V5.7 Console Firmware Release Notes

AlphaServer 800/Digital Server 3300 & AlphaServer 1000A

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1 Scope

The document lists significant changes in this firmware release and describes methods to update console firmware and console-supported I/O options firmware. This document does not describe the console firmware internals or console architecture.

1.1 Audience

The audience for this document is intended for individuals responsible for operating system installations or upgrades and for console firmware and console-support option firmware updates.

1.2 Golden Rules on Updating Firmware

Update console firmware before installing or updating an operating system. Update both consoles (SRM and ARC/AlphaBIOS) to ensure compatibility with the associated operating system. Run the appropriate EISA Configuration Utility when switching between Windows NT and Tru64Unix/OpenVMS.

1.3 Internet Access

Internet access is available to find the most recent release of console firmware.
www.compaq.com/support/ (click on ***Alpha Systems*** under the "***Downloadable Drivers & Utilities***" menu).
http://www.compaq.com/support/files/alphant/index.html (For the latest version of BIOS, HAL and NT Driver

1.4 Documentation

Table 1-1 Related Documentation

AlphaServer 800 User's Guide AlphaServer 800 Service Guide AlphaServer 800 Illustration Card	English	EK-AVS80-UG (order number) EK-AVS80-SG EK-AVS80-IG		
AlphaServer 1000/1000A Series User Information	English Spanish Italian German	EK-PCDSA-UI EK-PCDSS-UI EK-PCDSI-UI EK-PCDSG-UI	French Dutch Japanese	EK-PCDSP-UI EK-PCDSH-UI EK-PCDSY-UI
AlphaServer 1000/1000A Series CPU Module Information	English Spanish Italian German	EK-PCDSA-CI EK-PCDSS-CI EK-PCDSI-CI EK-PCDSG-CI	French Dutch	EK-PCDSP-CI EK-PCDSH-CI
AlphaServer 1000/1000A Series Installation	English	EK-PCDSA-II		
Alpha Systems' Console World Wide ID Manager for Fibre Channel Devices	http://ftp.digital.com/pub/DEC/Alpha/firmware/v5.7/doc/ Filename(s): wwidmgr.ps, wwidmgr.pdf, wwidmgr.txt			

2 Read Me First

2.1 Functional Changes this Release

- New Console Commands (on AlphaServer 800/Digital Server 3300 only):
  - 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 section 2.3.1 for details.
- 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.
- Loadable Firmware Utility [LFU] - enhanced to look for firmware from multiple CD drives
- DQ driver modified to read from multiple CD drives (e.g. for NHD3 kits)
- Console firmware no longer fits on one floppy diskette. Details in section 2.4.2
- DEFPA option firmware is now V3.20 DEFPA Firmware is now V3.20 - which has auto detect for DRAM parity support. If the parity DRAM is present, the DRAM parity code is enabled.

2.2 Firmware Revision Matrix

The following matrix lists the minimum recommend firmware revision that was qualified with the operating system. Console firmware is backward compatible with respect to hardware and OS revision. Upgrading firmware is generally recommended to keep your system current in terms of console enhancements, device support, and bug fixes. The Operating System release notes will note any exceptions to this general recommendation.

Table 2-1 Operating System and Firmware Revision Matrix

AlphaSystems Firmware Update CD V5.7			
Operating System			
OpenVMS	V7.2-1		
Windows NT	V4.0		
Tru64 Unix	V5.0		
EISA Config. Utility	V1.11A		
Console Firmware	**AlphaServer 800 Digital Server 3300**	**AlphaServer 1000A**	
		4/xxx	**5/xxx**
SRM Console	V5.7-86	V5.7-83	V5.7-80
AlphaBIOS	V5.70	ARC V4.59	V5.70
OVMS Palcode	V1.21-3	V5.56-7	V1.21-4
Unix Palcode	V1.23-5	V1.45-12	V1.23-6

2.3 New Console Commands

2.3.1 Show Bios/Run Bios Console Commands[1]

The *show bios* command lists the location of each BIOS expansion ROM in the system. Location is displayed in the form hose bus slot function type. The *run bios* command invokes an individual BIOS expansion ROM on the supported PCI adapter (e.g. KZPCC-CE). The *run bios* command is used to invoke functions or utilities in the ROM. For example, the KZPCC-CE uses the expansion ROM for its configuration utility. The *show bios/run bios* commands are run from a graphics console terminal. Make sure console is in graphics mode.

```
>>>set console graphics
>>> init
…

>>>show bios

   Hose Bus  Slot  Function Type

    0    0    13    0        S3 Trio64/Trio32

    0    2    2     0        I2O

    1    2    4     0        I2O

 >>>run bios 0 2 2 0
```

When you enter the **run bios** command, the system first does a bus reset. You are then prompted to type a control sequence within a certain number of seconds to enter the utility. The control sequence depends on the PCI option. See the documentation supplied with the option for information on running the utility.

2.4 Anomalies, Restrictions, & Workarounds

2.4.1 General Information

2.4.2 Console Firmware Requires Two Floppy Diskettes

Starting with V5.6 firmware, to update firmware using floppy diskette now requires two floppy diskettes. The first diskette is bootable by the fail-safe-loader and contains the Loadable Firmware Utility and the SRM console. The second diskette is a FAT-formatted floppy, which contains AlphaBIOS console.

