DIGITAL AlphaStation 200/400 Series

Firmware Update Procedures

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Contents

Preface v

1 AlphaStation 200/400 Series Firmware Update Procedure

1.1 Updating System Firmware 1–1
1.1.1 System Firmware 1–1
1.1.2 Update Utility 1–1
1.1.3 Flash Enable Jumper 1–1
1.2 Updating an OpenVMS or DIGITAL UNIX System 1–1
1.3 Updating a Windows NT system 1–3
1.3.1 Step 1: Shutdown Windows NT and Powerup system 1–3
1.3.2 Step 2: Go to the Supplementary menu 1–3
1.3.3 Step 3: Go to the Install New Firmware selection 1–3
1.3.4 Step 4: Perform Update and System Initialization 1–3

2 Network and InfoServer Upgrades

2.1 MOP Network Upgrade 2–1
2.1.1 Step 1: Load the Firmware Update Utility Compact Disc 2–2
2.1.2 Step 2a: VMS File Copy Instructions 2–2
2.1.3 Step 2b: ULTRIX or DIGITAL UNIX File Copy Instructions 2–2
2.1.4 Step 3: Set Up Host 2–3
2.1.5 Step 4: Boot the Firmware Update Utility 2–3
2.1.6 Step 5: Perform Update 2–4
2.2 BOOTP Network Upgrade 2–4
2.2.1 Step 1: Mount the Firmware Update Utility CD-ROM 2–4
2.2.2 Step 2: Modify or Create the Client Database in the `/etc/bootptab` File 2–4
2.2.3 Step 3: Invoke `bootpd` and `tftpd` daemons 2–4
2.2.4 Step 4: Enter the Following Command 2–5
2.2.5 Step 5: Perform Update and System Initialization 2–5
2.3 InfoServer Upgrade 2–5
2.3.1 Step 1: Enter the Following Command 2–5
2.3.2 Step 2: Perform Update and System Initialization 2–6

3 PCI Options Update Utility Procedures

3.1 Firmware Update Steps 3–2
3.1.1 Disk Upgrade 3–2
3.1.1.1 Step 1: Determine Device Number for the CD-ROM Drive 3–2
3.1.1.2 Step 2: Boot from the Firmware Update Utility Compact Disc . . . 3–3
3.1.2 Using the PCI Update Help Commands 3–4
3.2 Network Upgrade 3–5

4 AlphaStation 200/400 Series Firmware Information

4.1 New Features 4–1
4.2 Support for Auto Negotiation on DE500-AA,BA,FA Fast Ethernet Controllers. 4–1
4.3 Running the NT ARC or AlphaBIOS Console 4–1
4.3.1 Step 1: Determine the Device ID of the CD-ROM Drive 4–2
4.3.2 Step 2: Change the OS type environment variable 4–2
4.3.3 Step 3: Load the Firmware Update Utility Compact Disc 4–2
4.3.4 Step 4: Boot the ARC or AlphaBios Console 4–2
4.3.5 ARC Console Setup 4–2
4.3.6 AlphaBIOS Console Setup 4–3
4.4 Adding a DEC EtherWORKS 3 Turbo Plus Ethernet Controller to an AlphaStation System 4–4
4.4.1 Identifying your AlphaStation system's current ISA bus configuration 4–4
4.4.2 Installing a Turbo Plus when there are no bus conflicts 4–6
4.4.3 Installing a Turbo Plus board where there are conflicts 4–7
4.4.4 Help Screens 4–9
4.4.5 EWRK3_CONFIG Command Information 4–9
4.5 SRM Firmware Limitations 4–9
4.5.1 Upgrading from pre-V3.4 CD firmware 4–10
4.6 AlphaStation 255 Firmware Limitations 4–11

Figures

3–1 The show device Display 3–2

Tables

1 AlphaStation 200/250 Series - SRM Compatible vi
2 AlphaStation 400 Series - SRM Compatible vii
3 AlphaStation 200/250 and AlphaStation 400 Series - ARC Compatible vii
4 AlphaStation 255 - AlphaBIOS Compatible vii
5 AlphaStation 255 - SRM Compatible viii
1–1 Update Firmware from the SRM Console 1–2
2–1 Updating System Firmware 2–1
2–2 Filenames for VMS Host 2–2
2–3 Filenames for ULTRIX or DIGITAL UNIX Host 2–2
2–4 Filenames for BOOTP Network Upgrade 2–4
2–5 Filenames for InfoServer Upgrade 2–5
3–1 Procedure for Updating System Firmware (Method 1) 3–2
4–1 Bootfiles for AlphaStation 200/400 Series 4–2

Preface

Purpose of This Guide

This guide is intended for all managers of the AlphaStation 200 and AlphaStation 400 series of systems.

This guide describes how to update the system's firmware using the Firmware Update Utility.

Purpose and Responsibility of the Firmware Update Utility

The Firmware Update Utility has been developed to allow the owners of existing and new AlphaStation 200/400 Series systems to maintain firmware on their systems. Firmware provides a number of basic functions on your system, including operating system bootstrap, configuration identification, testing and some basic input/output operations.

To assist the owner, who's responsibility it is to perform the update, a simple and user friendly interface is provided as part of the Firmware Update Utility. This program should be executed as directed by the release notes whenever new software is purchased or as directed by Digital Equipment Corporation.

