DEC 7000 AXP System
VAX 7000
Console Reference Manual

Order Number EK–70C0B–TM.002

This manual is intended for the system manager or system operator and covers the console commands for the DEC 7000 and VAX 7000 systems.

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Preface

Intended Audience

This manual is written for the system manager or system operator.

Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient on- line and printed reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

This manual has three chapters and one appendix, as follows:

- **Chapter 1, Console Hardware,** briefly describes the console hardware.
- **Chapter 2, Console User Interface,** describes command syntax, special characters, environment variables, and device naming conventions.
- **Chapter 3, Console Commands,** describes each command and gives examples.
- **Appendix A, Deposit/Examine Symbols,** lists the symbols recognized by the **deposit** and **examine** commands.

Conventions Used in This Document

Commands and command options are printed in bold type; for example, The **help** command displays ....

Although commands and environment variables are not case sensitive (that is, **Boot** and **BOOt** are both valid), commands and command options are shown in lowercase type.

When a command may be abbreviated, the portion that may be omitted is shown in brackets: **-flags** or **-fl[ags]**. Brackets also indicate an element is optional.

Braces ({}) indicate a choice from the enclosed list.

Angle brackets (<>) indicate that the enclosed text is not a literal depiction of the element but instead a reference to the kind of item that can appear in that position.

Terminology. Unless specified otherwise, the use of "system" refers to either a DEC 7000 AXP or VAX 7000 system. The DEC 7000 AXP systems use the Alpha AXP architecture. References in text use DEC 7000 to refer to DEC 7000 AXP systems.

When a discussion applies to only one system, an icon is used to highlight that system. Otherwise, the discussion applies to both systems. Thus, the abstract for a module that applies only to DEC 7000 systems would look like this:

This section shows a sample boot of OpenVMS Alpha AXP from the RRD42 CD drive for DEC 7000 systems. The first step is issuing the show device command to determine the location of the RRD42.

Book titles. In text, if a book is cited without a product name, that book is part of the hardware documentation. It is listed in Table 1 along with its order number.

Documentation Titles

Table 1 lists the books in the DEC 7000 and VAX 7000 documentation set. Table 2 lists other documents that you may find useful.

Table 1 DEC 7000/VAX 7000 Documentation

Title	Order Number
Installation Kit	EK–7000B–DK
Site Preparation Guide	EK–7000B–SP
Installation Guide	EK–700EB–IN
Hardware User Information Kit	EK–7001B–DK
Operations Manual	EK–7000B–OP
Basic Troubleshooting	EK–7000B–TS
Service Information Kit—VAX 7000	EK–7002A–DK
Platform Service Manual	EK–7000A–SV
System Service Manual	EK–7002A–SV
Pocket Service Guide	EK–7000A–PG
Advanced Troubleshooting	EK–7001A–TS
Service Information Kit—DEC 7000	EK–7002B–DK
Platform Service Manual	EK–7000A–SV
System Service Manual	EK–7002B–SV
Pocket Service Guide	EK–7700A–PG
Advanced Troubleshooting	EK–7701A–TS

Table 1 DEC 7000/VAX 7000 Documentation (Continued)

Title	Order Number
Reference Manuals	
Console Reference Manual	EK–70C0B–TM
KA7AA CPU Technical Manual	EK–KA7AA–TM
KN7AA CPU Technical Manual	EK–KN7AA–TM
MS7AA Memory Technical Manual	EK–MS7AA–TM
I/O System Technical Manual	EK–70I0A–TM
Platform Technical Manual	EK–7000A–TM
Upgrade Manuals	
KA7AA CPU Installation Guide	EK–KA7AA–IN
KN7AA CPU Installation Guide	EK–KN7AA–IN
MS7AA Memory Installation Guide	EK–MS7AA–IN
KZMSA Adapter Installation Guide	EK–KXMSX–IN
DWLMA XMI PIU Installation Guide	EK–DWLMA–IN
DWMBB VAXBI PIU Installation Guide	EK–DWMBB–IN
H7237 Battery PIU Installation Guide	EK–H7237–IN
H7263 Power Regulator Installation Guide	EK–H7263–IN
BA654 DSSI Disk PIU Installation Guide	EK–BA654–IN
BA655 SCSI Disk and Tape PIU Installation Guide	EK–BA655–IN
Removable Media Installation Guide	EK–TFRRD–IN

Table 2 Related Documents

Title	Order Number
General Site Preparation	
Site Environmental Preparation Guide	EK–CSEPG–MA
System I/O Options	
BA350 DECstor/me Modular Storage Shelf Subsystem Configuration Guide	EK–BA350–CG
BA350 DECstor/me Modular Storage Shelf Subsystem User's Guide	EK–BA350–UG
BA350-LA DECstor/me Modular Storage Shelf User's Guide	EK–350LA–UG
CIXCD Interface User Guide	EK–CIXCD–UG
DEC FDDIcontroller 400 Installation/Problem Solving	EK–DEMFA–IP
DEC LANcontroller 400 Installation Guide	EK–DEMNA–IN
DEC LANcontroller 400 Technical Manual	EK–DEMNA–TM
DSSI VAXcluster Installation and Troubleshooting Manual	EK–410AA–MG
InfoServer 150 Installation and Owner's Guide	EK–INFSV–OM
KDM70 Controller User Guide	EK–KDM70–UG
KFMSA Module Installation and User Manual	EK–KFMSA–IM
KFMSA Module Service Guide	EK–KFMSA–SV
RRD42 Disc Drive Owner's Manual	EK–RRD42–OM
RF Series Integrated Storage Element User Guide	EK–RF72D–UG
TF85 Cartridge Tape Subsystem Owner's Manual	EK–OTF85–OM
TLZ06 Cassette Tape Drive Owner's Manual	EK–TLZ06–OM

Table 2 Related Documents (Continued)

Title	Order Number
Operating System Manuals	
Alpha Architecture Reference Manual	EY–L520E–DP
DEC OSF/1 Guide to System Administration	AA–PJU7A–TE
DECnet for OpenVMS Network Management Utilities	AA–PQYAA–TK
Guide to Installing DEC OSF/1	AA–PS2DA–TE
OpenVMS Alpha Version 1.0 Upgrade and Installation Manual	AA–PQYSA–TE
VMS Upgrade and Installation Supplement: VAX 7000–600 and VAX 10000–600 Series	AA–PRAHA–TE
VMS Network Control Program Manual	AA–LA50A–TE
VMSclusters and Networking	
HSC Installation Manual	EK–HSCMN–IN
SC008 Star Coupler User's Guide	EK–SC008–UG
VAX Volume Shadowing Manual	AA–PBTVA–TE
Peripherals	
Installing and Using the VT420 Video Terminal	EK–VT420–UG
LA75 Companion Printer Installation and User Guide	EK–LA75X–UG

Chapter 1

Console Hardware

This chapter describes how the console program and hardware function in DEC 7000 and VAX 7000 systems. Sections include:

- Processor Console Hardware
- System Controls and Connections
- Primary and Secondary Processors

1.1 Processor Console Hardware

The system processor module has several features dedicated to support of the console and diagnostic hardware.

The following hardware provides console support:

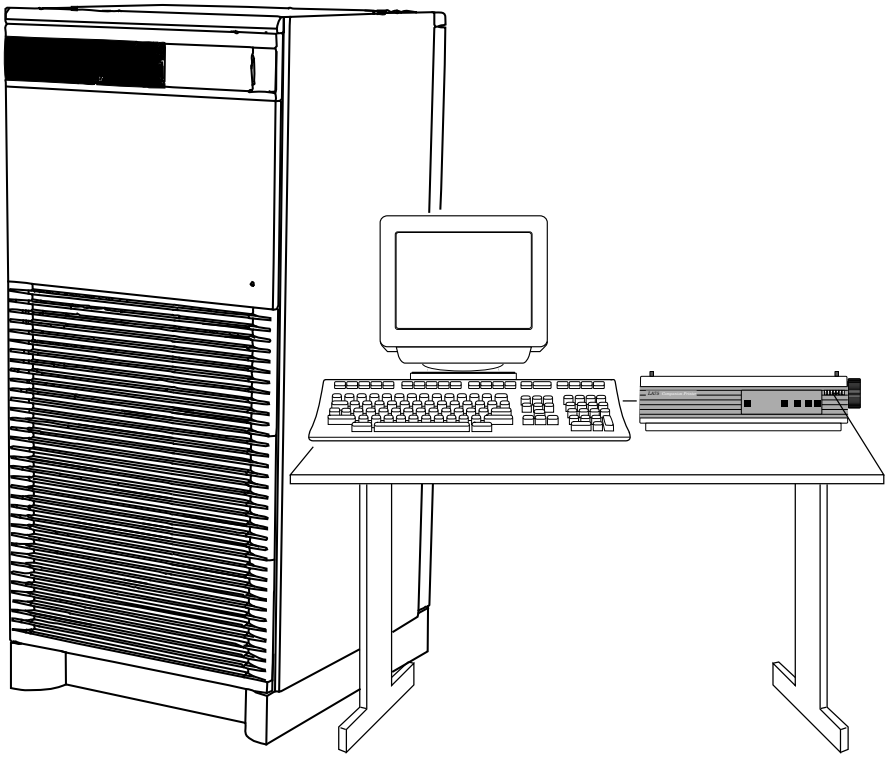
- 128- Kbyte flash- erasable programmable read- only memories (FEPROMs) hold the console program, diagnostic software, and bootstrap routines.
- One 128- Kbyte FEPROM contains code that performs minimal initialization and testing functions required to bring up the console environment. It also contains flash ROM recovery code.
- One 8- Kbyte electrically erasable programmable read- only memory (EEPROM) holds console parameters, bootstrap, and error logging information.
- One dual universal asynchronous receiver/transmitter (UART) supports programmable baud rates, parity, stop bits, and character length.
- Logic and registers allow the console to enable or disable halts, cause a system reset, and provide console communication.
- Hardware provides time- of- year and interval timer functions.
- Several LEDs display status and error information.

