

# *AlphaServer ES40 Family\**

## *Console Firmware Release*

### *Notes V7.3*

\* ES40, ES40cv, ES40lp, TS20 and TS40

*This document contains firmware  
enhancements and update procedures.*  
Start with Read Me First

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## Scope

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The document lists significant changes in this firmware release and describes methods to update console firmware. It does not describe console firmware internals or console architecture.

This document is intended for persons responsible for operating system installation upgrades and for console firmware and console-supported I/O option firmware updates.

## Golden Rules

Update all console firmware before installing or updating an operating system to ensure compatibility. Console firmware for this server consists of SRM, FSB, RMC, SROM, and TIG firmware. Ensure firmware is updated to the latest revision level.

AlphaServer systems recently shipped may have a higher console firmware revision than the firmware revision listed in this release. A higher firmware revision normally indicates support for the installed operating system.

It is not recommended to load firmware that is older than what is presently installed.

## References

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Technical Resources	<a href="http://h18002.www1.hp.com/alphaserver/archive/es40/es40_tech.html">http://h18002.www1.hp.com/alphaserver/archive/es40/es40_tech.html</a>
Firmware Main Page	<a href="http://www.hp.com">http://www.hp.com</a> , click on Large Enterprise Business, click on Server, click on HP AlphaServer Systems, click on firmware
Alpha Systems Support	<a href="http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp">http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp</a> <a href="http://www1.itrc.hp.com/service/home/home.do">http://www1.itrc.hp.com/service/home/home.do</a>

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## Read Me First

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### Changes This Release

#### Console Enhancements or Fixes

Keyboard driver - a USB keyboard, attached to a USB-to-PS/2 adapter, can sometimes hang when attempting to login to OpenVMS for the first time.

Solution: Read the keyboard data and status registers immediately after enabling keyboard interrupts, to drain any interrupts from the device.

Kgpsa driver - on certain new Brocade fibre-channel switches, the console can fail to login to the fabric switch port if the connection is moved from one switch port to another. Solution: When attempting to login to a fibre-channel switch port, use an SDID of zero and the switch will provide the new SDID to the host adapter.

Wwidmgr - the console supports a number of environmental variables to facilitate boot and crash dump to fibre-channel storage volumes. Presently there are four (4) WWIDx variables that define the world-wide-ID of a storage volume and eight (8) Nx variables that define the path to the storage volumes. The console uses these variables to define the volumes used for boot or crash dump devices. Solution: Increase the number of Nx (16) and WWIDx (8) console environmental variables.

I/O Option Firmware - no changes.

Please ensure all firmware is updated to the current revision levels.

## Console and OS Revisions

Operating System	OpenVMS	V8.2	Tru64UNIX	V5.1B
<b>PalCode</b>				
EV67,EV68 CPUs	OpenVMS	V1.98-104	Tru64UNIX	V1.92-105
EV6 CPUs	OpenVMS	V1.98-4	Tru64UNIX	V1.92-5
<b>Console Firmware</b>	SRM	V7.3-1 *		
	SRM	V2.22-G <sup>a</sup>		
	RMC	V2.8		
	AlphaBIOS	V5.71 <sup>b</sup>		
	TIG	10		

\* indicates a firmware change since the previous release.

- a. SRM version went from V2.12-F to V2.22G because the firmware is shared with other platforms
- b. Shown under AlphaBIOS console as V5.71-R1

## I/O Adapter Firmware Revisions

The following table list the firmware revision of I/O adapters that are updatable from the loadable firmware utility. There were no I/O adapter firmware changes this release.

I/O Adapter	Revision	Notes
CIBCA-BA	4.20	PCI to CI Host Bus Adapter
DEFPA-AC, DC, MC, UC	3.20	Univesel PCI to FDDI Adapter
KGPSA-BC	SS3.20X7	LP7000
DS-KGPSA-CA	CS3.93a0	LP8000 , 1GB, 64-bit/33MHz PCI Fiber Channel Host Bus Adapter
DS-KGPSA-DA	DS3.93a0	LP9002, 2Gb, 64-bit/66MHz PCI Fibre Channel Host Bus Adapter (FCA2354)
DS-KGPSA-EA	HD191x6	LP9802, LP9802 2Gb, 64-bit/133MHz PCI-X to Fibre Channel Host Bus Adapter (FCA2384)
DS-A5132-AA	TS1.91X6	LP10000
DS-A5134-AA		LP10000DC not supported on ES40
KZPCC	CQ17	SMOR Utility revision 1.12
KZPDC-DE, -DF	3.56	SmartArray 5302A, 5304A
KZPSA	A12	

An asterisk \* indicates a firmware change since the previous console release.



## Firmware Update Procedure

---

The firmware update procedure uses the loadable firmware update [LFU]. The LFU is invoked by booting the Alpha Systems Firmware CD. You can create a bootable firmware CD from the .iso image available on the firmware web site. Note that updating firmware from DVD is not supported.

### Update Firmware from CD

This is the procedure to update firmware from the Alpha Systems Firmware CD.

1. Insert firmware CD in the CD drive.
2. Type boot **dqa0** to invoke a program which determines the system model and displays the default bootfile for that system
3. Press the **Enter** key after the “Bootfile:” prompt to invoke the loadable firmware utility.
4. If RMC or TIG firmware has changed - type **exit** after the UPD> prompt, otherwise go to step 6.
5. Type **Y** or **yes** to switch to LFU Manual update mode. This mode allows updating RMC and TIG firmware.
6. Type the **update** command to update firmware.
7. Type **yes** to confirm updating firmware.
8. Type **exit** to leave the LFU, loads the firmware into flash, and returns to the SRM console prompt. A power cycle is required only if TIG firmware has been updated to a newer version.

