard type and press Enter.	The firmware holds a value in memory indicating the keyboard type.
8	If you have finished making changes in the Setup menu, see the section entitled Saving the System Set-Up or Quitting the Setup Menu .	The system saves the changes only when you exit from the Setup menu.

Example   The following example shows how to configure a system with two
diskette drives and a U.S. keyboard:

```
Select floppy drive capacity:
    5.25" 1.2MB
    3.5"  1.44MB
    3.5"  2.88MB

Is there a second floppy:
    Yes
    No

Select floppy drive capacity:
    5.25" 1.2MB
    3.5"  1.44MB
    3.5"  2.88MB

Select keyboard:
    U.S.    101-key keyboard
    Japanese 106-key keyboard
```

**Effects of This
Procedure**   The following table describes how this procedure affects other
system settings and the actions that you must take as a result of
using the procedure:

Effect	Suggested Action
Sets the FLOPPY environment variable to 0, 1, or 2.	None.
Sets the FLOPPY2 environment variable to N, 0, 1, or 2.	None.
Sets the KEYBOARDTYPE environment variable to 0 or 1.	None.
Affects the EISA configuration.	Run the EISA configuration utility following the instructions listed in Chapter 4.

Setting the System to Boot Automatically

Summary   This section describes how to set the system to boot automatically, when you turn it on, or when you switch from the OpenVMS and OSF console to the Windows NT firmware.

Procedure   The following table lists the steps that you must follow to set the system to boot automatically:

Step	Action	Result
1	If necessary access the Setup menu.	The system displays the Setup menu.
2	Choose the `Setup autoboot` menu item and press Enter.	The system displays a prompt asking you whether you want the system to boot automatically.
3	If you do not want the system to boot automatically, choose No and press Enter.	The system displays the Setup menu.
4	If you want the system to boot automatically, choose Yes and press Enter.	The system prompts you to enter the countdown value. You specify the countdown value in seconds. The countdown value gives you that number of seconds to stop the system from booting.
5	Enter a value for the countdown and press Enter.	The system displays the Setup menu.
6	If you have finished making changes in the Setup menu, see the section entitled Saving the System Set-Up or Quitting the Setup Menu .	The system saves the changes only when you exit from the Setup menu.

Example

The following example shows how to set the system to autoboot and set the countdown value to 10 (default):

```
Should the system autoboot:
    Yes
    No

Enter Countdown value (in seconds): 10
```

Effects of This Procedure

The following table describes how this procedure affects other system settings and the actions that you must take as a result of using the procedure:

Effect	Suggested Action
Sets the AUTOLOAD environment variable to YES or NO.	None.
Sets the COUNTDOWN environment variable to a value in seconds.	None.
Causes the system to begin a boot countdown sequence when you access the Boot menu in certain ways.	Use the up arrow key or down arrow key to choose another menu item to cancel the boot countdown and remain in the Windows NT firmware.

Editing the System Environment Variables

Summary

This section describes how to edit the system environment variables.

Important Information

―――――――――――――――― Caution ―――――――――――――――

Editing the values of the default Windows NT firmware environment variables can cause serious damage to the system. You must use this procedure only to edit or create your own environment variables. If you accidentally delete or modify one of the default Windows NT firmware environment variables, immediately follow the procedure described in the section entitled Resetting the System to Factory Defaults to reset the value.

――――――――――――――――――――――――――――――――――

Procedure

The following table lists the steps that you must follow to edit the environment variables:

Step	Action	Result
1	If necessary access the Setup menu.	The system displays the Setup menu.
2	Choose the `Edit environment variables` menu item and press Enter.	The system displays the environment variable edit screen.
3	Use the up arrow key or down arrow key to select the name of an existing environment variable or enter a new environment variable name.	Pressing the up arrow key or down arrow key displays the environment variables names in the list.
4	If necessary, edit the environment variable name. Press Enter when the environment name is correct.	The system displays the current value of the environment variable, if it already exists.
5	If you want to update the environment variable value, edit or enter the environment variable value and press Enter.	The system includes the modified or new environment variable at the bottom of the list.

Step	Action	Result
6	If you want to delete the environment variable, leave the value field blank and press Enter.	The system deletes the environment variable from the list.
7	Press the escape (ESC) key to return to the Setup menu.	The system displays the Setup menu.
8	If you have finished making changes in the Setup menu, see the section entitled Saving the System Set-Up or Quitting the Setup Menu .	The system saves the changes only when you exit from the Setup menu.

Example

The following example shows how to add a user-defined environment variable:

```
Use Arrow keys to select a variable, ESC to exit:

   Name:  C:
   Value:  scsi()disk(0)rdisk()partition(1)

Environment variables:
   CONSOLEIN=multi()key()keyboard()console()
   CONSOLEOUT=eisa()video()monitor()console()
   FWSEARCHPATH=scsi()disk(0)rdisk()partition(1)
   TIMEZONE=PST8PDT
   A:=eisa()disk()fdisk()
   FLOPPY2=N
   FLOPPY=1
   KEYBOARDTYPE=0
   AUTOLOAD=YES
   COUNTDOWN=10
```

Effects of This Procedure

This procedure creates an environment variable that you can use in other parts of the Windows NT firmware.

Default Windows NT Firmware Environment Variables

Summary   This section describes the default Windows NT firmware environment variables.

Important Information

──────────────────── **Caution** ────────────────────

Do not edit or delete the default firmware Windows NT environment variables. This can cause serious damage to the system.

──

Default Environment Variables   The following table lists and explains the default Windows NT firmware environment variables:

Variable	Description
CONSOLEIN	The console input device. The default value is multi()key()keyboard()console().
CONSOLEOUT	The console output device. The default value is eisa()video()monitor()console().
FWSEARCHPATH	The search path used by the Windows NT firmware and other programs to locate particular files. The default value is the same as the SYSTEMPARTITION environment variable value.
TIMEZONE	The time zone in which the system is located. This variable accepts ISO/IEC9945-1 (POSIX) standard values.
A:	The default diskette drive. The default value is eisa()disk()fdisk().
FLOPPY	The capacity of the default diskette drive, either 1 (1.2M bytes), 2 (1.44M bytes), or 3 (2.88M bytes).
FLOPPY2	The capacity of an optional second diskette drive, either N (not installed), 1, 2, or 3.
KEYBOARDTYPE	The type of keyboard connected to the system, either 0 (U.S.) or 1 (Japan).
AUTOLOAD	The default startup action, either YES (boot) or NO or undefined (remain in Windows NT firmware).

Variable	Description
COUNTDOWN	The default time-limit in seconds before the system boots automatically when AUTOLOAD is set to yes. The default value is 10.

Other Environment Variables

The operating system or other programs, for example, the ECU, may create either temporary or permanent environment variables for their own use. Do not edit or delete these environment variables.

Resetting the System to Factory Defaults

Summary   This section describes how to reset the system to the factory default settings.

Procedure   The following table lists the steps that you must follow to reset the system to the factory default settings:

Step	Action	Result
1	If necessary access the Setup menu.	The system displays the Setup menu.
2	Choose the `Reset system to factory defaults` menu item and press Enter.	The system displays a selection menu asking you to confirm your choice.
3	Choose NO and press Enter if you do not want to continue.	The system displays the Setup menu.
4	Choose YES and press Enter if you want to continue.	The system sets the default environment variables, sets the default configuration, creates at least one boot selection, and sets the AUTOLOAD environment variable to YES. It then displays the Setup menu.
5	If you have finished making changes in the Setup menu, see the section entitled Saving the System Set-Up or Quitting the Setup Menu .	The system saves the changes only when you exit from the Setup menu.

Effects of This Procedure   Resetting the system to factory defaults clears the EISA configuration information. You must run the EISA configuration utility (ECU) on the system before you try to boot the operating system. See Chapter 4 for information on using the ECU.

Saving the System Set-Up or Quitting the Setup Menu

Summary

This section describes how to exit from the Setup menu with or without saving the changes you make to the system set-up.

Saving the System Set-Up

The following table lists the steps that you must follow to save the system set-up after you make changes to it:

Step	Action	Result
1	Choose the `Supplementary menu, and save changes...` menu item and press Enter.	The system saves the changes that you have made in the NVRAM and then displays the Supplementary menu.

Quitting the Setup Menu

The following table lists the steps that you must follow to quit from the Setup menu without saving the changes that you made to the system set-up:

Step	Action	Result
1	Choose the `Supplementary menu, and do not save changes...` menu item and press Enter.	The system discards the changes that you have made and then displays the Supplementary menu.

Other Setup Menu Functions

Summary

This section describes where to get information on the following Setup menu functions:

- Managing boot selections

- Running the EISA configuration utility (ECU)

Managing Boot Selections

See Chapter 3 for information on managing the Windows NT boot selections.

Running the ECU

See Chapter 4 for information on running the EISA configuration utility.

3

Managing Windows NT Boot Selections

Introduction   This chapter describes how to manage the boot selections that the Windows NT operating system uses when booting.

In This Chapter   This chapter contains the following sections:

- Accessing the Boot Selections Menu
- Information on Boot Selection Variables
- Adding a Boot Selection
- Checking the Boot Selections for Errors
- Changing a Boot Selection
- Displaying the System Boot Selections
- Changing the Default Boot Selection
- Deleting a Boot Selection

Accessing the Boot Selections Menu

Summary   This section describes how to access the Boot selections menu.

Procedure   The following table lists the steps that you must follow to access the Boot selections menu:

Step	Action	Result
1	If necessary, access the Setup menu.	The system displays the Setup menu.
2	Choose the `Manage boot selection menu...` menu item and press Enter.	The system displays the Boot selections menu.

Example   The following example shows the Boot selections menu:

```
Boot selections menu:

    Add a boot selection
    Change a boot selection
    Check boot selections
    Delete a boot selection
    Dump boot selections
    Rearrange boot selections
    Setup menu...

Use the arrow keys to select, then press Enter.
```

Information on Boot Selection Variables

Summary   This section describes the Windows NT Boot selection variables
                that the system uses when booting.

Boot Selection   The following tables lists and explains the boot selection
Variables   variables:

Variable	Description
LOADIDENTIFIER	The name of the boot selection, for example, Windows NT. You can specify any string value. The firmware does not check the value of this string.
SYSTEMPARTITION	The ARC-defined device name for the partition containing the operating system loader (OSLOADER.EXE for Windows NT).
OSLOADER	The full file name of the operating system loader, including partition device name, directories, and file name.
OSLOADPARTITION	The ARC-defined device name for the partition containing the operating system kernel.
OSLOADFILENAME	The directory name of the root directory for the operating system directory tree, including partition device name (\WINNT for Windows NT).
OSLOADOPTIONS	A string that is passed to the operating system. The firmware does not check the value of this string.

Adding a Boot Selection

Summary   This section describes how to add a boot selection.

Procedure   The following table lists the steps that you must follow to add a
                boot selection:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the `Add a boot selection` menu item and press Enter.	The system displays a series of selection menus and prompts relating to the Windows NT operating system.
3	If you have not changed the location of the operating system files, you can use the default answers and choices provided by the procedure.	The system includes the boot selection in the list of boot selections and then displays the Boot selections menu.
4	If you have changed the location of the operating system files, you must edit the default answers or choose selections other than those provided by the procedure. See your operating system documentation for more information.	The system includes the boot selection in the list of boot selections and then displays the Boot selections menu.
5	If you have finished modifying the boot selections, choose the `Setup menu...` menu item and press Enter.	The system displays the Setup menu.

Example   The following example shows how to add a boot selection:

```
Select a system partition for this boot selection:
   Scsi Hard Disk 0 Partition 1
   New system partition

Enter location of system partition for this boot selection:
      Select media:
   Scsi Hard Disk
   Floppy Disk
   CD-ROM

      Enter SCSI bus number: 0

      Enter SCSI ID: 4

Enter the osloader directory and name: \os\nt\osloader.exe

Is the operating system in the same partition as the osloader:
   Yes
   No

Enter location of os partition:
      Select media:
   Scsi Hard Disk
   Floppy Disk
   CD-ROM

      Enter SCSI bus number: 0

      Enter SCSI ID: 0
      Enter partition : 1

Enter the operating system root directory: \winnt

Enter a name for this boot selection: Windows NT
Do you want to initialize the debugger at boot time:
   Yes
   No
```

Checking the Boot Selections for Errors

Summary
This section describes how to check the system boot selections for errors.

Errors in Boot Selections
There are two main causes of errors in boot selections:

- The boot selection is defined incorrectly

  This causes the system to search in the wrong locations for the operating system files.

- The operating system is installed incorrectly

  This causes the system to fail when it tries to locate the operating system files.

You must consider both possibilities when trying to correct any errors detected in the boot selection.

Procedure
The following table lists the steps that you must follow to check the boot selections for errors:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the Check boot selections menu item and press Enter.	The system checks the boot selections for errors. If it does not detect any errors, it remains in the Boot selections menu. If it does detect errors, it displays the name of the boot selection in which it detected the error, a selection menu, and a message indicating the cause of the error.

Step	Action	Result
3	If you want to change the boot selection variables causing the error, choose the `Change this boot selection` menu item and press Enter. Follow the steps listed in the procedure in the next section, starting at step 4, for information on changing the variable values.	The system displays the Boot selection edit display, listing the boot selection variables and their values.
4	If you want to delete the boot selection, choose the `Delete this boot selection` menu item and press Enter.	The system deletes the boot selection. If the system detects a further boot selection with errors, it repeats the display for that boot selection. Otherwise, it displays the Boot selections menu.
5	If you want to ignore errors in the boot selection, choose the `Ignore problems with this boot selection` menu item and press Enter.	If the system detects a further boot selection with errors, it repeats the display for that boot selection. Otherwise, it displays the Boot selections menu. When you return to the Setup menu, the `Manage boot selections` menu item error indicator (->) remains.
6	If you have finished modifying the boot selections, choose the `Setup menu...` menu item and press Enter.	The system displays the Setup menu.

Example The following example shows a display that results when the system detects an error in a boot selection:

```
Problems were found with Windows NT .  Choose an action:

    Ignore problems with this boot selection
    Delete this boot selection
    Change this boot selection

OSLOADPARTITION cannot be found, value is:
    scsi()disk(0)rdisk()partition(2)
```

Changing a Boot Selection

Summary   This section describes how to change a boot selection by modifying the values of the boot selection variables.

Procedure   The following table lists the steps that you must follow to change the value of a boot selection variable:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the `Change a boot selection` menu item and press Enter.	The system displays a selection menu listing the names of the system boot selections.
3	Choose the name of the boot selection that you want to change and press Enter.	The system displays the Boot selection edit display, listing the boot selection variables and their values.
4	Press the up arrow key or down arrow key to select the name of a variable.	Pressing the up arrow key or down arrow key displays the boot selection variable names in the list.
5	Press Enter when the system displays the name of the variable whose value you want to change.	The system displays the current value of the variable.
6	To update the boot selection variable value, edit the existing value and press Enter.	The system includes the modified or new boot selection variable in the boot selection display.
7	Press the escape (Esc) key to return to the Boot selections menu.	The system displays the Boot selections menu.
8	If you have finished modifying the boot selections, choose the `Setup menu...` menu item and press Enter.	The system displays the Setup menu.

Example   The following example shows how to change a boot selection:

```
 Use Arrow keys to select a variable, ESC to exit:

    Name:  OSLOADFILENAME
    Value:  \winnt

Environment variables for boot selection 1:
    LOADIDENTIFIER=Windows NT
    SYSTEMPARTITION=scsi()disk(0)rdisk()partition(1)
    OSLOADER=scsi()disk(0)rdisk()partition(1)\osloader.exe
    OSLOADPARTITION=scsi()disk(0)rdisk()partition(2)
    OSLOADFILENAME=\winnt
    OSLOADOPTIONS=nodebug
```

Displaying the System Boot Selections

Summary
This section describes how to fully display the system boot selections.

Procedure
The following table lists the steps that you must follow to fully display the system boot selections:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the Dump boot selections menu item and press Enter.	The system displays the system boot selections. The boot selection variable values for each boot selection are separated by semicolons (;). When possible, the values share the same line to save space on the screen.
3	When you have finished examining the boot selections, press Enter, or any other key.	The system displays the Boot selections menu.

Example The following example shows a sample boot selections display:

```
LOADIDENTIFIER=Windows NT 2;Windows NT ;Windows NT 3
SYSTEMPARTITION=scsi()disk(0)rdisk()partition(1);
                scsi()disk(0)rdisk()partition(1);
                scsi()disk(0)rdisk()partition(1)
OSLOADER=scsi()disk(0)rdisk()partition(1)\os\nt\osloader.exe;
        scsi()disk(0)rdisk()partition(1)\os\nt\osloader.exe;
        scsi()disk(0)rdisk()partition(1)\osloader.exe
OSLOADPARTITION=scsi()disk(0)rdisk()partition(1);
                scsi()disk(0)rdisk()partition(1);
                scsi()disk(0)rdisk()partition(2)
OSLOADFILENAME=\winnt;\winnt;\winnt
OSLOADOPTIONS=nodebug;nodebug;nodebug

 Press any key to continue...
```

Changing the Default Boot Selection

Summary
This section describes how to change the default boot selection.

Definition:
Default Boot
Selection
The default boot selection is the first boot selection on the system boot selections list. It is the boot selection that the system attempts to boot automatically if the AUTOLOAD environment variable is set to YES.

Procedure
The following table lists the steps that you must follow to change the default boot selection:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the `Rearrange boot selections` menu item and press Enter.	The system displays a selection menu listing the names of the system boot selections.
3	If you do not want to change the default boot selection, press the escape (Esc) key.	The system displays the Boot selections menu without changing the default boot selection.
4	If you want to change the default boot selection, choose the name of the boot selection that you want to become the default boot selection and press Enter.	The system places that boot selection at the top of the system boot selection list where it becomes the default boot selection.
5	Press the escape (Esc) key when you have finished rearranging the order of the boot selections.	The system displays the Boot selections menu.
6	If you have finished modifying the boot selections, choose the `Setup menu...` menu item and press Enter.	The system displays the Setup menu.

Example   The following example shows how to change the default boot
selection:

```
 Pick selection to move to the top, ESC to exit:
    Windows NT
    Windows NT 2
    Windows NT 3
```

Deleting a Boot Selection

Summary   This section describes how to delete a boot selection.

Procedure   The following table lists the steps that you must follow to delete
                     a boot selection:

Step	Action	Result
1	If necessary, access the Boot selections menu.	The system displays the Boot selections menu.
2	Choose the `Delete a boot selection` menu item and press Enter.	The system displays a selection menu listing the names of the system boot selections.
3	If you do not want to delete a boot selection, press the escape (Esc) key.	The system then displays the Boot selections menu without deleting a boot selection.
4	If you want to delete a boot selection, choose the name of that boot selection and press Enter.	The system deletes the boot selection and displays the Boot selections menu.
5	If you have finished modifying the boot selections, choose the `Setup menu...` menu item and press Enter.	The system displays the Setup menu.

Example   The following example shows how to delete a boot selection:

```
Selection to delete:
   Windows NT
   Windows NT 2
   Windows NT 3
```

4

Using the EISA Configuration Utility

Introduction   This chapter describes how to use the EISA configuration utility
(ECU) to configure EISA or ISA option boards within the system.

In This Chapter   This chapter contains the following sections:

- EISA Configuration Utility Overview
- Running the ECU
- Quick Configuration
- Configuring an EISA Option
- Configuring an ISA Option
- Using the Generic ISA Configuration File
- Moving an EISA Option Board to Another Slot
- Moving an ISA Option Board to Another Slot
- Removing an Option Board
- Changing Board Function and Resource Settings
- Advanced ECU Features
- Resolving a Conflict in the Configuration

EISA Configuration Utility Overview

Summary
This section provides a brief overview of the functions of the ECU and provides information that you must read before using it.

Function of the ECU
The system uses the ECU to assign system resources to each option board installed in the system. These resources include interrupt requests, direct memory access, input/output ports, and memory buffers. The ECU also identifies configuration conflicts and identifies the settings causing these conflicts.

You can use the ECU to customize the functions of the options boards installed in the system. For example, you can use the ECU to enable or disable network booting on a network option board.

Two ECU Diskettes
The system is supplied with two ECU diskettes. One diskette contains the ECU and configuration files for the OpenVMS and OSF/1 operating systems. The other diskette contains the ECU and configuration files for the Windows NT operating system. The configuration utilities on each disk are functionally equivalent, but the configuration files are different to support each operating system.

_____ **Caution** _____

Make sure that you use the correct ECU diskette for the operating system that you are running.

_____

Configuration Files

_____ **Note** _____

The standard configuration (.CFG) files supplied with the option you want to install may not work on this system. These files often use overlay files that are not required on this system or reference inappropriate system resources, for example, buffer addresses. Contact your Digital service representative if you want to verify

a configuration file that is not supplied on the ECU configuration diskettes.

Copying the Configuration Diskette

Make a backup copy of the configuration diskette before using it for the first time. Keep the original configuration diskette in a safe place and use the backup copy when you are configuring the system. The configuration diskette must have the volume label SYSTEMCFG.

Getting Help

The ECU provides extensive help. If you have not used the ECU before, Digital recommends that you choose the `Step 1: Important EISA configuration information` menu item on the main menu and read the information that the system displays. This information describes how to configure the system and explains the difference between EISA and ISA options. The ECU also provides two other sources of help that can help you when configuring the system, as follows:

- Automatic help screens
- Help menu

Automatic Help Screens

While you use the ECU, it displays help screens and messages that explain the function of each menu and screen that it displays. Read these help messages carefully.

Help Menu

You can access the ECU Help menu by pressing the F1 function key at any time. The Help menu provides many different ways of accessing help information and on using the Help menu itself. It provides help information on all aspects of the ECU.

Important Information

_____ **Caution** _____

When adding both EISA and ISA options, always add and configure the EISA option boards before you configure and add the ISA option boards.

Running the ECU

Summary
This section describes how to run the ECU and access its main menu from either the Windows NT firmware or the OpenVMS and OSF/1 console.

Running the ECU from a Diskette
The following table lists the steps that you must follow to run the ECU and access the main menu:

Step	Action	Result
1	Insert the configuration diskette (or backup copy) into the diskette drive.	You must use the correct configuration diskette for the operating system that you are running.
Windows NT Firmware Only		
2	If necessary, access the Setup menu. See Chapter 2 for information on accessing the Setup menu.	The system displays the Setup menu.
3	Choose the Run EISA configuration utility from floppy menu item and press Enter.	The system runs the ECU, then displays an introductory screen.
OpenVMS and OSF/1 Console Only		
2	Enter the RUNECU command at the console prompt.	The system displays a confirmation prompt.
3	Enter Y to run the ECU.	The system initializes the Windows NT firmware and runs the ECU. It then displays an introductory screen.
Both Types of Firmware		
4	Press Enter.	The ECU loads the required configuration files, then displays the ECU main menu. If it cannot find the required configuration files, it displays a message providing information on the files it needs and on where to find them.

Running the ECU from Another Location

The following table lists the steps that you must follow to run the ECU from a location other than the diskette drive and access the main menu:

Step	Action	Result
1	If necessary, access the Boot menu in the Windows NT firmware. See Chapter 2 for information on accessing the Boot menu.	The system displays the Boot menu.
2	Choose the `Run a program` menu item and press Enter.	The system prompts you to enter the name of the program that you want to run.
3	Enter the full device and directory specification for the ECU program (CF.EXE) and press Enter.	The system runs the ECU, then displays an introductory screen.
4	Press Enter.	The ECU loads the required configuration files, then displays the ECU main menu. If it cannot find the required configuration files, it displays a message providing information on the files it needs and on where to find them.

Quick Configuration

Summary   This section describes how to quickly configure the system using the ECU.

When to Use   You must use this procedure only when you have not added an
This Procedure   ISA option, or when you have added an EISA option and do
                        not want to make changes to the configuration. The procedure
                        described in this chapter does not provide information on
                        customizing or displaying system or configuration settings. This
                        information is provided in the following sections.

Procedure   The following procedure lists the steps that you must follow to
                        quickly configure the system:

Step	Action	Result
1	If necessary, run the ECU.	The ECU displays the main menu.
2	Choose the `Step 5: Save and exit` menu item and press Enter.	The system displays the Save and exit screen.
3	Choose the `Save the configuration and restart the computer` menu item and press Enter.	The ECU saves the configuration in the Nonvolatile RAM (NVRAM) and, if possible, in a file called SYSTEM.SCI on the current drive or partition. It then displays a Reboot information screen. The system is now configured.

OpenVMS and OSF/1 Console Only

Step	Action	Result
4	Turn the system off and then on.	The system enters the OpenVMS and OSF/1 console.
5	Remove the configuration diskette.	

Windows NT Firmware Only

Step	Action	Result
4	Press Enter to restart the system.	The system returns to the Windows NT firmware Boot menu.
5	Remove the configuration diskette.	

Configuring an EISA Option

Summary   This section describes how to configure an EISA option within the system.

Procedure   The following table lists the steps that you must follow to configure an EISA option within the system:

Step	Action	Result
1	Install the EISA option following the procedures described in Chapter 10.	
2	Run the ECU.	If the ECU locates the required configuration files on the configuration diskette, it displays the main menu. Go to step 5 for information on completing the configuration. If the ECU cannot find the required configuration files, it displays a message providing information on the files it needs and on where to find them.
3	Locate the configuration (.CFG) file following the instructions that the ECU displays.	There are two possible locations for the configuration file: • The configuration file is on the diskette supplied with the option. • The configuration file is on a library diskette or in a library directory on a disk drive. If you cannot locate the configuration file in either of these locations, contact your sales representative. When you locate the configuration file and copy it into the system memory, the system prompts you to insert the configuration diskette.
4	Insert the configuration diskette and press Enter.	The system copies the configuration file to the configuration diskette, then displays the main menu.