Instructions to create a floppy diskette set are on the firmware are available from:

- Tru64 Unix - http://ftp.digital.com/pub/Digital/Alpha/firmware/interim/as800/updateviaunix-as800.htm
- Windows - http://ftp.digital.com/pub/Digital/Alpha/firmware/interim/as800/updateviawindows-as800.htm

[1] show bios and run bios commands are in console firmware V5.7 or greater

2.4.3 Fibre Channel

2.4.3.1 MBX Not Ready

KNOWN PROBLEM:

You may see a "*** MBX not ready ***" error when formatting the Nvram with the "wwidmgr -set ada" command. Reissuing this command should succeed:

P00>>>**wwidmgr -set ada -item 9999 -topo fab**
pga0.0.0.6.1 - Nvram read failed.
Reformatting nvram
*** MBX not ready ***
pgb0.0.0.1.2 - Nvram read failed.
Reformatting nvram
P00>>>**wwidmgr -show ada**
item adapter WWN Cur. Topo Next Topo
*** MBX not ready ***
pga0.0.0.6.1 - Nvram format incorrect.
[0] pga0.0.0.6.1 1000-0000-c920-a763 FABRIC UNAVAIL
[1] pgb0.0.0.1.2 1000-0000-c920-c9fe FABRIC FABRIC
[9999] All of the above.
P00>>>**wwidmgr -set ada -item 9999 -topo fab**
P00>>>**wwidmgr -show ada**
item adapter WWN Cur. Topo Next Topo
[0] pga0.0.0.6.1 1000-0000-c920-a763 FABRIC FABRIC
[1] pgb0.0.0.1.2 1000-0000-c920-c9fe FABRIC FABRIC
[9999] All of the above.

2.4.3.2 wwidmgr -quickest -item <n>

KNOWN PROBLEM:

The command "wwidmgr -quickset -item <n>" MUST also have the "-unit" qualifier on the line. The WWIDMGR USERS' GUIDE says:
"If no unit number is specified, console will generate one that is a hashed value of the WWID."
This functionality is not working properly, and a -unit MUST be specified.

2.4.3.3 When the Console KGPSA Driver Starts

When the console KGPSA driver starts, you may see the error message: **pga0.0.0.2.4 - Nvram read failed.** The error message indicates the NVRAM on the KGPSA is either unformatted or is not working properly. The more likely reason is that the NVRAM is unformatted.

Beginning with V5.6 console firmware:

- The console contains a portion of the NVRAM on the KGPSA adapter to indicate if the adapter should be initialized for a Fabric (Switch) or for a Loop topology. By default, the console initializes the KGPSA to a Fabric topology.
- The NVRAM will automatically be formatted when the topology is set.

See the WWIDMGR USERS MANUAL for more information on the "**wwidmgr -set adap**" command.
http://ftp.digital.com/pub/DEC/Alpha/firmware/v5.7/doc/wwidmgr.*

The NVRAM will automatically be formatted when the topology is set.

```
P00>>>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 - Nvram read failed.
[ 1] pgb0.0.0.10.1    1000-0000-c921-0ce0          FABRIC     UNAVAIL
[9999] All of the above.
LP00>>>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
LP00>>>wwidmgr -show ada
item    adapter              WWN              Cur. Topo  Next Topo
[ 0] pga0.0.0.8.1     1000-0000-c920-05ab          FABRIC     FABRIC
[ 1] pgb0.0.0.10.1    1000-0000-c921-0ce0          FABRIC     FABRIC
[9999] All of the above.
LP00>>>init
```

2.4.3.4 Update CCMAB02 Firmware from the LFU

Console firmware V5.4 or greater enables the ability to update CCMAB02 (memory channel 2) firmware from the Loadable Firmware Utility.

2.4.3.5 Digital Server 33xx Systems

V5.1 or greater console firmware supports the Digital Server 3xxx systems. These systems are physically similar to the AlphaServer 800 systems and support *only* the Windows NT operating system. OpenVMS or Tru64 Unix is not supported.

2.4.4 SRM Console Specific Information

2.4.4.1 AlphaServer 800 Serial Console V5.0 and Earlier

In console serial mode, editing a file under EDT or vi and holding down the *page-down-key* may cause the system to hang. To recover from a hang, power-down the system, unplug power , wait 20 seconds, plug in power, power up system, then upgrade console firmware to V5.1 or greater. If you don't have V5.1 or greater, change the com1_baud and RMC_baud rate to 38400.

2.4.5 I/O Options Specific Restrictions

2.4.5.1 PBXGB-AA - Blank Screen on Tru64 Unix

The *switch setting* for the PBXGB-AA PowerStorm graphics card should be set to **position six** (1024x768 at 72Mhz) instead of default position zero (1280x1024 at 72Mhz). Tru64 Unix does not support (1280x1024 at 72Mhz) on this card.

2.4.5.2 PBXGB-AA Revision F03 is not Supported on AlphaServer 800

PBXGB-AA revision FO3 is not supported on AlphaServer 800 and Digital Server 3300 System. Support revisions are **E03** or earlier for these systems.