### Update Firmware from Floppy Diskette

From Windows: [ftp://ftp.hp.com/pub/alphaserver/firmware/current\\_platforms/v7.3\\_release/ES40\\_series/updateviawindows-es40.html](ftp://ftp.hp.com/pub/alphaserver/firmware/current_platforms/v7.3_release/ES40_series/updateviawindows-es40.html)

From Tru64UNIX: [ftp://ftp.hp.com/pub/alphaserver/firmware/current\\_platforms/v7.3\\_release/ES40\\_series/updateviaunix-es40.html](ftp://ftp.hp.com/pub/alphaserver/firmware/current_platforms/v7.3_release/ES40_series/updateviaunix-es40.html)

### The Loadable Firmware Utility

The loadable firmware utility [LFU] updates firmware from either a default update and a manual update mode. In default update mode, SRM, RMC Runtime, SROM, and I/O option firmware can be updated. In manual update mode FSB, RMC, and TIG firmware can also be updated.

## List Command

The list command displays the memory-loaded firmware images and supported flash ROM's (shown in the Device column). In this example the LFU is in the default update mode. Type "yes" after the exit command switches the LFU to manual update mode. Type "no" to leave the LFU.

```
UPD> list
```

Device	Current Revision	Filename	Update Revision
Abios	V5.71	abios_fw	V5.71
SRM	V7.2-2	srm_fw	V7.3-2
srom	V2.22-G	srom_fw	V2.22-G
		cipca_fw	A420
		dfxaa_fw	3.20
		fca_2354_fw	CS3.93A2
		fca_2384_fw	HS1.91X6
		fca_2684_fw	TS1.91X6
		kgpsa_8k_fw	DS3.93A0
		kzpcc_smor	1.12
		kzpcc_fw	CQ17
		kzpdw_fw	3.56
		kzpsa_fw	A12

```
UPD> exit
```

```
Do you want to do a manual update? [y/(n)] no
```

## Update Command

The update command loads firmware into the device. The following example updates firmware in manual update mode.

**FIGURE 1. Update Command - Manual Update Mode**

---

```
UPD> update
```

```
Confirm update on:
```

```
SRM
```

```
rmc
```

```
srom
```

```
tig      [Y/(N)]y
```

WARNING: updates may take several minutes to complete for each device.

DO NOT ABORT!

Abios	Updating to V5.71...	Verifying V5.71...	PASSED.
SRM	Updating to V7.3-1...	Verifying V7.3-1...	PASSED.
rmc	Updating to V2.8...	Verifying V2.8...	PASSED.

---

## Firmware Update Procedure

```
srom      Updating to 2.22-G... Verifying V2.22-G... PASSED.  
tig       Updating to 10...     Verifying 10... PASSED.  
UPD> exit
```

A complete AC power cycle is required only if TIG firmware has been updated with a newer version. (i.e. turn off the system, remove external power, wait three seconds, then restore power)

## Firmware Recovery

### Fail-Safe Loader

The fail-safe loader [FSL] is a method to recover from possible console firmware corruption (e.g. checksum ROM error). A FSL mechanism is enabled by jumper on the system board and requires an FSL floppy diskette to be installed in the floppy drive as part of the recovery system. To create an FSL floppy diskette, follow the link below.

#### Fail-Safe Loader

<http://h18002.www1.hp.com/alphaserver/firmware/readmes/es40fsl.html>

The FSL is jumper-enabled by moving jumper J22 from position 1-2 to position 2-3. On system power on, the SROM firmware checks jumper J22 then searches for the FSL program from floppy disk to load into memory. Once loaded into memory console terminal displays the SRM prompt P00>>>. From the SRM prompt, insert the Alpha System Update CD, then boot the CD to restore console firmware via the LFU.

Update firmware in LFU manual update mode, as described in section 3.2.2.1. Once firmware is updated, exit the LFU, power down the system and move jumper J22 back to position of 1-2.

Powering up the system completes the recovery procedure.

The part number for the Fail Safe Loader floppy diskette 1 is QC-081AA-HC

## Updating Firmware on ES40cv, ES40lp and TS40/TS20

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### SRM V6.5 and Newer

Firmware release V6.5 or greater allows updating all firmware for each platforms from CD. Prior to the V6.5 release, RMC firmware updates were done separately for each system type. Keep in mind, RMC firmware is not compatible between ES40, ES40cv, ES40lp, or between TS40 systems. Only the SRM console is compatible between all systems. The following procedure is to update all firmware from CD for ES40cv, ES40lp, and TS40 systems.

**Be sure to select the correct boot filename for your system.**

**TABLE 1.** Update Firmware from CD V6.5 and Newer

Action		Example [directory]bootfilename	
Boot firmware CD		P00>>> <b>boot dqa0</b>	
Select [directory]bootfile according to system type	ES40	[ES40]ES40_V7_3.EXE	press RETURN key enter directory and filename
	ES40cv	[ES40]ES40cv_V7_3.EXE	enter [directory]filename
	ES40lp	[ES40]ES40lp_V7_3.EXE	then press the RETURN key
	TS20/TS40	[ES40]TS40_V7_3.EXE	
Switch to LFU manual update mode only if you need to update RMC firmware		UPD> <b>exit</b> Do you want to do a manual update? [y/(n)] <b>yes</b> UPD> <b>update</b> Confirm update on: Abios SRM rmc tig [Y/(N)] ... UPD> <b>exit</b>	Type <b>exit</b> then <b>no</b> if you don't need to update rmc firmware.

### SRM V6.4 and Earlier

Booting the Alpha Systems Firmware CD will prompt for a bootfile of the Loadable Firmware Utility [LFU]. The LFU contains RMC firmware. Enter the correct system-type bootfile name then press the enter key. Update RMC as shown in the example below. After firmware is updated, type exit from the LFU causes the RMC firmware to be written into FLASH ROM.

**TABLE 2.** Update Firmware from CD - V6.4 and Earlier

<b>Action</b>		<b>Example [directory]bootfilename</b>	
Boot firmware CD		P00>>> <b>boot dqa0</b>	
Select [directory]bootfile according to system type	ES40cv	[ES40]ES40cv_F28.EXE	enter [directory]filename
	ES40lp	[ES40]ES40lp_I28..EXE	then press the RETURN key
Switch to LFU manual update mode only if you need to update RMC firmware		UPD> <b>exit</b> Do you want to do a manual update? [y/(n)] <b>yes</b> UPD> <b>update</b> Confirm update on: Abios SRM rmc tig [Y/(N)] ... UPD> <b>exit</b>	Type <b>exit</b> then <b>no</b> if you don't need to update rmc firmware.