For more information:

KN7AA CPU Technical Manual
KA7AA CPU Technical Manual

Figure 1- 1 illustrates the system hardware. The console terminal is used for entering console commands. The console terminal is connected to the system through the console terminal port (shown in Figure 1- 2). A printer, connected to the console terminal, provides a hardcopy record of console sessions. The console program is the software interface that translates console commands to the primary processor.

Figure 1-1 System Hardware

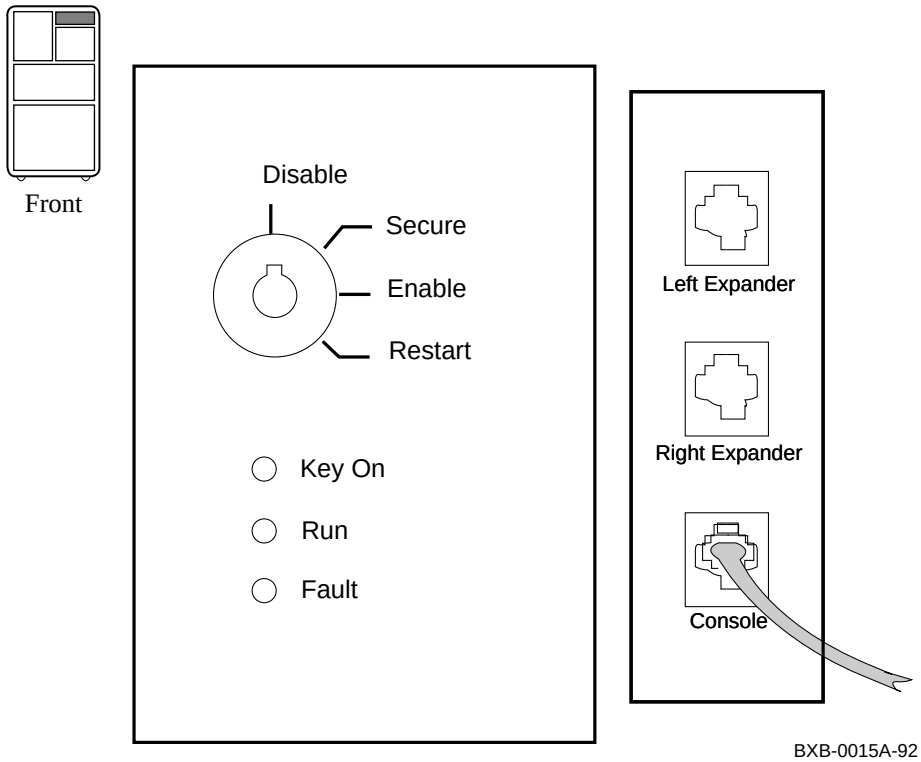


BXB-0023-92

1.2 System Controls and Connections

The system control panel consists of a keyswitch and three indicator lights. Three cable ports provide connections for expander cabinets and the console terminal. In a multiprocessor system, each processor has access to the console terminal line.

Figure 1-2 System Controls and Connections



The control panel keyswitch (see Figure 1- 2) has the following settings:

Disable	Removes 48 VDC power from the system. Power is still supplied to the cabinet control logic (CCL) module.
Secure	Prevents entry into console mode; position used while machine executes programs.
Enable	Allows entry into console mode; position used while machine executes programs.
Restart	A momentary switch position, used to reinitialize the system; causes self- test to start running.

The control panel indicator lights, when lit, indicate:

Key On	Power is supplied to entire system; the blower is running.
Run	Lit when the primary processor is running the operating system or user programs; off when the primary processor is in console mode.
Fault	Fault on LSB, XMI bus, or an I/O bus. Flashes during power sequencing or when errors are detected.

The signals for the control panel Run light, the console terminal, and the power system UARTs are carried by the system bus. A processor that is in console mode can perform I/O directly to the console terminal.

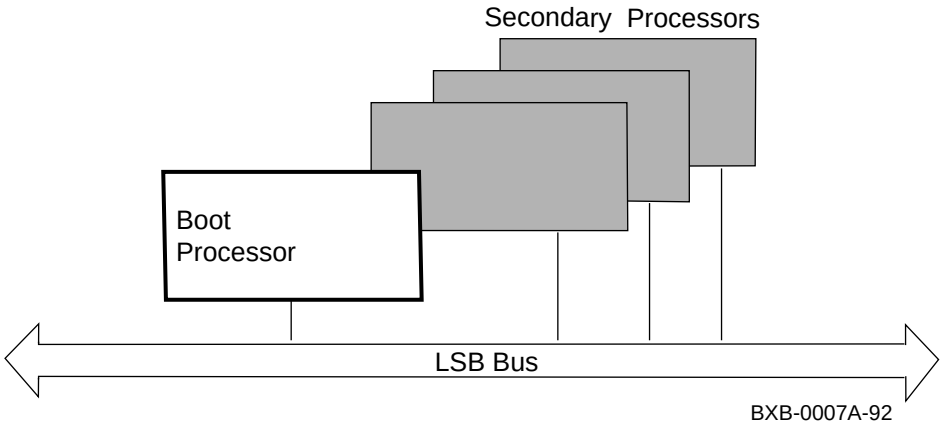
For more information:

Operations Manual

1.3 Primary and Secondary Processors

One processor is selected as the boot processor, and all other processors become secondary processors. This determination is made by the system at power- up or initialization and can be altered using console commands.

Figure 1- 3 Determining the Boot Processor



One processor in a multiprocessor system is designated as the primary processor. Since the primary processor performs the system bootstrap, it is also referred to as the boot processor. The lowest numbered enabled processor that has asserted its own boot processor bit is the boot processor. All console commands execute, by default, on the primary processor.

Under the operating system, secondary processors must communicate with the primary when they need to perform I/O on the console terminal using the hardware restart parameter block (HWRPB).

The low portion of main memory is reserved for the console program. When the system is booted, the console image is preserved in order to facilitate reentering the console program through a halt condition. In addition, a number of data structures are created in memory, primarily for communication between the console program and the operating system.

For more information:

Operations Manual
Advanced Troubleshooting
KN7AA CPU Technical Manual
KA7AA CPU Technical Manual

Chapter 2

Console User Interface

This chapter describes the console program's command language, console special characters, console environment variables, and device naming conventions. Console commands (see Chapter 3) allow you to boot the operating system, display the configuration, and verify the system.

When the system is in console mode, the system is halted and the console firmware is executing. The operator communicates with the firmware through the console terminal, which displays the following prompt:

>>> for a uniprocessor system, or
P0n>>> for a multiprocessor system

where *n* is 0 to 5, depending on which LSB slot the primary processor is in.

Sections in this chapter include:

- Command Syntax
- Console Special Characters
- Console Environment Variables
- Device Naming Conventions

2.1 Command Syntax

The console command language has syntax rules for forming commands. Commands can contain up to 80 characters on a single line, can be abbreviated, and accept options. Numbers are in hexadecimal notation. Tabs and spaces are compressed.

Table 2- 1 Console Command Language Syntax

Command Parameter	Attribute or Action
Length	80 characters maximum, unless the continuation character (\) is used.
Case	Upper- or lowercase characters are accepted.
Abbreviation	Varies with the command; usually the shortest unique combination of letters.
Options	Can appear after the command keyword or after any symbol or number in the command. Begin with a hyphen (-) and must be preceded by at least one space.
Numbers	Hexadecimal format unless otherwise noted.
No characters	Null command; no action taken.
Multiple adjacent spaces and tabs	Compressed to a single space.

Length: The console program accepts commands of up to 80 characters per line. This does not include the terminating carriage return or any characters deleted as the command is entered. A command longer than 80 characters, without the backslash character (see Section 2.2) causes the display of an error message.

Case: Upper- or lowercase characters can be used for input. Characters are displayed in the case they are entered.

Abbreviation: Commands and options can be abbreviated by dropping characters from the end of words. You must enter the minimum number of characters to identify the keyword unambiguously. All characters specified must match a keyword to be accepted. For example, although **E** uniquely identifies the **examine** command, **Exmn** is not a valid abbreviation. In the command reference sections that follow, characters that can be omitted appear in square brackets (**[ ]**). Abbreviation of environment variables (see Section 2.3) is allowed with the **show** command.

Options: You can use command options, to define or modify the environment, after the command keyword or after any symbol or number in the command. See individual keyword descriptions for examples.

Numbers: Numbers in console commands are in hexadecimal notation unless otherwise indicated. The hexadecimal (0X) default can be overridden by preceding decimal numbers by 0D, binary by 0B, and octal by 0O. Refer to the individual command descriptions. Register names (R0, R1, and so on) are not considered numbers and use decimal notation.

No Characters: A command line with no characters is a null command. The console program takes no action and does not issue an error message. The console prompt returns. The console supports command line recall and editing.

Spaces: Multiple adjacent spaces and tabs are compressed and treated as a single space. The console program ignores leading and trailing spaces.

2.2 Console Special Characters

The console program supports control characters, entered by holding down the Control (Ctrl) key and pressing the desired key, and other special characters.