2.4.5.3 KZPCM-DA PCI-slot Restriction Removed on AlphaServer 800 (Since V5.3)

V5.3 or greater console firmware removes the PCI bus slot restriction for the KZPCM-DA on AlphaServer 800 platforms. The 64-bit PCI slot was previously restricted to single-function PCI devices. The KZPCM-DA is a multifunction PCI device with 4 ports

2.4.5.4 PB2GA-JC/JD VGA Graphics Controller

The SRM console environment variable BOOT_RESET must be set to OFF to use the PB2GA-JC or -JD graphics card. OFF is the default value for BOOT_RESET. >>> set boot_reset off

2.4.6 PCI Bus Slot Restrictions on AlphaServer 1000A

The AlphaServer 1000A has seven PCI bus slots – three in front of a PCI-to-PCI bridge and four behind the bridge. PCI Primary slots are in front of the bridge whereas, PCI secondary slots behind the bridge.

2.4.6.1 KZPBA-DB

The KZPBA-DB, Dual Channel PCI to UltraSCSI Adapter, is restricted to the primary PCI bus slots.

2.4.6.2 PBXGB-AA/CA

The PBXGB-AA and -CA graphics cards are restricted to the primary PCI bus slots.

2.4.6.3 PBXDA-AC

The PBXDA-AC - 16 Port High Performance Asynchronous Multiplexer Controller has the following restrictions:

- No Restrictions on AlphaServer 800, Digital Server 3300, or AlphaServer 1000A Model 5/xxx systems
- Restricted to SECONDARY PCI bus slots on AlphaServer 1000A Model 4/xxx systems.
- NOT supported on AlphaServer 1000 systems

2.4.6.4 PBXGI-AD

- No Restrictions on AlphaServer 800
- Restricted to Primary PCI Bus slots for all AlphaServer 1000A systems
- NOT supported on all AlphaServer 1000 Systems

2.4.7 Operating System Specific Restrictions

2.4.7.1 WindowsNT Restart - Restriction on AS800/DS3300 with Fibre Channel and AlphaBIOS V5.68

WindowsNT Restart does not work with AlphaBIOS V5.68. To restart WindowsNT, do a complete shutdown instead of selecting the Restart radial button in the "Shut Down Windows" dialog box. If you select the Restart radial button, the system will go to a suspended state and the monitor screen will go blank. To return to a normal state, press the RESET button on the operator control panel [OCP]. This is noted for reference because AlphaBIOS V5.69 was released with V5.5 Alpha Systems Firmware.

2.4.7.2 DSSI Devices Not Seen Under OpenVMS

The following anomaly is OpenVMS specific and is noted here for informational purposes. A new OpenVMS driver may be needed for AlphaServer Systems with KFESA's [DSSI to EISA Storage Adapters]. The symptom is that data-disks off the KFESA may not be seen nor displayed by the OpenVMS "show device" command. The OpenVMS driver, who fixes this anomaly, is available from TIMA.

2.4.7.3 EISA Configuration Utility Diskette Version 1.10 for OpenVMS/Digital Unix

When you run ECU V1.10, the VGA Graphics Controller is DISABLED. Run the ECU and select STEP 3 to ENABLE the VGA Graphics Controller prior to booting the operating system. This will allow your Xserver to start.

These instruction do not apply to AlphaServer 1000 and 1000A systems using the Cirrus VGA graphics controller located on the motherboard. In previous ECU versions, the VGA Graphics Controller setting is ENABLED.

Note: ECU V1.10 has been replace by V1.11A. The order number for the most current ECU kit is **QA-01YAA-HC.**.

2.5 Special and General SRM Console Commands

2.5.1 Default Value for bus_probe_algorithm

For all systems, the default value is "**new**" for the SRM console environment variable **bus_probe_algorithm.** The operating systems include Tru64 Unix, (OpenVMS V6.2 and later), and Windows NT.

2.5.2 Set Console to Graphics or Serial

Use the INIT command to redirect the console output to the graphics port or to the serial port. The command sequence is as follows:

>>> set console graphics or >>> set console serial
>>> INIT

After the INIT command , console output is directed to the appropriate port

2.5.3 Using the TEST Command on Shared SCSI systems

The TEST command is designed for stand-alone systems, therefore, will not work on a shared SCSI system. To run the TEST command, disconnect one of the systems to the shared disks.

2.5.4 Clear Secure Mode

The Halt button now is latched in software. If the halt button is depressed when the console is starting, no nvram scripts are executed and the console returns >>>. If secure mode is set, you can clear the console in the following way:

- Type *login* at the SRM >>> prompt
- Press and Release the HALT Button after you see the enter password prompt
- password is now cleared after you release the HALT Button on the operators control panel

2.5.5 Save_NVRAM & Restore_NVRAM Commands

The save_NVRAM and restore_NVRAM commands are available only under the Loadable Firmware Utility [LFU]. The commands save or restore NVRAM configuration data. This feature is useful if upgrading a system's motherboard and you wish to restore the systems previous NVRAM contents. To get to the LFU-prompt to invoke these commands, boot the Alpha Firmware CD and press the enter-key after the Bootfile: prompt.