Configuring an EISA Option

Step	Action	Result
5	If you want to print the settings for the new option board to a file or printer attached to the parallel printer port, choose the `Step 4: Examine required switches` menu item and press Enter. Press F7 when the system displays the Examine required switches screen. If you do not want to print the settings, go to step 8.	The system displays the Print Settings menu.
6	Choose a menu item and press Enter, then follow the instructions that the system displays.	The system prints the settings to a file or to the printer.
7	When the system returns to the Examine required switches screen, press F10 or the escape (Esc) key to return to the main menu.	The system displays the main menu.
8	Choose the `Step 5: Save and exit` menu item to save the configuration.	The system displays menu items that allow you to save or discard the changes.
9	Choose the `Save the configuration and restart the computer` menu item and press Enter.	The system saves the configuration information. It then displays the Reboot information screen. The system is now configured.

OpenVMS and OSF/1 Console Only

10	Turn the system off and then on.	The system enters the OpenVMS and OSF/1 console.
11	Remove the configuration diskette.	

Windows NT Firmware Only

10	Press Enter to restart the system.	The system returns to the Windows NT firmware Boot menu.
11	Remove the configuration diskette.	

Configuring an ISA Option

Summary   This section describes how to configure an ISA option within the system when you have a configuration file for it.

**Important
Information**

_____ **Note** _____

You configure ISA options using jumpers on the option board. The ISA configuration files only provide a record of the jumper settings.

Many ISA options do not have configuration files. If you do not have a configuration file for the option, see the section entitled Using the Generic ISA Configuration File for information on configuring these options.

_____

Procedure   The following table lists the steps that you must follow to configure an ISA option within the system:

Step	Action	Result
1	Identify both the manufacturer's name and the name of the ISA option board.	You must have this information to locate a configuration file for the option, if one exists.
2	Run the ECU and, if necessary, configure the EISA option boards within the system. See the previous section for information on configuring the EISA option boards.	The system displays the main menu.
3	Choose the `Step 2: Add or remove boards` menu item and press Enter.	The system displays the Add or remove boards screen, listing the EISA slots and installed options.
4	Press the insert (Ins) key to add an ISA option board to the configuration.	The system displays information asking you to locate the configuration file for the option that you want to install.

Step	Action	Result
5	Locate the configuration (.CFG) file following the instructions that the ECU displays.	There are three possible locations for the configuration file: • The configuration file is on the configuration diskette. • The configuration file is on the diskette supplied with the option. • The configuration file is on a library diskette or in a library directory on a disk drive. If you cannot locate the configuration file in either of these locations, see the section entitled Using the Generic ISA Configuration File for information on using the generic ISA configuration file.
6	When you locate the configuration file, press Enter to select it.	Follow the instructions displayed on the screen. The system then displays the Add screen.
7	Choose an acceptable slot for the ISA option board and press Enter.	The system includes the option in the configuration.

_____ **Note** _____

The system displays a Caution message or a Configuration Changes screen if the option that you add causes a conflict in the configuration. It marks the board causing the conflict as *Deactivated*. Follow the instructions that the system displays or see the section entitled Resolving a Conflict in the Configuration for more information.

_____

Step	Action	Result
8	Press F10 or the escape (Esc) key to return to the main menu.	The system displays the main menu.

Step	Action	Result
9	Choose the `Step 4: Examine required switches` menu item and press Enter. Press F7 when the system displays the Examine required switches screen to print the settings for the new option board to a file or printer attached to the parallel printer port.	The system displays the Print Settings menu.
10	Choose a menu item and press Enter, then follow the instructions that the system displays.	The system prints the settings to a file or to the printer.
11	When the system returns to the Examine required switches screen, press F10 or the escape (Esc) key to return to the main menu.	The system displays the main menu.
12	Choose the `Step 5: Save and exit` menu item to save the configuration.	The system displays menu items that allow you to save or discard the changes.
13	Choose the `Save the configuration and restart the computer` menu item and press Enter.	The system saves the configuration information. It then displays the Reboot information screen.
14	Remove the configuration diskette and turn off the system.	
15	If necessary, change the switch or jumper settings on the ISA option board to match the requirements listed in the settings file that you printed to a file or the printer.	The ISA configuration file only displays the available system settings that you can set on the ISA option board. You must manually change the settings on the board.
16	Install the ISA option following the procedures described in Chapter 10.	The system is now configured.

Using the Generic ISA Configuration File

Summary   This section describes how to configure an ISA option board within the system when you cannot locate the configuration file for it.

Procedure   The following table lists the steps that you must follow to configure an ISA option within the system using the generic ISA configuration file:

Step	Action	Result
1	Run the ECU and, if necessary, configure the EISA option boards within the system. See the section entitled Configuring an EISA Option for information on configuring the EISA option boards.	The system displays the main menu.
2	Choose the `Step 2: Add or remove boards` menu item and press Enter.	The system displays the Add or remove boards screen, listing the EISA slots and installed options.
3	Press the insert (Ins) key to add an ISA option board to the configuration.	The system displays information asking you to locate the configuration file for the option that you want to install.
4	Locate the Generic ISA Adapter Definition configuration file (!ISA0000.CFG) following the instructions that the ECU displays.	This file is normally located on the configuration diskette.
5	When you locate the configuration file, press Enter to select it.	Follow the instructions displayed on the screen. The system then displays the Add screen.
6	Choose an acceptable slot for the ISA option board and press Enter.	The system includes the option in the configuration.
7	Press F10 or the escape (Esc) key to return to the main menu.	The system displays the main menu.
8	Choose the `Step 3: View or edit details` menu item and press Enter.	The system displays the View or edit details screen.

Step	Action	Result
9	Scroll through this screen and locate the Generic ISA Adapter Definition configuration information.	The screen lists resource settings for the ISA option board.
10	Set the resources for the ISA option.	See the ISA option board documentation for information on the resources required by the option.
11	Press F7 to access the Advanced menu.	The system displays the Advanced menu.
12	Choose the Lock/unlock boards menu item and press Enter.	The system displays the Lock/unlock boards screen.
13	Choose the Generic ISA Adapter Definition and press Enter.	This prevents the ECU from changing the settings that the ISA option uses when it is resolving resource conflicts.
14	Press F10 or the escape (Esc) key three times.	The system displays the main menu.
15	Choose the Step 4: Examine required switches menu item and press Enter. Press F7 when the system displays the Examine required switches screen. This allows you to print the settings for the new option board to a file or printer attached to the parallel printer port.	The system displays the Print Settings menu.

_____ **Note** _____

Locking the Generic ISA Adapter Definition may change the required switch settings for other EISA or ISA boards. Check the switch settings of all the option boards marked with an arrow on the Examine required switches screen.

_____

Step	Action	Result
16	Choose a menu item and press Enter, then follow the instructions that the system displays.	The system prints the settings to a file or to the printer.
17	When the system returns to the Examine required switches screen, press F10 or the escape (Esc) key to return to the main menu.	The system displays the main menu.

Step	Action	Result
18	Choose the `Step 5: Save and exit` menu item to save the configuration.	The system displays menu items that allow you to save or discard the changes.
19	Choose the `Save the configuration and restart the computer` menu item and press Enter.	The system saves the configuration information. It then displays the Reboot information screen.
20	Remove the configuration diskette and turn off the system.	
21	If necessary, change the switch or jumper settings on the ISA option board to match the requirements listed in the settings file that you printed to a file or the printer.	The ISA configuration file only displays the available system settings that you can set on the ISA option board. You must manually change the settings on the board.
22	Install the ISA option following the procedures described in Chapter 10.	The system is now configured.

Moving an EISA Option Board to Another Slot

Summary   This section describes briefly how to move an EISA option board
                   to a different slot in the configuration.

Procedure   The following table lists the steps that you must follow to move
                   an EISA option board to a different slot:

Step	Action	Result
1	Physically remove and replace the EISA option board that you want to move following the procedure listed in Chapter 10.	The system may indicate configuration errors when you turn it on.
2	Run the ECU.	The system reconfigures the option boards.
3	Choose the `Step 5: Save and exit` menu item and press Enter.	The system displays the Save and exit screen.
4	Save the configuration following the information that the system displays.	If you are running the ECU from the OpenVMS and OSF/1 console, turn off the system when it displays the Reboot information screen. Otherwise, press Enter to display the Windows NT firmware boot menu. The system is now fully reconfigured.

Moving an ISA Option Board to Another Slot

Summary   This section describes briefly how to move an ISA option board to a different slot in the configuration.

Procedure   The following table lists the steps that you must follow to move an ISA option board to a different slot:

Step	Action	Result
1	Run the ECU, choose the `Step 2: Add or remove boards` menu item and press Enter.	The system displays the Add or remove boards screen.
2	Choose the ISA option board that you want to move and press Enter.	The system displays a Move confirmation screen.
3	Press Enter to confirm the move, select a new slot for the ISA option board, then press Enter again.	The system moves the ISA option configuration information to that slot.
4	Press F10 or the escape (Esc) key to display the main menu, choose the `Step 4: Examine required switches` menu item, then press Enter.	The system displays the Examine required switches screen.
5	Print the configuration settings to a file or the printer.	
6	Return to the main menu, choose the `Step 5: Save and exit` menu item and press Enter.	The system displays the Save and exit screen.
7	Save the configuration following the information that the system displays.	If you are running the ECU from the OpenVMS and OSF/1 console, turn off the system when it displays the Reboot information screen. Otherwise press Enter to display the Windows NT firmware boot menu. The system is now fully reconfigured.
8	Remove and replace the ISA option that you want to move following the procedures listed in Chapter 10.	The system is now reconfigured.

Removing an Option Board

Summary   This section describes briefly how to remove an option board from the configuration.

Procedure   The following table lists the steps that you must follow to remove an option board from the configuration:

Step	Action	Result
1	Remove the option board following the procedures listed in Chapter 10.	The system may indicate configuration errors when you turn it on.
2	If you removed an EISA option board, follow the procedure listed in the section entitled Quick Configuration in this chapter.	
3	If you removed an ISA option board, run the ECU, then choose the Step 2: Add or remove boards menu item, and delete the configuration for the ISA option board that you removed.	The system removes the ISA board configuration information from the display.
4	Return to the main menu, then choose the Step 5: Save and exit menu item, and save the new configuration.	The system is now reconfigured.

Changing Board Function and Resource Settings

Summary This section describes how to change the function and resource settings used by an option board.

Function and Resource Settings When you access the View or edit details screen, many of the option boards listed in the configuration have function settings that you can change. For example, some network option boards allow you to set the network interface type or the network boot time-limit. You can change these settings to determine how the board operates.

You can also change the resource settings that the board uses, for example, interrupt request (IRQ) lines, direct memory access (DMA) channels, input/output (I/O) ports, or memory buffer addresses and sizes. These resource settings request system resources that are limited and cannot be shared between option boards. For example, if one board uses IRQ 5, no other board can use this IRQ. When more than one board requests the same resource, a configuration conflict occurs. Some function settings also have resource settings associated with them.

Procedure   The following table lists the steps that you must follow to change a function or resource setting:

Step	Action
1	Access the View or edit details screen.
2	Locate the function or resource that you want to change by using the up arrow, down arrow, page up, or page down keys to scroll through the screen.
3	Choose the function or resource and press Enter.
4	Choose a new setting.
5	If you want to change a resource setting associated with a function setting, choose the function setting and press F6. If a resource is marked with a plus sign (+), you can change it.
6	Press the escape (Esc) key to choose another function or resource setting, or press Enter to return to the View or edit details screen.
7	If the verification mode is set to automatic and the change that you make causes a configuration conflict, the system either displays a suggested configuration change or deactivates the board that caused the conflict. See the section entitled Resolving a Conflict in the Configuration for information on resolving these conflicts.
8	If the verification mode is set to manual, press F8 to verify the configuration. If there is a conflict in the configuration, the system marks the board function or resource setting causing the conflict with an asterisk (*). See the section entitled Resolving a Conflict in the Configuration for information on resolving these conflicts.

Advanced ECU Features

Summary
This section describes how to use the features provided by the Advanced menu in the ECU.

Accessing the Advanced Menu
To access the Advanced menu, access the View or edit details screen and press F7.

Advanced Features
The following table describes the features that are available in the Advanced menu:

Feature	Description
Lock/unlock boards	This feature allows you to lock or unlock the settings corresponding to an option board. When you lock the board's settings, the ECU cannot change that board's settings to automatically resolve configuration conflicts. You must lock an option board's settings in the following situations: • When adding an ISA option board using the Generic ISA Adapter configuration file • When a particular option board uses system resources that you do not want changed You may be required to unlock or remove an option board if the system detects a configuration conflict that it cannot resolve by changing another option board's settings.
View additional system information menu	This feature allows you to view the following information: • Option board specifications • System configuration specifications • Used resources • Available resources The Used resources and Available resources screens are helpful when you are trying to resolve a configuration conflict detected by the system.

Feature	Description
Set verification mode menu	This feature allows you to set the verification mode to automatic or manual. These modes have the following uses:
	• When the system is in automatic mode (default) it attempts to resolve configuration conflicts automatically. When you cause a conflict by changing a resource, the system displays a Configuration Changes screen that displays the resources that it needs to change in order to resolve the conflict. You can accept or reject the proposed change.
	• When the system is in manual mode, you must verify the configuration after you change a resource. Press F8 on the View or edit details screen to verify the configuration. If the system detects a conflict, it indicates the board settings on the option boards that are in conflict. You can now try changing the resources for these settings to resolve the conflict.
Maintain SCI files menu	This feature allows you to perform the following tasks:
	• Make a backup system configuration information (SCI) file.
	• Restore or import a previously created SCI file

Resolving a Conflict in the Configuration

Summary

This section provides information on resolving conflicts in the configuration.

Causes of Configuration Conflicts

Option boards cause configuration conflicts when more than one option board requests the same system resource, for example, the same IRQ or DMA. To resolve the conflict, you must change the settings on one of the boards causing the conflict.

Detecting Conflicts

If the verification mode is set to automatic, the system automatically informs you when you perform an action that causes a configuration conflict. If the verification mode is set to manual, you must verify the configuration before you exit the ECU by pressing F8 on the View or edit details screen. If there is a configuration conflict, the system displays a warning message and indicates the board settings that are causing the conflict.

Procedure

The following table lists the steps that you must follow to resolve a conflict in the configuration:

Step	Action
1	If the verification mode is set to automatic, and the system suggests an acceptable resource setting change that resolves the conflict, press Enter to resolve the conflict.
2	If the conflict remains, set the verification mode to manual if necessary.
3	Access the View or edit details screen and press F8 to verify the configuration.
4	Examine the View or edit details screen for the board settings marked with an asterisk(*). If necessary, view the system resources used by these settings.
5	Write down the resource type and value that the board uses for the settings causing the conflict.

Step	Action
6	Access the Advanced menu to examine the Available resources screen to determine if you can change the resource settings of any of the boards causing the conflict to an available setting.
7	If you cannot change the resource settings of any of the boards causing the conflict to an available resource, examine the View or edit details screen for boards that are locked.
8	The board causing the conflict may be able to use the resource settings of a locked board. If possible, unlock the board and change any of the resources used by that board to resolve the conflict. See the documentation supplied with the locked option board for information on the valid resource settings for that board.
9	If you follow steps 1 to 8 and the conflict remains, you must remove one of the option boards causing the conflict.

5

Using the OpenVMS and OSF/1 Console

Introduction   This chapter describes how to use the OpenVMS and OSF/1 console to secure the console, display the system devices, display the system configuration, and set system defaults in the OpenVMS and OSF/1 console.

In This Chapter   This chapter contains the following sections:

- Console Security Feature

- Setting or Changing the Security Password

- Enabling and Disabling the Console Security Feature

- Entering and Exiting Privileged Console Mode

- Displaying the OpenVMS and OSF/1 System Device Display

- Displaying the System Configuration

- Setting the Default Boot Device for OpenVMS and OSF/1

- Setting the Default Boot Flags for OpenVMS and OSF/1

- Setting the Default Startup Action

- Setting the Default Keyboard Language

- Setting the Default Operating System from the OpenVMS and OSF/1 Console

- Setting the HOST SCSI ID

- Setting the Console Display Device

- Displaying the System Status

Console Security Feature

Summary   This section describes how to use the console security feature.

Description   The console security feature is provided on the OpenVMS and
                     OSF/1 console to prevent unauthorized access to the majority
                     of the OpenVMS and OSF/1 console commands. The console
                     security feature allows you to set a password that privileged
                     users must enter to access these commands.

**Unprivileged   Unprivileged users, who do not know the security password,
Commands**   can use only three commands. The following table lists these
                     commands:

Command	Description
BOOT (without parameters)	This command boots the default operating system using the parameters stored in nonvolatile memory. When the system boots successfully, the system enters secure mode if a valid security password is set.
CONTINUE	This command restarts the operating system after an external halt.
LOGIN	This command allows privileged users access to all the console commands after entering the security password, if a password is set.

**Console
Security
Feature
Commands**

The following table describes the commands provided by the
password security feature. The following sections describe these
commands in more detail:

Command	Description
SET PASSWORD	This command sets the security password.
SET PSE	This command secures the console if a valid password is set. When the console is secured, privileged users must log in using the correct password to access all of the console commands.
LOGIN	This command allows privileged users to access all of the console commands. The command prompts for the security password before permitting access.

**Clearing the
Password**

To clear the console security password, disconnect the system
battery for several seconds. See Chapter 12 for information on
disconnecting the battery.

Setting or Changing the Security Password

Summary
This section describes how to set the security password.

Effects of Setting the Password
Setting the security password causes the following effects:

- The system sets the PASSWORD environment variable with an encrypted representation of the security password.

- Successful completion of the BOOT or CONTINUE command causes the system to enter secure mode.

- The SET PSE ON command causes the system to enter secure mode.

Procedure
The following table lists the steps that you must follow to set the security password:

Step	Action	Result
1	If the console is secured, enter the LOGIN command then enter the security password when prompted.	The system enters secure mode.
2	Enter the SET PASSWORD command.	The system prompts you to enter either the current security password (PSWD0>>>) or a new security password (PSWD1>>>).
3	If necessary, enter the current system password.	The system does not display the password as you type it. The system prompts you to enter a new system password.
4	Enter a new security password. The password must be exactly 16 characters long.	The system does not display the password as you type it. If the password is more or less than 16 characters, the system displays an error message and returns to the console prompt. If the password format is correct, the system prompts you to verify it.

Step	Action	Result
5	Enter the new security password again.	The system does not display the password as you type it. If you do not enter the new security password correctly, the system displays an error message and returns to the console prompt. If you do enter it correctly, the system stores the new password in the nonvolatile memory.

Example 1   The following example shows how to use the SET PASSWORD command to enter the security password:

```
>>> SET PASSWORD
  PSWD0>>> (Enter a new password)
  PSWD1>>> (Verify the new password)

>>>
```

Example 2   The following example shows how to change the security password:

```
>>> SET PASSWORD
  PSWD0>>> (Enter the current password)
  PSWD1>>> (Enter a new password)
  PSWD2>>> (Verify the new password)
```

Enabling and Disabling the Console Security Feature

Summary

This section describes how to enable and disable the console security feature using the SET PSE command.

Console Security Feature Enabled

When the console security feature is enabled, you can use only the BOOT, CONTINUE and LOGIN Commands. You must use the LOGIN command to enter privileged console mode before you can use all other console commands. The console security feature remains enabled after you boot, halt, or turn on the system.

Console Security Feature Disabled

When the console security feature is disabled, you are always in privileged console mode. You can use all the supported console commands. The console security feature remains disabled after you boot, halt, or turn on the system. When the system is shipped, the console security feature is disabled.

Enabling the Security Feature

The following table lists the steps that you must follow to enable the console security feature:

Step	Action	Result
1	If necessary, use the SET PASSWORD command to set the security password.	The security password must be set before you enter the SET PSE command.
2	Enter the SET PSE ON command.	If the security password is not set, the system responds with an illegal command message (?23 ILL CMD) indicating that you must set the security password. If the security password is set, the system responds with a message indicating that PSE is ON. The console security feature is now enabled.

Disabling the Security Feature

The following table lists the steps that you must follow to disable the console security feature:

Step	Action	Result
1	If necessary, use the login command to access the privileged console mode.	You can now use all of the console commands.
2	Enter the SET PSE OFF command.	The system responds with a message indicating that PSE is OFF. The console security feature is now disabled.

Example

The following example shows how to enable the console security feature:

```
>>> SET PSE ON

PSE = ON
>>>
```

Entering and Exiting Privileged Console Mode

Summary	This section describes how to enter and exit privileged console mode.
Privileged Console Mode	When the console security feature is enabled, you must enter privileged console mode to use all supported console commands. When the console security feature is disabled, you are always in privileged console mode.
Entering Privileged Console Mode	The following table lists the steps that you must follow to enter privileged console mode:

Step	Action	Result
1	Enter the LOGIN command.	If a valid security password is set, the system prompts you to enter it. If the password is not set, the system displays a message indicating that the password is not entered.
2	When prompted, enter the security password.	If the password you enter matches the password stored in the nonvolatile memory, the system enters privileged console mode.

Exiting Privileged Console Mode	To exit privileged console mode, perform one of the following tasks:

- Successfully boot the system

- Enter the CONTINUE command

- Halt the system

Example   The following example shows how to use the enter privileged console mode:

```
>>> LOGIN
  PSWD0>>> (Enter the password)
```

Displaying the OpenVMS and OSF/1 System Device Display

Summary	This section describes how to display the system device display and determine the storage and boot devices installed in the system.
Command	Enter the SHOW DEVICE command (❶) to display the system device display.
Uses	You can use the system device display for the following tasks:

- Identifying the OpenVMS and OSF/1 boot devices

- Displaying information on the devices in the system

- Identifying errors in the system device configuration

  See Chapter 7 for information on using the system device display for identifying errors in the system device configuration.

Identifying the Boot Devices   The following table lists the device names that you can use as boot devices in the OpenVMS and OSF/1 console:

Device Name	Description
ERA0 or EZ0A	ERA0 (OpenVMS) or EZ0A (OSF/1) represents the Ethernet device. You use this device when booting the system over a network.
DKx0	DKx0 represents a disk drive with a SCSI ID of 0 on SCSI bus x, where x is a letter in the range A to D. When the system supports two or less SCSI adapters, DKA0 is normally the default boot device when the system is shipped.
DKxn00	DKxn00 represents a CD-ROM drive, disk drive, or diskette drive with a SCSI ID of n on SCSI bus x, where n is a number in the range 1 to 7 and x is a letter in the range A to D.
MKxn00	MKxn00 represents a tape drive with a SCSI ID of n on SCSI bus x, where n is a number in the range 1 to 7 and x is a letter in the range A to D.

Example   The following example shows a sample system device display:

```
>>> SHOW DEVICE ❶
 BOOTDEV      ADDR      DEVTYPE     RM/FX    DEVNAM      REV      NUMBYTES
 -------      ----      -------     -----    ------      ---      --------
 ERA0         08-00-2B-2E-2E-C3
 DVA0         PC Floppy DISK        RM
 SCSI Devices..
 DKA0         A/0/0     DISK        FX       RZ25        0700     426.25MB
 MKA200       A/2/0     TAPE        RM       TZK10       03B8     ......
 DKA400       A/4/0     RODISK      RM       RRD42       4.5d     ......
 HOST         A/5/0     PROC                 AHA1742A    G.2
```

Displaying the OpenVMS and OSF/1 System Device Display, *continued*

Displaying System Device Information	You can use the system device display to show useful information on the devices installed in the system. The following table shows how to interpret the information contained in the system device display:

Item	Description
BOOTDEV (❶)	The BOOTDEV column lists the software device names of the devices connected to the system. The previous section explains some of these device names. In addition, the system device display contains the device names DVA0 or FD0 and HOST. DVA0 (OpenVMS) and FD0 (OSF/1) are the device names of the diskette drive connected to the SCSI adapter using the PC/AT-standard interface and HOST is the SCSI adapter.
ADDR (❷)	The ADDR column lists the Ethernet addresses and the SCSI addresses of the devices on the SCSI bus. The SCSI addresses have the following format:
	• The letter represents the SCSI bus identifier, in this case A. The system supports up to four SCSI adapters with bus identifier letters A to D.
	• The first number represents the SCSI ID of the device.
	• The second number represents the logical unit number (lun) of the device.
DEVTYPE (❸)	The DEVTYPE column lists the device type of the devices on the SCSI bus. The system uses the following device types: DISK, TAPE, RODISK (read-only) and PROC (SCSI controller).
RM/FX (❹)	The RM/FX column lists whether the device uses removable (RM) or fixed (FX) media.
DEVNAM (❺)	The DEVNAM column lists the manufacturer's device name for each SCSI device.
REV (❻)	The firmware revision of the device.
NUMBYTES (❼)	The NUMBYTES column lists the capacity of the SCSI device, when the system can determine it.