Table 2- 2 Console Special Characters

Character	Function
Return	Carriage return; ends a command line.
Backslash	Line continuation.
<X]	Delete key; deletes previously typed character.
Help	By itself, displays first- level help. When pressed after part of a command, displays options available.
Ctrl/A, F14	Toggles between insertion/overstrike mode.
Ctrl/B, ^ (up- arrow)	Recall previous command(s).
Ctrl/C	Terminate running process.
Ctrl/D, <	Move cursor left one position.
Ctrl/E	Move cursor to end of line.
Ctrl/F, >	Move cursor right one position.
Ctrl/H, BS, F12	Move cursor to beginning of line.
Ctrl/J	Delete word.
Ctrl/O	Stop output to console terminal for current command. Toggles between enable/disable.
Ctrl/P	In console mode, acts like Ctrl/C. In program mode, causes the boot processor to halt and begin running the console program.
Ctrl/Q	Resume output to console terminal.
Ctrl/R	Redisplay the current line.
Ctrl/S	Stop output to console terminal.
Ctrl/U	Delete entire line.
*	Wildcarding for certain commands.
" "	Quotes for **set** environment variable name.
#, !	Comment specifiers.

Return terminates command line input. No action is taken on a command line until it is terminated by a carriage return. If no characters are entered and the Return key is pressed, it is treated as a null command. No action is taken, and the console prompts for input. Carriage return is echoed as carriage return, line feed.

Backslash (\) allows continuation across lines from the terminal; must be the last character on the line to be continued.

When the **Delete** key is pressed, the console deletes the character previously typed.

Help provides additional information on console commands.

Ctrl/A or **F14** toggles between insertion mode and overstrike mode for command line editing. The default mode is overstrike.

Ctrl/B or **up- arrow**/**down- arrow** recall the previous command(s). The last 16 commands are stored in the recall buffer.

Ctrl/C terminates the current command. Echoed as ^C, Ctrl/C clears Ctrl/S and also resumes output that was suspended using Ctrl/O. When Ctrl/C is entered as part of a command line, the line is deleted as if you entered Ctrl/U. Ctrl/C has no effect as part of a binary data stream.

Ctrl/D or **left- arrow** moves the cursor one position to the left.

Ctrl/E moves the cursor to the end of the line.

Ctrl/F or **right- arrow** moves the cursor right one position.

Ctrl/H, **Backspace**, or **F12** moves the cursor to the beginning of the line.

Ctrl/J deletes previously typed word.

Ctrl/O stops output to the console terminal until Ctrl/O is entered again. Ctrl/O is echoed as ^O followed by a carriage return and is not echoed when output is reenabled. Output is also reenabled when the console prompts for a command, issues an error message, enters program mode, or when Ctrl/P is entered. It is not reenabled by displaying a **repeat** command.

Ctrl/P works like Ctrl/C and is echoed as ^C, if the console terminal is in console mode. If the console terminal is in program mode and is secured, Ctrl/P is not echoed, but is passed to the operating system for processing. If the console terminal is in program mode and is not secured, Ctrl/P halts the processor and begins the console program. See the **continue** command for additional information.

Ctrl/Q resumes console output to the console terminal that was suspended with Ctrl/S. Additional Ctrl/Q strokes are ignored. Ctrl/Q is not echoed.

Ctrl/R is echoed as ^R, followed by a carriage return, line feed, and printing the current command line. Deleted characters are omitted. This command is useful for hardcopy terminals.

Ctrl/S suspends output to the console terminal until Ctrl/Q is entered. Ctrl/S is not echoed.

Ctrl/U discards all characters that you entered on the current line. It is echoed as ^U, followed by a carriage return, line feed, and a new prompt.

* allows wildcarding with device names and environment variables. Wildcarding is allowed with the following commands:

1. **cdp**
2. **clear**
3. **initialize**
4. **set - d**
5. **show**
6. **show configuration**
7. **show device**
8. **show <envar>**
9. **show network**
10. **stop**
11. **test**
12. **update**

See Chapter 3 for specific examples.

Double quotes (" ") allow you to denote a string for environment variable assignment.

and ! allow you to enter a comment. All characters following a **#** or ! are recognized as a comment only. Exceptions include the above control characters.

2.3 Console Environment Variables

Console environment variables allow the user to modify the way the console commands operate.

An environment variable is a name and value association maintained by the console program. The value associated with an environment variable is an ASCII string (up to 127 characters in length) or an integer. Certain environment variables are typically modified by the user to tailor the recovery behavior of the system on power- up and after system failures. Volatile environment variables are initialized by a system reset; others are nonvolatile across system failures.

Environment variables can be created, modified, displayed, and deleted using the **create**, **set**, **show**, and **clear** commands. A default value is associated with any variable that is stored in EEPROM. This default value is used if the EEPROM is unreadable.

Table 2- 3 lists the predefined console environment variables, their attributes, and their functions. Refer to Chapter 3, Console Commands, for examples of their use.

Table 2- 3 Environment Variables

Variable	Attribute	Function
auto_action	Non-volatile	Specifies the action the console will take following an error halt. Values are: **restart** - Automatically restart. If restart fails, boot the operating system. **boot** - Automatically boot the operating system. **halt** (default) - Enter console mode.
baud	Non-volatile	Sets the console terminal port baud rate. Allowable values are 300, 600, 1200, 2400, 4800, and 9600. The default value is 9600.

Table 2- 3 Environment Variables (Continued)

Variable	Attribute	Function
bootdef_dev	Non-volatile	The default device or device list from which booting is attempted when no device name is specified by the **boot** command.
boot_file	Non-volatile	The default file name used for the primary bootstrap when no file name is specified by the **boot** command, if appropriate.
boot_osflags	Non-volatile	Additional parameters to be passed to the system software during booting if none are specified by the **boot** command with the **- flags** qualifier.
boot_reset	Non-volatile	Resets system and displays self- test results during booting. Default value is **on**.
cpu	Volatile	Selects the current boot processor.
cpu_enabled	Non-volatile	A bitmask indicating which processors are enabled to run (leave console mode). Default is **0xff**.
cpu_primary	Non-volatile	A bitmask indicating which processors are enabled to become the next boot processor, following the next reset. Default is **0xff**.
d_harderr	Volatile	Determines action taken following a hard error. Values are **halt** (default) and **continue**. Applies only when using the **test** command.
d_report	Volatile	Determines level of information provided by the diagnostic reports. Values are **summary** (default) and **full**. Applies only when using the **test** command.

Table 2- 3 Environment Variables (Continued)

Variable	Attribute	Function
d_softerr	Volatile	Determines action taken following a soft error. Values are **continue** (default) and **halt**. Applies only when using the **test** command.
dump_dev	Non-volatile	Complete device specification of the device to which operating system dumps are written (if supported by the operating system). Default value is **null**.
enable_audit	Non-volatile	If set to **on** (default), enables the generation of audit trail messages. If set to **off**, audit trail messages are suppressed. Console initialization sets this to **on**.
interleave	Non-volatile	The memory interleave specification. Value must be **default**, **none**, or an explicit interleave list. Default value is **default**.
language	Non-volatile	Determines whether system displays message numbers or message text in English (default).

2.4 Device Naming Conventions

To use the console, the user needs to be familiar with the device names assigned by the system console.

The system firmware assigns names to all supported CPUs, memories, I/O windows, I/O adapters, and end I/O devices in the system.

The **show configuration**, **show device**, and **show network** commands (see Chapter 3) are used to obtain the assigned device mnemonics for all devices in the system. The assigned mnemonics provide an easy means to refer to devices with the various console commands. Example 2- 1 illustrates several examples. Refer to the individual console commands in Chapter 3 for additional examples.

Example 2- 1 Device Names

```
1. >>> test dua23.0.1.14.1


2. >>> set host demna0

3. >>> update kn7aa* -f

4. >>> examine xmi0:21880004
```

The **show configuration** command displays all supported CPUs, memories, I/O windows, I/O adapters, and I/O subsystems (that is, whole XMIs) and assigns a mnemonic to each (ka7aa0, ms7aa3, dwlma0, demna0, demna1, xmi0, and so forth).

The **show device** command displays all supported disks (including CD-ROM and solid state disks) and tapes and assigns a mnemonic to each (dua23.0.1.14.1, for example).

The **show network** command displays all supported network boot devices (Ethernet and FDDI) and assigns a mnemonic to each (exa0.0.0.14.0, fxb0.0.0.4.1, for example).

The device name for end I/O devices (disks, tapes, network devices, and so forth) is of the form:

ddccuuuu.node.channel.slot.hose

where the fields, described in Table 2- 4, are separated by periods (**.**). Numbers in Table 2- 4 are decimal.

Table 2- 4 Device Name Fields

Field	Size	Definition
dd	2	Protocol used to access device: DK - SCSI disk (DEC 7000 only) DU - MSCP disk (CI, SI, and DSSI [VAX 7000 only]) MK - SCSI tape (DEC 7000 only) MU - MSCP tape (CI, SI, and DSSI [VAX 7000 only]) EX - XMI Ethernet FX - XMI FDDI
cc	1 or 2	Controller letter (a–zz) assigned by console, based on the system configuration.
uuuu	4 (max)	Unit number of device (0–9999) determined by the I/O channel number and the XMI slot number of the adapter.
node	3 (max)	Node number (0–255) of the device on a remote (CI or DSSI) bus. If the remote node is a CI, this is the CI node number of the HSC; if it is a DSSI, this is the node number of the disk.
channel	1	Channel number (0–1); used only if the adapter is a KFMSA (VAX 7000) or KZMSA (DEC 7000).
slot	2 (max)	XMI slot number (1–14) of the adapter.
hose	1	Hose number (0–3) that connects to the I/O bus.

Chapter 3

Console Commands

Console commands provide the capabilities to examine and modify system state. Additionally, they allow tests to be directed to functional components of the system. The following console commands are described:

- boot
- build eeprom
- cdp - VAX 7000 only
- clear (eeprom, <envar>, screen)
- continue
- crash
- create
- deposit
- examine
- help
- initialize
- mchk - DEC 7000 only
- repeat
- set (configuration, eeprom, <envar>, host, power)
- show (configuration, device, eeprom, <envar>, memory, network, power)
- start
- stop
- test
- update
- comment (#, !)