2.5.5.1 Save_NVRAM

Save the system NVRAM data from 8KB EEROM and last 50 TOY RAM bytes onto a write-UN-locked FAT formatted floppy to a file. By default, if no script argument is specified, all NVRAM is saved to file ALLNVRAM.SAV. If the file already exists, then a copy of the original file is made to *.BAK. If that file exists, it is overwritten. Note: attempts to write to a write-locked floppy fail silently.

Syntax save_nvram [{**all,arc,srm,toy**}]

all : All of the 8KB EEROM and 50 bytes of TOY RAM are saved in file allnvram.sav. This is the default, if no argument is specified
arc : ARC (AlphaBIOS) data in first 6KB of the 8KB EEROM is saved in file arcnvram.sav.
srm : SRM console data in last 2KB of the 8KB EEROM is savedin file srmnvram.sav.
toy : TOY console data in the 50 bytes of TOY RAM is saved in file toynvram.sav.

Example to copy a script from floppy: (Note this command is unnecessary when running from the LFU)

>>> cat fat:savenvr.txt/dva0 > save_nvram

Example: To save all the system NVRAM to an image on floppy:

>>> save_nvram Save all NVRAM data to file fat:allnvram.sav/dva0.0.0.1000.0. If file already exists, first copy original to a .bak file.

Please insert a write-UN-locked, FAT formatted floppy... and enter "y" to continue.
Y checking for a
FAT formatted floppy... ...Found it.
Checking for existing
fat:allnvram.sav/dva0.0.0.1000.0... ...Found one.
Copying
fat:allnvram.sav/dva0.0.0.1000.0 to .bak file... ...Succeeded.
Copying all
NVRAM to fat:allnvram.sav/dva0.0.0.1000.0... ...Succeeded.
>>> End of

Example

2.5.5.2 Restore_NVRAM

Restore the system NVRAM data to 8KB EEROM and/or last 50 TOY RAM bytes from a floppy containing the NVRAM save file(s). By default, if no script argument is specified, all NVRAM is restored from file ALLNVRAM.SAV.

Syntax restore_nvram [{**all,arc,srm,toy**}]

all : All of the 8KB EEROM and 50 bytes of TOY RAM are saved in file allnvram.sav. This is the default, if no argument is specified
arc : ARC (AlphaBIOS) data in first 6KB of the 8KB EEROM is saved in file arcnvram.sav.
srm : SRM console data in last 2KB of the 8KB EEROM is savedin file srmnvram.sav.
toy : TOY console data in the 50 bytes of TOY RAM is saved in file toynvram.sav.

2.5.6 Redirect Console Output to Floppy Disk

This command was introduced in console v4.8. You can redirect console output to a FAT-formatted floppy disk and display the contents of the file saved on floppy disk.

Example to Redirect Console Output to Floppy disk:
Format: >>> **console-command > fat:filename/dva0**

This example stores the systems configuration to a floppy file:
>>> show config > fat:showconfig.fat/dva0

This example displays the contents of console output file stored on floppy disk.
>>> cat fat:showconfig.fat/dva0 | more

This example stores the system power-up sequence:

>>> cat el > x
>>> cat x > fat:cat_el.fat/dva0

This example combines the above two commands into one:

>>> cat el > fat:cat_el.fat/dva0

End of Examples

3 Firmware Update Procedure

This chapter explains how to update firmware. AlphaServer systems contain flash ROM(s) to store SRM and ARC/AlphaBIOS console firmware. SRM console is used for Tru64 Unix and OpenVMS, whereas, ARC/AlphaBIOS console is used for the WindowsNT operating system.

AlphaServer systems recently shipped may have a higher firmware revision than the firmware revision listed in this release. *Do not load firmware that is older than what is presently installed.* A higher firmware revision usually indicates support for the currently shipping operating system. The revision number of console firmware and the Alpha Firmware CD are mutually exclusive.

3.1 Loadable Firmware Utility Commands

The Loadable Firmware Utility is the mechanism to update console and option firmware.

3.1.1 List Command

Use the list command to show a list of memory-loaded images and currently supported flash ROMs. In the following example three devices are installed in a system that can be firmware-updated.

UPD> list

Device	Current Revision	Filename	Update Revision	
ARC	4.49	arc_fw	4.52	
SRM	v4.7-163	srm_fw	4.7-169	
….		fwb0	2.46	
. ...		dfpaa_fw	2.46	
… …		dfxaa_fw	2.46	see note below on dfxaa_fw
…		dfeab_fw	2.46	
…		kzpsa_fw	A11	

Options DEFEA and the DEPAA use the dfxaa_fw firmware file. Option firmware dfxaa_fw is an encapsulation for older and new versions of the DEFEA and DFPAA. Older DEFEA models part number: 54-21497-XX] use different firmware newer DEFEA models [part number: 54-21503-xx].

3.1.2 Update Command

Use the update command to update console and option firmware or to update option-only firmware.
UPD> update [updates console and option firmware]
UPD> update <option-name> e.g. >>> update ccmab02

3.2 Update Firmware via SRM Console

The following procedure shows how to update console and option firmware. To update only option firmware, select the option name after the update command e.g. UPD> update pka0.