---

## Helpful Hints

---

**Console Bios Commands** The console **show bios** and **run bios** commands can be run only from a serial console terminal. The serial terminal should be at least a VT220 and setup with the following parameters: 9600 bauds, 8-bits, No Parity and One Stop-bit .

### KVM Switch - Run Bios Not Supported in Console Graphics Mode

The **run bios** command is not supported from a graphics console when connected through the KVM switch. The result is unexpected keyboard behavior. Use the **run bios** command only from the serial console via a serial port connection.

### Show Bios

The **show bios** command will lists the location of controllers with a BIOS expansion ROM. The show bios command will reset the I/O buses. Note that notall controllers have a BIOS expansion ROM. The command format is as follows:

```
P00>>> show bios <hose>
```

The value for <hose> can be 0 or 1, and the default is 0.  
Use the **show config** command to determine the controller location.

### Run Bios

The **run bios** command will invoke a BIOS expansion ROM on a supported PCI controller (for example, KZPCC-CE). This command is commonly used to invoke functions or utilities in the device expansion ROM. For example, the KZPCC-CE uses the expansion ROM for its configuration utility. The command format is as follows:

First use the **show config** command to determine which hose the controller is located on. Then invoke the command: P00>>> run bios [controller name] for example,  
P00>>> run bios pka0

The **run bios** command will reset the PCI bus then prompts the user to enter a control sequence (for example, Ctrl^D) in order to enter the BIOS utility of the PCI option. The control sequence may differ depending on the PCI option. Refer to the documentation supplied with the PCI option.

## FRU Table Notes

### Clearing Error Flags

To clear FRU-table error flags, use the following sequence of commands after the console prompt >>>.

1. Display the fru table to list any error flags. >>> **show fru**
2. Record the system serial number. >>> **show sys\_serial\_num**
3. Clear errors >>> **clear\_error all**
4. Restore system serial number >>> **set system\_serial xxxxxxxxxx**
5. Initialize or press Reset button >>> **init**

It is recommended to use this command sequence after adding CPU's to the system, to avoid a serial number mismatch report from the SRM show error command.

### Buildfru -m Command - Used for Power Supplies Only

SRM Console V6.2 and greater supports the **buildfru -m** command to update FRU information for power supplies. The **buildfru -m** command assumes a correctly programmed power supply FRU ROM to begin with and can only be used to update the part number or serial number. The command format is as follows:

```
P00>>> buildfru -m pwr<0 or 1 or 2> part-number serial-number  
P00>>> init
```

For example:

```
P00>>> buildfru -m pwr0 30-49448-01.C05 AY11223344  
P00>>> init
```

The buildfru -m command should not be used for other devices.

## Selected Console Commands

### Set User\_def1 or User\_def2

Starting with the V7.0 firmware release, console environment variables **user\_def1** and **user\_def2** were added for customer use. They are non-volatile environment variables that are readable and writable from the SRM console and accessible the Tru64 operating system.

---

Format	P00>>> <b>set user_def&lt;1 or 2&gt;</b> <i>“any character string”</i>
SRM console example	P00>>> <i>set user_def1 “asset no.1234 system location: green zone”</i>
Tru64UNIX console example	<i># consver -g user_def1</i> <i>user_def1 = System_Asset_No: 1234, System_Location: green-zone</i>

Only a limited set of console environment variables are accessible from operating system.

### Set Memory\_Test

The **memory\_test** environment variable [EV] allows the console to test a fixed amount of memory. The default value of **full** is to test all of memory. The other values shown are used for testing only:

```
P00>>> set memory_test full      ; test all memory (default value)
P00>>> set memory_test partial   ; test 128MB memory (for mfg use only)
P00>>> set memory_test none      ; test 32MB memory (for mfg use only)
```

The **memory\_test** EV should be set to the *default value* before booting an operating system.

### Set CPU\_Enabled

The SRM environment variable **cpu\_enabled** is set to a default mask value of **F** to enable all CPU's. Use the **init** command after changing the **cpu\_enabled** mask value. Also, press the **Reset** button on the operator control panel before booting an Operating System. This will avoid seeing a CPU-timeout informational message on the CPU(s) that were disabled. For example changing **cpu\_enabled**, on a four-CPU system, from **F** to **0** will disable **cpu1-3**, after typing **init**.

Without resetting the system, OpenVMS may report the informational message: *“one CPU active and three CPU's are in Timeout”*



## Set Com1\_Mode

When **com1\_mode** is set to **firm\_bypass** and external power is removed then later restored, the value of **com1\_mode** will change to its default value.

P00>>> **set com1\_mode through.**

The table below lists **com1\_mode** value combinations.

**TABLE 1. COM1\_Mode Values**

Current Value	Value after external power is removed and restored
Through (default)	Through
Local	Local
Snoop	Snoop
Soft_bypass	Snoop
Firm_bypass	Through

## Before Invoking the LFU Command

After shutting down the Operating System, you must type the **init** command before typing the **lfu** command. The **init** command will initialize the memory allocation regions to their correct console state.

## Unplugging Power

After removing power from one of the power supplies, wait at least thirty seconds after the **green leds** turn off before restoring power. The wait will ensure correct status is displayed in the operator control panel [OCP] by the SRM *show power* command and by the RMC *env* command. If the status remains the same, press the RESET button the from the Operator's Control Panel if the system is at the console prompt. Also if you are at console mode while replacing power supplies, press the RESET button before booting an Operating System.

## DE602-BA -BB Identification

The SRM **show config** command displays **DE602-B\*** for the DE602-BA and/or the DE602-BB Ethernet cards because both cards use the same Ethernet chip but have different PCI Bridge chips. Use the **show config** command to identify the **21154-BE** PCI Bridge chip which is used only on the DE602-BB.