Example   The following example shows a sample system device display:

```
>>> SHOW DEVICE
     ❶           ❷          ❸          ❹         ❺        ❻         ❼
 BOOTDEV      ADDR      DEVTYPE     RM/FX     DEVNAM     REV     NUMBYTES
 -------      ----      -------     -----     ------     ---     --------
 ERA0         08-00-2B-2E-2E-C3
 DVA0         PC Floppy DISK        RM
 SCSI Devices..
 DKA0         A/0/0     DISK        FX        RZ25       0700    426.25MB
 MKA200       A/2/0     TAPE        RM        TZK10      03B8    ......
 DKA400       A/4/0     RODISK      RM        RRD42      4.5d    ......
 HOST         A/5/0     PROC                  AHA1742A   G.2
```

Displaying the System Configuration

Summary	This section describes how to display the system configuration display. It also describes how to use this display.
Command	Enter the SHOW CONFIG command (❶) to display the system configuration display.
Uses	You can use the system device display for the following tasks: • Reviewing the results of the power-up tests • Identifying errors in the EISA configuration See Chapter 7 for information on using the system configuration display for these tasks.
Interpreting the Display	The following table describes how to interpret the system configuration display:

Item	Description
❷	This column lists the EISA slot numbers and the device identifiers of any EISA option boards installed in those slots. The system does not list ISA devices in this column.
❸	This column lists the power-up and self-test device names of the devices that the system detected when it last ran the power-up tests.
❹	This column lists the results of the most recent power-up or self-test for each device in the display.

Example The following example shows a sample of a SHOW CONFIG display:

>>> **SHOW CONFIG** ❶

```
DEC 2000 Model 300 AXP - Rom Version nnn
Digital Equipment Corporation
VMS PAL Xn.nn/OSF PAL Xn.nn - Built on 19-MAY-1992 13:38:25.71
        ❷              ❸                    ❹
Eisa Info      Devnam            Devstat
---------      --------          -------
               CPU          OK EV4 P2
               MEM          OK 32MB
               NVR          OK
               SCC          OK
                IT          OK
               KBD          OK
               LPT          OK
1 DEC4220       NI          OK 09-01-2B-2F-3D-D4
2
3
4
5
6 ADP0002     SCSI          OK
```

Setting the Default Boot Device for OpenVMS and OSF/1

Summary   This section describes how to set the default boot device for the OpenVMS and OSF/1 operating systems.

Valid Settings   You can use any of the boot devices listed in the section entitled Displaying the OpenVMS and OSF/1 System Device Display . In addition, the system also accepts the following settings:

- A list

  You can enter a list of valid device names separated by commas (,). The system attempts to boot from each device in turn until it is successful. If it fails to boot from the last device, it returns to the console prompt.

- A period (.)

  A period sets the boot device value to a null value.

Procedure   The following table lists the steps that you must follow to set the default boot device for the OpenVMS or OSF/1 operating systems:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter the SHOW DEVICE command at the console prompt.	The system displays a list of the system devices.

Step	Action	Result
3	Enter commands at the console prompt similar to those shown in the example, using the device name or names that you require.	The first command displays the current default boot device. The second command resets the default boot device to the device or devices that you specify. See the section entitled Displaying the OpenVMS and OSF/1 System Device Display for a description of the OpenVMS and OSF/1 device name conventions. In the example, the command changes the boot device to a list including the Ethernet device and the system disk.
		The system stores the boot device setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Important Information

——————————— **Caution** ———————————

The OpenVMS and OSF/1 console does not verify the device names that you enter. It treats the values as a string.

————————————————————————————

Example

The following example shows the commands that you must enter in the OpenVMS and OSF/1 console to reset the default boot device:

```
>>>  SHOW BOOTDEF_DEV

BOOTDEF_DEV = DKA0
>>>  SET BOOTDEF_DEV ERA0,DKA0

BOOTDEF_DEV = ERA0,DKA0
>>>
```

Setting the Default Boot Flags for OpenVMS and OSF/1

Summary This section describes how to set the default boot flags for OpenVMS and OSF/1.

OpenVMS and OSF/1 Boot Flags See your operating system documentation for information on the specific boot flags that you can set when booting either OpenVMS or OSF/1.

Procedure The following table lists the steps that you must follow to set the default boot flags:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter commands at the console prompt similar to those shown in the example.	The first command displays the current default boot flags. The second command resets the default boot flags for OpenVMS to 0,1.
		The system stores the boot flags setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Important Information

_____ **Caution** _____

The OpenVMS and OSF/1 console does not verify the boot flags that you enter. It treats the values as a string.

Example The following example shows the commands that you must enter in the OpenVMS and OSF/1 console to reset the default boot flags for OpenVMS:

```
>>> SHOW BOOT_OSFLAGS

BOOT_OSFLAGS = 0,0
>>>
>>> SET BOOT_OSFLAGS 0,1

BOOT_OSFLAGS = 0,1
>>>
```

Setting the Default Startup Action

Summary

This section describes how to set the default startup action for the OpenVMS and OSF/1 operating systems. The startup action determines the action of the system when you turn it on or when it fails.

Startup Action Values

The following table lists the startup (or recovery) action values and describes the results of each value:

Value	Description
RESTART	The system boots automatically when it is turned on or after it fails.
BOOT	The system boots automatically when it is turned on. It halts after a system failure.
HALT	If the OS_TYPE environment variable is set to OSF or VMS, the system halts in the OpenVMS and OSF/1 console when the system is turned on. The system halts in the OpenVMS and OSF/1 console after the system fails.

Procedure   The following table lists the steps that you must follow to set the default startup action:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter commands at the console prompt similar to those shown in the example.	The first command displays the current default startup action. The second command resets the default startup action to BOOT.
		The system stores the startup action setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Example   The following example shows the commands that you must enter in the OpenVMS and OSF/1 console to reset the default startup action:

```
>>> SHOW AUTO_ACTION

AUTO_ACTION = HALT
>>>
>>> SET AUTO_ACTION BOOT

AUTO_ACTION = BOOT
>>>
```

Setting the Default Keyboard Language

Summary This section describes how to set the default keyboard language from the OpenVMS and OSF/1 console.

Keyboard Languages Enter the HELP SET command (❶) to display a list of the supported keyboard languages.

Procedure The following table lists the steps that you must follow to set the default keyboard language:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter commands at the console prompt similar to those shown in the example.	The first command displays the HELP SET display, listing the keyboard languages. The second command displays the current default keyboard language. The third command resets the default keyboard language to American English (US). After you press Enter, the system displays the new default keyboard language.
		The system stores the default keyboard language setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Example   The following example shows the commands that you must enter
in the OpenVMS and OSF/1 console to reset the default keyboard
language:

```
>>> HELP SET ❶
  SET AUTO_ACTION <{RESTART | 1} | {BOOT | 2 } | {HALT | 3}>
  SET BOOTDEF_DEV <ddau>
  SET BOOT_OSFLAGS <bflg>
  SET DIAGENV <1 | 2 | 3 >
  SET KEYBOARD < DANSK     | DEUTSCH     | SCHWEIZ >
               < US        | UK          | ESPANOL >
               < FRANCAIS  | CANADIAN    | SUISSE >
               < ITALIANO  | NEDERLANDS  | NORSK >
               < PORTUGUES | SUOMI       | SVENSKA >
               < VLAAMS >
  SET PASSWORD
  SET PSE
  SET SCSI_{A | B | C | D} <0 - 7>
  SET OS_TYPE <{NT | 1} | {VMS | 2} | {OSF | 3}>
  SET CONSOLE <{SERIAL | 1} | {VGA | 2}>

>>> SHOW KEYBOARD

KEYBOARD = UK
>>>
>>> SET KEYBOARD US

KEYBOARD = US
>>>
```

Setting the Default Operating System from the OpenVMS and OSF/1 Console

Summary

This section describes how to set the default operating system from the OpenVMS and OSF/1 console.

Operating System Names

The following table lists the operating system names that you can use in the OpenVMS and OSF/1 console commands:

Operating System Name	Description
NT	Windows NT Advanced Server operating system
OSF	OSF/1 operating system
VMS	OpenVMS operating system

Procedure   The following table lists the steps that you must follow to set the default operating system from the OpenVMS or OSF/1 console:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter commands at the console prompt similar to those shown in the example.	The first command displays the current default operating system. The second command resets the default operating system to Windows NT Advanced Server.
		The system stores the operating system setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Example   The following example shows the commands that you must enter in the OpenVMS and OSF/1 console to reset the default operating system:

```
>>> SHOW OS_TYPE

OS_TYPE = VMS
>>>
>>> SET OS_TYPE NT

OS_TYPE = NT
>>>
```

Setting the HOST SCSI ID

Summary   This section describes how to set the SCSI adapter (HOST) SCSI
                  ID on SCSI bus A, B, C, or D.

SCSI Buses   The system supports up to four SCSI adapters. Each SCSI
                  adapter provides a SCSI bus. These SCSI buses are identified by
                  the letters A to D.

SCSI IDs   Each device on a SCSI bus must have a unique SCSI ID. These
                  IDs are in the range 0 to 7. The SCSI adapter default SCSI ID
                  is 7. It is possible to have two SCSI adapters on the same bus,
                  for example, in different systems, connected to the same external
                  devices and the internal devices in both systems. In situations
                  like this, you must change the default SCSI ID of one of the
                  SCSI adapters.

Procedure   The following table lists the steps that you must follow to set the
                  default SCSI ID on the SCSI adapter:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter commands at the console prompt similar to those shown in the example.	The first command displays the current default SCSI ID of the SCSI adapter on SCSI bus A. The second command resets this default SCSI ID to ID 6.
		The system stores the SCSI ID setting that you specify in the system nonvolatile random-access memory (NVR). This setting is maintained by the NVR battery when the system is turned off.

Example   The following example shows the commands that you must enter
                     in the OpenVMS and OSF/1 console to reset the default SCSI ID
                     of the SCSI adapter on SCSI bus A:

```
>>> SHOW SCSI_A

SCSI_A = 00000007
>>>
>>> SET SCSI_A 6

SCSI_A = 00000006
>>>
```

Displaying the System Status

Summary

This section describes how to display the status of the system.

Command

Enter the SHOW BOX_SETUP command to show the status of the system.

Interpreting the Results

The following table describes how to interpret the information contained in the system status display:

Item	Description
Mode ❶	Displays whether the system is running or in standby mode.
Temperature ❷	Displays whether the system temperature is OK or high.
SPS ❸	Displays whether an internal or external SPS is installed.
Battery state ❹	Displays whether the battery is flat or the charge voltage. The system displays this item only when an SPS is present.
Power source ❺	Displays whether the system is powered from the power supply or the battery. The system displays this item only when an SPS is present.

Example

The following example shows a sample system status display:

```
>>> SHOW BOX_SETUP

BOX No. 1
BOX is Running ❶
Temperature is OK ❷
SPS present ❸
    Battery charge voltage = 18 v. ❹
    Power on active. ❺
```

Setting the Console Display Device

Summary

This section describes how to switch the console display device from a monitor (SVGA port) to a terminal (serial port) and vice versa.

Important Information

_____ **Caution** _____

Be aware of the following before using the procedure:

- You must have a monitor and a terminal attached to the system before you switch from one to the other.

- The system does not store the console display device setting in the system nonvolatile random-access memory (NVR). When you turn the system off this setting is lost.

Procedure

The following table describes how to switch the console display between a monitor and terminal, then back again:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter a command at the console prompt similar to the first command in the example.	This command switches the console display from the monitor to the terminal.
3	On the terminal keyboard, enter a command at the console prompt similar to the second command in the example.	This command switches the console display from the terminal to the monitor.

Example   The following example shows the commands that you must enter
in the OpenVMS and OSF/1 console to switch the console display
between a monitor and terminal, then back again:

```
>>> SET CONSOLE SERIAL
```

```
>>> SET CONSOLE VGA
```

6
Troubleshooting the System

Introduction   This chapter describes how to troubleshoot the system using troubleshooting tables.

In This Chapter   This chapter contains the following sections:

- Before You Begin
- Determining the Problem
- Power-Up Problems
- Boot Problems
- Keyboard and Mouse Problems
- Diskette Drive Problems
- SCSI Drive Problems
- Network and Option Board Problems

Before You Begin

Summary

This section describes the procedure that you must use to troubleshoot system problems.

Problem Solving Methods

There are two ways to identify and solve problems with the system, as follows:

- Use the troubleshooting tables in this chapter to identify and, if possible, correct the problem.

- Use the procedures listed in Chapter 7 to identify the problem and then report it to your Digital service representative.

What You Must Do First

The following table lists the steps that you must follow to identify and possibly correct system problems:

Step	Action
1	When you detect a system problem, try to match the problem with one of the titles of the other sections in this chapter.
2	If you can match the problem with a section title, use the troubleshooting tables in that section to further isolate the problem.
3	Check the causes of the symptom in the Possible Cause column of the troubleshooting table. If the troubleshooting table lists more than one possible cause, check the possible causes and their suggested solutions in the order listed.
4	Follow the advice in the Suggested Solution column.
5	Follow the procedures listed in Chapter 7 if you cannot match the problem in the sections of this chapter or if the problem persists after you follow the advice in the troubleshooting tables.
6	If the problem still persists, contact your Digital service representative.

Determining the Problem

Summary

This section lists the types of problems described in the troubleshooting tables.

Troubleshooting Table Titles

The following table lists the troubleshooting table titles and their associated page numbers:

Title	Page Number
Power-Up Problems	6-4
Boot Problems	6-8
Keyboard and Mouse Problems	6-9
RX™26 Diskette Drive Problems	6-11
Generic SCSI Drive Problems	6-12
RRD42™ CD-ROM Drive Problems	6-13
TLZ06 Tape Drive Problems	6-14
TZK10 Tape Drive Problems	6-15

Network Problems

See the section entitled Network and Option Board Problems for information on troubleshooting network problems.

Power-Up Problems

Summary

This section describes possible power-up and operating system boot problems.

Power-Up Troubleshooting

The following table lists possible problems that the system may experience when you turn it on. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
The system unit fan is off or the power light is off.	The power cord is not connected. The power cord may be faulty. The power socket may not be working. The power cord fuse may have blown.	Make sure that all the power cords are connected correctly at both ends. Try a power cord that works or test the power socket with an appliance that works.
	The overload protection circuitry of the power supply may have shut down because of an abnormal condition on the power line.	Turn the system off and then turn it back on.
	The power supply unit (PSU) is faulty.	Contact your Digital service representative.
The IFP fails to display	There is no power supply or SPS power.	Check the power cable at both ends.
	The IFP-related cables are not connected correctly.	Contact your Digital service representative.
The IFP displays the message SYSTEM POWER OFF.	The IFP cable is not connected correctly to the system module.	Contact your Digital service representative.

Symptom	Possible Cause	Suggested Solution
The IFP displays a FAN FAILURE message.	The fans have failed, the fan cable is not connected to the IFP, or the power distribution board is not connected correctly or is faulty.	Contact your Digital service representative.
The IFP displays the CONSOLE FAIL message.	The IFP has failed its internal diagnostic tests.	Contact your Digital service representative.
The IFP displays the STANDBY BATT. LOW message.	The battery voltage level is low.	To force the system to continue the power-up tests, press the Run/standby key once and the Speaker key twice.
The power-up display does not show after 20 seconds.	The monitor or terminal is not turned on.	Turn on the monitor or terminal.
	The monitor or terminal brightness and contrast controls are incorrectly set.	Adjust the monitor or terminal contrast and brightness controls.
	The terminal or monitor cable is not connected correctly.	Make sure that all the cables are connected at both ends.
	The terminal cable is not connected to the correct serial port.	Check the serial port to which the terminal cable is connected. Make sure that it is connected to the left-hand serial port.
	The power cord is not connected. The power cord may be faulty. The power socket may not be working.	Make sure that all the power cords are connected correctly at both ends. Try a power cord that works or test the power socket with an appliance that works.
	The terminal or monitor fuse may have blown.	Replace the blown terminal or monitor fuse. See the terminal or monitor documentation.

Symptom	Possible Cause	Suggested Solution
	The terminal settings may be incorrect.	See the *DEC 2000 Model 500 AXP User Information* manual for the list of correct terminal settings. See the terminal documentation for information on setting up the terminal.
	The port to which the terminal or monitor connects may be faulty.	Try connecting the terminal or monitor to another system using the same terminal or monitor cable. If the terminal or monitor works, the port to which the terminal or monitor was connected is faulty. Contact your Digital service representative.
	The terminal, monitor, or cable may be faulty.	Connect the cable and the terminal or monitor to another system. If the connected terminal or monitor works, the system connector or connector circuitry is faulty. Otherwise, the cable or the terminal or monitor is faulty. If the terminal or monitor still fails to work, try another cable if possible. If the terminal or monitor works, the original cable was faulty. Otherwise, the terminal or monitor is faulty.
The power-up display contains question marks or the word *failed*.	A diagnostic error has occurred.	See Chapter 7 for information on determining the cause of the error.
The power-up test display contains unexpected characters.	The terminal settings are incorrect or the system circuitry is faulty.	Make sure the terminal settings are correct, then run the power-up test again. If the terminal is set correctly, contact your Digital service representative.

Symptom	Possible Cause	Suggested Solution
The NVR test indicates one of the following error messages: ?? 00 NVR 0020 or ?? 00 NVR 0004	The NVR battery may be faulty.	If you see this error message repeatedly, replace the battery following the procedure listed in Chapter 12.

Boot Problems

Summary This section describes possible operating system boot problems.

Boot Troubleshooting The following table lists possible problems that the system may experience when you try to boot the operating system. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
The system fails to boot the operating system.	(OpenVMS and OSF/1 only) The system defaults are incorrectly set.	Set the system defaults as described in Chapter 5, then try booting the system again. In particular, examine the settings of the following system defaults: AUTO_ACTION, BOOTDEF_DEV, and OS_TYPE. If the system still fails to boot, contact your Digital service representative.
	(OpenVMS and OSF/1 only) The boot device is incorrectly configured.	Use the SHOW BOOTDEF_DEV command to display the boot device, then make sure that the setting is correct.
	(Windows NT only) The boot selection is incorrectly set.	Follow the instructions in Chapter 3 for information on checking the boot selections.
	There is a hardware problem or configuration problem with the boot device.	See the section entitled SCSI Drive Problems for more information.
	There is a software problem or the operating system is not installed.	See your operating system documentation for more information.

Keyboard and Mouse Problems

Summary

This section describes possible keyboard and mouse problems with the system.

Keyboard and Mouse Troubleshooting

The following table lists possible problems that you may experience when you try to use the mouse or the keyboard on the system. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
The monitor does not display the character that you type.	The keyboard cable is incorrectly connected.	Make sure that the keyboard cable is connected correctly in the keyboard connector.
	The keyboard has failed.	Replace the keyboard. If the problem persists, contact your Digital service representative.
The monitor displays a message indicating a keyboard error.	The keyboard is not connected correctly.	Make sure that the keyboard is connected to the keyboard port.
The mouse pointer is displayed on the monitor, but does not move correctly.	The mouse is connected incorrectly.	Make sure that the mouse cable is connected correctly in the mouse connector.
	The mouse ball is dirty.	Remove the ball from the mouse and clean it in a lukewarm, mild-soap solution. Do not use organic solvents to clean the ball, for example, paint thinner. These solvents can damage the coating. Dry the mouse ball and replace it securely.
The mouse pointer does not show on the monitor.	The mouse is connected incorrectly or the mouse cable is loose.	Make sure that the mouse cable is connected correctly in the mouse connector.

Symptom	Possible Cause	Suggested Solution
	The system is in console mode.	The mouse pointer is displayed only when the operating system is running. Boot the operating system.
	The mouse is faulty.	Replace the mouse. You can order a replacement three-button mouse from your Digital sales representative.

Diskette Drive Problems

**RX26
Diskette Drive
Troubleshooting**

The following table lists possible problems that you may experience when you try to use the RX26 diskette drive. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
The system cannot read from or write to the diskette.	The diskette is not formatted.	Format the diskette.
	The diskette is not inserted correctly.	Eject the diskette. Try inserting the diskette again.
	The diskette is faulty.	Try a different diskette.
	The diskette drive head may be dirty.	See the *DEC 2000 Model 500 AXP User Information* manual for information on cleaning the diskette drive head.
	The ID select switch is in the wrong position or the drive power or signal cable may be disconnected.	Check the position of the ID select switch and make sure that the signal and power cables are correctly connected.
	The diskette drive controller may be faulty.	See Chapter 7 for information on running diagnostic tests. If the SCSI test fails, contact your Digital service representative.
	The diskette drive is faulty.	Contact your Digital service representative.
The system can read from but cannot write to a diskette.	The write-protect switch is in the write-protect position.	Eject the diskette and reset the switch. Try writing to the diskette again.
The diskette does not eject.	The diskette is positioned incorrectly in the drive.	Gently press the diskette with your finger and reposition it. Press the eject button again.

SCSI Drive Problems

Summary This section describes possible SCSI drive problems.

Generic SCSI Drive Troubleshooting The following table lists possible problems that you may experience when you try to use the SCSI drives. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
You cannot access the software or data on the drive.	The SCSI ID of the drive is not unique or the SCSI drive cables are connected incorrectly.	See Chapter 7 for information on displaying the SCSI device configuration. If the device is not listed in the display, check the SCSI cabling and the drive's SCSI ID.
	The SCSI controller is faulty.	See Chapter 7 for information on running diagnostic tests. If the SCSI test fails, contact your Digital service representative.
	The SCSI drive is faulty.	Contact your Digital service representative.
The system fails to complete the SCSI test or the SHOW DEVICE display.	There are too many disk drives installed in the system.	See Chapter 11 for information on the maximum number of internal disk drives that the system can support.

RRD42 CD-ROM Drive Troubleshooting

The following table lists possible problems that you may experience when you try to use the RRD42 CD-ROM drive. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
You cannot read from the device.	Generic SCSI problem.	See the table on page 6-12 for information on possible causes and suggested solutions.
The drive does not accept the caddy.	The disc is upside-down in the caddy or it is not placed correctly in the caddy.	Remove the disc from the caddy and reinsert it properly.
	A caddy is already present.	Eject the caddy and replace it with a new one.
The eject button fails to eject the caddy.	The eject button is disabled by software.	Re-enable the eject button or manually eject the caddy.
	The system does not have power.	Set the system unit on/off switch to the on position and press the eject button again.
	The RRD42 compact disc drive is faulty.	If you want to eject the caddy manually, see the *DEC 2000 Model 500 AXP User Information* manual for instructions. If the problem persists, contact your Digital service representative.

SCSI Drive Problems, *continued*

**TLZ06
Tape Drive
Troubleshooting**

The following table lists possible problems that you may experience when you try to use the TLZ06 tape drive. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
You cannot read from or write to the device.	Generic SCSI problem.	See the table on page 6-12 for information on possible causes and suggested solutions.
The system cannot write to the cassette tape.	The write-protect switch is in the write-protect position.	If the write-protect LED is on, remove the tape, reset the switch and try writing to the tape again. If the problem persists, contact your Digital service representative.
	The cassette tape is not loaded.	Load the cassette tape.
The write-protect LED flashes.	The tape drive heads are dirty or the tape is worn.	Clean the drive heads (see the *DEC 2000 Model 500 AXP User Information* manual). If the problem persists, use a new tape.
The data read from the cassette tape is corrupted.	The tape drive heads may be dirty.	See the *DEC 2000 Model 500 AXP User Information* manual for information on cleaning the drive heads.

TZK10 Tape Drive Troubleshooting	The following table lists possible problems that you may experience when you try to use the TZK10 tape drive. It suggests possible causes and associated suggested solutions.

Symptom	Possible Cause	Suggested Solution
You cannot read from or write to the device.	Generic SCSI problem.	See the table on page 6-12 for information on possible causes and suggested solutions.
The data read from the QIC tape is corrupted.	The drive head is dirty.	Clean the drive head. See the *DEC 2000 Model 500 AXP User Information* manual for information on cleaning the drive heads.
The system cannot write to the QIC tape.	The write-protect switch is in the write-protect position.	Remove the QIC tape, reset the switch, and try writing to the QIC tape again. If the problem persists, contact your Digital service representative.
The system cannot read from or write to the QIC tape.	The QIC tape may be faulty.	Remove the QIC tape. If the amber LED turns off when you remove the QIC tape, the tape is probably faulty. Try a different QIC tape. If the amber LED stays on or if the problem persists, contact your Digital service representative.

Network and Option Board Problems

Summary
This section describes possible network and option board problems.

Network Troubleshooting
The system may experience different network problems depending on the type of network option board that you have installed. See the option board documentation for information on troubleshooting network problems.

Option Board Troubleshooting
The system may experience different problems depending on the types of option board that you have installed. See the option board documentation for information on troubleshooting option board problems.

7
Running Diagnostics

Introduction

This chapter describes how to use the OpenVMS and OSF/1 console commands to detect problems with the system. It also provides a diagnostic procedure that lists the order in which Digital recommends that you use these commands.

Important Information

_____ **Note** _____

If necessary, you must switch from the Windows NT firmware to the OpenVMS and OSF/1 console before using the procedures described in this chapter. See Chapter 1 for information on performing this task.

_____

In This Chapter

This chapter contains the following sections:

- Diagnostic Procedure
- IFP Error Messages
- Running Power-Up Tests
- Running Self-Tests
- Configuration Display
- System Device Display
- Interpreting Diagnostic LEDs

Diagnostic Procedure

Summary
This section describes the order in which Digital recommends that you run the diagnostic commands when troubleshooting the system.