Insert Firmware CD into drive	>>> show device	Find the CD-ROM device ID e.g. dka400
Boot the Alpha Firmware CD	>>> Boot dka400	Boot code determines the AlphaServer type
Press the enter- key after Bootfile	Bootfile:	To use default firmware
Type update	UPD> update	Update console and option firmware
Exit the LFU	UPD>exit	Exiting will initialize the system

Example:

>>> show device
dka400.1.0.1.0 DKA400 RRD43 1084

>>> **boot dka400** (Firmware CD is inserted in CD Drive)

block 0 of dka400.1.0.1.0 is a valid boot block reading 989 blocks from dka400.5.0.1000.0
bootstrap code read in base = 156000, image_start = 0, image_bytes = 7ba00
initializing HWRPB at 2000
initializing page table at 148000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

[Release notes are displayed]

Bootfile: [press enter-key]

eb.....ea.e9.e8.e7.e6.

Checking dba500.5.0.1000.0 for the option firmware files…

***** Loadable Firmware Update Utility *****

Function Description

Display Displays the system's configuration table.
Exit Done exit LFU (reset).
List Lists the device, revision, firmware name, update rev
Update Replaces current firmware with loadable data image.
Verify Compares loadable and hardware images.
? or Help Scrolls this function table.

UPD> **update**

(answer **y**es to all questions then exit)

UPD> **exit**

End of Example - firmware is now loaded into ROM. Typing exit will reset the AlphaServer system and invoke the new firmware.

3.3 Update Firmware via ARC/AlphaBIOS

The following procedure shows how to update console and I/O option firmware. To update only I/O option firmware, select the option name after the update command e.g. UPD> update pka0.

To get to the ARC or AlphaBIOS console menu from Windows NT, shutdown the operating system then reset the system. To get to the ARC console from the SRM console prompt >>> , type "***set os_type NT***" then reset the system or type >>> ***arc*** from the SRM console.

Insert Alpha Firmware CD into CD-ROM drive Select "Supplementary Menu" (to get to the "Install New Firmware" menu item) Select "Install New Firmware (to invoke the LFU from the Alpha Firmware CD) Type "***update***" after the UPD> prompt (to update console and I/O option firmware) Type "***exit***" after the firmware has updated (to reset system in "flash-in" the new firmware)

3.3.1 CPU_Upgrade (AlphaServer 1000/1000A 4/xxx Only)

This command provides the ability to upgrade to EV5 CPU by only changing the console firmware. This command does not exist on other systems. Make sure you have an EV5 CPU ready to replace the EV4 CPU before you begin. You must run the EISA Configuration Utility after you have replaced the CPU module.

Procedure to upgrade your system to an EV5 CPU. UPD> cpu_upgrade Answer Yes to all questions UPD> exit Power down system and replace EV4 CPU with EV5 CPU Power up system and run the appropriate ECU for your operating system Exit ECU than Boot Operating System End of Procedure

3.3.2 CPU_Downgrade (AlphaServer 1000 5/xxx with MLB 54-23499-01 Only)

The cpu_downgrade command is valid ONLY for AlphaServer 1000 5/xxx and 1000A 5/xxx systems that have the older Main Logic Board 54-23499-01. **Do not use this command on systems with Main Logic Board 54-23499-02**.

This command provides the ability to upgrade to EV5 CPU by only changing the console firmware. This command does not exist on other systems. Make sure you have an EV4 CPU ready to replace the EV5 CPU before you being. You must run the EISA Configuration Utility after you have replaced the CPU module.

Procedure to downgrade your system to an EV4CPU. UPD> cpu_downgrade Answer Yes to all questions UPD> exit Power down system and replace EV5 CPU with EV4 CPU Power up system and run the appropriate ECU for your operating system Exit ECU than Boot Operating System End of Procedure

4 DE500 Notes

DE500-FA	• supports 100BaseFx half and full duplex - >>> set ew*0_mode *fast* or *fastfd* • V5.1 is the minimum supporting console version • does not support auto-negotiation m
DE500-BA DE500-AA	Supports: • 10BaseT half-duplex, full duplex- >>> set ew*0_mode *twisted or full* • 100BaseTx half-duplex or full duplex - >>> set ew*0_mode *fast* or *fastfd* • auto-negotiation - >>> set ew*0_mode *auto-negotiation* V4.7 and V4.9 is the minimum supporting console versions for DE500-AA and –BA respectively

4.1.1.1 What is Auto-Negotiation

Auto-negotiation is a mechanism to advertise, to detect, and to negotiate line speed abilities to an Ethernet wire. In auto-negotiation mode, a user does not need to know the line speed of the auto-negotiation-supported device on the Ethernet wire. In this mode, the DE500-AA or -BA advertises its abilities sending a link code word [LCW]and than waits for a responding LCW. The DE500 will default to 100BaseTX full-duplex mode if it does not receive a proper LCW from another auto-negotiation-supported device

5 Using Console Environment Variables FFAUTO and FFNEXT

This section describes how to use console environment variables FFAUTO and FFNEXT to force devices (e.g. disks) from a "not connected" state to a "connected" state to make them bootable. The console does not allow booting devices that are in the "not connected" state.