## RMC V2.8

RMCV V2.8 was released on the V6.5 CD in July 2003.

## PCI Temperature Sensing

ES40 RMC Firmware V2.8 supports reporting an error condition to shut down the system when two or more sensors detect over temperature in the PCI option area. Prior to RMC V2.8, the RMC would report an error condition when one of the three sensors detected an over temperature condition.

---

## Helpful Hints

RMC V2.8 does not require any changes to system board jumper J26. This jumper controls over temperature shutdown due to CPU over temp (not PCI over temp). J261-2: Causes system to shut down if over-temperature limit is reached (factory default)

J26:2-3: Permits the system to continue running at over-temperature

Note - systems that require J26 in position 2-3 must issue the “**disable ot**” command to disable over temperature shutdown sensing in the PCI option area. Over temperature shutdown is enabled by default.

**TABLE 2. RMC - Enable/Disable OverTemperature Command**

---

```
RMC> disable ot
Disable over temperature shutdown
Verifu over temperature is disabled.

RMC> env
Temperture (warnings at 45.0°C, power-off disabled)
Enable over temperture shutdown is enabled.

RMC>enable ot
Enable overtemp shutdown
Verify over temperature shutdown uis enabled

RMC> env
Temperture (warnings at 45.0°C, power-off at 50.0°C)
```

## Clearing FRU Table Error Flags

Use the following sequence to clear the error flags seen, under FRU Table column E column, using the “show fru” command:

**TABLE 3. Clearing Error Flags from FRU Table**

---

P00>>> <b>show sys_serial_num</b>	<b>Record</b> system serial number
P00>>> <b>set sys_serial_num “”</b>	Clear system serial number
P00>>> <b>clear_error all</b>	Clear errors
P00>>> <b>set sys_serial_num snnnnnnnn</b>	<b>Restore</b> system serial number
P00>>> <b>init</b>	<b>Init</b> or Press the RESET button

## Info Commands

The **info 7 & 8** commands are used to display or to clear the console error log. The error log may contain environment-event state information monitored by the remote management console. Environment-event states include: power supply voltages, fans, temperature and cabinet covers. For example, a failing fan or opening the PCI cabinet door cover will result in a 680-machine check. Machine check data is displayed on the console terminal, and recorded in the error log.

Type Info then type 7 or 8 after the Enter Selection prompt.

```
P00>>> Info
```

---

## Helpful Hints

P00>>>info

- 0. HWRPB MEMDSC
- 1. Console PTE
- 2. GCT/FRU 5
- 3. Dump System CSRs
- 4. IMPURE area (abbreviated)
- 5. IMPURE area (full)
- 6. LOGOUT area
- 7. Dump Error Log
- 8. Clear Error Log

Enter selection: **7** or **8**

### Console\_memory\_allocation EV

The console\_memory\_allocation environment variable determines which memory locations the SRM console will allocate for its private use. If you are running Tru64 UNIX, set this environment variable to old (which is the default value). For creating an OpenVMS Galaxy environment, set this environment variable to **new**. (set console\_memory\_allocation new)



## Known Anomalies and Restrictions

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### DVD Media

#### Bootable DVD's

Bootable DVD's are not supported on all Alpha systems because of a limited memory size architectural restriction.

### Console Command Sequences

#### Press Halt Button, Crash Command and Continue Command

When the console is in graphics mode, the sequence of pressing the **Halt button** followed by typing the **crash** command then the **continue** command will not work, and cause different behaviors as described below.

#### *Command Sequence Behavior in an OpenVMS Environment*

Environment: OpenVMS with DW-Motif enabled, SRM console set to graphics mode, and graphics card installed.

Symptom: Pressing the HALT button puts the graphics monitor to a frozen state. You must reset the system to clear this state. Use one of the following solutions to prevent getting into this state.

Solution1: Set console to serial mode then type init before booting the operating system.

Solution2: Disable DW-MOTIF before pressing the HALT button using the following sequence.

1. Login to OS if you are not already logged in.
2. At the OpenVMS prompt, type: STOP DECW\$SERVER\_0
3. Press and release the HALT Button (if configured for HALT) to SRM console prompt.
4. Type crash
5. Reset the system and reboot the operating system.  
or
6. Continue and resume your DW-MOTIF session by issuing  
@sys\$startup:decw\$startup, then log out to bring up the DW-MOTIF session.

#### *Command Sequence Behavior in a Tru64UNIX Environment*

The Tru64UNIX environment includes X11 enabled, SRM console set to graphics mode, and a graphics card installed. The symptom occurs when pressing the HALT button, (if configured for HALT), which puts the graphics monitor to a frozen state. You must reset the system to clear this state.

Solution1: Set console to serial mode before booting the operating system.

Solution2:

Disable X11 before pressing the HALT button (if configured for HALT)

1. Login to OS if you are not already logged in.
2. Stop X11 by issuing the stop command (`#/sbin/init.d/xlogin stop`)
3. Press and release the HALT Button (if configured for HALT) to get to SRM console prompt
4. Type the crash command.
5. Reset the system then reboot the operating system.

## Bus Slot Restrictions

### DEGPA-SA -TA

**DEGPA-SA is supported ONLY in PCI SLOTS 1, 2 and 3.** The CSC hardware support group has received several reports on “**system hangs**” or “**660 sys machine check with a PCI Write Data Parity Error**”, because DEGPA’s were installed in the wrong PCI slot.

**DEGPA-TA is supported only in PCI slots: 1, 2, 3, 6, 9 , and 10 (not supported in slots 4, 5, 7, 8).** The DEGPA-TA used in the ES45 PCI slot 5 configuration can cause PCI Parity Errors that may result in a System Crash and Hangs.I

## Illegal Memory Channel 2 Configurations

Starting with SRM V6.2, the console displays an illegal configuration message when it detects unsupported hardware revisions of the Memory Channel 2 module (CCMAB-AA). The correlation between hardware revision and SROM revision is shown below. The “show config” command displays only the SROM revision.