Procedure
The following table lists the order in which Digital recommends that you run the diagnostic commands when troubleshooting the system:

Step	Action	Result
1	Troubleshoot the system following the procedures listed in Chapter 6.	The troubleshooting procedures can identify certain problems that the diagnostic tests cannot.
2	Turn on the system and examine the IFP display.	The IFP can identify problems with the power supplies, SPS, and fans. It also indicates power-up test problems if the system fails to display on a monitor or terminal.
3	Examine the power-up tests.	The power-up tests test each device in the system. When a device fails a power-up test, the system displays an error code that indicates the cause of the failure.
4	If the screen remains blank, examine the diagnostic LEDs.	The diagnostic LEDs provide clues to the state of the system when the screen fails to work.
5	If you see error codes in the power-up test display, write down the device name and error code associated with the device that failed, and run self-tests on those devices	The self-tests provide more information on the reason for the failure than the power-up tests do.
6	If you do not see error codes in the power-up test display, but know that the system is experiencing hardware problems, run the self-tests on all the devices in the system.	The self-tests sometimes detect problems that the power-up tests miss.

Step	Action	Result
7	Use the SHOW DEVICE command to display the system device display. The problem might be associated with a system device.	The SHOW DEVICE display can identify problems in the system device configuration or with individual system devices.
8	Use the SHOW CONFIG command to display the EISA configuration. The problem might be associated with the EISA devices.	The SHOW CONFIG display provides more information on the EISA configuration.

IFP Error Messages

Summary   This section describes the IFP error messages.

Error Messages   The following table lists the IFP error messages and explains their significance:

Message	Description
CONSOLE FAIL	The IFP is faulty, or the IFP cable is faulty or not connected properly, or the power supply is faulty. Contact your Digital service representative.
FAN FAIL	The fans are faulty, the fan cable is faulty or not connected properly, or the power supply is faulty. Contact your Digital service representative.
HIGH TEMPERATURE	The IFP, system module, or system cabling is faulty. Contact your Digital service representative.
RAM BACK-UP FAULT	The IFP is faulty. Contact your Digital service representative.
STANDBY BATT. LOW	The battery voltage is low. Press the Run/standby key once and the Speaker key twice to force the system to continue the power-up tests.
SYSTEM POWER OFF	The system unit is damaged or the IFP cables are incorrectly connected or damaged. Contact your Digital service representative. The system also displays this message when you set the on/off button to the off position.

Important Information

_____ **Caution** _____

When you override the STANDBY BATT. LOW message and power up the system, the system is not protected from power failures until the standby battery recharges.

_____

Running Power-Up Tests

Summary

This section describes how to run and interpret the power-up tests.

Running Power-Up Tests

Power-up tests run when you turn on the system. The power-up test display varies depending on the default operating system setting. The power-up test display for Windows NT is different from the displays for the other operating systems.

Interpreting the Power-Up Test Displays

The following table shows how to interpret the power-up test displays:

Item	Description	Action
❶	Console code version.	Write down the console code version. Your Digital service representative may need this information.
❷	ROM version.	Write down the ROM version. Your Digital service representative may need this information.
❸	CPU type and version—The CPU type and version are displayed in the OpenVMS and OSF/1 console only.	Write down the CPU type and version. Your Digital service representative may need this information.
❹	Passing memory test—The memory test also displays the system memory configuration. Similarly, when the Ethernet test passes, it displays the Ethernet ID of the system.	
❺	Passing test—When a test passes, its status is listed as *OK* or *passed*, depending on the default operating system setting.	
❻	Failing test—When a test fails, its status is listed as double question marks (??) or *failed*, depending on the default operating system setting. Double question marks indicate an error in the OpenVMS and OSF/1 console. The system also displays the error code associated with the failure. The IFP also displays the last error code in the power-up test display.	Write down the error code and device name of the failing test. Your Digital service representative may need this information.

Important Information

_____ **Note** _____

The power-up self-tests do not test all types of option board. See the option board documentation for information on whether the system tests that particular option board.

_____

OpenVMS and OSF/1 Display

The following example shows an OpenVMS and OSF/1 display:

```
This 1mb flash contains base level n.n DEC 2000 Model 500 AXP console code
                                   ❶

DEC 2000 Model 500 AXP - Rom Version nn ❷
Digital Equipment Corporation
System conducting power up tests
-------------------------------------------------------------
Devnam          Devstat
--------         -------
    CPU          OK EV4 P2 6.6ns ❸
    MEM          OK 32MB ❹
    NVR          OK
    SCC          OK ❺
     IT          OK
    KBD          OK
    LPT          OK
     NI          ?? 2000 0182 ❻
   SCSI          OK
-------------------------------------------------------------
```

Windows NT Display

The following example shows a Windows NT display:

```
       .
       .
       .
Testing KBD .... passed   ❺
Testing LPT .... passed
Testing VGA .... passed
Testing NI .... failed 2000 0182 ❻
Testing SCSI .... passed
-------------------------------------------------------------
```

Running Self-Tests

Summary This section describes how to run and interpret the self-tests.

Running Self-Tests You can run self-tests on all the devices listed in the power-up test display, with the exception of CPU on the OpenVMS and OSF/1 console power-up test display. To run self-tests on a device, enter the command TEST followed by the device name. The following example shows how to run a self-test on the Ethernet (NI) device.

Successful Self-Test Display When you run the self-test, the system tests the device. On certain devices, the system displays status messages from the subtests of the self-test that you are running. On all devices, the system displays the word *OK* (❶) before displaying the console prompt if the test succeeds.

Failing Self-Test Display On certain devices, the system displays error status messages, followed by the error code line, and then the words *84 FAIL* before displaying the console prompt. On all devices, the system displays the error code line and the words *84 FAIL* before displaying the console prompt.

If the test fails, write down the device name (❷), the error status message (❸) and the error code line (❹). Your Digital service representative may need this information.

Successful Self-Test

The following example shows a successful Ethernet (NI) device self-test display:

```
>>> TEST NI
OK ❶
>>>
```

Failing Self-Test

The following example shows a failing Ethernet (NI) device self-test display:

```
>>> TEST NI  ❷
T_STS_NI - Test BUS
T_STS_NI - Test INIT
T_STS_NI - Test IRQ
T_ERR_NI - Interrupt test - interupt did not occurr.  ❸
       CSR0 = 1c1
?? 03    NI    150  ❹

  84 FAIL
>>>
```

Configuration Display

Summary   This section describes how to display and interpret the system configuration.

Displaying the System Configuration   You can display the system configuration by entering the SHOW CONFIG command.

Interpreting the Configuration Display   The configuration display shows a summary of the status of all the system devices in the order in which they were tested by the power-up tests. There are two ways to change the status of a device on the configuration display, as follows:

- By running a self-test on the device

- By turning off the system and then turning it on again

One of the most useful features of the configuration display is that it displays the EISA slot and device type of the devices that are located on EISA option boards. For example, the Ethernet (NI) device (❶) is an EISA option board in the first EISA connector. This feature allows you to check the system configuration after installing, moving, or removing an EISA option board.

EISA Device Error   If the configuration display shows an error code beside an EISA device, write down the EISA connector number and error codes associated with that device. Your Digital service representative may want this information.

If the configuration display shows error codes beside several EISA devices, the system module may be faulty. Write down the EISA connector numbers and error codes associated with all the failing devices.

**Important
Information**

_____ **Note** _____

The system configuration display does not include ISA
devices. The system may also exclude certain EISA
option boards from the display. See the EISA option
board documentation for more information.

**System
Configuration
Display**

The following example shows a sample System Configuration
display:

```
>>> SHOW CONFIG

DEC 2000 Model 500 AXP - Rom Version nnn
Digital Equipment Corporation
VMS PAL X5.41/OSF PAL X1.30 - Built on 19-MAY-1992 13:38:25.71

Eisa Info    Devnam          Devstat
---------    --------        -------
             CPU          OK EV4 P2
             MEM          OK 32MB
             NVR          OK
             SCC          OK
              IT          OK
             KBD          OK
             LPT          OK
1 DEC4220    NI           OK 09-01-2B-2F-3D-D4 ❶
2
3
4
5
6 ADP0002    SCSI         OK

>>>
```

System Device Display

Summary   This section describes how to display and interpret the system
                         device display.

Displaying the   You can display the system device display by entering the SHOW
System Device   DEVICE command.
Display

Interpreting the   The system device display shows the Ethernet devices, the
System Device   PC/AT-standard interface diskette drive, and the SCSI devices
Display   installed in the system. Perform the following actions, depending
                         on the display:

- If the display does not contain an entry for all the Ethernet
  devices installed, along with their associated Ethernet
  addresses, make sure that the Ethernet option boards are
  correctly connected to the system unit, and that all the
  Ethernet ports or cables are properly terminated. See the
  Ethernet option board documentation for more information.

- If the display does not contain the diskette drive, check the
  diskette drive, the diskette drive power and signal cables,
  and the SCSI option board. See the SCSI option board
  documentation for more information.

- If the display does not contain an entry for all the SCSI
  devices installed, or if the display fails to complete, check
  the SCSI IDs of the devices, making sure that they are
  unique, check the devices, the device signal and power
  cables, and the SCSI option board. See the SCSI option
  board documentation for more information. Also, make sure
  that you do not have too many SCSI disk drives installed
  in the system. See Chapter 11 for more information on the
  maximum number of supported disk drives.

System Device Display

The following example shows a sample system device display:

```
>>> SHOW DEVICE

  BOOTDEV      ADDR       DEVTYPE      RM/FX     DEVNAM     REV      NUMBYTES
  -------      ----       -------      -----     ------     ---      --------
  ERA0         08-00-2B-2E-2E-C3
  DVA0         PC Floppy DISK          RM
  SCSI Devices..
  DKA0         A/0/0      DISK         FX        RZ25       0700     426.25MB
  MKA200       A/2/0      TAPE         RM        TZK10      03B8     ......
  DKA400       A/4/0      RODISK       RM        RRD42      4.5d     ......
  HOST         A/5/0      PROC                   AHA1742A   G.2
```

Interpreting Diagnostic LEDs

Summary This section describes how to interpret the diagnostic LED display.

Interpreting the Diagnostic LEDs Display You can use the diagnostic LEDs to determine system problems when the system fails to display the power-up test display on the monitor or terminal. When you turn on the system, the system displays different combinations of the diagnostic LEDs as the system completes the power-up tests. If the power-up tests fail, the diagnostic LEDs display the combination that represents the failing test.

When reading the diagnostic LED combinations, read the LEDs from the top of the system unit. Most diagnostic LED combinations indicate serious problems with the system. However, the following table shows Diagnostic LED combinations that may indicate problems that you can correct without calling your Digital service representative. In the following table, the number 0 indicates a LED that is off, and the number 1 indicates a LED that is on.

Diagnostic LED Combination	Interpretation	Possible Problem and Solution
1110 or 1000	The system has successfully halted in the Windows NT firmware or the system has successfully halted at the OpenVMS and OSF/1 console.	If the monitor or terminal has not displayed the power-up test display, check that the monitor or terminal power and signal cables are connected correctly and that the monitor or terminal is turned on and working. If the monitor or terminal is working correctly, contact your Digital service representative.

Diagnostic LED Combination	Interpretation	Possible Problem and Solution
1001 or 0101	Memory error in memory bank 0 or memory bank 1.	If you have recently installed new memory modules or have changed the memory module configurations, ensure that the memory modules are properly installed in the memory module connectors. See Chapter 12 for information on properly configuring the memory modules. If the memory configuration is correct, contact your Digital service representative.

Illustration The following figure shows the location of the diagnostic LED display. The figure shows the LED combination 1011.
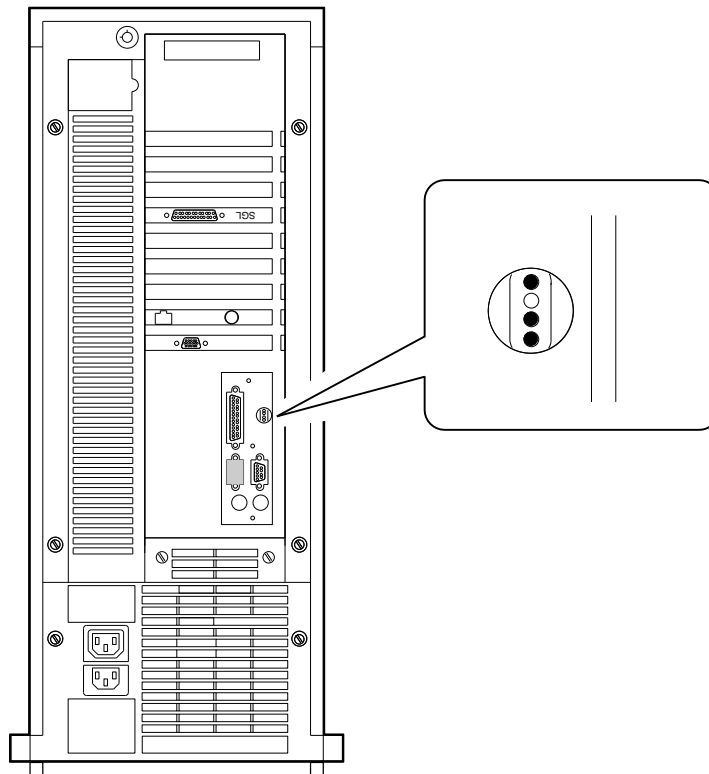
GA_EN00663A_93A

8

Contacting Your Digital Service Representative

Introduction　　This chapter describes the steps that you must perform before contacting your Digital service representative.

In This Chapter　　This chapter contains the following sections:

- Reporting Problems to Your Digital Service Representative
- Problem Reporting Form

Reporting Problems to Your Digital Service Representative

Summary

This section describes how to report problems with your system to your Digital service representative. If you follow this procedure, your Digital service representative can determine the cause of the problem more easily.

Problem Reporting Procedure

The following table lists the steps that you must follow before contacting your Digital service representative:

Step	Action
1	Make a copy of the problem reporting form (see the section entitled Problem Reporting Form in this chapter).
2	Indicate the name of the operating system in one of the squares provided and write the version number in the space provided.
3	Indicate whether the system supports a second power supply or a standby power supply.
4	Indicate the LEDs that are on in the circles on the form. Read the LEDs from top to bottom.
5	Write down the Ethernet type that your system is using, if your system is connected to a network.
6	Follow the procedures listed in Chapter 6. List the actions that you take and the result of those actions in the space provided on the form.
7	Follow the procedures listed in Chapter 7. List the commands that you enter and any error messages or omissions on the resulting displays, for example, an installed device that is not displayed on the system configuration display or SCSI device configuration display.
8	Write down any messages displayed by the IFP in the space provided on the form.
9	List the EISA or ISA devices connected to the system beside their associated connector slot numbers.

Step	Action
10	List the SCSI devices that are connected to or installed in the system beside their associated SCSI IDs.
11	When you have all the information you need, call your service representative. You must be beside the system when you call, so that you can enter diagnostic commands, see the resulting displays, and read the diagnostic LED display when asked.

Problem Reporting Form

Summary

This section provides a problem reporting form. Use the problem reporting form to gather the information that you need before contacting your Digital Service representative.

Using the Problem Reporting Form

Before you contact your Digital service representative, complete the procedure listed in the previous section. To preserve the form for future calls, either copy the form, or write the information requested on a separate piece of paper. Have the information available to you when you make the call.

DEC 2000 Model 500 AXP
Problem Reporting Form

Model Number:
Serial Number:
Operating System Installed: OpenVMS ☐ OSF/1 ☐ Windows NT ☐   V.___
Second Power Supply: Yes ☐ No ☐
Standby Power Supply   Yes ☐ No ☐
Diagnostic LED Display: O O O O

Troubleshooting Notes

Diagnostic Procedure Notes

IFP Messages

Power-Up Tests:

Device	Error Code

Self-Tests:

Device	Error Code

EISA/ISA Devices

Slot	Device
1	
2	
3	
4	
5	
6	

SCSI Devices:

ID	Bus A	Bus B	Bus C	Bus D
0				
1				
2				
3				
4				
5				
6				
7				

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9

Accessing Internal Components

Introduction   This chapter describes how to access components inside the
system unit. It describes how to open and close both the front
bezel and the rear sliding compartment of the system unit.

In This Chapter   This chapter contains the following sections:

- Before You Begin
- Removing the Front Bezel
- Removing the EMC Shields
- Replacing the EMC Shields
- Replacing the Front Bezel
- Opening the Rear Sliding Compartment
- Closing the Rear Sliding Compartment

Before You Begin

Summary
To access the internal components, you must either remove the front bezel or open the rear sliding compartment, depending on the task you want to complete. This section describes the components accessed either behind the front bezel or within the rear sliding compartment. It also describes the tasks you should complete before opening the system unit.

Front Bezel
You must remove the front bezel to remove storage devices from, or install them into, the system unit. In addition, you access the battery pack for the optional internal standby power supply (SPS) through the front bezel.

Rear Sliding Compartment
You must open the rear sliding compartment to access the system module, the NVR battery, EISA or ISA option boards, and the memory modules.

Important Information

—————————— WARNING ——————————

Take the following precautions before opening the system unit:

- **Make sure that the system unit on/off switch is in the off position before opening the system unit and that the power cable is removed.**

- **Wait one minute before opening the system unit for the electrical charges on the power supply and battery to dissipate.**

_____

**Preparing
to Open the
System Unit**

The following table lists the steps that you must follow before opening the system unit:

Step	Action
1	Shut down the operating system following the instructions listed in the operating system documentation.
2	Set the on/off switches on all peripherals connected to the system to the off position.
3	Set the on/off switch on the system unit to the off position.
4	Disconnect the power supply cables from the power source and from the system unit.

Removing the Front Bezel

Summary This section describes how to remove the system unit front bezel.

Procedure The following table lists the steps that you must follow to remove the front bezel:

Step	Action
1	Unlock the system unit using the chassis key (❶).
2	Remove the top cover (❷) by sliding it to the rear of the system unit and lifting it.
3	Depress the two locking tabs (❸) on the front bezel (❹), then tilt it forward, and remove it.

Important Information

_____ **Caution** _____

Static electricity can damage electronic components. Use an antistatic wrist strap while handling the components installed in the system (see Appendix B).

Illustration   The following figure shows how to remove the front bezel:
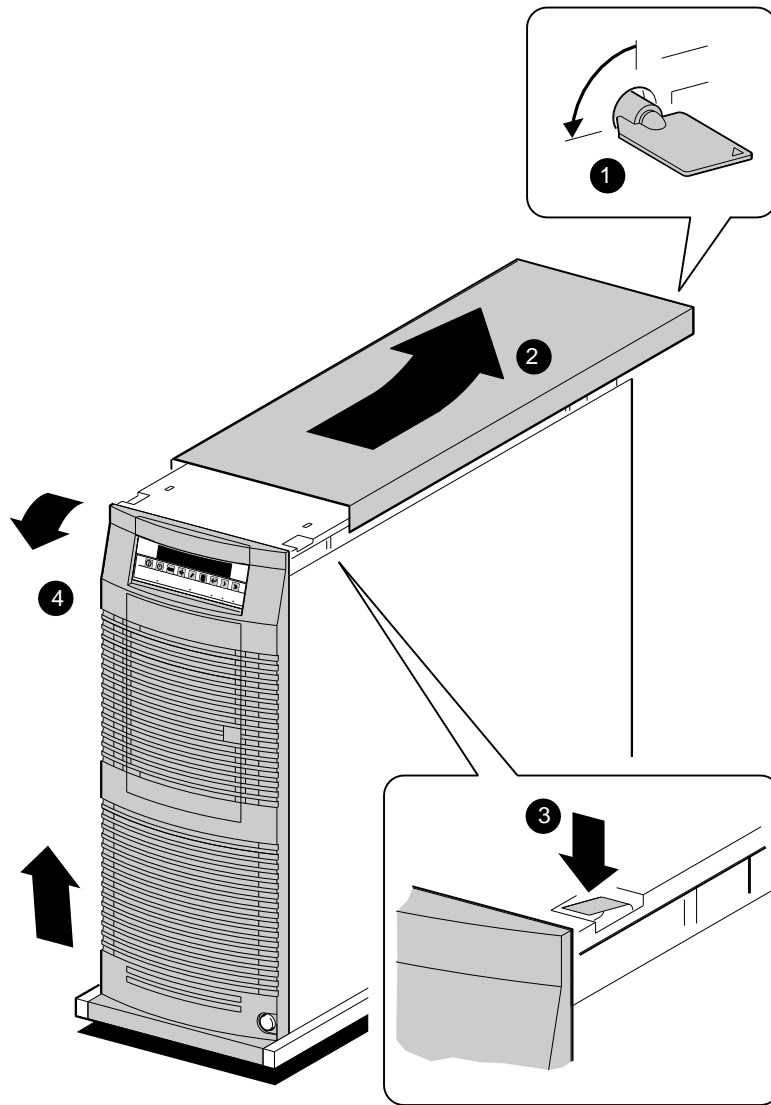
GA_EN00608A_93A

Removing the EMC Shields

Summary   This section describes how to remove the EMC shields.

Procedure   The following table describes how to remove the EMC shields:

Step	Action
1	Remove the screw (❶) securing the top EMC shield to the removable media device shelf above it.
2	Remove the screws (❷) at both sides of the EMC shield securing it to the chassis and lift the EMC shield off the one below it.
3	Repeat step 2 for each small EMC shield that you want to remove.
4	Remove the screws at both sides of the large EMC shield and lift it off the lip at the bottom of the system unit.

Illustration　　　　The following figure shows how to remove the EMC shields:

GA_EN00658A_93A

Replacing the EMC Shields

Summary   This section describes how to replace the EMC shields.

Procedure   The following table describes how to replace the EMC shields:

Step	Action
1	Insert the large EMC shield (❶) onto the lip at the bottom of the system unit. Make sure that tabs (❷) on the large EMC shield are arranged on both sides of the lip, as shown.
2	Push the large EMC shield into place with the tabs (❸) inside the sides of the chassis.
3	Secure the large EMC shield to the chassis at each side using the screws you removed.
4	Insert a small EMC shield (❹) into the top of the EMC shield below it, as shown.
5	Secure the EMC shield to the chassis at each side using the screws (❺) you removed.
6	Repeat steps 3 and 4 for each small EMC shield.
7	Secure the top EMC shield to the removable media device shelf above it, using the screw (❻) you removed.

Illustration   The following figure shows how to replace the EMC shields:
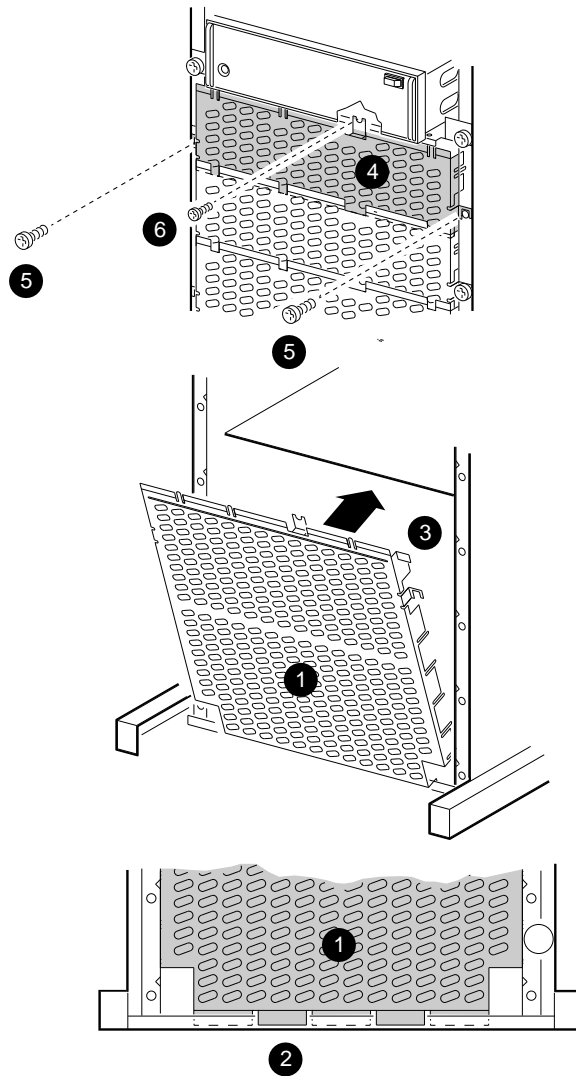
GA_EN00659A_93A

Replacing the Front Bezel

Summary   This section describes how to replace the system unit front bezel.

Procedure   The following table lists the steps that you must follow to replace the front bezel:

Step	Action
1	Carefully place the hooks at the bottom of the front bezel (❶) in position over the lip (❷) on the bottom of the system unit, as shown.
2	Tilt the front bezel into position until the two locking tabs (❸) secure it to the system unit.
3	Place the top cover (❹) onto the system unit, making sure that the sliding clips fit into the slots provided.
4	Slide the top cover towards the front of the system unit.
5	Lock the system unit using the chassis key (❺).