FFAUTO and FFNEXT are used for situations and configurations where an operator needs to force the console to boot a "not connected" device. These console environment variables were introduced in console firmware V5.5 (August 1999).

5.1 Background

5.1.1 Behavior of "Not Connected" Devices

HSZ8x disk array controllers or HSG8x array controllers may have their disks in a "connected" or "not connected" state. In MULTIBUS mode, a disk state of "not connected" is normal and correct. Because the console does not allow booting devices in the "not connected" state, attempted to boot a "not connected" disk produces the console error message below:

```
P00>>>b dga40.1003
resetting all I/O buses
VGA Bios failed, status = 1
(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0
```

Therefore, to successfully boot a disk, select either a "connected" disk or use the FFAUTO or FFNEXT command.

5.1.2 Determining a "Not Connected" Device from an HSZ80 or HSG80

The HSZ8x or HSG8x console can help the operator determine where a disk device is connected. In this HSG80 console example below, the state of disk device d40 is 'ONLINE to this controller' therefore connected.

```
HSG80> show d40
    LUN                                             Uses             Used by
------------------------------------------------------------------------------

  D40                                               DISK50000
        LUN ID:      6000-1FE1-0000-04A0-FFFF-FFFE-0005-0000
        IDENTIFIER = 40
        Switches:
          RUN                     NOWRITE_PROTECT        READ_CACHE
          READAHEAD_CACHE
          MAXIMUM_CACHED_TRANSFER_SIZE = 32
        Access:
          ALL
        State:
          ONLINE to this controller
          Not reserved
          NOPREFERRED_PATH
        Size: 4110480 blocks
        Geometry (C/H/S): ( 3045 / 16 / 85 )
```

5.1.3 Determining a "Not Connected Device" from an AlphaServer Console

There are a couple of ways:

- The console error message at boot time, as previously shown, is one way to determine a not connected device. This console error message is also displayed when a console disk exerciser attempts to exercise a not connected device.
- Using the WWIDMGR command, the console can also display the status of fibrechannel devices controlled by an HSG8x.

```
P00>>>wwidmgr -show wwid -udid 40 –full

[0] UDID:40 WWID:01000010:6000-1fe1-0000-04a0-ffff-fffe-0005-0000 (ev:wwid0)
 - current_unit:40 current_col: 1 default_unit: 5901
        via adapter      via fc_nport          Con    DID    Lun
 -       pga0.0.0.6.0  5000-1fe1-0000-04a2  Yes  210313    40
 -       pga0.0.0.6.0  5000-1fe1-0000-04a1  Yes  210513    40
 -       pga0.0.0.6.0  5000-1fe1-0000-04a4  No   210713    40
```

5.2 Forcing the Console to Use a Not Connected Device

5.2.1 Using FFAUTO

FFAUTO determines console behavior when the system is trying to autoboot. An autoboot is any boot other than a manual **>>>boot** command issued at the SRM console by a user. FFAUTO can be set to ON or OFF. The default state is OFF where console behavior is not affected. FFAUTO is stored in non-volatile memory therefore its state persists across system resets and power cycles.

>>> set FFAUTO ON

In the ON state, console behavior is affected during an autoboot. When the console is trying to autoboot, the console attempts to boot from each "connected" device listed in bootdef_dev. If the console reaches the end of the bootdef_dev list without successfully booting, the console goes to the beginning of the bootdef_dev list and attempts booting again. Disks that are found in the "not connected" state are changed to the "connected state", thereby enabling the console to access that device.

5.2.1.1 EXAMPLE: FFAUTO

```
P00>>>set FFAUTO ON
P00>>>set bootdef_dev dga40.1003
P00>>>b
(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0
P00>>>init

VMS PALcode V5.56-7, OSF PALcode V1.45-12
starting console on CPU 0
CPU 0 booting

(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0

Retrying, type ^C to abort...

(boot dga40.1003.0.6.0 -flags 0)
block 0 of dga40.1003.0.6.0 is a valid boot block
reading 896 blocks from dga40.1003.0.6.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 70000
initializing HWRPB at 2000
initializing page table at 1ff0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```

5.2.2 Using FFNEXT

FFNEXT determines the console behavior of the next command issued to a "not connected" device. FFNEXT can be set to either OFF or ON. The default-state is OFF where console behavior is not affected. FFNEXT is a volatile environment variable and its value is temporary therefore does not propagate across a system reset or reboot.

>>> set FFNEXT ON

In the ON-state, the console will change the next "not connected" device to a "connected" state for booting. The FFNEXT state is automatically reset to OFF after the console changes device state from "not connected" to "connected".

Resetting FFNEXT to OFF protects the user from accidentally changing the state of disks. Stated in another way, FFNEXT is a one shot. It stays in effect until a not connected device is accessed.

5.2.2.1 EXAMPLE: FFNEXT

```
P00>>>b dga40.1001
(boot dga40.1001.0.6.0 -flags 0)
dga40.1001.0.6.0 is not connected
failed to open dga40.1001.0.6.0
P00>>>set ffnext on
P00>>>b dga40.1001
(boot dga40.1001.0.6.0 -flags 0)
block 0 of dga40.1001.0.6.0 is a valid boot block
reading 896 blocks from dga40.1001.0.6.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 70000
initializing HWRPB at 2000
initializing page table at 1ff0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code