3.1 Boot

The boot command boots the operating system.

Example 3- 1 Boot Command

```
1. >>>                  # Boot from local disk.
   >>> show device      # Display I/O device information.
   polling for units on kfmsa0, slot 1, xmi0...
   dua2.2.0.1.0   R2TDYC$DIA2 RF73
   polling for units on kdm700, slot 2, xmi1...
   dua1.0.0.2.1   DUA1        RA92

   >>> boot dua2.2.0.1.0# Boot device designations:
                        # du = device code.
                        # a = controller designation.
                        # 2 = device unit number.
                        # 2 = node number.
                        # 0 = device channel number.
                        # 1 = XMI slot number.
                        # 0 = I/O channel number.

2. >>>                  # Boot from network device.
   >>> show net         # Display network information.
   polling for units on demna0, slot 3, xmi0...
   exa0.0.0.3.0 08-00-2B-0B-BB-ED
                        # exa0.0.0.3.0 = path info.
                        # 08-00-2B-0B-BB-ED = controller
                        # hardware address (hex).

   >>> b exa0 -flags 0,0,0 -file ISL_LVAX_V02
                        # Boot from InfoServer.
                        # exa0 = network device.
                        # -flags 0,0,0 = additional
                        # command parameters.
                        # ISL_LVAX_V02 = load file.

                        (Examples are continued on p. 3-4)
```

The **boot** command syntax is:

b[oot] [- flags NNNN, M, PPPP] [- file <filename>] <device_name>

where the **- flags** parameter allows additional **boot** command parameters **N**, **M**, and **P**. Specifying **- fl[ags]** overrides the **boot_osflags** environment variable (see Section 2.3). The **NNNN** flags, dependent on the system configuration, are used with OpenVMS VAX when booting from a shadow set. The **M** flag, dependent on the system configuration, specifies the system root of the boot device. The **PPPP** flags are for the operating system bootstrap loader options. The **- file** parameter indicates booting from the file **<filename>**. Specifying **- file** overrides the **boot_file** environment variable (see Section 2.3). Device names can be found by using the **show device** and **show network** commands. See Section 2.4 for information on device names.

Boot command flags can be shortened, since values such as zero or commas (which can be used as placeholders) do not have to be specified. These parameters are read from right to left (**PPPP**, **M**, **NNNN**). For example, **boot - fl 0,0,100** or **boot - fl ,,100** are the same as **boot - fl 100**, where **100** is the value of the **P** option.

For more information:

Operations Manual
VMS Upgrade and Installation Supplement:
VAX 7000-600 and VAX 10000-600 Series

```
3. >>>                    # Boot a system in a CI
                          # VAXcluster.
   >>> sh dev             # Display I/O device information.

   polling for units on cixcd0, slot 2, xmi0...
   dua20.14.0.2.2   $100$DUA20        RA82
   dua31.14.0.2.2   $100$DUA31        RA82

   >>> boot -fl 0,4,0 dua20.14.0.2.2
                          # -fl[ags] indicates additional
                          # command options follow.
                          # 0 = not a shadow set boot
                          # 4 = system root of boot device.
                          # 0 = bootstrap loader options.
                          # du = device code.
                          # a = controller designation.
                          # 20 = device unit number.
                          # 14 = node number.
                          # 0 = device channel number.
                          # 2 = XMI slot number.
                          # 2 = I/O channel number.

4. >>>                    # Shadow set boot.
   >>> b -fl 8DAC,2,0 dua3500.14.0.12.1,dua63.14.0.12.1
                          # 8DAC = load device virtual
                          # unit number;
                          # 8 indicates shadow set booting.
                          # DAC = value (hex) of virtual
                          # device unit number 3500 (dec.).
                          # 2 = system root.
                          # 0 = bootstrap loader options.
                          # dua3500 = virtual device.
                          # dua63 = physical device.
                          # 14 = node number.
                          # 0 = device channel number.
                          # 12 = XMI slot number.
                          # 1 = I/O channel number.
                          # The console attempts to boot
                          # from the virtual device; then
                          # from the physical device.  The
                          # parameters for the physical and
                          # virtual device are identical
                          # except for device number.
```

3.2 Build EEPROM

The build eeprom command is used to create a new EEPROM image or to restore a corrupted EEPROM image.

Example 3- 2 Build EEPROM Command

```
>>> build eeprom             # Build EEPROM if invalid
                             # message is displayed.
Creating new EEPROM image
System Serial Number> GAO1234567  # If the EEPROM is
Module Serial Number> SG226LFH01  # corrupted, enter
                                  # system serial number
                                  # and module serial
                                  # number, part number,
                                  # and firmware revision.

Module Unified 2-5-2-4 Part Number>   -E2040-AA. M06
Module Firmware Revision> 1.5
>>>
```

The **build eeprom** command syntax is:

bu[ild] ee[prom]

If you are restoring a corrupted EEPROM, you will be prompted to supply the system serial number and module serial, part, and firmware revision numbers. The **build eeprom** command may be required during a console firmware upgrade. Before upgrading, you should refer to Table 2- 3 and use the **show <envar>** command (see Section 3.24) to display present environment variables values. After rebuilding, use the **set <envar>** command (see Section 3.18) to set the environment variables to their desired values.

For more information:

Advanced Troubleshooting
Release Notes

3.3 Cdp

The cdp command performs basic configuration management of DSSI devices.

Example 3-3 Cdp Command

```
1. >>> show device        # Display I/O device
                          # information.
   polling for units on kfmsa0, slot 0, xmi0...
   dua5.0.0.13.0    BASHFL$DIA5       RF71
   polling for units on cixcd0, slot 14, xmi1...
   dub44.1.0.13.1   $1$DIA44 (BLANK4) RF71

   >>> cdp -i             # -i entered to select
                          # interactive mode - set all
   dua.5.0.0.13.0:        # parameters; no changes made.
   Node Name [BASHFL]?
   Allocation Class [0]?
   Unit Number [5]?
   dub44.1.0.13.0:
   Node Name [BLANK4]?
   Allocation Class [1]?
   Unit Number [44]?
2. >>> cdp -n dua5        # -n dua5 entered to set device
                          # node name of dua5; no change
   dua5.0.0.13.0:         # made.
   Node Name [BASHFL]?    # Press Return to exit.

3. >>> cdp -a             # -a entered to set device
   dua5.0.0.13.0:         # allocation class, allclass,
   Allocation Class [0]? # for all DSSI devices; no
   dub44.1.0.13.0:        # changes made.
   Allocation Class [1]?
```

The **cdp** command syntax is:

cdp [- {a,i,n,o,u}] [- sn] [- sa <val>] [dssi_device]

where **<val>** is **allclass** or **unitnum**, and **dssi_device** is the DSSI device. Table 3- 1 summarizes the **cdp** command options. The **cdp** command permits the modification of DSSI device parameters from the console without explicit connection to a node's DUP server. The parameters modified are the DUP task parameters **nodename**, **allclass**, and **unitnum**.

Table 3- 1 Cdp Command Options

Option	Function
- a	Sets device allocation class, **allclass**.
- i	Selects interactive mode; sets all parameters.
- n	Sets device node name, **nodename** (up to 16 characters).
- o	Overrides warning messages.
- u	Sets device unit number, **unitnum**.
- sa allclass	Sets **allclass** for all DSSI devices in the system to the specified value.
- sn	Sets **nodename** to either RFhscn or TFhscn h is the device hose number (0–3) s is the device slot number (1–14) c is the device channel number (0, 1) n is the device node ID number (0–6)
- su unitnum	Sets the starting **unitnum** for the first DSSI device in the system to the specified value. Subsequent DSSI unit numbers are incremented from this base.

3.4 Clear EEPROM

The clear eeprom command allows you to clear the selected EEPROM option.

Example 3-4 Clear EEPROM Command

```
>>> clear eeprom log          # Clears all failure
                              # information logged in
                              # EEPROM.
```

The **clear eeprom** command syntax is:

cl[ear] ee[prom] <option>

The **clear eeprom** command can be used to clear **diag_sdd**, **diag_tdd**, **symptom**, or **log**.

For more information:

Advanced Troubleshooting

3.5 Clear <envar>

Clear <envar> is used to remove an environment variable.

Example 3- 5 Clear <envar>

```
>>> create fred              # Create fred with null value
fred set to
>>> set fred "this is a string in an environment variable"
fred set to this is a string in an environment variable
>>> show fred
fred        this is a string in an environment variable
>>> clear fred
>>> show fred
Environment variable not found
>>>
```

The **clear <envar>** removes an environment variable. However, some environment variables, such as **baud**, are permanent and cannot be removed.

The **clear** command syntax is:

cl[ear] <envar>

where **<envar>** is the name of an environment variable, for example, a boot specification to be cleared (see Table 2- 3).

3.6 Clear Screen

The clear screen command allows you to clear the terminal screen.

Example 3- 6 Clear Screen Command

```
>>> clear screen            # Refresh the terminal
                            # screen.
```

The **clear screen** command syntax is:

cl[ear] sc[reen]

There are no parameters or options.

3.7 Continue

The continue command resumes processing at the point where it was interrupted by a Ctrl/P. Programs continue executing at the address currently in the program counter of the processor.