Illustration   The following figure shows how to replace the front bezel:
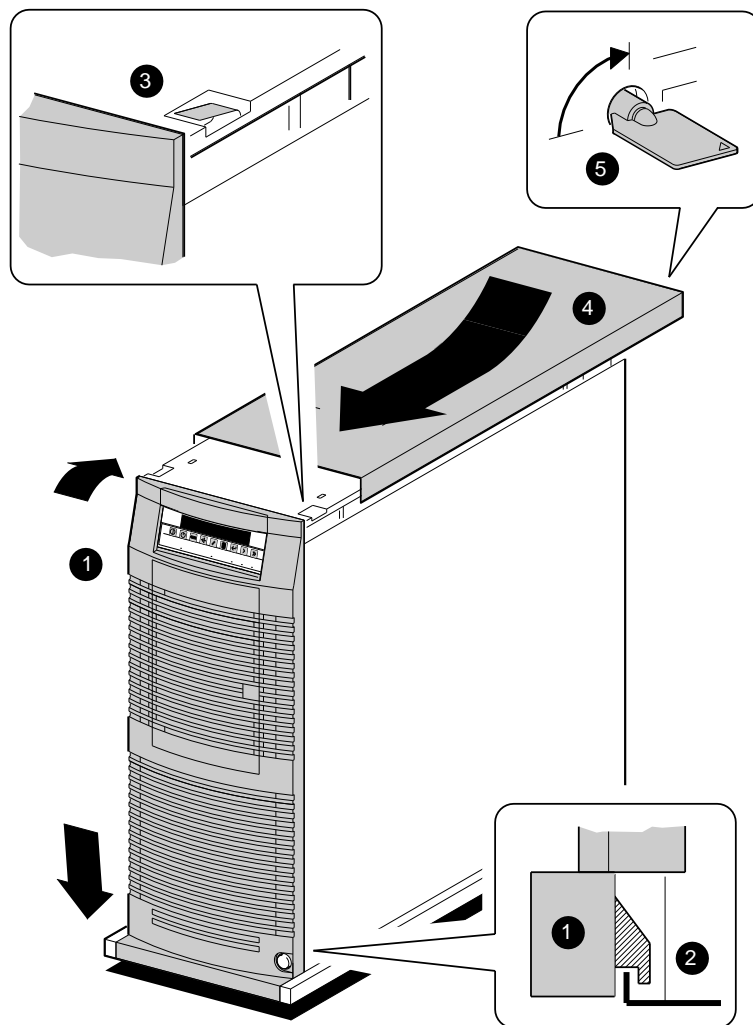
GA_EN00607A_93A

Opening the Rear Sliding Compartment

Summary

This section describes how to open the rear sliding compartment.

Procedure

The following table lists the steps that you must follow to open the rear sliding compartment:

Step	Action
1	Unlock the system unit using the chassis key (❶).
2	Loosen the six captive screws (❷).
3	Hook the handle (❸) onto the rear sliding compartment as shown.
3	Pull the sliding compartment out until the locking clip clicks into place.

Illustration   The following figure shows how to open the rear sliding
compartment:
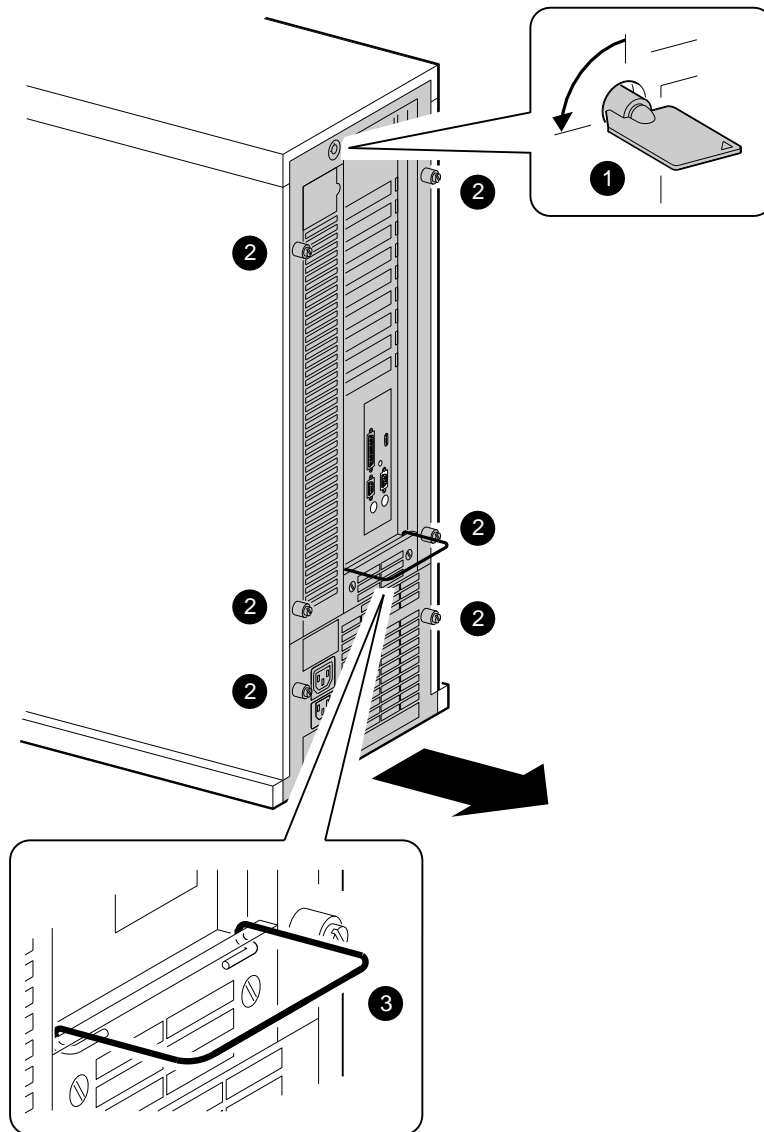
GA_EN00656A_93A

Closing the Rear Sliding Compartment

Summary   This section describes how to close the rear sliding compartment.

Important   _____ **Note** _____
Information
                       The power supply fails to operate if the rear sliding
                       compartment is not closed properly.

Closing the   The following table lists the steps that you must follow to close
Rear Sliding   the rear sliding compartment:
Compartment

Step	Action
1	Hold down the locking clip (❶) to release the rear sliding compartment.
2	Slide the compartment back into the system and press it home firmly, especially at the bottom.
3	Tighten the six captive screws.
4	Lock the system unit using the chassis key.

Illustration   The following figure shows how to close the rear sliding compartment:
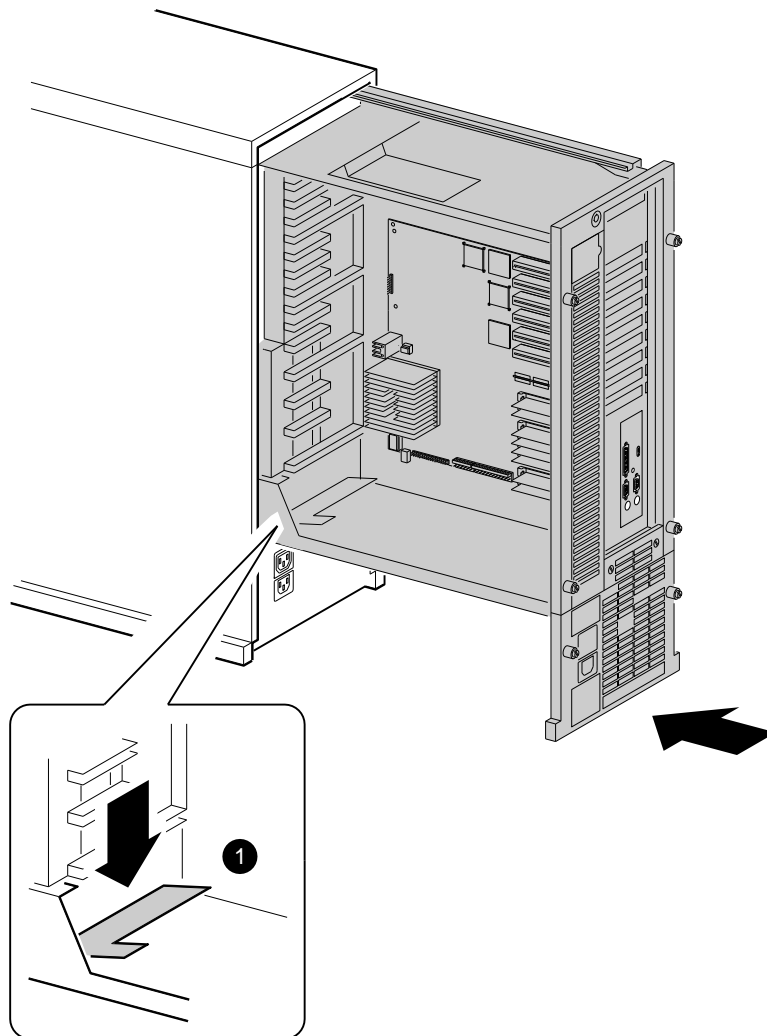
GA_EN00657A_93A

10

Installing, Moving, or Removing Option Boards

Introduction   This chapter describes how to install, move, or remove EISA or ISA option boards.

In This Chapter   This chapter contains the following sections:

- Before You Begin
- Removing an Option Board
- Installing an Option Board
- Testing an Option Board Installation
- Reconfiguring the Option Boards

Before You Begin

Summary   This section describes the order in which you must follow the procedures listed in this chapter. It also describes the equipment that you need to complete the procedures listed.

Equipment Requirements   You need the following equipment to install, move, or remove an option board:

- Philips-head screw driver

- Antistatic wrist strap

- Option board kit or option board packaging material, depending on whether you are installing or removing the option board.

Slots and Option Types   You must use specific slots to install certain option boards. The following table lists these option board types and indicates the slots that they must occupy:

Option Board Type	Slot
ISA video adapter	Slot 1 (bottom)
SCSI adapter for SCSI cable 1	Slot 6 (one SCSI option board) or slot 5 (two or more SCSI option boards)
SCSI adapter for SCSI cable 2	Slot 6

_____ **Note** _____

The OpenVMS and OSF/1 operating systems assume that a video adapter in slot 1 is an ISA video adapter if it cannot recognize an EISA ID.

_____

**Important
Information**

─────────────── **Note** ───────────────

You must open the rear sliding compartment to complete
the procedures listed in this chapter. See Chapter 9 for
information on opening the rear sliding compartment.

**Tasks and
Related
Sections**

The following table lists the tasks described in this chapter
and the section titles that you must read in the order listed to
complete the task:

Task	Page	Section Title
Removing an option board	10-2	Before You Begin
	10-4	Removing an Option Board
	10-10	Reconfiguring the Option Boards
Installing an option board	10-2	Before You Begin
	10-6	Installing an Option Board
	10-8	Testing an Option Board Installation
	10-10	Reconfiguring the Option Boards
Moving an option board	10-2	Before You Begin
	10-4	Removing an Option Board
	10-6	Installing an Option Board
	10-8	Testing an Option Board Installation
	10-10	Reconfiguring the Option Boards

Removing an Option Board

Summary

This section describes how to remove an ISA or EISA option board from the system unit.

Important Information

———————————— **Caution** ————————————

Static electricity can damage electronic components. Use an antistatic wrist strap while handling these components (see Appendix B).

Procedure

The following table lists the steps that you must follow to remove an option board:

Step	Action
1	If necessary, disconnect any cables connected to other option boards that prevent you from accessing the option board that you want to remove.
2	Disconnect any cables connected to the external or internal ports on the option board.
3	Remove the screw (❶) securing the option board to the chassis.
4	Carefully disconnect the option board from the connector on the system module and remove it from the system.
5	If you intend leaving the option slot vacant, install a slot cover and secure it to the chassis using the screw (❶) that you removed.
6	If you have finished removing or installing internal options, reassemble the system following the procedure described in Chapter 9.

Illustration   The following figure shows how to remove an option board:
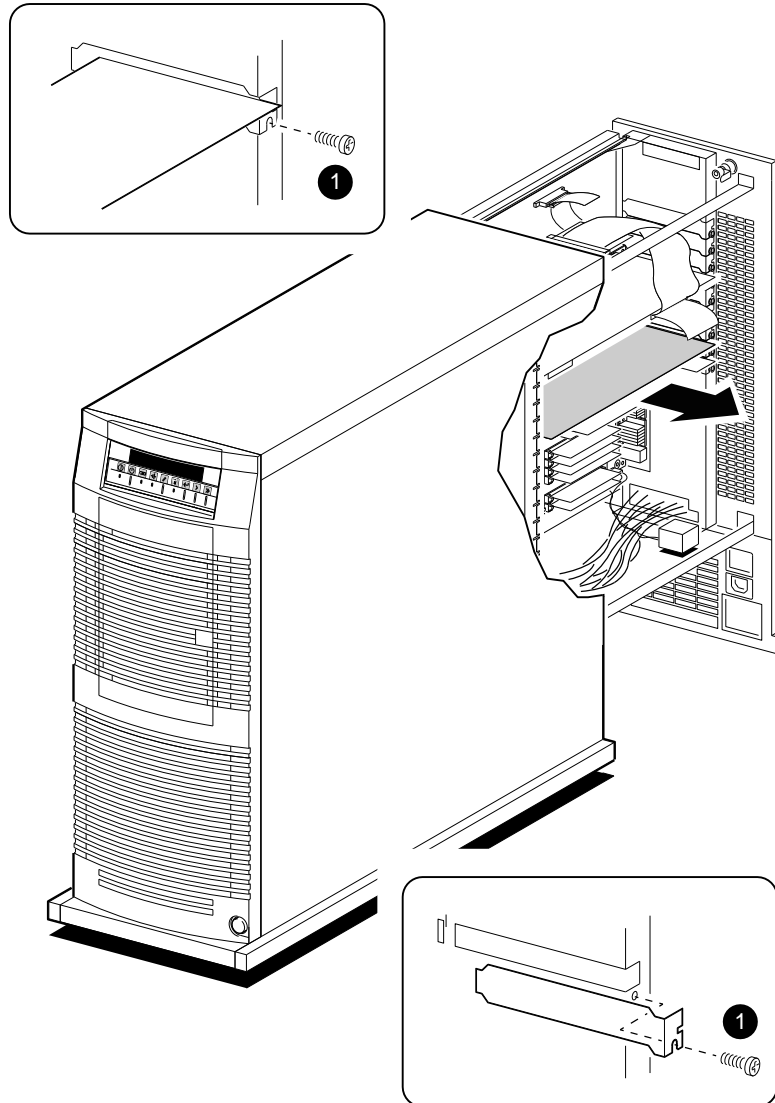
GA_EN00654A_93A

Installing an Option Board

Summary

This section describes how to install an ISA or EISA option board in the system unit.

Important Information

_____ **Caution** _____

Static electricity can damage electronic components. Use an antistatic wrist strap while handling these components (see Appendix B).

_____

Procedure

The following table lists the steps that you must follow to install an option board:

Step	Action
1	Select a vacant option board slot on the system unit.
2	If necessary, disconnect any cables connected to other option boards that prevent you from accessing the option board slot.
2	Remove the screw (❶) securing the slot cover to the chassis.
3	Remove the slot cover from the system unit and store it for future use.
4	Carefully install the option board into the appropriate connector on the system module and press it firmly into place.
5	Secure the option board to the chassis using the screw (❶) you removed.
6	If you have finished removing or installing internal options, reassemble the system following the procedure described in Chapter 9.

Illustration   The following figure shows how to install an option board:
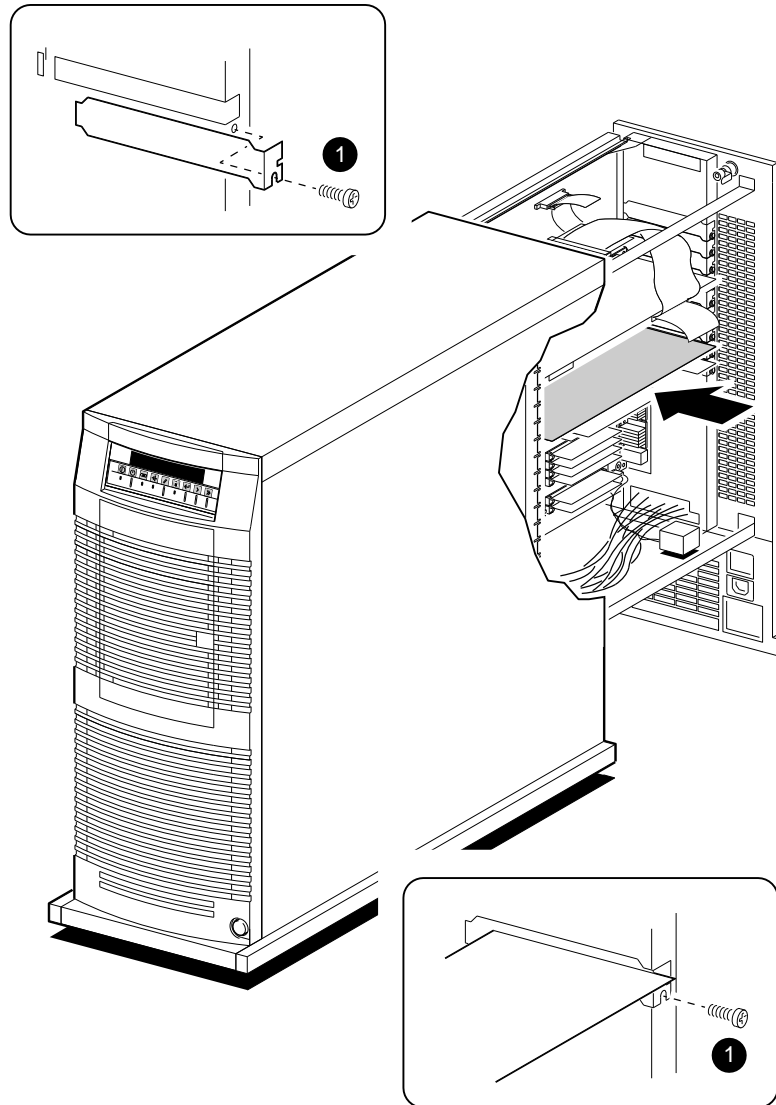
GA_EN00655A_93A

Testing an Option Board Installation

Summary

This section describes how to test an option board installation. The system tests all option boards that must be operate correctly to ensure that the system boots. These tests include many of the EISA options and ISA video adapters.

Important Information

―――――――――――――――― **Caution** ――――――――

Reassemble the system following the procedures listed in Chapter 9 before you turn on the system unit.

――――――――――――――――――――――――――――――――

Procedure

The following table lists the steps that you must follow to test an EISA option board installation:

Step	Action	Result
1	If necessary, use the LOGIN command to access all the console commands.	
2	Enter the SHOW CONFIG command (❶) to display the system configuration.	The system displays the configuration display.
3	Examine the EISA Info column (❷) to make sure that the new EISA option (❹) is listed.	If the EISA option is not listed, see Chapter 6.
4	Examine the Devnam column (❸) to determine the device name of the new EISA option.	You must know the device name to run self-tests on the EISA option.
5	Run a self-test on the EISA option by entering the TEST command followed by the device name of the option (❺).	If the self-test passes, the system displays the word OK (❻) before displaying the console prompt (>>>). If the system displays a failure message, for example, *84 FAIL*, see Chapter 6.

Example   The following example shows a sample of a system configuration display followed by a self-test display:

```
>>> SHOW CONFIG ❶

DEC 2000 Model 500 AXP - Rom Version nnn

Digital Equipment Corporation
VMS PAL X5.41/OSF PAL X1.30 - Built on 19-MAY-1992 13:38:25.71
     ❷              ❸
Eisa Info    Devnam          Devstat
---------    --------        -------
             CPU             OK EV4 P2
             MEM             OK 32MB
             NVR             OK
             SCC             OK
              IT             OK
             KBD             OK
             LPT             OK
1            VGA             ISA Video Adapter
2
3 DEC4220    NI              OK 09-01-2B-2F-3D-D4 ❹
4
5
6 ADP0002    SCSI            OK

>>>
>>> TEST NI ❺
T-STS-NI - Test BUS
T-STS-NI - Test INIT
T-STS-NI - Test IRQ
T-STS-NI - Test NAR
T-STS-NI - Test ILB
T-STS-NI - Test CRC
T-STS-NI - Test RXB
T-STS-NI - Test ADF
T-STS-NI - Test COLL

OK  ❻
>>>
```

Reconfiguring the Option Boards

Summary   This section describes how to reconfigure the EISA option boards.

Option Boards Reconfiguration Procedure

After you turn on the system, the system power-up sequence examines the EISA option slots and determines whether you have changed the EISA configuration. If you have changed the EISA configuration, the system displays a message indicating that a new configuration is required.

If you are running the Windows NT operating system, access the Windows NT firmware and run the ECU to reconfigure the option boards. If you are running the OpenVMS or OSF/1 operating system, enter the RUNECU command at the console prompt to run the ECU. See Chapter 4 for more information on running the ECU.

11

Installing or Removing Internal Storage Devices

Introduction This chapter describes how to install an internal storage device in or remove it from the system unit.

In This Chapter This chapter contains the following sections:

- Before You Begin
- Identifying Device Slots
- Determining the Available SCSI IDs
- Attaching a Disk Drive to a Disk Drive Shelf
- SCSI Cabling for Disk Drives
- Removing a 3.5-Inch Disk Drive
- Installing or Replacing a 3.5-Inch Disk Drive
- Attaching Removable Media Devices to the Device Shelves
- Removable Media Device Cable Routing
- Removing a 3.5-Inch Diskette Drive
- Replacing a 3.5-Inch Diskette Drive
- Removing a 5.25-Inch Removable Media Device
- Installing or Replacing a 5.25-Inch Removable Media Device
- Testing the System Device Configuration

Before You Begin

Summary

This section describes the order in which you must follow the procedures in this chapter. It also describes the equipment that you need to complete the procedures listed.

Equipment Requirements

You need the following equipment to install, move, or remove an internal storage device:

- Philips-head screw driver

- Antistatic wrist strap

- Storage device kit or packaging material, depending on whether you are installing or removing the storage device

Important Information

─────────────── **Note** ───────────────

You must remove the front panel and EMC shields to complete the procedures listed in this chapter. See Chapter 9 for information on removing the front panel and EMC shields.

───

Tasks and Related Sections

The following table lists the tasks described in this chapter and the section titles that you must read in the order listed to complete the task:

Task	Page	Section Title
Removing and replacing a diskette drive	11-2	Before You Begin
	11-4	Identifying Device Slots
	11-16	Attaching Removable Media Devices to the Device Shelves
	11-18	Removable Media Device Cable Routing
	11-20	Removing a 3.5-Inch Diskette Drive
	11-22	Replacing a 3.5-Inch Diskette Drive
	11-28	Testing the System Device Configuration
Removing, installing or replacing a disk drive	11-2	Before You Begin
	11-4	Identifying Device Slots
	11-6	Determining the Available SCSI IDs
	11-8	Attaching a Disk Drive to a Disk Drive Shelf
	11-10	SCSI Cabling for Disk Drives
	11-12	Removing a 3.5-Inch Disk Drive
	11-14	Installing or Replacing a 3.5-Inch Disk Drive
	11-28	Testing the System Device Configuration
Installing, removing or replacing a removable media device	11-2	Before You Begin
	11-4	Identifying Device Slots
	11-6	Determining the Available SCSI IDs
	11-16	Attaching Removable Media Devices to the Device Shelves
	11-18	Removable Media Device Cable Routing
	11-24	Removing a 5.25-Inch Removable Media Device
	11-26	Installing or Replacing a 5.25-Inch Removable Media Device
	11-28	Testing the System Device Configuration

Identifying Device Slots

Summary   This section describes how to identify the device slots and lists the devices that you can install in each slot.

Device Slots   The following table lists the device slots and indicates the types of devices that you can install in each slot:

Slot	Cable	Supported Devices
❶	IFP cable	IFP
❷	PC/AT cable	3.5-inch diskette drive
❸	SCSI cable 1	5.25-inch removable media device
❹	SCSI cable 1	5.25-inch removable media device
❺	SCSI cable 1	5.25-inch removable media device or 3.5-inch disk drives (2)
❻	SCSI cable 1	3.5-inch disk drives (2)
❼		Must be vacant
❽	SCSI cable 2	3.5-inch disk drives (2)
❾	SCSI cable 2	3.5-inch disk drives (2)
❿†	SCSI cable 2	3.5-inch disk drives (2)
⓫†	SCSI cable 2	3.5-inch disk drives (2)

†This slot is unavailable if the 460 Watt SPS battery is installed.

Illustration   The following figure shows the location of the device slots in the
system unit:
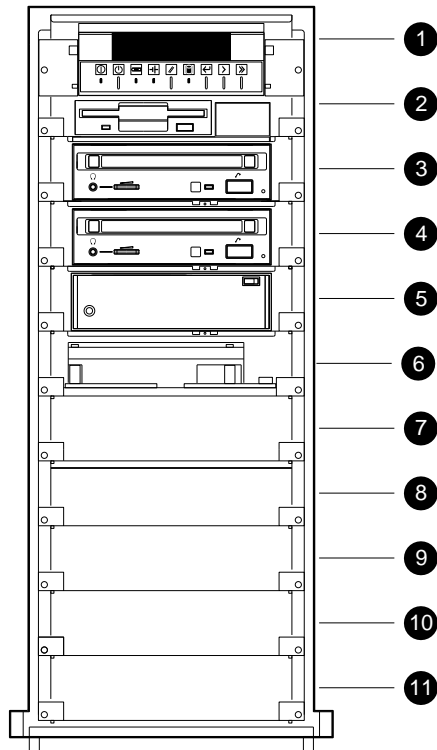
GA_EN00609A_93A

Determining the Available SCSI IDs

Summary   This section describes how to identify the available SCSI IDs
                     by checking the system configuration. You must have this
                     information if you want to install a new SCSI drive within the
                     system.