    OpenVMS (TM) Alpha Operating System, Version X6PC-SSB


halted CPU 0

halt code = 5
HALT instruction executed
PC = ffffffff8b4e2ba4
P00>>>show ffnext
ffnext              OFF

End of Examples
```

6 Changes from Previous Console Firmware Releases

6.1 V5.6

- Support on AlphaServer 800 Only for
  - DS-KZPCC-CE (64-bit PCI to three channel LVD Ultra2 SCSI backplane RAID controller) - the console contains an X86 bios emulator to support this controller.
  - DS-KGPSA-CA (64-bit PCI to Fibre Channel host bus adapter w/embedded optical)

AlphaBIOS Console V5.70

6.2 V5.5

- Console recognition of ATM adapters: DAPBA-FA, DAPBA-UA, DAPCA-FA
- **(AlphaServer 800 and Digital Server 3300 ONLY)** Console has boot support for the DE600-AA, DE600-FA, DE602-AA Ethernet cards. These cards use the Intel 82559 Ethernet chip. Note that non-Compaq Ethernet cards which use either the 82558 or 82559 Ethernet chip will be recognized from SRM console s "Intel 8255x Ethernet" cards. Note the DE600 cards are translated to Compaq Product names as follows. Refer to: http://www.compaq.com./products/networking/nics/index.html

DE600-AA = NC3123	DE602-AA = NC3131	DE602-TA = NC3132	DE602-FA = NC3133

- Console recognition of Ethernet cards: DE600-AA, DE602-AA/FA/TA.
  The DE602-FA and the DE602–TA are "daughter cards" which plug into the DE602-AA
- New PCI Device ID's for the PBXDP-AA
- AlphaBIOS Console V5.69
- ARC Console V4.59 For AlphaServer 1000 4/xxx and 1000A 5/xxx systems
- Bug fix to the Ethernet driver Fast Full Duplex Mode for the DE500-BA

6.3 V5.4

- SRM Console Changes – **1**) Console support for Intel 82558 Ethernet cards **2**) Console support for ELSA Gloria Synergy graphic cards **3**) Fibre Channel [KGPSA] on AlphaServer 800 Systems. See restrictions. **4**) Console recognition of ATM Adapters. **5**) M Console "Date command" removed
- AlphaBIOS Console V5.68 & ARC Console V4.58

6.4 V5.3

- AlphaBIOS Console V5.66 - V5.66 identifies the System Type of a Digital Server 3300 as an AlphaServer Family. This is fixed in next AlphaBIOS release (V5.68 or greater).
- ARC Console V4.57 – 1) Microsoft required that firmware understand years up to 2035 for Y2K certification. We have changed maximum year to 2050. 2) the number of parameters that can be passed to an arcapp was increased from 8 to 16, and parameter checking was added to ensure that this limit is not exceeded

- ISP1020/1040 firmware V5.57 – 1)Fix bug checking user flags set by the SXP firmware when an Interrupt is pending from the SXP to the RISC. The user flags register was latched when the interrupt was set and any new user flag bits are in the second rank of register. Testing the bit tests the value in the latch but not the flags set in the second rank. 2) Fix bug in the routine Process_WDTR_Msg where the target would never went to Message Out phase and subsequently never went to the Message Out Handler where it would send the number of message bytes. If the CDB has not been sent to the target, we need to command the SXP to set attention so that the target goes to Message Out phase.

- KZPCM-DA **PCI Bus slot restriction removed** for AlphaServer 800/Digital Server 3300 platforms

- SRM Console Changes – **1**) Device recognition of the PBXDP-AB and PBXDP-AC multi-port sync. Controller and for the DEGPA-SA Gigabit Ethernet Adapter **2**) Sparce Space expanded to 496Mb - EV5 platforms only **3**)SRM Console Environment Variable *pka0_soft_term* is no longer supports "diff" mode

6.5 V5.2

- ISP1020/1040 Firmware V5.54 -This version of ISP1020 fixes a problem with a tape drive used only *by Computer Special Systems*. V5.54 addresses the problem of improper speed negotiation with a very slow SCSI device.

- Console support for the PCI-to-Cardbus Adapter
- Console recognition of the PBXDA-AA/AB/AC and the SN-PBXNP-AA/AC adapters

6.6 V5.1

- ISP1020 firmware - V5.53

- AlphaBIOS V5.64, ARC console V4.56

- SRM Console Changes – Support for DE500-FA - 100Mb/s MultiFiber Fast EtherWorks Adapter **2**) Fix TGA8 problem that causes ARC machines to boot with colors) **3**) Support for PBXDA-AC - 16 port high performance asynchronous multiplexer controller (see restrictions) **4**) Support for PBXGI-AD - PowerStorm Advanced 3D Graphics Accelerator (see restrictions) **5**) Support for CCMAB-AA - Memory Channel 2 Adapter **6**) Support for DigitalServer 3000 Systems

6.7 V5.0

- New revision of ISP1020 firmware – V5.57 – which supports UltraSCSI devices

6.8 V4.9

- SRM Changes – 1) PCI slot restriction for the KZPBA-DB on AlphaServer 1000A **2**) FRU Table support for AlphaServer 800 systems **3**) Support for DE500-BA Adapter **4**) Latent console support for OpenVMS and DIGITAL UNIX to change console password **5**) Support to "silently update" console firmware **6**) Change ISP1020 and NCR810 display strings **7**) Update EV5 revision table **8**) Fix TGA8 problem that causes ARC machines to boot with colors