Example 3-7 Continue Command

```
$ ^P                # VAX 7000 example
                    # Stop processing on boot processor;
                    # processor enters console mode.

Console entry reason: ^P or Node Halt
Entry PC: 80805442    Entry PSL: 041F8200
                    # System responds with message; system
                    # has halted with 80805442 in the
                    # program counter (PC).

>>>                 # Console session begins
          .         #
          .         #
          .         #
>>> continue        # Processor resumes at the address
                    # where processing was stopped by
                    # Ctrl/P.  Here processing continues
                    # at address 80805442.
```

The **continue** command syntax is:

c[ontinue]

Continue causes the primary processor to resume program mode, executing at the address currently in the program counter (PC). This address is the address that was in the PC when the primary processor received a Ctrl/P command. The system displays the hexadecimal PC value.

When the boot processor receives a **continue** command, it does not perform processor initialization as it would for a boot procedure. The boot processor just returns to the program it was processing.

Following execution of the **continue** command, the console terminal enters program mode, and any ASCII characters entered on the console terminal are passed on to the operating system. In program mode, the console terminal acts like any other terminal on the system until a Ctrl/P is issued to return it to console mode.

NOTE: **^*P*** followed by ***continue*** *should be used selectively since some console commands (for example,* ***cdp****,* ***deposit****,* ***set host****,* ***show device****,* ***show network****, and* ***test****) can corrupt the machine state so that the execution of the current program cannot resume successfully.*

3.8 Crash

The crash command causes the operating system to be restarted and generates a memory dump.

Example 3- 8 Crash Command

```
P01>>> crash
          [operating system output appears]
```

The **crash** command causes the operating system to be restarted in such a way as to force a crash. This allows the user to ^P a hung system and generate a memory dump.

The **crash** command syntax is:

cra[sh]

There are no parameters or options. See the **mchk** command.

3.9 Create

The create command allows you to create an environment variable.

Example 3- 9 Create Command

```
1. >>> create fred           # Create a new environment
   fred set to               # variable fred with a value
   >>> show fred             # equal to null.
   fred
2. >>> create stuff 356      # Create a new environment
                             # variable stuff with a value
                             # equal to 356.
3. >>> create -nv delay      # Create a new nonvolatile
                             # environment variable delay
                             # in EEPROM with a value
                             # equal to null.
4. >>> create -nv work "dua44.0.0.4.0"
                             # Create a new nonvolatile
                             # environment variable work
                             # in EEPROM equal to
                             # dua44.0.0.4.0.
5. >>> cr bootspec "-flags 0,1 dua21.0.0.14.1"
                             # Create an environment
                             # variable bootspec equal to
                             # -flags 0,1 dua21.0.0.14.1.
```

The **create** command syntax is:

cr[eate] [- nv] <envar> [<value>]

where the **- nv** option indicates the nonvolatile environment variable is stored in EEPROM, and **<value>** is the optional variable value. Created environment variables are volatile by default. **value** can be a quoted string for specifying boot specifications (see **boot** command description). For additional information on environment variables, see Section 2.3 and the **clear** and **set** command descriptions.

3.10 Deposit

The deposit command stores data in a specified location.

Example 3- 10 Deposit Command

```
1. >>> dep -b -n 1FF pmem:0 0 # Clear first 512 bytes
                              # of physical memory.
2. >>> d -l -n 3 vmem:1234 5  # Deposit 5 into four long-
                              # words starting at virtual
                              # memory address 1234.
3. >>> d -n 8 R0 FFFFFFFF     # Load GPRs R0 through R8
                              # with -1.
4. >>> d -1 -n 10 -s 200 pmem:0 8 # Deposit 8 in the first
                                  # longword of the first
                                  # 17 pages in physical
                                  # memory.
5. >>> d -1 pmem:0 0         # Deposit 0 to physical
                             # memory address 0.
   >>> d + FF               # Deposit FF to physical
                             # memory address 4.
6. >>> d scbb 800000         # Deposit SCBB
                             # with 800000.
```

When using **deposit**, if no options are given in subsequent commands, the system uses the options from the preceding commands as the defaults for address or location referenced, data type (**- b**, **- l**, **- w**, and so forth), data size for increment (**- s**), and address space (**gpr**, **ipr**, **pmem**, and so forth).

For more information:

KN7AA CPU Technical Manual
KA7AA CPU Technical Manual
MS7AA Memory Technical Manual

The **deposit** command syntax is:

d[eposit] [- {b,w,l,q,o,h,u}] [- {n val, s val}] [space:]<address> <data>

where the options are values from Table 3- 2, and **<data>** is the value to be stored. If the specified value is too large to fit in the data size to be deposited, the console ignores the command and issues an error response. For data lengths longer than a longword, each longword of data should be separated by a space. If the data is smaller than the data size to be deposited, the higher order bits are filled with zeros.

Table 3- 2 Deposit Command Options

Option	Meaning
- b	Defines data size as a byte.
- h	Defines data size as a hexword.
- l	Defines data size as a longword; initial default,
- o	Defines data size as an octaword.
- q	Defines data size as a quadword.
- w	Defines data size as a word.
- n val	Number of consecutive locations to modify.
- s val	Specifies the address increment size. Default is data size.
- u	Allows access to console private memory, while disabling virtual address protection checks.

space: is the optional device name (or address space) of the device to access (see Table 3- 3), and **address** specifies the offset within a device to which data is deposited. Valid symbolic address forms (see Appendix A) include:

- fpr- name, a symbol representing a floating- point register (DEC 7000 only).
- gpr- name, a symbol representing a general purpose register.
- ipr- name, a symbol representing the internal processor register.
- PC, the program counter. The address space is set to GPR.
- PSL, the processor status longword (VAX 7000 only).
- pt- name, a symbol representing a PAL temp register (DEC 7000 only).
- +, the location immediately following the last location referenced in an **examine** or **deposit** command. For physical and virtual memory, the referenced location is the last location plus the size of the reference (1 for byte, 2 for word, 4 for longword). For other address spaces, the address is the last referenced address plus one.
- –, the location immediately preceding the last location referenced in an **examine** or **deposit** command. For physical and virtual memory, the referenced location is the last location minus the size of the reference (1 for byte, 2 for word, 4 for longword). For other address spaces, the address is the last referenced address minus one.
- *, the last location referenced in an **examine** or **deposit** command.
- @, the location addressed by the last location referenced in an **examine** or **deposit** command.

NOTE: Since the console program actually resides in low memory when running, depositing to memory should be done with care.

Table 3- 3 Device Name and Address Space Options

Option	Device Name and Address Space Meaning
<dev_ name>	Device name: xmi0, ka7aa1, demna0, and so forth.
fpr	Defines the address space as the floating- point register set, F0 through F31 (DEC 7000 only).
gpr	Defines the address space as the general register set, R0 through R15.
ipr	Defines the address space as the internal processor registers (IPRs).
pt	Defines the address space as the PAL temp register set, PT0 through PT31 (DEC 7000 only).
pmem	Defines the address space as physical memory; initial default.
vmem	Defines the address space as virtual memory. All access and protection checking occur.

For more information:

Alpha Architecture Reference Manual

3.11 Examine

The examine command displays the contents of a memory location, a register, or a device. The options are similar to the deposit command options.

Example 3- 11 Examine Command

```
1. >>> examine pc                  # Examine the program
   gpr: 000000F (    PC) 00000000  # counter - VAX 7000.

2. >>> examine sp                  # Examine the stack
   gpr: 000000E (    SP) 00012FB8  # pointer - VAX 7000.

3. >>> examine psl               # Examine the processor
                                 # status longword -
                                 # VAX 7000.
         CM TP FPD IS CURMOD PRVMOD IPL DV FU IV T N Z V C
PSL 041F0000 0 0  0 1 KERNEL KERNEL  1F  0  0  0 0 0 0 0 0

4. >>> e  -n 6 r4             # Examine register R4 and
                              # the next 6 registers -
                              # DEC 7000.
   gpr: 00000004 (    R4) 00000003F4000000
   gpr: 00000005 (    R5) 0000000000001404
   gpr: 00000006 (    R6) FFFFFFFF80680000
   gpr: 00000007 (    R7) 0000000000000000
   gpr: 00000008 (    R8) 0000010000000000
   gpr: 00000009 (    R9) 0000000000000002
   gpr: 0000000A (   R10) 0000000000000001

5. >>> examine pmem:400EC           # Examine physical
   pmem:  000400EC A762FAF847E11411 # memory - DEC 7000.

6. >>> examine demna0:0              # Examine demna0's
   demna0: 00000000 0000000108020C03 # Device Register -
                                     # DEC 7000.
```

The **examine** command syntax is:

e[xamine] [- {b,w,l,q,o,h,d,u}] [- {n val, s val}] [space:] <address>

where the options are values from Table 3- 4, **space:** is the optional device name (or address space) of the device to access, and **address** is a longword that specifies the first location to be examined. Appendix A lists the symbols recognized by the **examine** (and **deposit**) command.

The display line consists of the device name, the hexadecimal address or offset within the device, and the examined data also in hexadecimal.

Table 3- 4 Examine Command Options

Option	Meaning
- b	Defines data size as a byte.
- d	Disassembles instruction at current address.
- h	Defines data size as a hexword.
- l	Defines data size as a longword; initial default.
- o	Defines data size as an octaword.
- q	Defines data size as a quadword.
- w	Defines data size as a word.
- n val	Number of consecutive locations to examine.
- s val	Specifies the address increment size. Default is data size.
- u	Allows access to private console memory, while disabling virtual address protection checks.

For more information:

KN7AA CPU Technical Manual
KA7AA CPU Technical Manual
MS7AA Memory Technical Manual

Examine uses most of the same options as **deposit**. Additionally, the **examine** command supports the **- d** option (instruction decode, which will disassemble the instructions at the current address). When using **examine**, if no options are given in subsequent commands, the system uses the options from the preceding commands as the defaults for address or location referenced, data type, including **- d**, (**- b**, **- l**, **- w**, and so forth), data size for increment (**- s**), and address space (**gpr**, **ipr**, **pmem**, and so forth).