Procedure   The following table lists the steps that you must follow to
                     determine the available SCSI IDs:

Step	Action	Result
1	Enter the SHOW DEVICE command (❶) to display the SCSI configuration.	The system responds with a display similar to the following example.
2	Examine the ADDR column (❷) in the display.	The ADDR column lists the SCSI address of each device connected to the SCSI bus.
		The first letter in the SCSI address (❸) indicates the SCSI bus to which the device is connected. The first number in the SCSI address is the SCSI ID. It must be a unique number in the range 0 to 7. Any unused SCSI IDs in this range are available for use by the devices that you want to connect to the system.
3	Write down the list of unused SCSI IDs.	

SCSI Bus Letters and Cable Numbers

The SCSI bus letters corresponding to SCSI cables 1 and 2 depend on the number of SCSI adapters installed in the system. The system assigns bus letters to the SCSI adapters depending on their order in the EISA slots. It assigns the bus letter A to the SCSI adapter in the lowest EISA slot number. When you have more than two SCSI adapters installed in the system, the SCSI adapter connected to SCSI cable 1 must be installed in EISA slot 5 and the SCSI adapter connected to SCSI cable 2 must be installed in EISA slot 6. Their drive letters depend on how many other SCSI adapters are installed in EISA slots with lower numbers.

SHOW DEVICE Display

The following example shows a sample SHOW DEVICE display:

```
>>> SHOW DEVICE ❶


            ❷
  BOOTDEV    ADDR        DEVTYPE   RM/FX   DEVNAM    REV     NUMBYTES
  -------    ----        -------   -----   ------    ---     --------
  ERA0       08-00-2B-2E-2E-C3
  DVA0       PC Floppy DISK        RM
  SCSI Devices..
  DKA0       A/0/0       DISK      FX      RZ25      0700    426.25MB
  MKA200     A/2/0       TAPE      RM      TZK10     03B8    ......
  DKA400     A/4/0       RODISK    RM      RRD42     4.5d    ......
  HOST       A/5/0       PROC              AHA1742A  G.2
             ❸
```

Attaching a Disk Drive to a Disk Drive Shelf

Summary

This section describes how to attach a disk drive to a disk drive shelf.

Important Information

—————————————— **Note** ——————————————

Each disk drive shelf supports two disk drives. If you are installing a disk drive in a system with an even number of disk drives already installed, you require a new disk drive shelf.

———————————————————————————————————————

—————————————— **Caution** ——————————————

To prevent overloading the power supply, you must set the jumpers on all disk drives to disable automatic spin-up when you turn the system on. See Appendix A or the disk drive documentation for information on disabling automatic spin-up

———————————————————————————————————————

Procedure

The following table lists the steps that you must follow to connect a disk drive to the disk drive shelf:

Step	Action
1	If you are replacing a disk drive, set the SCSI ID on the replacement disk drive to the same ID as the original disk drive. If you are installing a disk drive, set the SCSI ID on the new disk drive to an available ID. See Appendix A or the documentation supplied with the disk drive for information on setting the SCSI IDs.
2	Connect either the front or rear shelf power cable (❶) and SCSI cable (❷) to the disk drive.
3	Attach the disk drive to the shelf using four screws (❸).

Illustration   The following figure shows how to connect a disk drive to the
disk drive shelf:

GA_EN00662A_93A

SCSI Cabling for Disk Drives

Summary
This section describes how to attach SCSI cables to the disk drive shelves. The cabling method that you use depends on the SCSI device configuration.

Disk Drive Configurations
The maximum number of disk drives that you can install in the system depends on the number of power supplies, SCSI adapters, and removable media devices installed in the system. The following table lists the maximum number of disk drives for various system configurations:

		Removable Media Devices		
Power Supplies	**SCSI Buses**	**3**	**2**	**1**
1	1	2	4	6
1	2	4	6	8
2	2	8	10	12

Digital recommends that you distribute the disk drives evenly between both buses when you have two SCSI buses.

Cabling Disk Drives
The following table lists the steps that you must follow to connect SCSI cables to the disk drive shelves:

Step	Action
1	Connect the end of either SCSI cable 1 (❶) or SCSI cable 2 (❷) into one of the SCSI connectors on the first disk drive shelf.
2	If the disk drive shelf is not the last on that bus, connect a SCSI interconnect cable between the second SCSI connector on the disk drive shelf and the SCSI connector immediately below it.
3	If the disk drive shelf is the last on that bus, connect one end of a SCSI interconnect cable to the second SCSI connector.
4	Connect a SCSI terminator to the loose end of the SCSI interconnect cable.

Illustration   The following figure shows how to connect the SCSI cables
between disk drive shelves:
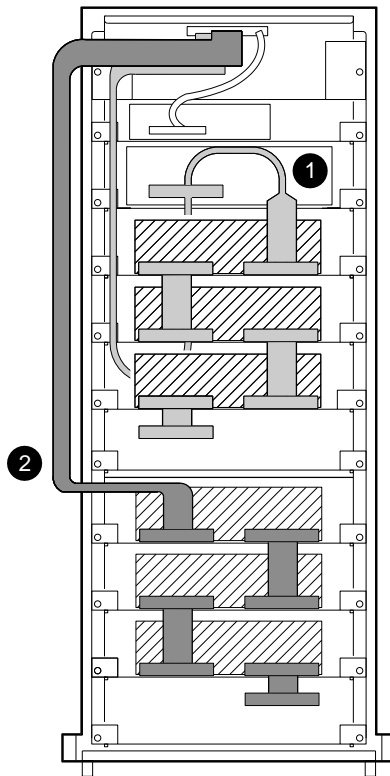
GA_EN00611A_93A

Removing a 3.5-Inch Disk Drive

Summary   This section describes how to remove a 3.5-inch disk drive.

Procedure   The following table describes how to remove a 3.5-inch disk
                drive:

Step	Action
1	Disconnect the SCSI ribbon cables (❶) from both connectors on the disk drive shelf.
2	Remove the shelf (❷) from the slot.
3	Remove the appropriate disk drive from the drive shelf and disconnect the shelf SCSI and power cables.

Illustration   The following figure shows how to remove a 3.5-inch disk drive:
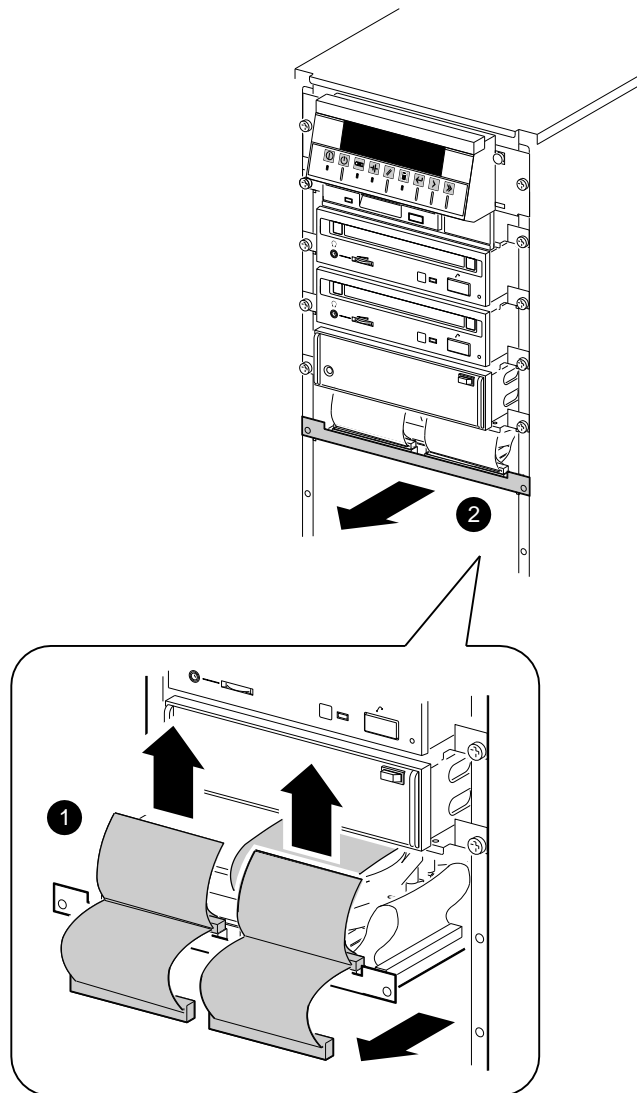
GA_EN00673A_93A

Installing or Replacing a 3.5-Inch Disk Drive

Summary

This section describes how to install or replace a 3.5-inch disk drive.

Important Information

――――――――――――――――― **Caution** ――――――――――――

To prevent damaging SCSI cable 2, do not install a disk drive shelf in slot 7.

Procedure

The following table lists the steps that you must follow to install or replace a 3.5-inch disk drive:

Step	Action
1	If you are installing a disk drive in a system with an odd number of disk drives, remove the disk drive shelf with the single disk drive.
2	Attach the disk drive to the shelf.
3	Insert the disk drive shelf between the guide rails on the sides of the chassis and push it in until the tabs (❶) on the shelf make contact with the chassis.
4	If you are replacing the disk drive, reconnect the cables (❷) that you removed from the two connectors on the disk drive shelf.
5	If you are installing the disk drive, either connect the end of SCSI cable 1, or the end of SCSI cable 2, or an interconnecting ribbon cable from another disk drive shelf, to one of the connectors on the shelf.
6	Connect either an interconnecting ribbon from another disk drive shelf, or an interconnecting ribbon cable with a terminator attached, to the second connector on the disk drive shelf.

Illustration   The following figure shows how to install or replace a 3.5-inch disk drive:
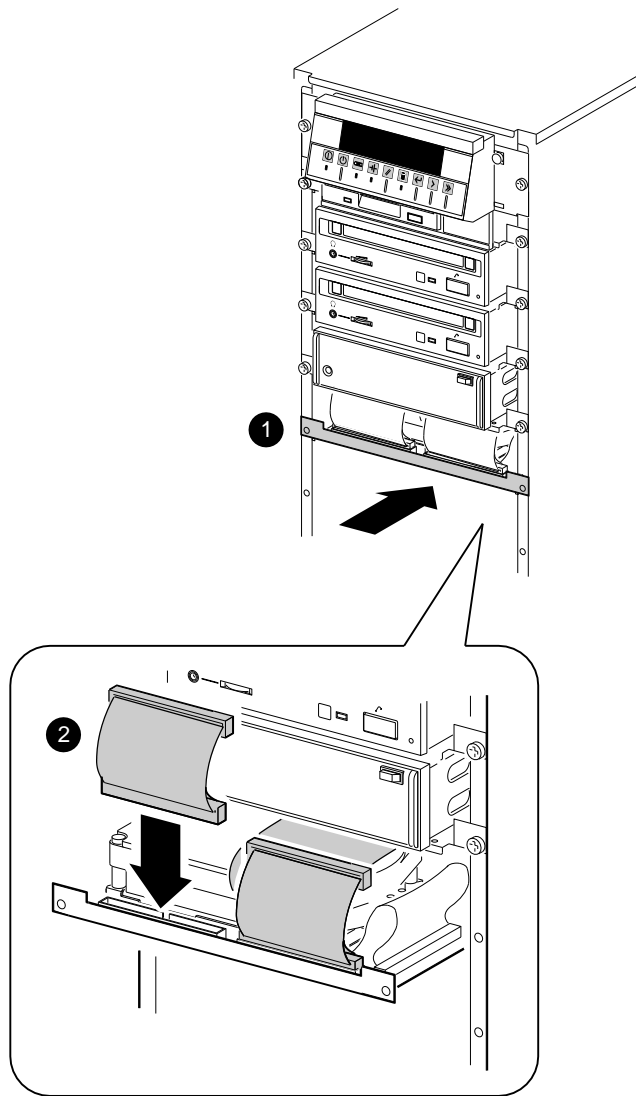
GA_EN00674A_93A

Attaching Removable Media Devices to the Device Shelves

Summary

This section describes how to attach either a diskette drive and other removable media devices to the appropriate device shelf.

Diskette Drive Shelf

The following table lists the steps that you must follow to connect a diskette drive to the diskette drive shelf:

Step	Action
1	Attach the diskette drive to the shelf using four screws (❶).
2	Connect the shelf power cable (❷) to the diskette drive.

Removable Media Device Shelf

The following table lists the steps that you must follow to connect a removable media device to the removable media device drive shelf:

Step	Action
1	If you are replacing a device, set the SCSI ID on the replacement device to the same ID as the original device. If you are installing a device, set the SCSI ID on the new device to an available ID. See Appendix A or the documentation supplied with the device for information on setting the SCSI IDs.
2	Attach the removable media device to the shelf (❸) using four screws. Depending on the device, use the holes indicated.
3	Connect the shelf power cable to the removable media device.

Illustration   The following figure shows how to attach a diskette drive or other removable media device to the appropriate device shelf:
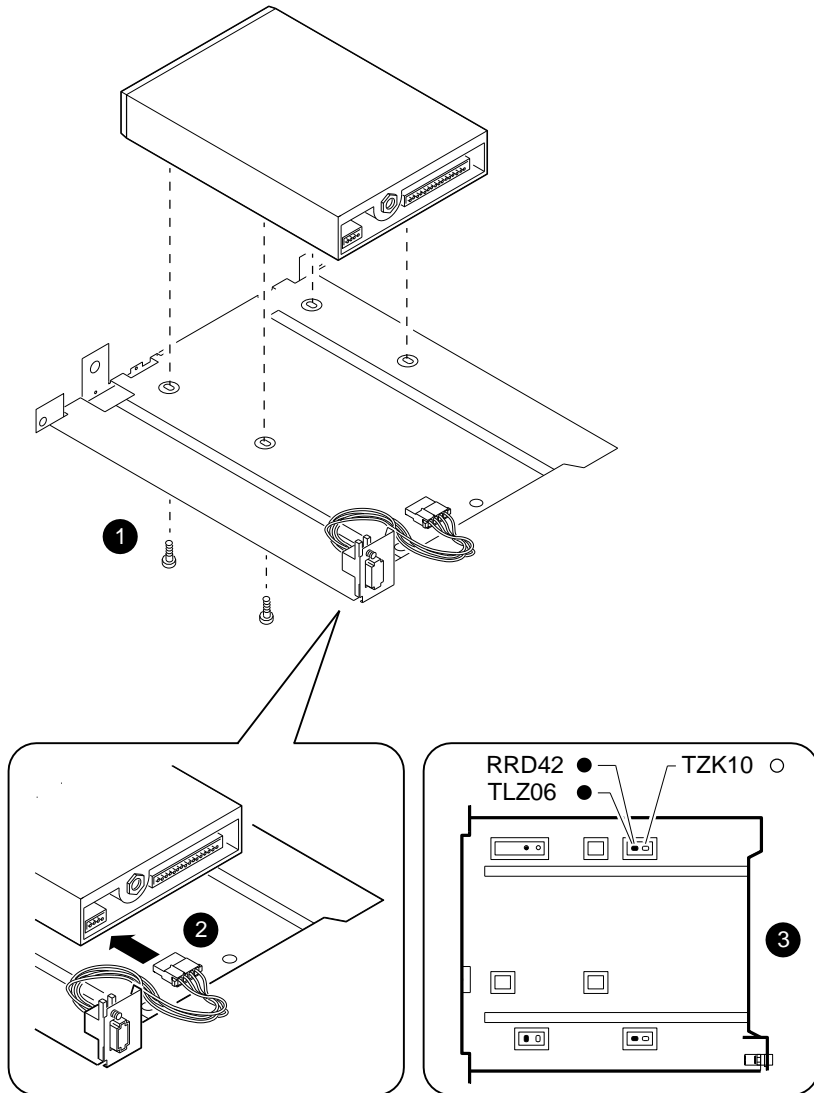
GA_EN00612A_93A

Removable Media Device Cable Routing

Summary

This section describes how to route the cable to connect up to three removable media devices on SCSI cable 1. It also describes the diskette drive cabling.

Removable Media Devices

You must connect the removable media devices to SCSI cable 1. SCSI cable 1 (❶) extends into the top device slot as a ribbon cable. It is then routed down the inside of the chassis in a plastic sleeve, held in place by clips. It supports four connectors, three for removable media SCSI devices, and one for disk drives. The removable media device connectors support specific device slots, as follows:

- The first connector connects to a removable media device in slot 5.

- The second connector connects to a removable media device in slot 4.

- The third connector connects to a removable media device in slot 3.

Diskette Drive

The PC/AT-standard cable (❷) extends into the top device slot. It has two connectors for diskette drives. You must connect the diskette drive in slot 1 to the first connector on the cable. The second connector, at the end of the cable, is not used.

Illustration   The following figure shows how to route the SCSI cable 1 and
the PC/AT-standard cable:
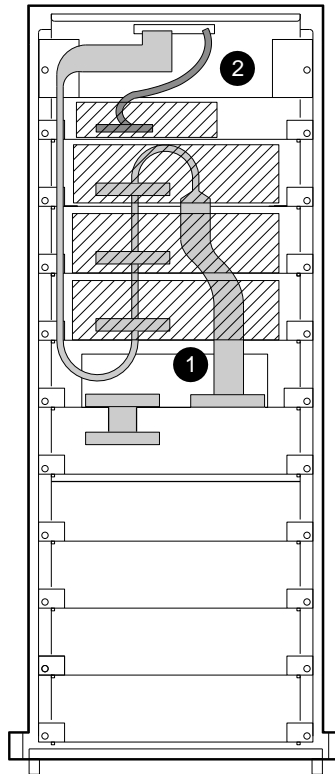
GA_EN00610A_93A

Removing a 3.5-Inch Diskette Drive

Summary

This section describes how to remove a 3.5-inch diskette drive.

Procedure

The following table lists the steps that you must follow to remove a 3.5-inch diskette drive:

Step	Action
1	Remove the four screws (❶) securing the IFP shelf and the diskette drive shelf to the system unit.
	Keep the screws in a safe place.
2	Remove the IFP shelf from its slot and disconnect the cables attached to it.
3	Remove the diskette drive shelf from its slot.
4	Disconnect the PC/AT-standard cable (❷) from the diskette drive.
5	Disconnect the shelf power cable from the diskette drive and unscrew the drive from the diskette drive shelf.
	Keep the screws in a safe place.

Illustration   The following figure shows how to remove a 3.5-inch diskette
drive:
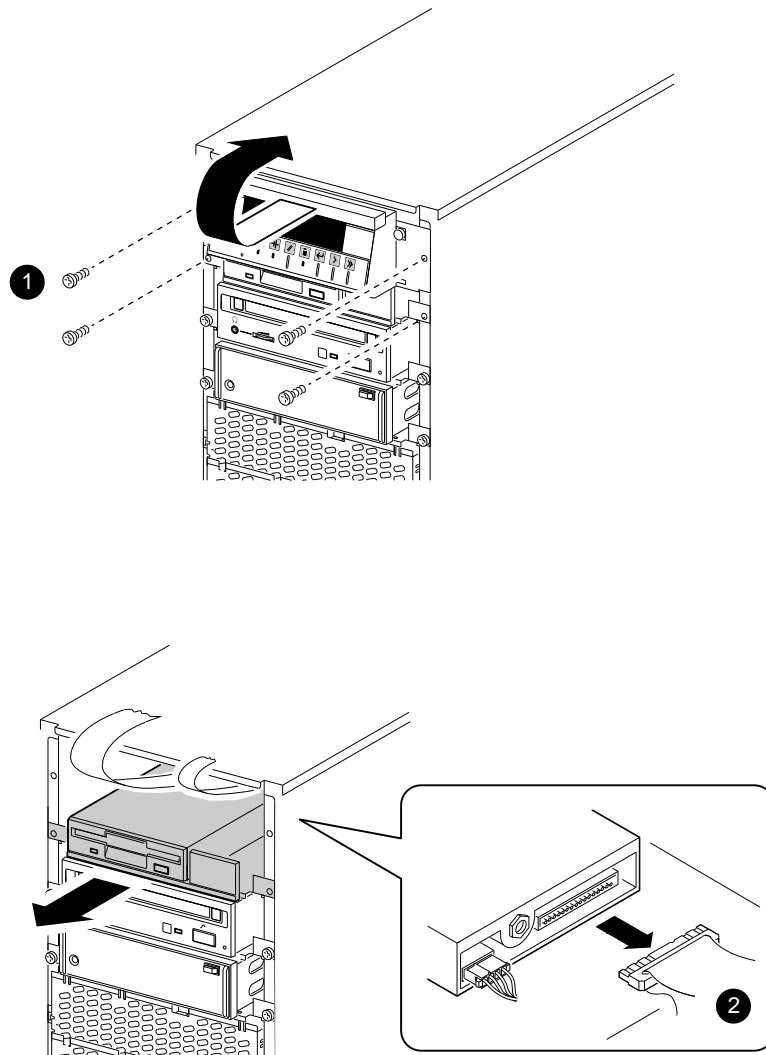
GA_EN00644A_93A

Replacing a 3.5-Inch Diskette Drive

Summary   This section describes how to replace a 3.5-inch diskette drive.

Procedure   The following table lists the steps that you must follow to replace
a 3.5-inch diskette drive:

Step	Action
1	Set the ID select switch on the replacement diskette drive to the same position as the ID select switch on the original diskette drive.
2	Attach the replacement diskette drive to the diskette drive shelf using the four screws you removed from the original drive.
3	Connect the shelf power cable to the diskette drive.
4	Thread the PC/AT-standard cable (❶) under the shelf power cable and connect the first connector (❷) to the diskette drive.
5	Place the second PC/AT-standard cable connector (❸) on the diskette drive shelf beside the diskette drive.
6	Insert the diskette drive shelf between the guide rails on the sides of the chassis and push it in until the tabs (❹) on the shelf make contact with the chassis.
7	Remove the slack from the PC/AT cable by pulling it forward and arranging it beside the diskette drive.
8	Reconnect the IFP cables and insert the IFP shelf between the guide rails on the sides of the chassis.
9	Pull the IFP ribbon cable forward behind the IFP display to remove the slack and push the IFP shelf in fully.
10	Secure the IFP shelf and the diskette drive shelf to the chassis using the four screws that you removed.

Illustration   The following figure shows how to replace a 3.5-inch diskette drive:
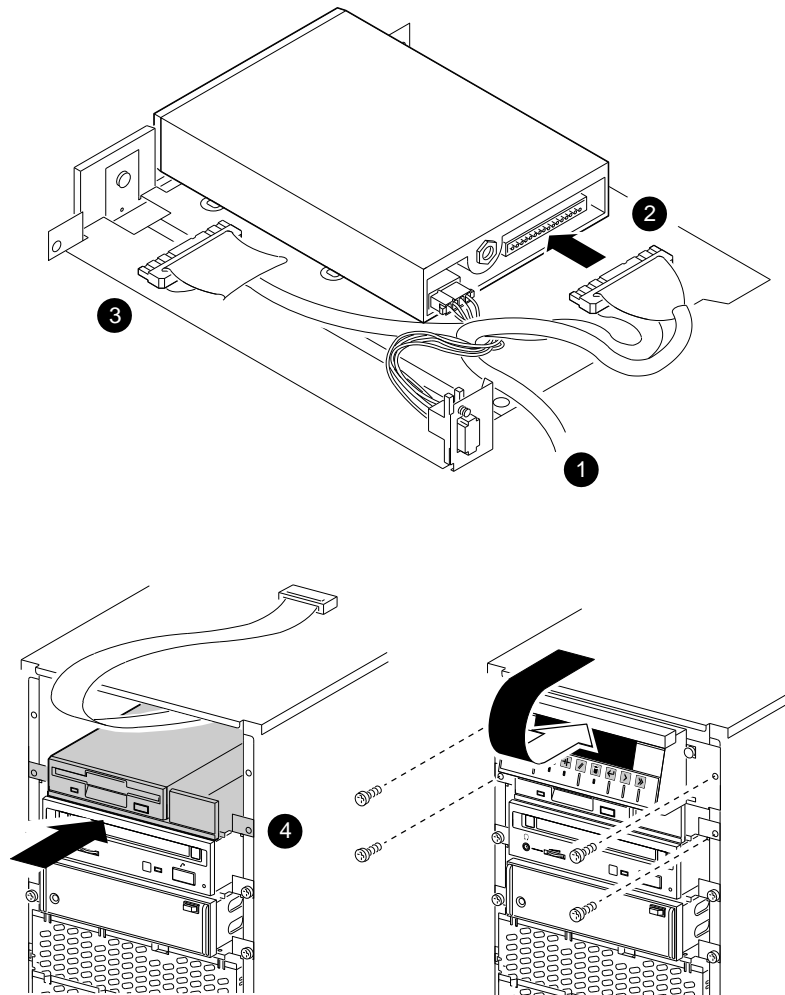
GA_EN00645A_93A

Removing a 5.25-Inch Removable Media Device

Summary

This section describes how to remove a 5.25-inch removable media device.

Important Information

---------------- **Note** ----------------

To remove a removable media device shelf, you must remove the shelf below it. Therefore, to remove the top removable media device shelf, you may first have to remove up to three other shelves below it. Follow this procedure until you remove the correct shelf.