- New ARC console V4.54

6.9 V4.8

- Console support for AlphaServer 800 Systems

- New options firmware for the DEFPA (EISA-to_FDDI) I/O adapter

- ARC Console V4.52

- SRM Console Changes – 1) New LFU commands to save or restore NVRAM data to a FAT-formatted floppy diskette, and the ability to redirect console output to a FAT-formatted. 2) V4 PALcode updates to support Environment Mgmt Monitoring. 3) Enhancements to KFESA and KFESB drivers 4) Boot_reset fix to V4.7 console 5) SMM/LURT register updated for AlphaServer 1000A 4/233 systems 6) Updated ISP driver to support the ISP1040B SCSI Processor

6.10 V4.7

- SRM Changes – 1) Support of the V4.0 FRU table in the HWRPB **2**) Enabled AlphaServer 1000A Environmental Monitoring **3**) Power, fan, and temperature failure detection/reporting are supported in UNIX PALcode and later supported OpenVMS. On 1000A - available when the environmental monitoring jumper is enabled. On powerup, environment interrupts are probed to see if any are pending, and reported **4)** LFU CPU_UPGRADE script cpu_upgrade – Only for EV4 to EV5 systems upgrades. **5)** LFU script *cpu_downgrade* – Only for EV5 to EV4 systems upgrades. **6**) BOOT_RESET environment variable Is now referenced to modify the boot behavior on command line initiated boots and on forced OS reboots. If BOOT_RESET is "ON", then the system is reset prior to boot. By default BOOT_RESET is **"OFF" 7**) Added COM port environment variables **8**) SCSI drivers updated for tape boot **9**) PALcode fix for REMQTIQ (V1.19 PAL). **10**) Proper PCI Emulex module device recognition. **11**) Change COM1_BAUD rate from OS with out masking interrupts. 12) FRU table fixes for DECevent memory descriptor. **13**) Remove additional PCI FRU entries. **14**) Support for the DE500-AA Fast EtherWorks Adapter **15**) support for the Japanese Keyboard

6.11 V4.6

- SRM Changes – 1) Support for Digital Unix V3.2F and V3.2G, and V4.0A 2) for OpenVMS V6.2-1H1. 3) Support for PowerStorm Graphics (TGA2) (8- and 24-plane). Must be in VGA mode. **4**) Console recognition of the DIGITAL ATMWorks 350, Emulex PCI Sync, Thomas Conrad Token Ring, PowerStorm, and Systech Ethernet Plex. **5**) Power, fan, and temperature failure detection/reporting enhancements in UNIX PALcode only. SRM recognize and enable environment features or disable is set on powerup. On powerup environment interrupts are probed to see if any are pending. Executed during the e4 countdown sequence of the SRM. **6**) New way to probe PCI bus, powerup display is different. **7**) Changed memory display in the show config command and the in show memory command. These commands display the SIMM size of the bank. **8**) A one time diagnostic script is run on the powerup path on EV5 based systems. **9**) EV5 platforms - SROM passes to the SRM console failing memory SIMM information, which is logged to the screen and to the event log. Also logged when you have a mismatch of SIMM sizes. This information is displayed on the console and logged to the event log (el). **10)**HALT button now is latched in software. If the halt button is depressed when the console is starting, no nvram scripts are executed and the console returns >>>. If secure mode is set, you can clear the console in the following way: **11**) Login, at the enter password prompt, depress and release the halt button and then hit return. The password is now cleared. **12)** EV5 - environment variable full_powerup_diags disables the test script on powerup, default is ON. **13**) EV4 to EV5 systems upgrades - script in the update utility cpu_upgrade, which upgrades the system to EV5 SRM EV5 firmware from CD a floppy.**14**) EV5 to EV4 systems downgrades - script in the update utility called cpu_downgrade, which downgrades the console to EV4 CD or floppy. **15**) EV5 - test script is called sys_exer, not test. **16**) TGA uses the blue screen, jumpscroll and cursor in the top left. Also the backing store is turned on to re-paints the screen on console re-entry.

6.12 V4.5

- AlphaServer 1000 Model 4/xxx Model 5/xxx Systems – 1) Updating the AlphaBIOS 5.13 using the LFU update utility causes a system hang. The workaround is to set the os_type under AlphaBIOS to VMS or UNIX, initialize

the system, and then use the LFU update utility under the SRM. 2) Fixed problem of KZPSC with 16MB/32MB cache 3)Fixed incorrect speed display problem in the 'show config' command output

- AlphaServer 1000A Model 4/xxx and Model 5/xxx Systems – 1)Model 4/xxx now supports up to seven TGA1s at the console level 2) Fixed HALT button problem under UNIX PALcode 3) Restriction - restriction is that system from the console does not display devices connected to a KZPSC on the secondary bus.