**TABLE 1.** Memory Channel 2 SROM and Hardware Revisions

SROM Revision	Hardware Revision	Is it Supported on ES45
0X24	D02	Supported
0X23	C03	Not Supported
0X22	C02	Not Supported

Illegal Configuration Messages from the Console:

“Illegal Configuration - Memory Channel 2 in bus <n> slot <n> - must be revision 24 (hardware rev D02) or higher”.

The message is displayed during system initialization when probing the PCI Bus

## Console V5.9-10 & EV68 CPUs

Console firmware V5.9-10, which was shipped in early systems and recognizes EV68 CPU’s of revision 3.0 and earlier. Console firmware should be updated to the most current release before installing newer revisions of EV68 CPU’s.

**Serial Number Mismatch** After adding CPU's to a system, the SRM **show error** command may report a serial number mismatch. (for example, SMBO.CPU1 SYS\_SERIAL\_NUM Mismatch ). Refer to “Clearing Error Flags” on page 13 to clear this message.

## Kzpea Notes

### Powering Up Attached Storage

When in console mode, use the **init** command *after* powering up a storage device attached to a KZPEA controller. The **init** command is not necessary when the storage device is powered up at the same time as the rest of the system or when the storage device is powered up with the operating system is already running.

### Missing BUS Termination Jumpers Can Hang Console

The KZPEA-DB requires both SCSI buses to be terminated at both ends of the bus to prevent signal degradation. Signal degradation may cause the console to hang probing the controller for information. Verify that the termination jumpers, (**J3** and **J5**) on the host adapter, are installed to enable termination on both channels.

## PBXGB-AA

### Do Not Use Swap Position Zero

The PBXGB-AA PowerStorm graphics card should be set to **position six** (1024x768 at 72Mhz). Graphics card may be shipped with the switch set to **position zero** (1280x1024 at 72Mhz). Tru64 Unix currently does not support this graphics card when set to position zero.

## Mouse and Keyboard

### Do Not Hot Swap

Do not hot swap the mouse or keyboard with power on. Disconnecting them with power on may cause electronic damage to the transceivers. Ensure power is off before swapping them. If the system is in console graphics mode, removing the mouse prevents any response from the keyboard, until the mouse is plugged back into the system.

## Fibre Channel Notes

### Reconfiguring Fibre Channel Switches

To ensure access from a fibre channel switch, a console **init** command is required if a fibre channel cable is moved from one port to another port, or if the cable has been removed and replaced.KGPSA nformational Messages

Kgpsa device messages, similar to “retry ct pga0.0.0.2.6”, are informational messages only. Retry messages, of this type, result from a device trying to gain access to a busy fibre channel switch. Device access is rejected, which causes the device to retry accessing the switch.

## Kgpsa Driver Startup Messages

When the console Kgpsa fiber channel driver starts up, you may see the message, "pga0.0.0.2.4 - Nvram read failed". The message indicates the KGPSA's NVRAM is either un-formatted or is not working properly. The more likely reason is an un-formatted NVRAM.

The console contains a portion of the NVRAM to indicate if the adapter should be initialized to either a Fabric (also known as Switch) topology or initialized to a Loop topology. By default, the console initializes the KGPSA to a Fabric topology. The NVRAM is automatically formatted when the topology is set. For more information refer to the wwidmgr user's manual.

### *NVRAM Read Failed Message Example*

```
>>>wwidmgr -show ada
```

item	adapter	WWN	Cur. Topo	Next Topo
pga0.0.0.8.1 - Nvram read failed.				
[0]	pga0.0.0.8.1	1000-0000-c920-05ab	FABRIC	UNAVAIL
pgb0.0.0.10.1 - <b>Nvram read failed.</b>				
[1]	pgb0.0.0.10.1	1000-0000-c921-0ce0	FABRIC	UNAVAIL
[9999] All of the above.				

```
>>>wwidmgr -set adapter -item 9999 -topo fabric
```

```
pga0.0.0.8.1 - Nvram read failed.
Reformatting nvram
pgb0.0.0.10.1 - Nvram read failed.
Reformatting nvram
```

```
>>>wwidmgr -show ada
```

item	adapter	WWN	Cur. Topo	Next Topo
[0]	pga0.0.0.8.1	1000-0000-c920-05ab	FABRIC	
[1]	pgb0.0.0.10.1	1000-0000-c921-0ce0	FABRIC	
[9999] All of the above.				

```
>>>init
```

## MBX Not Ready

You may see a "\*\*\* MBX not ready \*\*\*" message when first formatting the NVRAM with the "wwidmgr -set ada" command. Reissuing this command should succeed.

```
>>>wwidmgr -set ada -item 9999 -topo fab
pga0.0.0.6.1 - Nvram read failed.
Reformatting nvram
```



## Firmware Change History

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### V7.2 - June 2006

#### Console Enhancements and Fixes

- WWIDMGR change – do not attempt to get a universal device id [UDID] on a Fibre Channel SAN for SCSI Sequential Access devices or for SCSI Media Changer devices (i.e. tape drives, robot arm)
- Added new module naming for the following I/O devices seen under the show config command:
- DE602-FA/TA (equivalent to –FR/-TR) all devices displayed as DE602-F\*/T\*
- DEGXA-SB/TB (equivalent to –SR/-TR) all devices displayed as DEGXA-S\*/T\*

#### New I/O Option Firmware Revisions

- KGPSA-CA (LP8000) - Firmware Revision 3.93A0
- KGPSA-DA (LP9002) - Firmware Revision 3.93A0
- KGPSA-EA (LP9802) - Firmware Revision 1.91X6
- DD-A5132-AA (LP10000) – Firmware Revision 1.91X6

### V7.1 - January 2006

#### Console Enhancement and Fixes

- Memory Timing Register adjusted to improve memory DIMM reliability when in elevated temperature environments.
- Kgpsa driver: faster retry on PLOGI frames
- SCSI driver: enhance page and field length checks for SCSI inquiry responses.
- AIC78XX driver: increase the number of supported targets from 16 to 32
- See note on KVM console switch – restriction using “run bios” command