After initialization, the default address space is physical memory, the default data size is a longword, the default address is zero, and the default address increment size is the data size. If conflicting address space or data sizes are specified, the console ignores the command and issues an error response.

Table 3- 5 Device Name and Address Space Options

Option	Device Name and Address Space Meaning
<dev_name>	Device name: xmi0, ka7aa1, demna0, and so forth.
fpr	Defines the address space as the floating- point register set, F0 through F31 (DEC 7000 only).
gpr	Defines the address space as the general register set, R0 through R15. The data size is always a longword.
ipr	Defines the address space as the internal processor registers (IPRs). The data size is always a longword.
pt	Defines the address space as the PAL temp register set, PT0 through PT31 (DEC 7000 only).
pmem	Defines the address space as physical memory.
vmem	Defines the address space as virtual memory. All access and protection checking occur.

3.12 Help

The help command provides basic information on the console commands, when the system is in console mode.

Example 3- 12 Help Command

```
1. >>> help create      # Display basic create command
                        # information.  Minimum
                        # command input is highlighted.
   create [-nv] <envar> <value>

2. >>> h examine
examine[-{b,w,l,q,o,h,d,u}][-n val][-s val][space:]address
        -{b,w,l,q,o,h}    ! data length
        -d                ! decode instruction
        -n <count>        ! repeat count
        -s <size>         ! repeat address increment size
        -u                ! protected mode

3. >>> help             # Display help information on
                        # all console commands beginning
                        # with boot.

  boot   [-flags <val>] [-filename <name>] <device_list>
  build  <option>
  clear  <option> or <envar>...
```

The **help** command syntax is:

h[elp] [<option>]

where **<option>** is one of the console commands. The **<helpkey>** can also be used after a partial command has been typed. For example, **set <helpkey>** will display the options supported by the **set** command.

3.13 Initialize

The initialize command performs a reset. You can initialize the entire system or a specified device or subsystem.

Example 3- 13 Initialize Command

```
>>> initialize demna0
```

The **initialize** command syntax is:

i[nitialize] [<device_name>]

where **<device_name>** is the name of the device or subsystem to be initialized. If **<device_name>** specifies a memory module, you will receive a message stating that memory cannot be initialized, since the console runs from main memory. See Section 2.4 for information on how to learn device names in the system.

The **initialize** command can be used to reset the entire system or a specified device, except memory nodes. **Initialize** only applies to modules and not end I/O devices (that is, **init kdm70*** would be a valid command, but **init dua*** would not be valid). If no option is specified, a full system reset is performed.

The **initialize** command (with no device specified) and turning the keyswitch on the system control panel to Restart perform the same function: both reset the machine and run systemwide self- test.

Self- test results are displayed after a system reset but not after a device reset.

For more information:

Basic Troubleshooting

3.14 Mchk

The mchk command is used to dump internal state information to aid in the diagnosis of hardware failures.

Example 3- 14 Mchk command

```
>> mchk            V5.25-1/01.14-1
pal_flags          8450010860000005
PTBR ipr: 0000000A ( PTBR) 0000000000000000
SCBB ipr: 0000000B ( SCBB) 0000000000000000
PCBB ipr: 00000008 ( PCBB) 0000000000001000
exc_addr    pmem: 00006130 0000000000031930
iccsr       pmem: 00006148 00000000009F0000
hirr        pmem: 00006160 0000000000000042
mm_csr      pmem: 00006168 00000000000053A0
dc_stat     pmem: 00006170 0000000000000007
dc_addr     pmem: 00006178 00000007FFFFFFFF
biu_stat    pmem: 00006188 0000000000000250
biu_addr    pmem: 00006190 0000000000006120
biu_ctl     pmem: 00006198 0000000850006447
fill_syndrome pmem: 000061A0 0000000000000000
fill_addr   pmem: 000061A8 0000000000006140
va          pmem: 000061B0 0000000000006190
lep_gbus    pmem: 000061C0 0020000000000038
lber        pmem: 000061CC 00000021
lmerr       pmem: 000061D4 00000000
lbesr0      pmem: 000061D8 0000000C
lbesr1      pmem: 000061DC 0000000C
lbesr2      pmem: 000061E0 0000000C
lbesr3      pmem: 000061E4 0000000C
lbecr0      pmem: 000061E8 0000DE98
lbecr1      pmem: 000061EC 00004040
vhit        pmem: F8000F80 00000000
tag         pmem: 00006008 00E0055500000010
dwlma XBE   xmi0: 60000004 0000000100000142
dwlma LERR  xmi0: 6000004C 0000000100068000
>>>
```

The **mchk** command is typically used after a system crash to provide internal state information to aid in diagnosing hardware failures. The **mchk** command syntax is:

mchk [n]

where **[n]** is the LSB node id of the processor you are interested in. By default, you will get information from the primary processor.

3.15 Repeat

The repeat command reexecutes the command that you pass as its argument until Ctrl/C is entered.

Example 3- 15 Repeat Command

```
>>> repeat examine 00000000   # Perform the specified
P 00000000 EEEDFACC           # command until stopped
P 00000000 EEEDFACC           # by Ctrl/C.
P 00000000 EEEDFACC
^C
>>>
```

The **repeat** command syntax is:

r[epeat] [<command>]

where **<command>** is the console command to repeat. To stop the **repeat** command, enter Ctrl/C.

3.16 Set Configuration

The set configuration command records the current system configuration in EEPROM.

Example 3- 16 Set Configuration Command

```
>>> set configuration
```

The set configuration command syntax is:

se[t] c[onfiguration]

The command takes no options. This command is used with the **show configuration - s** command.

3.17 Set EEPROM

The set eeprom command allows you to set the selected EEPROM option.

Example 3- 17 Set EEPROM Command

```
1. >>> set eeprom field
   LARS #> 09494820          # Enter labor activity
   Message> EEPROM update    # reporting system (LARS)
   >>>                       # number (8 digits) and
                             # message (up to 68
                             # characters).
2. >>> set eeprom man        # Enter module serial number,
                             # part number, and firmware
                             # revision.

   Module Serial Number> SG226LFH01
   Module Unified 2-5-2-4 Part Number>   -E2040-AA. M06
   Module Firmware Revision> 1.5
   >>>
```

The **set eeprom** command syntax is:

se[t] ee[prom] <option>

where **option** is **field**, **manufacturing**, or **serial**.

For more information:

Advanced Troubleshooting

3.18 Set <envar>

Set <envar> allows you to modify environment variables.

Example 3- 18 Set <envar>

```
1. >>> set auto_action restart # On an error halt, system
                               # will automatically re-
                               # start. If restart fails,
                               # boot the operating
                               # system.
2. P00>>> set cpu 1            # Designate CPU in slot
   cpu set to 1                # 1 as the primary, or
   P01>>>                      # boot, processor.
3. >>> set d_harderr halt      # System will halt on hard
                               # error.
4. >>> se class                # Set the value of
                               # environment variable
                               # class to null.
5. >>> show enable*            # Display the status
   enable_audit        OFF     # of the enable_audit
   >>> set enable_audit on     # environment variable. Set
                               # enable_audit on to enable
                               # generation of audit trail
                               # messages.
```

The **set <envar>** syntax is:

se[t] <envar> [value]

where **envar** (environment variable) and **value** are from Table 2- 3, which also indicates which environment variables are volatile. Certain environment variables, such as boot specifications, must be defined using the **create** command. For additional information, see Section 3.9. Unambiguous abbreviations can be used for an environment variable name when using the **set** command. **Set - d envar** resets the value of **envar** to its default value. Wildcarding is also allowed with the **set** command. For example, **set - d** * resets all environment variables to their default values.

Example 3- 18 Set <envar> (Continued)

```
6. >>> set interleave 5,7:6      # Creates a 4-way
                                 # interleave set.
```

In the above example, assume there are three memory arrays, as follows:

Node 5 - 128 Mbytes
Node 6 - 64 Mbytes
Node 7 - 64 Mbytes

By default, the console creates a 4- way interleave by combining nodes 6 and 7 and interleaving the resulting 128 Mbytes with the other 128 Mbyte array. (The 4- way interleaving results from the on- board 2- way interleaving of the 128 Mbyte arrays.) Three operators are used with the **set interleave** command: comma (**,**) plus (**+**), and colon (**:**). **,** separates interleave sets, **+** separates members of a given interleave set, and **:** groups smaller arrays together to form larger members of a set. **Set interleave 5+6:7** produces a memory interleave identical to **set interleave default**. **Set interleave 5,6,7** produces a memory interleave identical to **set interleave none**.

For more information:

MS7AA Memory Technical Manual

3.19 Set Host

The set host command allows you to connect to another console or service. The - dup option is used to invoke the DUP server on the selected node.

Example 3- 19 Set Host Command

```
1. >>> show configuration

       Name       Type    Rev   Mnemonic
   LSB
   0+  KA7AA    (8002)   0000  ka7aa0
   1+  MS7AA    (4000)   0000  ms7aa0
   7+  MS7AA    (4000)   0000  ms7aa1
   8+  IOP      (2000)   0001  iop0
   C0 XMI                      xmi0
   8+  DWLMA    (102A)   0104  dwlma0
   C+  KDM70    (0C22)   1E11  kdm700
   E+  DEMNA    (0C03)   0802  demna0
   >>> set host demna0
   Connecting to remote node, ^Y to disconnect.
   T/R                      # To begin RBDs on DEMNA
   RBDE>                    # in Slot E.
2. >>> show device kdm700
   polling for units on kdm700, slot 12, xmi0...
   dua32.0.0.12.0  DUA32   RA70   # Use set host -dup to
   dua34.0.0.12.0  DUA34   RA70   # connect to a KDM70
   dua77.0.0.12.0  DUA77   RA70   # device.
   >>> set host -dup dua32.0.0.12.0
   dup: starting DIRECT on kdm70_a.0.0.12.0 ()

   DIRECT  1  D  Directory Utility
   ILEXER  1  D  InLine Exerciser
   Task?                        # Select utility or
                                # exerciser.
```

The **set host** command syntax is:

se[t] h[ost] <device_adapter> or

se[t] h[ost] <- dup> <- bus b> node [task]

The **set host <device_adapter>** command is used to connect to a remote XMI adapter for running XMI module- resident ROM- based diagnostics, as shown in the first example in Example 3- 19. Use Ctrl/Y to terminate the command and return to the primary processor.