Procedure

The following table lists the steps that you must follow to remove a 5.25-inch removable media device:

Step	Action
1	Remove all the disk drive shelves connected to SCSI cable 1.
2	Remove the screws (❶) securing all the removable media devices to the chassis.
3	Starting with the top removable media shelf, pull each removable media shelf towards the front of the system until it extends about half way.
	If a shelf stops moving before it extends half way, pull the shelf below it forward. Repeat this step until all the removable media shelves extend half way.
4	Pull the top shelf out fully and disconnect the SCSI cable (❷) from the drive.
5	Repeat step 4 until you remove the correct shelf.
6	Disconnect the shelf power cable from the removable media device and unscrew it from the removable media shelf.
	Keep the screws in a safe place.

Illustration   The following figure shows how to remove a 5.25-inch removable
media device:
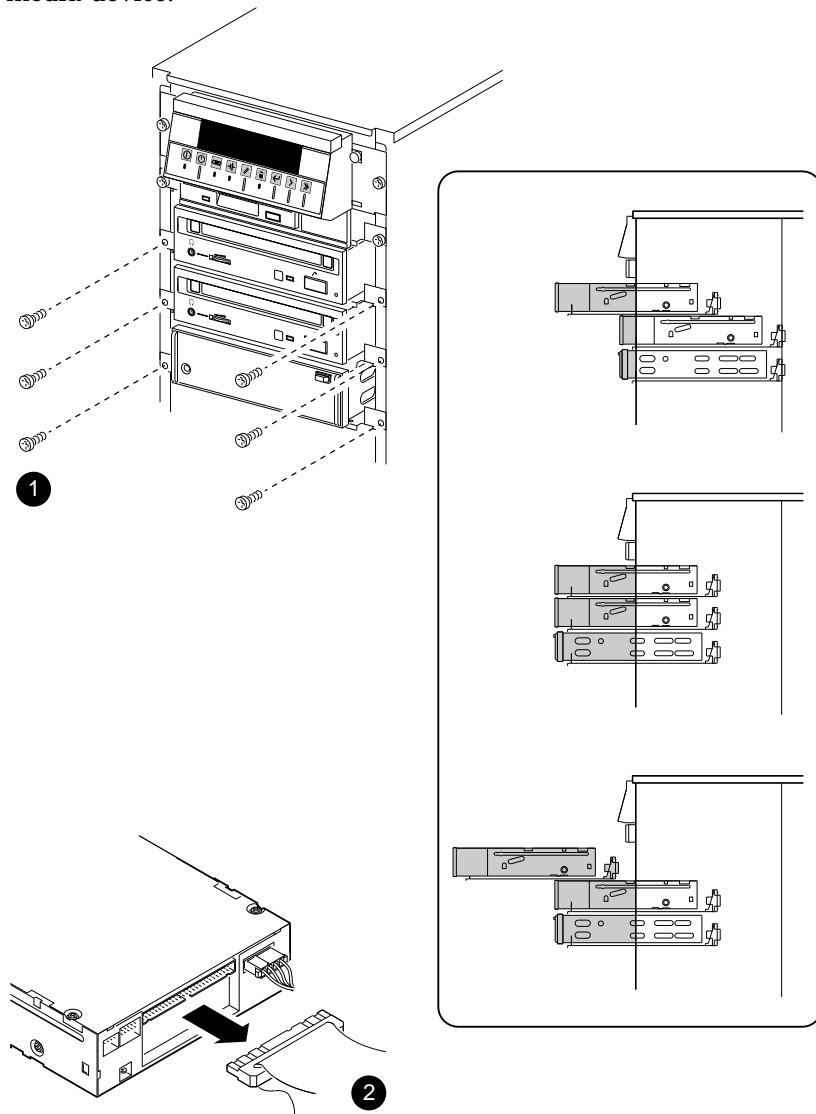
GA_EN00660A_93A

Installing or Replacing a 5.25-Inch Removable Media Device

Summary   This section describes how to install or replace a 5.25-inch removable media device.

Procedure   The following table lists the steps that you must follow to install or replace a 5.25-inch removable media device:

Step	Action
1	Remove all the SCSI device shelves, including disk drive shelves, connected to SCSI cable 1.
2	If you are replacing a device, attach the replacement device to the original device shelf using the four screws that you removed.
3	If you are installing a new device, attach the device to the new device shelf using the four screws supplied.
4	Connect the shelf power cable to the device.
5	Connect the appropriate SCSI connector (❶) to the bottom removable media device.
6	Insert the device shelf between the guide rails on the sides of the chassis and push it in half way.
7	Repeat the actions in steps 6 and 7 until you insert the top removable media device shelf.
8	Starting with the top removable media device shelf, push in each shelf until the tabs on the shelf make contact with the chassis.
9	Secure the removable media device shelves to the chassis using the screws (❷) that you removed.
10	Push the loop of SCSI cable that extends below the bottom removable media device shelf up behind that shelf.

Illustration   The following figure shows how to install or replace a 5.25-inch removable media device:
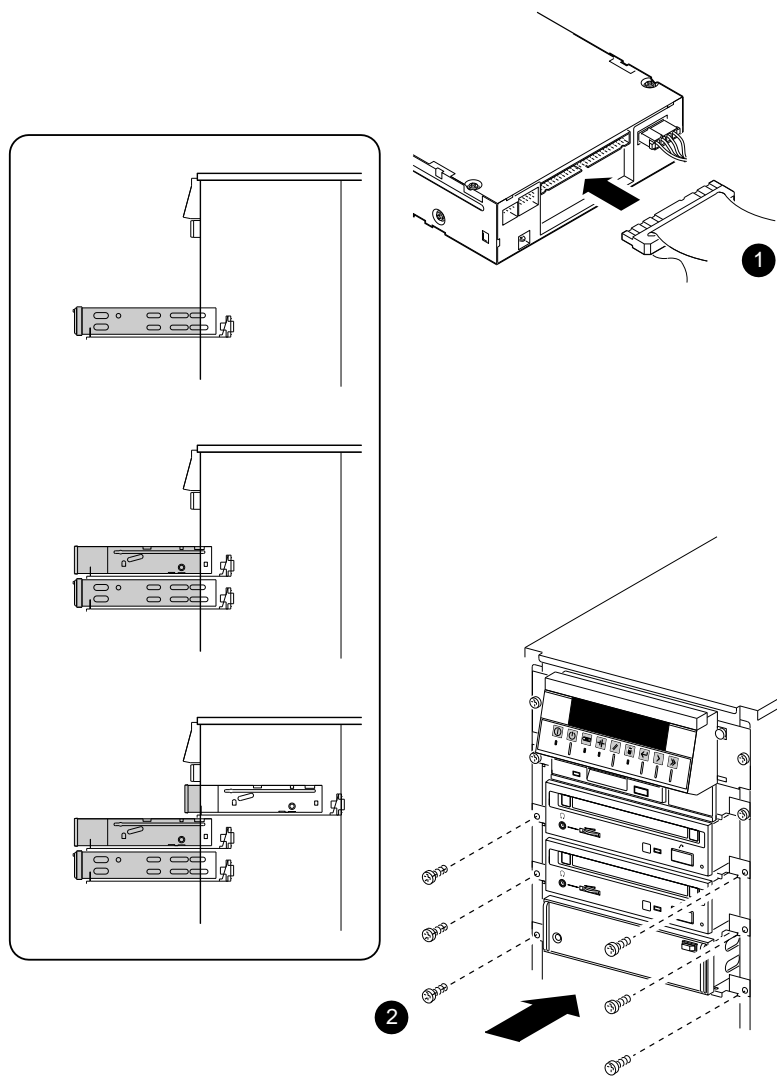
GA_EN00661A_93A

Testing the System Device Configuration

Summary

This section describes how to test the system device configuration.

Important Information

―――――――――――――――――― **Caution** ――――――――――――――――――

Reassemble the system following the procedures listed in Chapter 9 before you turn on the system unit.

Procedure

The following table lists the steps that you must follow to test the system device configuration:

Step	Action	Result
1	If necessary, access the OpenVMS and OSF/1 console.	The system displays the console prompt (>>>).
2	Enter the SHOW DEVICE command (❶) to display the system device configuration.	The system responds with a display similar to that shown in the following example.
3	Examine the BOOTDEV column (❷) to make sure that the new device (❹) is listed.	If the device is not listed, see Chapter 6 for information on troubleshooting.
4	For SCSI devices, examine the ADDR column (❸) to make sure that the SCSI ID in each SCSI address is unique.	If the SCSI ID is not unique, you must reset the SCSI ID on the new device to an unused SCSI ID. See Appendix A or the device documentation for information on setting the SCSI IDs.

**Updated SHOW
DEVICE Display**

The following example shows a sample of an updated SHOW
DEVICE display:

```
>>> SHOW DEVICE ❶

   ❷            ❸
 BOOTDEV      ADDR      DEVTYPE    RM/FX    DEVNAM     REV       NUMBYTES
 -------      ----      -------    -----    ------     ---       --------
 ERA0         08-00-2B-2E-2E-C3
 DVA0         PC Floppy DISK       RM
 SCSI Devices..
 DKA0         A/0/0     DISK       FX       RZ25       0700      426.25MB
 DKA100❹       A/1/0     DISK       FX       RZ25       0700      426.25MB
 MKA200       A/2/0     TAPE       RM       TZK10      03B8      ......
 DKA400       A/4/0     RODISK     RM       RRD42      4.5d      ......
 HOST         A/5/0     PROC                AHA1742A   G.2
```

12

Installing and Removing Memory and the NVR Battery

Introduction

This chapter describes how to replace the nonvolatile RAM (NVR) battery. It also describes how to configure and handle memory options inside the system unit and how to install and replace the memory modules in the memory options.

In This Chapter

This chapter contains the following sections:

- Replacing the NVR Battery
- Handling and Configuring Memory Options
- Installing or Replacing Memory
- Testing the Memory Modules Installation

Replacing the NVR Battery

Summary

This section describes how to remove and replace the NVR battery when it has a low charge. The NVR battery maintains the information in the nonvolatile RAM. This information includes important system defaults and settings.

Buying Replacement NVR Batteries

The system uses an industry-standard 4.5 Volt computer clock battery. You can order replacement batteries directly from Digital. Contact your Digital sales representative for information on ordering the battery.

Important Information

———————————— **Caution** ————————————

Static electricity can damage electronic components. Use an antistatic wrist strap while handling these components (see Appendix B).

Procedure

The following table lists the steps that you must follow to replace the NVR battery:

Step	Action
1	Open the rear sliding compartment following the procedure listed in Chapter 9.
2	Disconnect the battery cable (❶) from the connector on the system module.
3	Remove the NVR battery from the system unit by separating it from the velcro strip (❷).
4	Attach the replacement NVR battery to the velcro strip on the system unit.
5	Connect the battery cable to the connector on the system unit.
6	Reassemble the system unit following the procedure listed in Chapter 9.

Illustration The following figure shows how to replace the NVR battery:
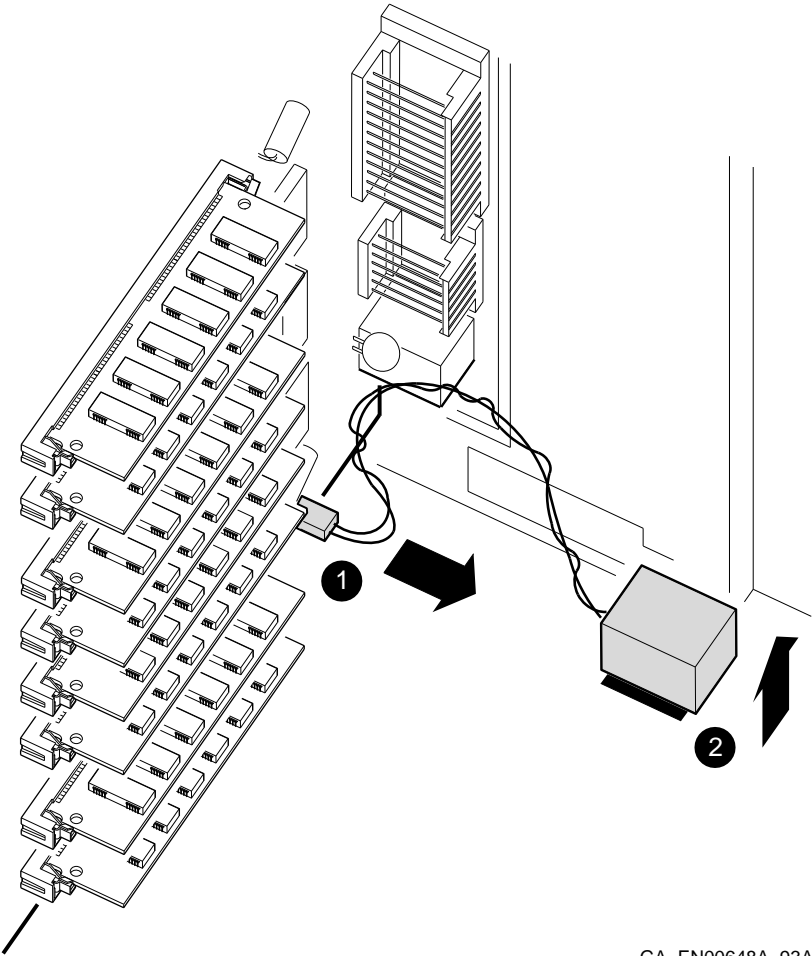
GA_EN00648A_93A

Handling and Configuring Memory Options

Summary

This section describes how to handle memory options and how to configure them inside the system unit.

Important Information

<hr>
Caution
<hr>

Be aware of the following before handling memory options:

- Static electricity can damage electronic components. Use an antistatic wrist strap while handling these components (see Appendix B).

- You may have to remove other memory modules to access a particular memory module. Note the position of any memory modules that you remove and reinstall them in the same location.

- The memory modules are keyed to prevent incorrect orientation. Do not force a memory module into a memory connector.

<hr>

Configuring Memory

The system unit supports eight memory module connectors on the system module. These memory connectors are logically grouped in two memory banks. The following figure shows the memory banks and identifies the memory module connectors associated with each bank. You must follow the following rules when installing memory modules in these banks:

- Bank 0 must contain a memory option.

- A memory option consists of four memory modules. When you install a memory option in a memory bank, you must install a memory module in all of the connectors in that bank.

- Do not install different types of memory modules in the same bank.

- The OpenVMS and OSF/1 operating systems require a minimum memory size of 32M bytes.

Supported Memory Options

The system unit supports two sizes of memory option: 16M bytes and 64M bytes. Using combinations of these two memory options, the system supports between 16M bytes and 128M bytes of memory.

Banks and Associated Connectors

The following figure shows memory bank 0 and memory bank 1 and their associated memory module connectors:
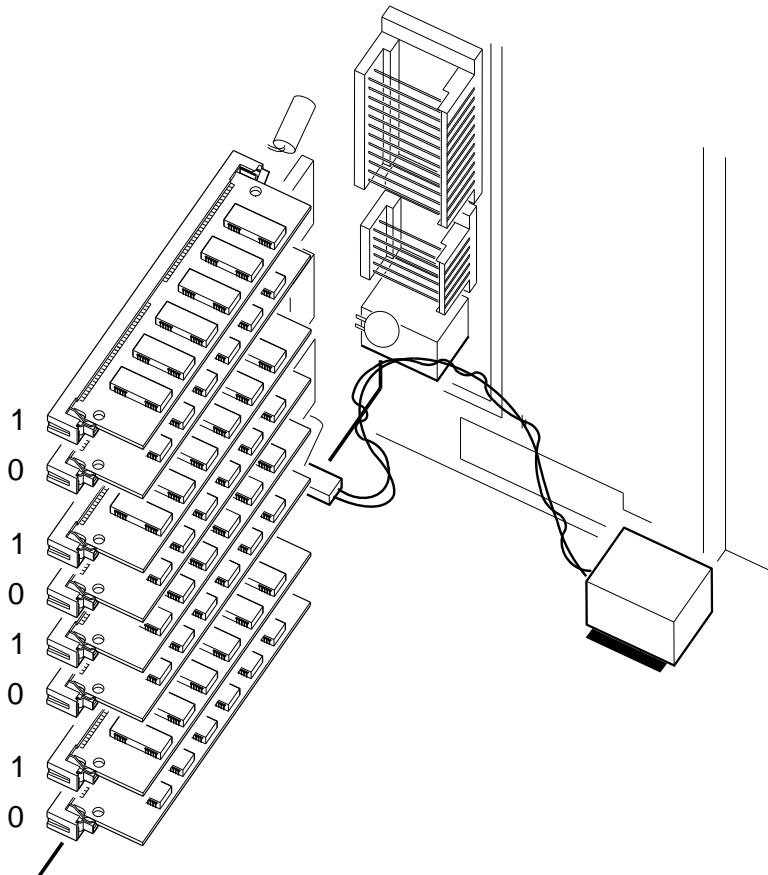
GA_EN00649A_93A

Installing or Replacing Memory

Summary

This section describes the following tasks:

- Installation of a second memory option in a system configured with only one memory bank occupied

- Replacement of a 16M-byte memory option in a memory bank with a 64M-byte memory option or vice versa

- Replacement of one or more faulty memory modules

Procedure

The following table lists the steps that you must follow to install or replace memory modules:

—————————————— **Note** ——————————————

You may need to remove other memory modules to access particular memory modules or memory connectors. You must replace these other modules in the locations from which you removed them.

——————————————————————————————————

Step	Action
1	Read the section entitled Handling and Configuring Memory Options before you continue.
2	Remove the appropriate memory modules by holding back the metal clips on the memory module connector, tilting the memory module, and lifting it out of its connector.
3	Install a new memory module if the one you removed is faulty or if you are upgrading a memory bank.
4	Reinstall the memory modules you removed for access purposes.

Illustration   The following figure shows how to install or replace a memory option:
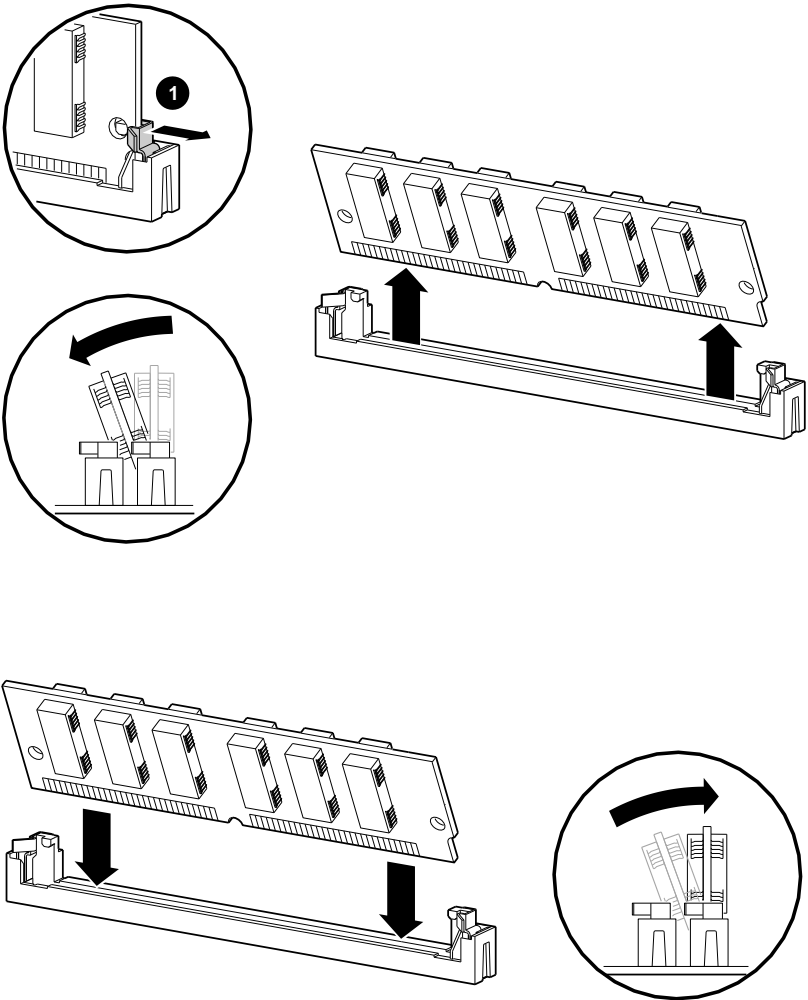
GA_EN00284A_93A

Testing the Memory Modules Installation

Summary

This section describes how to test the memory modules and verify that they work correctly.

Important Information

———————————— **Caution** ————————————

Reassemble the system following the procedures listed in Chapter 9 before you turn on the system unit.

Testing the Memory

After you have completed installing the memory modules, you must test the connections. Enter the SHOW MEMORY command (❶) to display the memory configuration. If the resulting display does not show the correct memory size or configuration, enter the TEST MEM command (❷) to test the memory modules. If the resulting display contains question marks and error messages, check the memory module connections again. If the memory modules are installed correctly, contact your Digital service representative.

**SHOW
MEMORY
Example**

The following example shows how to use the SHOW MEMORY
command and the memory configuration display.

>>> **SHOW MEMORY** ❶

```
DEC 2000 Model 500 AXP Memory Configuration: 32 Mbytes

---------------------------------------------------------
BANK #      MEMORY_SIZE      START_ADDRESS
------      -----------      -------------
0           016 Mbytes       0x00000000
1           016 Mbytes       0x01000000

>>>
```

**TEST MEM
Example**

The following example shows how to use the TEST MEM
command and a sample display where the test passes.

>>> **TEST MEM** ❷
```
T-STS-MEM - Cell Test 00200000 <-> 04000000
T-STS-MEM -      Wr AAAAAAAA Addr 02800000
T-STS-MEM -      FWD - Rd AAAAAAAA Wr 55555555 Addr 01800000
T-STS-MEM -      REV - Rd 55555555 Wr AAAAAAAA Addr 02800000
T-STS-MEM - Addr Test 00200000 -> 04000000
T-STS-MEM -      Wr Data = Addr 03000000
T-STS-MEM -      Rd Data = Addr 02800000
T-STS-MEM - LLSC Test Addr 00200000
T-STS-MEM - Clr Mem 00200000 -> 04000000
T-STS-MEM -      Wr 00000000 Addr 02800000

OK

>>>
```

A

Setting Storage Device Jumpers and Switches

Introduction

This appendix describes how to set the jumpers and switches on the following devices:

- RRD42 CD-ROM drive
- RZ24L, RZ25, RZ25L, RZ26, RZ26L, and RZ28 disk drives
- TLZ06 and TZK10 tape drives

In This Appendix

This appendix contains the following sections:

- Setting the Jumpers on the RRD42 CD-ROM Drive
- Setting the Jumpers on the RZ24L Disk Drive
- Setting the Jumpers on the RZ25 Disk Drive
- Setting the Jumpers on the RZ25L Disk Drive
- Setting the Jumpers on the RZ26 and RZ28 Disk Drives
- Setting the Jumpers on the RZ26L Disk Drive
- Setting the Switches on the TLZ06 Tape Drive
- Setting the Jumpers on the TZK10 Tape Drive

Setting the Jumpers on the RRD42 CD-ROM Drive

Summary

This section shows the location of the jumpers on the RRD42 CD-ROM drive and describes how to set these jumpers.

Setting Jumpers

A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

_____

RRD42 Jumper Settings

The following table describes how to set the jumpers on the RRD42 CD-ROM drive:

Step	Action
1	Make sure that the MODE jumper is installed.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper 0—1 • Jumper 1—2 • Jumper 2—4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper 2 is installed the SCSI ID is 4, and when jumper 0 and jumper 2 are installed the SCSI ID is 5.

Default Settings   The default SCSI ID setting for the RRD42 CD-ROM drive is 4. This is the value the Windows NT firmware uses when installing the operating system from compact disc and when completing other tasks.

RRD42 Jumper Locations   The following figure shows the location of the jumpers on the RRD42 CD-ROM drive:

Mode 0   1   2
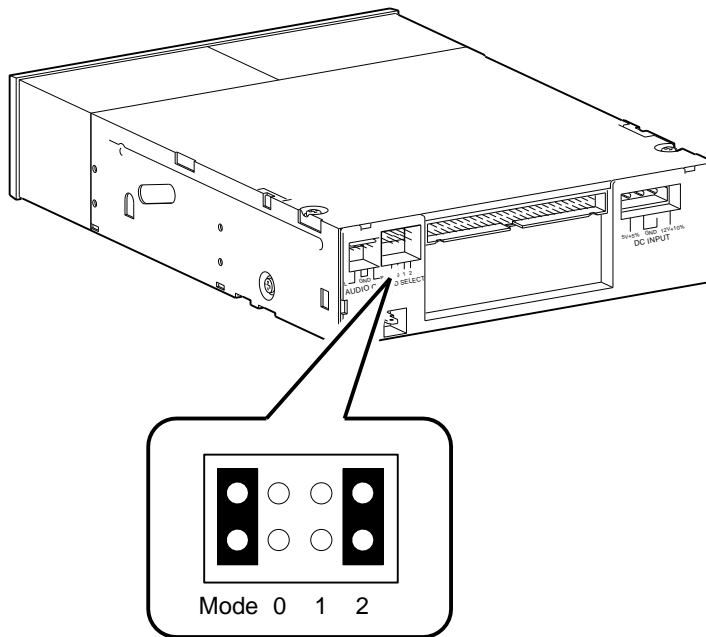
GA_EN00515A_93A

Setting the Jumpers on the RZ24L Disk Drive

Summary
This section shows the location of the jumpers on the RZ24L disk drive and describes how to set these jumpers.