#### New I/O Option Firmware revisions

- LP10000 - Firmware Revision 1.91A1
- LP9802 - Firmware Revision 1.91A1
- KZPDC - Firmware Revision 3.56
- KZPEC - Firmware Revision 2.58 (new option)

### V7.0 - June 2005

#### Console Enhancements and Fixes

- Two new SRM console environment variables [EV] (user\_def1 and user\_def1) for customer use. They take a string argument and accepts any characters within double quotes. The EV's are nonvolatile and are accessible from the Tru64UNIX operating system. They are not accessible from the OpenVMS operating system.
- DEFPA driver - increase driver setup time in the data link layers
- KGPSA and WWIDMGR – increase the number of Nx EV's
- SmartArray 5300 – fixed serial emulation

**V6.9 - November 2004**

**Console Enhancement and Fixes**

**WWIDMGR Hang**

Symptom - A patch has been applied to the fibre-channel support to resolve a problem that causes the WWIDMGR utility to hang and never complete. The hang would occur with the first invocation of the WWIDMGR utility. Configurations where this problem has been seen are: EMC Symmetrix storage arrays utilizing Timefinder or SRDF business continuance volumes (BCV) that are in an “established” state, and possibly mis-configured or failing volumes. These volumes may respond to an inquiry from the host as being “not ready”. The “not ready” state is indicated by an invalid device id that was accepted as valid by the console.

Solution - The console software has been modified to bypass volumes with invalid device ids and log the device id information to the console error log.

**V6.8 - August 2004**

**Console Enhancements and Fixes**

Fibre Channel Driver - Correct a problem that occasionally resulted in a boot, reboot or crash dump failure with an error message of "cb\_open failure".

**Console Recognition of the following Options**

- 3X-DAPBA-FB, 3X-DAPBA –FB/UB Asynchronous Transfer Mode Adapters
- 3X-KPKON-AA Fault Management Control Module

**New I/O Option Firmware Revisions**

- LP8000/KGPSA-B - DS3.92A2
- LP9002 /FCA\_2354 - CS3.92A2
- LP9802/FCA\_2384 - HS1.81A5

- LP9802/FCA\_2384 - HS1.81A5

## V6.7 - May 2004

### Console Enhancements or Fixes

- Loadable Firmware Utility - add support to update option firmware for the LP1000 (FCA-2684) Fibre Channel Card
- Console Recognition of three Asynchronous Transfer Mode [ATM] Adapters - 3x-DAPBA-FA, 3X-DAPBA-UA, and 3X-DAPCA-UA
- Gigabit Ethernet driver:  
Fix output of link state messages during a callback. The console log, when Open-VMS is booting, is now cleaner.  
Fix link status after plugging into a live Ethernet network after the system has been powered up. Symptom: Link light would turn not on after plugging in a wire until a boot or an init command.
- X86 - fix a double de-allocation of memory in the bios emulator. This prevents a stack trace on an OS shutdown if the bootbios is set to a controller that is not used to boot the operating system.

### I/O Option Firmware Changes

- KZPDC option firmware update to version 3.40 (was v2.94)
- LP10000 firmware included in firmware CD

## V6.6 - November 2003

### Console Enhancements

Console recognition for the following Gigabit Enet Server NICs”

- 3X-DEGXA-SA - PCI-X/PCI to Single-Port MMF
- 3X-DEGXA-TA - PCI-X/PCI to Single-Port UTP

KGPSA Behavior - Several KGPSA changes have been made to prevent "cb\_open fail" and other boot failures. Serious kgpsa faults will now cause the console to crash rather than hang in the debugger. In some rare cases it may take up to a minute or more for the link to initialize. There is a two-minute timer to prevent the system from hanging. There is a small period of time after the system is initialized where some fibre channel disks will not be displayed with a "show device" command. If the system boots during this period the message "waiting for poll to complete" followed by the device name will be displayed while waiting for the device.

KGPSA Messages - The KGPSA will report when it is not connected to a switch or to an arbitrated loop with the message "*open fibre*" followed by the *device name*. Several kgpsa error messages have been expanded to include the device name. Several kgpsa error messages have been removed because they were reporting normal behavior

### New I/O Option Firmware Revision

FCA\_2384 (LP9802) firmware revision changed to 1.00x8

## V6.5 - June 2003

### Console Enhancements or Fixes

- Update test scripts to support testing gigabit Ethernet network devices (example ega0)
- RMC – Report over-temperature failure only when two sensors fail instead of one.
- Memory Channel 2 driver updated - module configuration register was incorrectly being restored during a system warm restart.

### Note

KZPDC disk drives – when using KZPDC disk drives as boot devices, set heap\_expand to 2MB. Details are in the Smart Array 5300A Backplane RAID Controllers Installation and Configuration Guide (Manual Number: EK-SA530-IN-A01).

See Known Anomalies with OXYGEN VX1 graphics card when using the HALT button.

## V6.4 December 2002

### Console Enhancements or Fix

- RMC - adjust power supply tolerances
- SRM – KGPSA Firmware Revision Update
- Support for the DEGXA-SA fiber optic network card
- DEGPA corrected to re-establish the link during a console callback that attempts to perform I/O on the Gigabit Ethernet device. Problem description: Console driver for Gigabit Ethernet failed to establish a link during a Tru64 Unix RIS installation, causing the installation to fail.
- Memexer\_mp – fix script for d\_group usage to enable running memtest\_victim (for manufacturing use only).
- Show FRU command did not display device plugged into hose3 slot2.

## V6.3 August 2002

### Console Enhancements and Fixes

- Update buildfru to accept new mfg serial number prefix's JA and 4D
- Device recognition, boot support, and adapter firmware update support, for the 3X-KZPDC-BE and 3X-KZPDC-DF SmartArray 5305A adapters.
- The “set prompt” command was added to console command list e.g. P00>> set prompt “\_system1>” results in console prompt **P00\_system1>**
- KGPSA - The console now properly recognizes responses from remote KGPSA adapters in console mode and does not report "probe timeout retry." This message, which does not indicate abnormal operation, is now reported in the event log rather than the console log.