The **set host - dup...** command is used to run diagnostics and utilities on devices that support the DUP protocol, as shown in the second example in Example 3- 19. In the command, **- dup** specifies that the remote node is a DUP server, **node** specifies the node number of the processor or device to attach the console, and **task** specifies the optional task to invoke from the DUP driver. **- bus b** is used to specify the DSSI bus on which the node resides. When the **- dup** option is specified, the node number must be in the range of 0 to 7. See the **cdp** command for information on how to configure DSSI devices.

Set host can only be issued from the boot processor, and only one **set host** command is in effect at a time. Characters typed from the console terminal are passed through to the target node. All output from the target node is displayed on the console terminal.

For more information:

Advanced Troubleshooting

3.20 Set Power

The set power command is used to configure the system power regulators for battery backup.

Example 3- 20 Set Power Command

```
>>> set power -b 8 left
>>>
```

The **set power** command syntax is:

se[t] p[ower] - b <value> <option>

where **- b** allows you to configure the system with batteries**, <value>** is the number of batteries (**4** or **8**), and **<option>** is the cabinet containing the batteries (**main**, **left**, or **right**).

3.21 Show Configuration

The show configuration command displays the last saved configuration.

Example 3- 21 Show Configuration Command

```
>>> show configuration       # DEC 7000 example

    Name      Type    Rev  Mnemonic
LSB
0+  KN7AA    (8001)   000B  kn7aa0
6+  MS7AA    (4000)   0000  ms7aa0
7+  MS7AA    (4000)   0000  ms7aa1
8+  IOP      (2000)   0006  iop0
C0 XMI                      xmi0
1+  DEMNA    (0C03)   0802  demna0
4+  KDM70    (0C22)   1E11  kdm700
8+  DWLMA    (102A)   0104  dwlma0
C1 XMI                      xmi1
6+  DEMNA    (0C03)   0802  demna1
8+  DWLMA    (102A)   0104  dwlma1
D+  KDM70    (0C22)   1E11  kdm701
E+  KZMSA    (0C36)   413F  kzmsa0
```

The **show configuration** command syntax is:

sh[ow] c[onfiguration] [- s]

The screen displays the system configuration, including the hardware device type, revision level, and mnemonic for each LSB and XMI node. **- s** displays the saved configuration (from the **set configuration** command). See Section 2.4 for device mnemonic information.

3.22 Show Device

Displays device information for any disk/tape adapter or group of adapters.

Example 3- 22 Show Device Command

```
>>> show device kdm700
polling for units on kdm700, slot 12, xmi0
dua32.0.0.12.0  DUA32   RA70
dua34.0.0.12.0  DUA34   RA70
dua77.0.0.12.0  DUA77   RA70
```

The **show device** command syntax is:

sh[ow] dev[ice] [<dev_name>]

See Section 2.4 for information on how to learn device names in the system. **Show device** with no **<dev_name>** gives all devices in the system. **<dev_name>** can be any CIXCD, KDM70, or KFMSA (VAX 7000 only) adapter name (wild- carding is allowed). For example, **show device cixcd*** will display information on all CIXCD devices in the system.

3.23 Show EEPROM

The show EEPROM command allows you to display selected EEPROM information.

Example 3- 23 Show EEPROM Command

```
1. >>> show eeprom serial    # Display system serial
                             # number.
   System Serial Number = GAO1234567
2. >>> show eeprom manufacturing # Display manufacturing
                                 # information.
   Module Serial Number = SG226LFH01
   Module Part Number =   -E2040-AA. M06
   Module Firmware Revision = 1.5
```

The **show eeprom** command syntax is:

sh[ow] ee[prom] <option>

where **option** is **diag_sdd**, **diag_tdd, symptom, field**, **manufacturing**, or **serial**.

3.24 Show <envar>

Show <envar> displays the current state of the specified environment variable.

Example 3- 24 Show <envar>

```
1. >>> show auto_action
   auto_action        restart
   >>>
2. >>> show baud
   baud               9600
3. >>> show d_harderr
   d_harderr          halt
4. >>> show enable*             # Displays status of
   enable_audit       OFF      # enable_audit
5. >>> show interleave
   interleave         none
```

The **show envar** command syntax is:

sh[ow] <envar> or **sh[ow] ***

where **envar** is an environment variable name (see Table 2- 3). Unambiguous abbreviations can be used for an environment variable name when using the **show <envar>** command. See the **set <envar>** command for related information.

3.25 Show Memory

The show memory command displays memory module information.

Example 3- 25 Show Memory Command

```
>>> show memory

Set    Node   Size    Base Addr   Intlv   Position
---    ----   ----    ---------   -----   --------
 A       7    128M    000000000   2-Way       0
```

The **show memory** command syntax is:

sh[ow] m[emory]

In the above example, the memory module at node 7 is in a two- way system interleave indicated by the first interleave set A. The total memory size is 128 Mbytes. See the **set interleave** example in Section 3.18 for additional information.

For more information:

Basic Troubleshooting
MS7AA Memory Technical Manual

3.26 Show Network

The show network command displays the names and physical addresses of all known network devices in the system.

Example 3- 26 Show Network Command

```
>>> show network
polling for units on demna0, slot 14, xmi0...
exa0.0.0.14.0: 08-00-2B-24-3F-E1
polling for units on demfa0, slot 14, xmi1...
exb0.0.0.14.2: 08-00-2B-0B-BB-FF
```

The **show network** command syntax is:

sh[ow] ne[twork]

There are no options or qualifiers.

3.27 Show Power

The show power command gives the power status of the system.

Example 3-27 Show Power Command

```
>>> show power
Cabinet: Main              Regulator :         A           B           C
-------------------------------------------------------------------------------
          Primary Micro Firmware Rev :       2.0         2.0         2.0
        Secondary Micro Firmware Rev :       2.0         2.0         2.0
                  Power Supply State :    NORMAL      NORMAL      BBU MODE
              AC Line Voltage (V RMS) :    113.71      114.35      115.93
                DC Bulk Voltage (VDC) :    227.02      227.02      227.02
            48V DC Bus Voltage (VDC) :     47.57       47.57       47.57
            48V DC Bus Current (ADC) :     30.17       29.68       29.58
      48V Battery Pack Voltage (VDC) :     50.85       50.72       47.91
      24V Battery Pack Voltage (VDC) :     25.56       25.56       23.95
   Battery Pack Charge Current (IDC) :      2.91        2.90        0
      Ambient Temperature (Degree C) :     26.22       24.80       24.75
                Elapsed Time (Hours) :    290.00      290.00      290.00
Remaining Battery Capacity (Minutes) :      8.00        8.00        8.00
     Battery Cutoff Counter (Cycles) :      0           1.00        1.00
               Battery Configuration :  4 Batteries  4 Batteries  4 Batteries
                     Heatsink Status :    NORMAL      NORMAL      NORMAL
                  Battery Pack Status :    CHARGING    CHARGING    DISCHG'G
                 Last UPS Test Status :    PASSED      PASSED      TESTING
LDC POWER Status     : 0
PIU Primary Status   : 0
PIU Secondary Status : 0
```

The **show power** command syntax is:

sh[ow] p[ower] [- {h,s}] [option]

where **- s** displays the current status (default) and **- h** the history status (value of each parameter at the last system shutdown) and **option** selects the cabinet (**main**, **right**, or **left**).

3.28 Start

The start command begins execution of an instruction at the address specified in the command string. The start command does not initialize the system.

Example 3-28 Start Command

```
>>> start 40000000          # Start processor at
                            # address 40000000.
```

The **start** command syntax is:

s[tart] address

where **address** is the address the PC is set to start execution. The **start** command is equivalent to **continue**, except you can specify the address at which to begin executing.

*NOTE: The **start** command should be used selectively since some console commands (for example, **cdp**, **deposit**, **set host**, **show device**, **show network**, and **test**) may corrupt the machine state so that execution of the current program may not resume successfully.*

3.29 Stop

The stop command halts a specified processor.

Example 3- 29 Stop Command

```
P00>>> stop ka7aa1      # Stop the secondary processor.
```

The **stop** command syntax is:

sto[p] <cpu_device_name>

where **<cpu_device_name>** specifies the secondary processor to be halted. The **stop** command does not control the running of diagnostics and does not apply to adapters or memories.

3.30 Test

The test command allows you to test the entire system, a portion of the system (subsystem), or a specific device. By default, the entire system is tested.

Example 3-30 Test Command

```
1. >>> test -t 300       # Test the entire system.
                         # -t 300 specifies a system test
                         # run time of 300 seconds.
2. >>> t -nowrite "dua*" -write -t 60
                         # Test disk write/read/compare.
                         # This example is a system test
                         # since no dev_arg is given.
                         # Write/read/compare testing of
                         # disks is specified for all
                         # disks not associated with
                         # controller "a".  Test run time
                         # is 60 seconds.
3. >>> t xmi0            # Test all devices associated
                         # with XMI0.
4. >>> test kdm701       # Test kdm701 and all associated
                         # devices.
```

For more information:

Basic Troubleshooting
Advanced Troubleshooting

The **test** command syntax is:

t[est][- write][- nowrite "list"][- omit "list"][- t time][- q][dev_arg]

where **dev_arg** specifies the target device, group of devices, or subsystem to test. A list of available devices and subsystem mnemonics in the system can be obtained by issuing a **show configuration**, **show device**, or **show network** command. You would then issue the **test dev_arg** command to test the desired device. Table 3- 6 lists the command options.