Setting Jumpers
A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

_____

RZ24L Jumper Settings
The following table describes how to set the jumpers on the RZ24L disk drive:

Step	Action
1	Make sure that the wait spin (WS) jumper is *installed*.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper A0 equals 1 • Jumper A1 equals 2 • Jumper A2 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper A2 is installed the SCSI ID is 4, and when jumper A0 and jumper A2 are installed the SCSI ID is 5 (1 + 4).

Default Settings   Disk drives normally use SCSI IDs in the range 0 to 3. SCSI ID
0 is reserved for the system disk in DEC 2000 Model 500 AXP
systems.

RZ24L Jumper   The following figure shows the location of the jumpers on the
Locations   RZ24L disk drive:
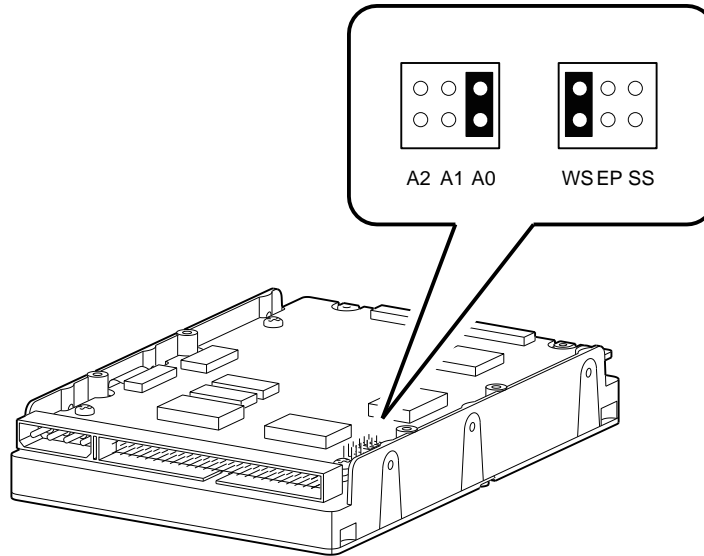
GA_EN00676A_93A

Setting the Jumpers on the RZ25 Disk Drive

Summary

This section shows the location of the jumpers on the RZ25 disk drive and describes how to set these jumpers.

Setting Jumpers

A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

Caution

Be careful not to break the metal pins or the jumper when removing it.

RZ25 Jumper Settings

The following table describes how to set the jumpers on the RZ25 disk drive:

Step	Action
1	Make sure that the wait-spin jumper (jumper 2) is *installed* and that jumpers 5, 7, and 8 are installed.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper A0 equals 1 • Jumper A1 equals 2 • Jumper A2 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper A2 is installed the SCSI ID is 4, and when jumper A0 and jumper A2 are installed the SCSI ID is 5 (1 + 4).

Default Settings   Disk drives normally use SCSI IDs in the range 0 to 3. SCSI ID
0 is reserved for the system disk in DEC 2000 Model 500 AXP
systems.

**RZ25 Jumper
Locations**   The following figure shows the location of the jumpers on the
RZ25 disk drive:
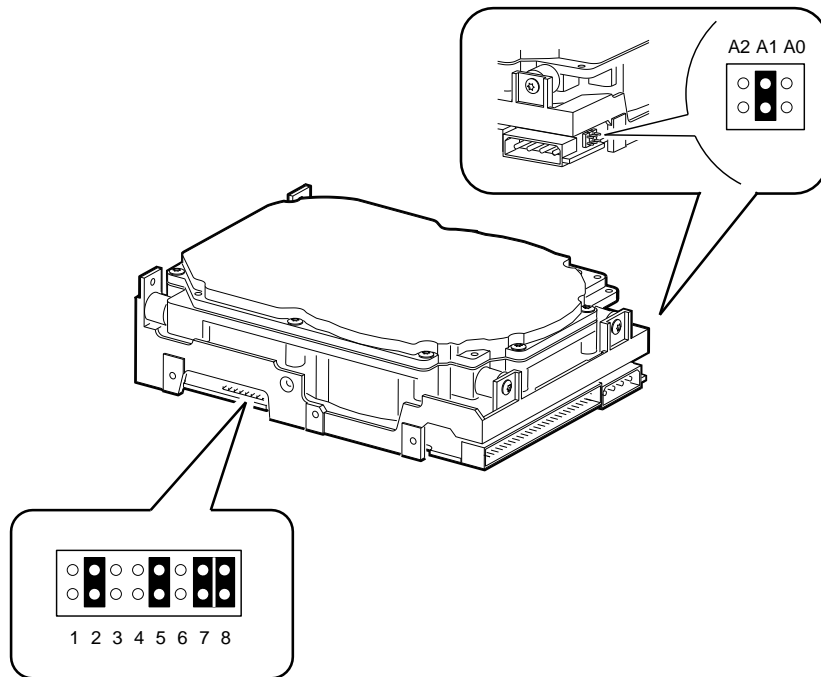
GA_EN00677A_93A

Setting the Jumpers on the RZ25L Disk Drive

Summary
This section shows the location of the jumpers on the RZ25L disk drive and describes how to set these jumpers.

Setting Jumpers
A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

RZ25L Jumper Settings
The following table describes how to set the jumpers on the RZ25L disk drive:

Step	Action
1	Make sure that the TP (2), PE, and ME jumpers are *installed* and that the SS, WP, DS, and RS jumpers are removed.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper A0 equals 1 • Jumper A1 equals 2 • Jumper A2 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper A2 is installed the SCSI ID is 4, and when jumper A0 and jumper A2 are installed the SCSI ID is 5 (1 + 4).

Default Settings   Disk drives normally use SCSI IDs in the range 0 to 3. SCSI ID
0 is reserved for the system disk in DEC 2000 Model 500 AXP
systems.

RZ25L Jumper   The following figure shows the location of the jumpers on the
Locations   RZ25L disk drive:
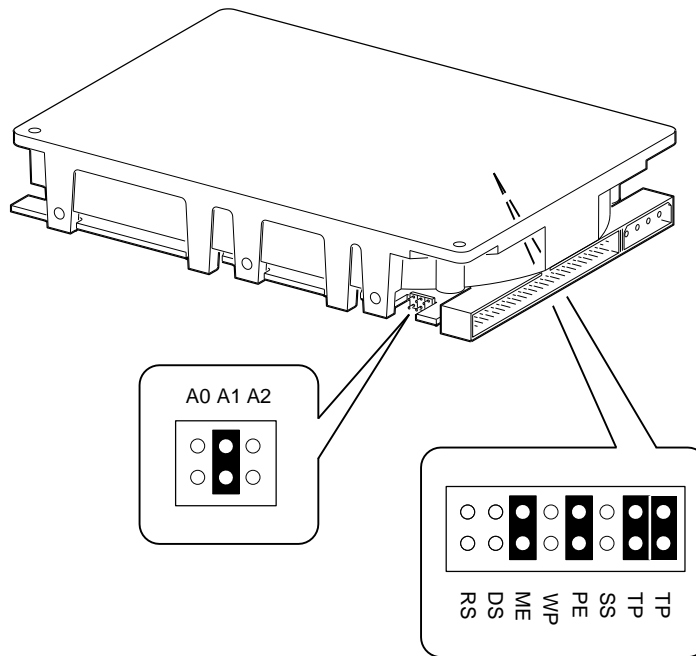
GA_EN00647A_93A

Setting the Jumpers on the RZ26 and RZ28 Disk Drives

Summary

This section shows the location of the jumpers on the RZ26 and RZ28 disk drives and describes how to set these jumpers.

Setting Jumpers

A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

_____

RZ26 and RZ28 Jumper Settings

The following table describes how to set the jumpers on the RZ26 and RZ28 disk drives:

Step	Action
1	Make sure that the wait spin jumper (jumper 7) is *removed*.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper 1 equals 1 • Jumper 2 equals 2 • Jumper 3 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper 3 is installed the SCSI ID is 4, and when jumper 1 and jumper 3 are installed the SCSI ID is 5 (1 + 4).

Default Settings   Disk drives normally use SCSI IDs in the range 0 to 3. SCSI ID 0 is reserved for the system disk in DEC 2000 Model 500 AXP systems.

RZ26 and RZ28 Jumper Locations   The following figure shows the location of the jumpers on the RZ26 and RZ28 disk drives:

1 2 3 4 5 6 7 8 9 10
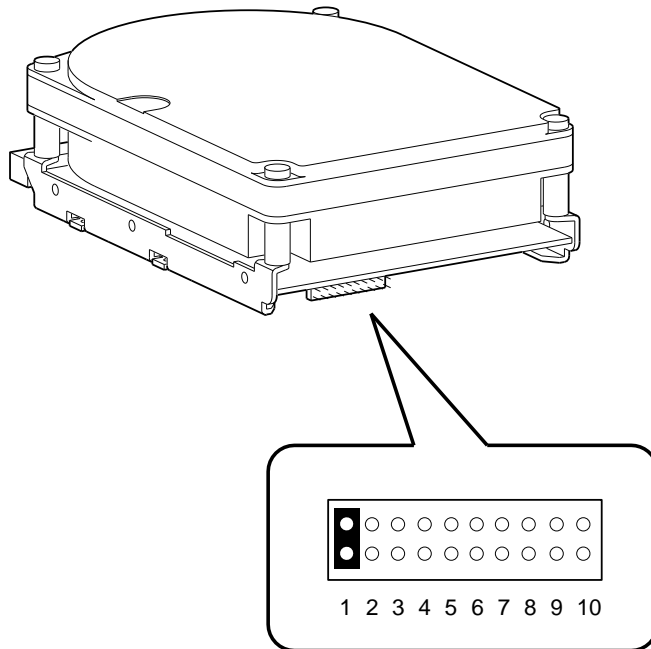
GA_EN00675A_93A

Setting the Jumpers on the RZ26L Disk Drive

Summary

This section shows the location of the jumpers on the RZ26L disk drive and describes how to set these jumpers.

Setting Jumpers

A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

_____

RZ26L Jumper Settings

The following table describes how to set the jumpers on the RZ26L disk drive:

Step	Action
1	Make sure that the wait spin jumper (jumper 7) is _removed_.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper 1 equals 1 • Jumper 2 equals 2 • Jumper 3 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper 3 is installed the SCSI ID is 4, and when jumper 1 and jumper 3 are installed the SCSI ID is 5 (1 + 4).

Default Settings Disk drives normally use SCSI IDs in the range 0 to 3. SCSI ID 0 is reserved for the system disk in DEC 2000 Model 500 AXP systems.

RZ26L Jumper Locations The following figure shows the location of the jumpers on the RZ26L disk drive:

1 2 3 4 5 6 7 8 9 10
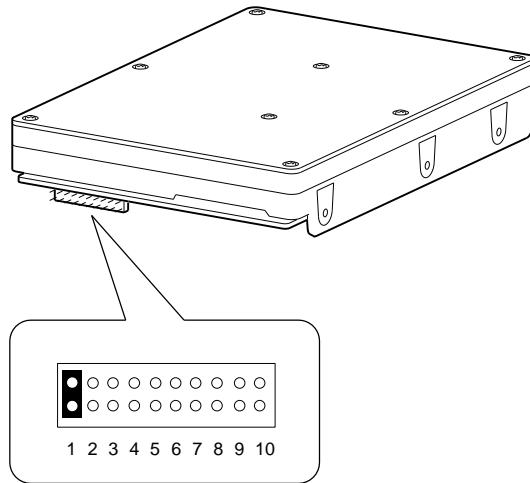
GA_EN00670A_93A

Setting the Switches on the TLZ06 Tape Drive

Summary

This section shows the location of the switches on the TLZ06 tape drive and describes how to set these switches.

TLZ06 Switch Settings

The following table describes how to set the switches on the TLZ06 tape drive:

Step	Action
1	Make sure that switch 7 remains in the off (up) position and that switches 4, 5, 6, and 8 remain in the on (down) position.
2	Set the SCSI ID SELECT switches to an unused SCSI ID. The ID select switches have the following values: • Switch 1 equals 1 • Switch 2 equals 2 • Switch 3 equals 4 The sum of the installed switches equals the SCSI ID. For example, when none of the switches are in the on (down) position, the SCSI ID is 0, when switch 3 is in the on position the SCSI ID is 4, and when switch 1 and switch 3 are in the on position the SCSI ID is 5 (1 + 4).

**TLZ06 Switch
Locations**

The following figure shows the location of the switches on the
TLZ06 tape drive:
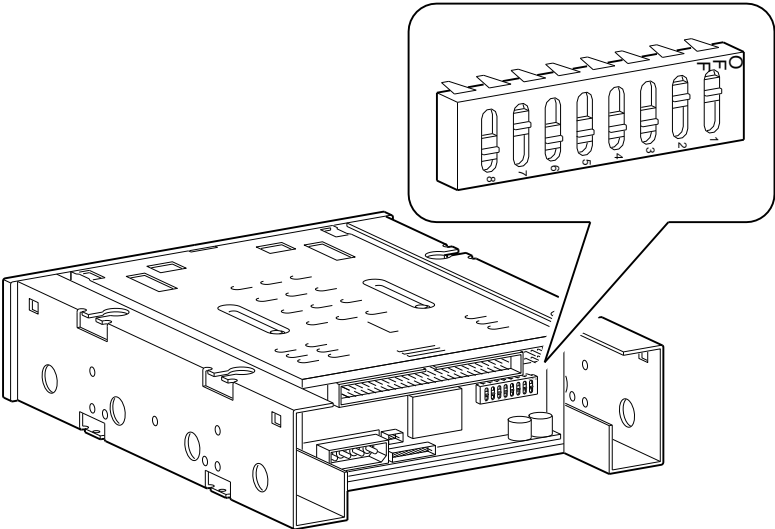
GA_EN00510A_93A

Setting the Jumpers on the TZK10 Tape Drive

Summary

This section shows the location of the jumpers on the TZK10 tape drive and describes how to set these jumpers.

Setting Jumpers

A jumper is a metal contact, in a plastic case, used to complete an electrical connection between two adjacent pins. The presence or absence of the jumpers in particular locations determines the drive settings. To change the drive settings, either install a jumper in the location indicated, or use a small flat-head screwdriver to remove it.

_____ **Caution** _____

Be careful not to break the metal pins or the jumper when removing it.

_____

TZK10 Jumper Settings

The following table describes how to set the jumpers on the TZK10 tape drive:

Step	Action
1	Make sure that the disable auto-density (DADS) jumper is _removed_ and that the terminator power (TPWR) jumper is installed.
2	Set the SCSI ID SELECT jumpers to an unused SCSI ID. The ID select jumpers have the following values: • Jumper 0 equals 1 • Jumper 1 equals 2 • Jumper 2 equals 4 The sum of the installed jumpers equals the SCSI ID. For example, when none of the jumpers are installed, the SCSI ID is 0, when jumper 2 is installed the SCSI ID is 4, and when jumper 0 and jumper 2 are installed the SCSI ID is 5 (1 + 4).

TZK10 Jumper Locations

The following figure shows the location of the jumpers on the TZK10 tape drive:
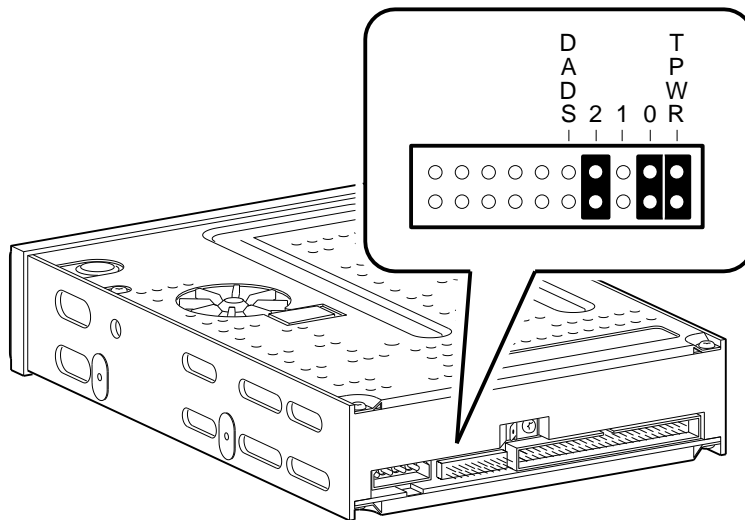
GA_EN00511A_93A

B

Antistatic Precautions

Introduction   This appendix describes the antistatic precautions that you must take when handling the system internal components to prevent damaging those components.

In This Appendix   This appendix contains the following section:

• Using the Antistatic Wrist Strap

Using the Antistatic Wrist Strap

Summary

This section describes how to attach the antistatic wrist strap to your wrist and to the system unit. It also describes how to remove the antistatic wrist strap and store it for future use.

Attaching the Strap

The following table lists the steps that you must follow to attach the antistatic wrist strap to your wrist and to the system unit:

Step	Action
1	Set the on/off switches on all peripherals and on the system unit to the off position.
2	Locate and remove the wrist strap from an envelope labeled *Disposable Grounding Wrist Strap*. Save the envelope. You need it to store the wrist strap after you use it.
3	After you remove the outside cover and the internal covers from the system unit, remove the protective paper from the metal strip at the end of the wrist strap. Save the paper. You need it to store the wrist strap after you use it.
4	Firmly attach the metal strip (❶) to a clean metal surface in the system unit.
5	Keeping the sticky side down, wrap the other end of the wrist strap twice around your wrist.

Removing and Storing the Strap

The following table lists the steps that you must follow to remove the antistatic wrist strap and store it for future use:

Step	Action
1	After you have finished handling the internal components, remove the metal strip from the system unit.
2	Cover the metal strip with the protective paper that you removed earlier.
3	Unwrap the wrist strap from your wrist.
4	Fold the wrist strap and store it in the envelope that you saved earlier.

Illustration

The following figure shows how to attach the antistatic wrist strap to your wrist and to the system unit:
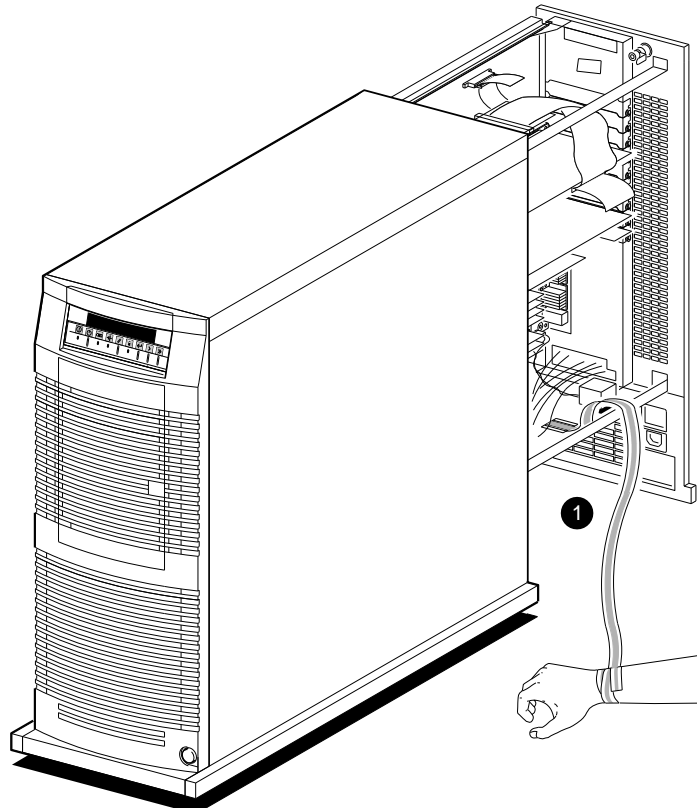
GA_EN00650A_93A

C

Using the Fail-Safe Booter

Introduction

This appendix describes how to use the fail-safe booter (FSB) to recover the system firmware if, for example, the power fails during the firmware update procedure.

In This Appendix

This appendix contains the following section:

- Using the Fail-Safe Booter

Using the Fail-Safe Booter

Summary
This section describes when and how you use the FSB program, located in NVRAM, to recover the system firmware.

When to Use the FSB
You use the FSB in the following situations:

- When the power fails during a firmware upgrade

- When you accidentally turn the system off during a firmware upgrade

Running the FSB
The FSB runs automatically when you restore power to the system, if the power failed during a firmware upgrade. Make sure that the diskette containing the JNUPDATE.EXE program is inserted in the diskette drive. The FSB reads the diskette drive and runs the JNUPDATE program. See Chapter 2 for information on completing the firmware upgrade procedure.

Example
The following example shows the messages the FSB displays when it runs:

```
DEC FailSafe Booter, Version 1.09
Copyright (c) 1993 Microsoft Corporation
Copyright (c) 1993 Digital Equipment Corporation

This is running because an update to your system firmware was
interrupted.

** If you were not just attempting a firmware update, contact
** your Digital Field Service representative!

Looking for eisa()disk()fdisk()jnupdate.exe...
```

D

Connector Pin Specifications

Introduction

This appendix lists the pin specifications of the standard system connectors.

In This Appendix

This appendix contains the following sections:

- Keyboard and Mouse Connector Pin Specifications
- Serial Port Pin Specifications
- Parallel Port Pin Specifications

Keyboard and Mouse Connector Pin Specifications

Summary   This section lists the pin specifications for the keyboard and mouse connectors.

Illustration   The following figure shows the pin numbers on the keyboard and mouse connectors:

GA_EN00286A_93A
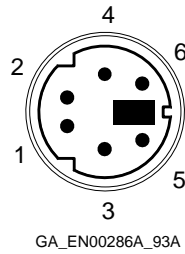
Specifications   The following table describes the functions of the pins on the keyboard and mouse connectors:

Pin	Function
1	Data
2	Unused
3	Ground
4	+5 Volts dc
5	Clock
6	Unused

Serial Port Pin Specifications

Summary   This section lists the pin specifications for the serial port.

Illustration   The following figure shows the pin numbers on the serial port:
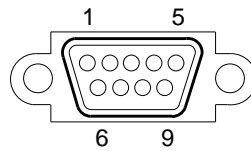
GA_EN00287A_93A

Specifications The following table describes the functions of the pins on the
serial port:

Pin	Function
1	Carrier detect
2	Receive data
3	Transmit data
4	Data term ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator

Parallel Port Pin Specifications

Summary   This section lists the pin specifications for the parallel port.

Illustration   The following figure shows the pin numbers on the parallel port:

GA_EN00288A_93A
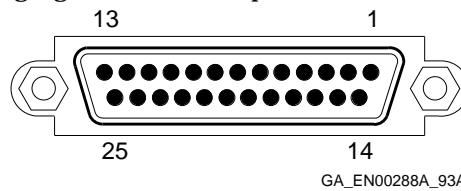
Specifications   The following table describes the functions of the pins on the parallel port:

Pin	Function	Pin	Function
1	Strobe	14	Auto linefeed
2	Data bit 0	15	Error
3	Data bit 1	16	Initialize printer
4	Data bit 2	17	Select in
5	Data bit 3	18	Signal ground
6	Data bit 4	19	Signal ground
7	Data bit 5	20	Signal ground
8	Data bit 6	21	Signal ground
9	Data bit 7	22	Signal ground
10	Acknowledge	23	Signal ground
11	Busy	24	Signal ground
12	Paper end	25	Signal ground
13	Select		

E

Hardware Specifications

Introduction

This appendix lists the hardware specifications of the system unit.

In This Appendix

This appendix contains the following sections:

- System Unit Specifications
- Electrical Specifications
- Environmental Specifications

System Unit Specifications

Summary The following table lists the system unit specifications:

Subject	Description
Processor	DECchip 21064 (EV4 P2 or P3).
Boot and diagnostic firmware ROM	1M bytes.
DRAM memory	16M bytes, expandable to 128M bytes.
Storage devices	Contact your Digital sales representative for information on the list of supported storage devices.
Terminals	Supports the VT series.
Monitors	Contact your Digital sales representative for information on the list of supported monitors.
Interfaces	One keyboard port, one mouse port, one serial port, one parallel port, six EISA connectors.
EISA Slots	Six
Weight†, kg (lb)	54.0 (118.8)
Height, cm (in)	59.8 (23.5)
Width, cm (in)	23.0 (9.0)
Depth, cm (in)	70.0 (27.5)

†Depends on the configuration.

Electrical Specifications

Summary   The following table lists the system electrical specifications:

Subject	240 Volt Setting	120 Volt Setting
Single Power Supply		
Input voltages (Volts)	220 to 240	100 to 120
Frequency (Hertz)	47.5 to 52.5	57 to 63
Root mean square (RMS) voltage (Volts)	230	120
RMS current (Amps)	2.0	3.7
Power factor	0.57	0.60
Power consumption (Watts)	415	415
Dual Power Supply		
Input voltages (Volts)	220 to 240	100 to 120
Frequency (Hertz)	47.5 to 52.5	57 to 63
Power consumption (Watts)	717	717

Environmental Specifications

Summary The following table lists the system environmental specifications:

Condition	Range or Value
Operating	
Temperature range	10°C (50°F) to 35°C (95°F)
Relative humidity	10% to 90% noncondensing
Maximum wet bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)
Altitude	2000 m (6562 ft)
Nonoperating	
Temperature range	–40° (–40°F) to 66°C (151°F)
Relative humidity	10% to 90%
Altitude	3600 m (12 000 ft)
Maximum wet bulb temperature	32°C (90°F)

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