World Wide ID - show config and show device commands display the **port WWID** rather than the **node WWID**. The **port WWID** number is needed to configure fibre channel switches and storage controllers.

- Any of 255 units on an HSV fibre channel storage controller can now be configured rather than the previous limit of the first 127 units.

**V6.2 Interim May 2002**

Manufacturing use only - Add support for the new mfg serial number prefix's to the buildfru command.

**V6.2 April 2002****Console Enhancements and Fixes**

- Changed eia\*\_mode default to "auto-negotiate" for DE600 and DE602 Ethernet cards
- Changed eia\*\_mode default to "FastFD" for the DE602-FA
- Bootp driver – generate ack on tftpoack (required for Linux Servers)
- Show FRU display - serial number format correction for 3<sup>rd</sup> Party DIMMs and for power supplies. Serial number is now ten characters for power supplies.
- New PALCode
- SRM Console – missing CPU's under OpenVMS 7.3 with console environment variables lp\_count equal to zero and lp\_cpu\*mask equal to non-zero.
- Fixed memory allocation symptom using wwldmgr commands on a large SAN. The symptom was seen after the first wwldmgr command and would cause the following messages from the console:  
    "CPU0: insufficient dynamic memory for a request of 2048 bytes"  
    "Console heap space will be automatically increased in size by 256KB"
- Removed unnecessary warning messages "PRLO has a null sb - Issuing LOGO" and "PRLI has a null sb - Issuing LOGO", will no longer be seen on a large Storage Array Network. The message was seen on large Storage Array Networks (e.g. first seen on a site with 50 terabytes of storage with lots of KGPSA adapters and switches).

**New I/O Option Firmware**

KGPSA-BA firmware updated to revision 3.20x7 (replaces revision kg7303a1).

**V6.1 November 2001****SRM Console Enhancements**

- PALCode – OpenVMS V1.93, UNIX 1.88 – new flag to control reporting correctable-read-data interrupts with c\_stat = 0. The address of this flag is at per\_cpu + offset 0x3c8. Use the info 5 command to get the per\_cpu address. Deposit a 1 to this address to enable this flag. Deposit a zero to disable flag. This flag is mainly used for low-level debugging.
- Adaptec driver – firmware upgrade to CHIM V3.62
- Change default protection to read-only on SRM flash ROM segment
- LFU Firmware Update support for the LP9002 Fibre Channel Controller

- The console displays DE602-B\* for the DE602-BA or DE602-BB. Both cards use the same NIC chip but use different PCI Bridge chips. The DE602-BB uses the Intel 21154-BE bridge chip.

#### Bug Fixes

- KGPSA - Fixed a problem where after a system completed a very large number of reboots without the system being initialized, the system would show that the device was not "connected".
- KZPEA - With versions prior to V6.1 it was necessary to set the SCSI\_ID twice, once from the console by setting "pka\*\_host\_id" where "\*" is the adapter number and once by using the bios utility accessed by "run bios pk\*0" where "\*" is the adapter letter of the first port on the card. The SCSI\_ID should now only be set with the bios utility but can be examined by "show pk\*". Please refer to section 6 on known anomalies.
- Adaptec drive - redundant de-allocation of OSMIOB buffer corrupted free buffer free list, Not enough OSMIOB buffers caused the driver to hang, Improper free of target control structure caused memory free error, Drives on a starlite shelf do respond to scsi select after a scsi reset until after a delay.
- Galaxy -  
Access violations on partition-one (V6.0 firmware only)V6.0 May 2001  
Correctly partition memory when greater than 10Gb  
AlphaStation ES40 banner not enabled (V6.0 firmware only)  
Added SMM value to support EV68 CPU. The SMM value is used by the operating system to verify the system type. Running third party application may require a license adjustment when changing the system type such as when doing a CPU upgrade.
- PBXDA-AC (Rev.F Module) – causes console hang in V6.0 firmware)
- Fibre Channel driver – remove duplicate tags
- RMC on ES40cv system  
New RMC version F2.8 has a range tolerance increase for the Negative 12 Volt warning threshold to 25% (-12V warning).
- RMC on TS40/TS20 system  
New RMC version G2.8 for the TS40/TS20 system has the following changes: CPU fans are set to be Fans 5 & 6, PCI fans are set to be Fans 1 & 2. They also have a new shutdown delay on the firmware of approximately 3 minutes whenever there is at least 1 PCI fan failure.

#### V6.0 May 2001

##### SRM Console Enhancements

- New PALCode to support EV67 pass 2.6, EV68A pass 2.2 and EV68CB Pass 2.4 CPUs
- Console recognition of the Compaq AXL300 Secure Socket Layer [SSL] Accelerator Card

- Console recognition of the DE602-BA Ethernet card, which supports the DE602-TA (twisted-pair) and DE602-FA (fiber) daughter cards. Note however, the DE600-AA however supports only the DE602-FA.
- Full disable of USB support

### Bug Fixes

- Probe Timeout failures on KGPSA devices - while configuring the KGPSA disks with WWIDMGR commands or by booting those disks, messages containing "probe timeout" resulted in loss of access to disks needed for booting or writing crash dumps. The console now continues probing when unresponsive nodes are encountered. These nodes are usually other host adapters on systems that are initializing. When this occurs the message "probe timeout retry" indicates that an unresponsive node has been skipped.
- Possible incorrect fru data when invoking the build\_fru command and system\_serial\_number environment variable contains a null value. Note, all systems should have an *assigned* system\_serial\_number.
- RMC – symptom - if power supply PS2 fails, the env command shows “PS2 : OK” because PS1 status bit was used for PS2.
- RMC on ES40LP – symptom - PCI fan 5 - speed setting was not being adjusted properly during system power up, and it remained at high speed
- AlphaBIOS – symptom: AlphaBIOS hangs when an Adaptec card is plugged into lower PCI slot number than the VX1/Oxygen graphics card.