If no parameter is specified, the entire system is tested. Note that system testing performed by the **test** command is very different from that performed during power- on or reset. To execute systemwide self- test, use the **initialize** command.

Table 3- 6 Test Command Options

Option	Meaning
- write	Selects writes to media as well as reads (read only is the default). Only applicable to disk testing (ignored otherwise).
- nowrite "list"	Used with **- write** to prevent selected devices or groups of devices from being written to.
- omit "list"	Specifies device not to test; takes a single device or device list as a qualifier.
- t time	Run time in seconds for the **test** command, following system sizing and configuration; default for system test is 600 seconds (10 minutes).
- q	Quiet option prevents testing start and stop informational messages from being displayed on the console terminal. Error messages are always reported.

3.31 Update

The update command copies the contents of the boot processor's EEPROM or FEPROM to the EEPROM or FEPROM of the specified secondary processor(s).

Example 3-31 Update Command

```
1. P00>>> update -ee ka7aa1  # CPU 0 is the primary CPU.
                             # Copy EEPROM to CPU 1.
   Update ka7aa1's EEPROM [Y/N]? Y
   Updating ka7aa1's EEPROM done

   P00>>> set cpu 1          # Makes CPU 1 the primary.
   P01>>> update -fl ka7aa0  # Copy FEPROM to CPU 0.
   Update ka7aa0's FLASH ROMS [Y/N]? Y
   Updating ka7aa0's FLASH ROMs ....done

2. P00>>> update ka7aa* -fl  # Use wildcarding to update
                             # all CPUs.
   Update ka7aa1's FLASH ROMS [Y/N]? Y
   Updating ka7aa1's FLASH ROMs ....done
   Update ka7aa2's FLASH ROMS [Y/N]? Y
   Updating ka7aa2's FLASH ROMs ....done
```

The update command syntax is:

up[date] - f[lash] - e[eprom] <device_name>

where **<device_name>** is the CPU mnemonic of the secondary processor (displayed with the **show configuration** command) that is to receive the contents of the primary processor's FEPROM or EEPROM. By default, neither EEPROM/FEPROMs are updated.

The **update - eeprom** command copies the parameters that can be set as well as any additional information stored in the EEPROM of the boot processor. Note that **update** copies from the primary CPU to the specified target CPU. If you wish to update the primary CPU with data from a secondary CPU, you must first use **set cpu**. In the first example above, we have a dual- processor system and want to propagate the EEPROM from CPU 0 to CPU 1, but the FEPROM from CPU 1 into CPU 0. This might occur in a multiprocessor upgrade where the new CPU (CPU 1) has newer FEPROM code, but CPU 0 contains site- specific boot parameters, and so forth.

Update should be issued following any field service installation of a new CPU. Updated information includes systemwide console parameters, baud rate, interleave, terminal characteristics, and saved boot specifications.

3.32 Comment (#, !)

A comment can be introduced using the # symbol or ! symbol. The entire comment is ignored.

Example 3-32 Comment (#, !) Command

```
1. >>> # This example illustrates the comment command.
   >>>

2. >>> exam pmem:0400EC  ! Examine physical memory.
       pmem: 000400EC D0FFFFFD
   >>>
```

Appendix A

Deposit/Examine Symbols

This section lists symbols recognized by the DEC 7000 deposit and examine commands.

Symbol	Equivalent Space:Offset
R0	gpr:0
R1	gpr:1
R2	gpr:2
R3	gpr:3
R4	gpr:4
R5	gpr:5
R6	gpr:6
R7	gpr:7
R8	gpr:8
R9	gpr:9
R10	gpr:a
R11	gpr:b
R12	gpr:c
R13	gpr:d
R14	gpr:e
R15	gpr:f
R16	gpr:10
R17	gpr:11
R18	gpr:12
R19	gpr:13
R20	gpr:14
R21	gpr:15
R22	gpr:16
R23	gpr:17
R24	gpr:18
R25	gpr:19
R26	gpr:1a

R27	gpr:1b
R28	gpr:1c
R29	gpr:1d
R30	gpr:1e
R31	gpr:1f
AI	gpr:19
RA	gpr:1a
PV	gpr:1b
FP	gpr:1d
SP	gpr:1e
RZ	gpr:1f
F0	fpr:0
F1	fpr:1
F2	fpr:2
F3	fpr:3
F4	fpr:4
F5	fpr:5
F6	fpr:6
F7	fpr:7
F8	fpr:8
F9	fpr:9
F10	fpr:a
F11	fpr:b
F12	fpr:c
F13	fpr:d
F14	fpr:e
F15	fpr:f
F16	fpr:10
F17	fpr:11
F18	fpr:12
F19	fpr:13
F20	fpr:14
F21	fpr:15
F22	fpr:16
F23	fpr:17
F24	fpr:18
F25	fpr:19
F26	fpr:1a
F27	fpr:1b
F28	fpr:1c
F29	fpr:1d
F30	fpr:1e

F31	fpr:1f
PT0	pt:0
PT1	pt:1
PT2	pt:2
PT3	pt:3
PT4	pt:4
PT5	pt:5
PT6	pt:6
PT7	pt:7
PT8	pt:8
PT9	pt:9
PT10	pt:a
PT11	pt:b
PT12	pt:c
PT13	pt:d
PT14	pt:e
PT15	pt:f
PT16	pt:10
PT17	pt:11
PT18	pt:12
PT19	pt:13
PT20	pt:14
PT21	pt:15
PT22	pt:16
PT23	pt:17
PT24	pt:18
PT25	pt:19
PT26	pt:1a
PT27	pt:1b
PT28	pt:1c
PT29	pt:1d
PT30	pt:1e
PT31	pt:1f
PC	N/A
ASN	ipr:0
ASTEN	ipr:1
ASTSR	ipr:2
AT	ipr:3
FEN	ipr:4
IPIR	ipr:5
IPL	ipr:6

MCES	ipr:7
PCBB	ipr:8
PRBR	ipr:9
PTBR	ipr:a
SCBB	ipr:b
SIRR	ipr:c
SISR	ipr:d
TBCHK	ipr:e
TBIA	ipr:f
TBIAP	ipr:10
TBIS	ipr:11
ESP	ipr:13
SSP	ipr:14
USP	ipr:15
WHAMI	ipr:16
VPTB	ipr:17
PS	ipr:18

NOTE: some IPRs are read only or write only.

VAX 7000 **This section lists symbols recognized by the VAX 7000 deposit and examine commands.**

Symbol	Equivalent Space:Offset
R0	gpr:0
R1	gpr:1
R2	gpr:2
R3	gpr:3
R4	gpr:4
R5	gpr:5
R6	gpr:6
R7	gpr:7
R8	gpr:8
R9	gpr:9
R10	gpr:a
R11	gpr:b
R12	gpr:c
R13	gpr:d
R14	gpr:e
R15	gpr:f
AP	gpr:c
FP	gpr:d
SP	gpr:e
PC	gpr:f
PSL	N/A
KSP	ipr:0
ESP	ipr:1
SSP	ipr:2
USP	ipr:3
ISP	ipr:4
P0BR	ipr:8
P0LR	ipr:9
P1BR	ipr:a
P1LR	ipr:b
SBR	ipr:c
SLR	ipr:d
CPUID	ipr:e

PCBB	ipr:10
SCBB	ipr:11
IPL	ipr:12
ASTLVL	ipr:13
SIRR	ipr:14
SISR	ipr:15
ICCS	ipr:18
NICR	ipr:19
ICR	ipr:1a
TODR	ipr:1b
MCESR	ipr:26
SAVPC	ipr:2a
SAVPSL	ipr:2b
MAPEN	ipr:38
TBIA	ipr:39
TBIS	ipr:3a
PME	ipr:3d
SID	ipr:3e
TBCHK	ipr:3f
LMBOX	ipr:79
INTSYS	ipr:7a
PMFCNT	ipr:7b
PCSCR	ipr:7c
ECR	ipr:7d
MTBTAG	ipr:7e
MTBPTE	ipr:7f
BIU_CTL	ipr:a0
DIAG_CTL	ipr:a1
BC_TAG	ipr:a2
BIU_STAT	ipr:a4
BIU_ADDR	ipr:a6
FILL_SYN	ipr:a8
FILL_ADDR	ipr:aa
STC_RESULT	ipr:ac
BCDECC	ipr:ae
CHALT	ipr:b0
SIO	ipr:b2
SOE_IE	ipr:b4
QW_PACK	ipr:b8
CLR_IO_PACK	ipr:b9
VMAR	ipr:d0
VTAG	ipr:d1
VDATA	ipr:d2
ICSR	ipr:d3

BPCR	ipr:d4
BPC	ipr:d6
BPCUNW	ipr:d7
MP0BR	ipr:e0
MP0LR	ipr:e1
MP1BR	ipr:e2
MP1LR	ipr:e3
MSBR	ipr:e4
MSLR	ipr:e5
MMAPEN	ipr:e6
PAMODE	ipr:e7
MMEADR	ipr:e8
MMEPTE	ipr:e9
MMESTS	ipr:ea
TBADR	ipr:ec
TBSTS	ipr:ed
PCADR	ipr:f2
PCSTS	ipr:f4
PCCTL	ipr:f8

NOTE: some IPRs are read only or write only.

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