## V5.9 January 2001

### SRM Console Enhancements

- OpenVMS and Unix PALCode - improved memory scrubbing, ensure a double bit error detected during a crd flow for any kind of error will be turned into a machine check
- SROM V2.12F – improved cache timing for EV68 CPU module. V5.9 is required for EV68.
- Loadable Firmware Utility [LFU]
- Support updating KGPSA Fibre channel firmware
- No longer supports updating CCMAB memory channel firmware.
- Console Environment Variables
- memory\_test – expand to test 128MB when set to “partial” e.g. P00>>> set memory\_test partial
- pci\_parity - previously only checked at console initialization, now checked during system shutdown so that the appropriate action is taken during an automatic reboot(this was affecting certain 3<sup>rd</sup> party graphic cards)
- new - exx0\_tftp\_blocksize (e.g. ewa0\_tftp\_blocksize) – enables a client to negotiate tftp blocksize to allow downloading files between 32MB and 90MB. Blocksize is limited to 512, 1024 and 1450 bytes. Default blocksize value is 1024. The blocksize switches to 512 bytes when negotiating with servers that do not support rfc.1782 and rfc 1783.

Bug Fixes

- DE6xx driver - fix auto-negotiate by negotiating the proper setting during power-up
- DE60xx/DE5xx driver – fix “slow MOP booting” with KZPCM by setting receive process to one CPU
- OpenVMS Galaxy environment – fix OpenVMS induced crash/hang when symbios controller is in partition 1
- RMC - during an over temperature warning, if another event changes from bad to good, the RMC may hang (fixed in RMC V2.6)
- Console recognition of the FCA-2354 Fibre Channel Host Bus Adapter

V5.8 August 2000

SRM Console Enhancements

- RMC V2.5 (was V2.4 )- Fixes "RMC parser in use" symptom.
- SROM V2.11-F (was V2.10-F) - Now supports the 833MHz CPU
- Galaxy bugs fixed  
when a secondary galaxy CPU is moved to the other instance the CPU it is moved to either halts or times out depending on SRM version.  
lp\_mem\_size0 is ignored if lp\_count is equal to zero.
- PALCode/CPU Speed Mismatch Checker (new)
- Format change for the run bios command
- New Info command 7 & 8 - to show and clear errors logged in NVRAM - P00>>>  
info 7 = show error log , info 8 = clear error log
- New console environment variable - sys\_com1\_rmc - section 5.12.2 above.
- Console environment variable boot\_reset is now enabled to indicated whether or not to init the system in response to a boot command. e.g. P00>>> set boot\_reset on
- Loadable Firmware Utility now searches for firmware from multiple CD drives.

V5.7 March 2000

SRM Console Enhancements

- Include release notes for AlphaServer ES40cv and AlphaServer ES40lp systems.
- New Console Commands: The **show bios** command lists the location of each BIOS expansion ROM in the system. The **run bios** command invokes an individual BIOS expansion ROM on the supported adapter. See “Show Bios” on page 12.
- Loadable firmware utility [LFU] - enhanced to look for firmware from multiple CD drives.
- DQ driver modified to read from multiple CD drives (e.g. required for NHD kits)
- The console exer command is no longer limited to exercising a maximum of thirty disk drives

RMC firmware - updated to V2.4 to improve power sequencing, improve voltage tolerance monitoring to +/- 15%, fix fan5/fan6 sensing problem that was only in RMC V2.3.



DEFPA option firmware is now V3.20. This version auto detects for DRAM parity support. If the parity DRAM is present, the DRAM parity code is enabled. Otherwise it is left disabled.

Console support/recognition for:

- KZPCC-CE controller - added BIOS support using "show bios" and "run bios" command. The console "show config" command will display the controller as: DPT PM3755 on one line, I2O on the next line.
- EV67 CPU Version 2.5 (667Mhz CPU)
- KZPEA-DB - 64-bit PCI, 2 channel LVD, UltraSCSI3 host bus adapter
- DEGPA-TA - 1000BaseT UTP gigabit Ethernet adapter
- Ensoniq sound card

## V5.6 December 1999

Console Enhancements and Fixes

- The SRM console will recognize 1GB which is the memzone limit size.
- Memory exerciser splits up testing of large sections of memory into multiple smaller sections; to test and start a memtest process on each section. This may show up as multiple memtests processes displayed in the show\_status output.
- Fixed machine check frame of fatal 680 delivered to OS via HWRPB.
- Unix PALCode fix for simple-lock-timeouts seen under Tru64 Unix.
- Several changes to the RMC and the SROM. Be sure to update both RMC and SROM firmware in addition to the SRM and AlphaBIOS firmware.
- Loadable Firmware Utility modified to list and update SRM, AlphaBIOS, and SROM as the default mode. RMC firmware is updated only in LFU-manual-mode.
- Elsa Gloria Synergy graphics cards - console driver fix to refresh graphics display. SRM console is displayed when the Halt button is pressed while the system is running Tru64 Unix.
- KGPSA driver can now format the on board NVRAM.

Support for:

- EV6 CPU Version 2.5 (V5.6 firmware is compatible with previous EV6 CPU versions)
- DS-KZPCC-CE (64-bit PCI to three channel LVD Ultra2 SCSI backplane RAID controller) - the console now contains an X86 bios emulator to support this controller.
- DS-KGPSA-CA (64-bit PCI to Fibre Channel host bus adapter w/embedded optical)
- DS-KZPEA-DP (Adaptec AHA3690DU controller)

## V5.5 August 1999

First Console Release.

- Console recognition of ATM adapters: DAPBA-FA, DAPBA-UA, DAPCA-FA
- Console recognition of Ethernet cards: DE600-AA, DE602-AA/FA/TA. The DE602-FA and the DE602-TA are "daughter cards" which plug into a DE602-AA Console.

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## **Firmware Change History**

- Boot Support for DE600/DE602 Ethernet cards
- New Console Environment Variables - FFAUTO and FFNEXT