Conventions

The following conventions are used in this guide:

Convention	Description
RZ2x	RZ2x refers to any of the RZ-series fixed disk drives, including the RZ24L, RZ25, and RZ26.
Return	A key name in a box indicates that you press a named key on the keyboard.
Ctrl/x	A sequence such as Ctrl/x indicates that you must hold down the key labeled Ctrl while you press another key.
`show config`	This typeface denotes commands and command output. Commands are not case-sensitive except where specifically indicated.
italics	Italicized letters indicate a variable value that you must provide. For example, `>>> set` *`variable`* Return
Caution	Cautions provide information to prevent damage to equipment or software.
Warning	Warnings contain information to prevent personal injury.

Firmware and Operating System Revisions

Notes

Systems that have shipped recently may have firmware revisions at a higher level than is in this kit. The higher level firmware revisions support the revisions of the operating systems that are currently shipping. Some files on the CD-ROM are from previous firmware releases. Systems should not be loaded with older firmware than is presently installed.

The system firmware on this CD has a unique revision and is independent of the revision of this firmware kit.

Tables 1, 2, 3, 4 and 5 show the compatibility between the firmware revisions and revisions of OpenVMS, DIGITAL UNIX, and Windows NT.

Table 1 AlphaStation 200/250 Series - SRM Compatible

SRM Firmware	OpenVMS	DIGITAL UNIX
X5.0-29	6.2	3.2c
X5.2-29	6.2, 6.2-1h1, 7.0	3.2c
V6.0-943	6.2, 6.2-1h1, 6.2-1h2, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.1-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.2-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.3-4	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.4	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.5	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.6	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.7	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.8	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.9	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V7.0	6.2-1h2,6.2-1h3, 7.0, 7.1, 7.2	3.2c, 4.0x

Table 2 AlphaStation 400 Series - SRM Compatible

SRM Firmware	OpenVMS	DIGITAL UNIX
X5.0-30	6.2	3.2c
X5.2-30	6.2, 6.2-1h1, 7.0	3.2c
X6.0-943	6.2, 6.2-1h1, 6.2-1h2, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.1-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.2-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.3-4	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.4	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.5	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.6	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.7	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.8	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.9	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V7.0	6.2-1h2,6.2-1h3, 7.0, 7.1, 7.2	3.2c, 4.0x

Table 3 AlphaStation 200/250 and AlphaStation 400 Series - ARC Compatible

ARC Firmware	Windows NT
4.45	3.51
4.49	3.51, 4.0
4.53	3.51, 4.0
4.56	3.51, 4.0
4.57	3.51, 4.0
4.58	3.51, 4.0

Table 4 AlphaStation 255 - AlphaBIOS Compatible

AlphaBIOS Firmware	Windows NT
5.12	3.51
5.21	4.0
5.30	4.0
5.64	4.0
5.65	4.0
5.66	4.0
5.68	4.0

Table 5 AlphaStation 255 - SRM Compatible

SRM Firmware	OpenVMS	DIGITAL UNIX
6.0-943	6.2, 6.2-1h1, 6.2-1h2, 7.0	3.2d, 3.2d, 4.0
V6.1-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.2-2	6.2, 6.2-1h1, 6.2-1h2,6.2-1h3, 7.0	3.2c, 3.2d, 3.2d, 4.0
V6.3-5	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.4	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.5	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.6	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.7	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.8	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V6.9	6.2-1h2,6.2-1h3, 7.0, 7.1	3.2c, 4.0x
V7.0	6.2-1h2,6.2-1h3, 7.0, 7.1, 7.2	3.2c, 4.0x

Associated Documentation

These firmware release notes do not describe how to use the console firmware commands nor do they list their error codes. You can find information about these subjects in the associated documentation listed in the following table.

Document Title	Language	Part Number
AlphaStation 400 Series User Information	English	EK-PCDSA-UI
	Spanish	EK-PCDSS-UI
	Italian	EK-PCDSI-UI
	German	EK-PCDSG-UI
	French	EK-PCDSP-UI
	Dutch	EK-PCDSH-UI
	Japanese	EK-PCDSY-UI
AlphaStation 400 Series CPU Module Information	English	EK-PCDSA-CI
	German	EK-PCDSG-CI
	Spanish	EK-PCDSS-CI
	French	EK-PCDSP-CI
	Italian	EK-PCDSI-CI
	Dutch	EK-PCDSH-CI
AlphaStation 400 Series Installation Information	English	EK-PCDSA-II
AlphaStation 200/400 Series Technical Information	English	EK-PCDSA-TI
AlphaStation 400 Series Service Information	English	EK-PCDSA-OI
AlphaStation 200 Series User Information	English	EK-PCDTA-UI
	Spanish	EK-PCDTA-US
	Italian	EK-PCDTA-UU

Document Title	Language	Part Number
	German	EK-PCDTA-UG
	French	EK-PCDTA-UP
	Dutch	EK-PCDTA-UH
AlphaStation 200 Series Installation Information	English	EK-PCDTA-II
AlphaStation 200 Series Service Information	English	EK-PCDTA-OI
AlphaStation 250 User Information	English	EK-PCCTA-UI
AlphaStation 255 User Information	English	EK-VLLXA-II

Reader Comments

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Digital Equipment Corporation
Information Design
129 Parker Street
PK03-2/2E30
Maynard, MA 01754-2199

1

AlphaStation 200/400 Series Firmware Update Procedure

This chapter explains how to update the AlphaStation 200/400 Series firmware. Topics are as follows:

- Upgrading a DIGITAL UNIX or OpenVMS system from a CD
- Upgrading a Windows NT system from a CD

1.1 Updating System Firmware

1.1.1 System Firmware

The DIGITAL AlphaStation 200/400 Series systems contain four flash ROMs, two with ARC console firmware for the Windows NT operating system and two with SRM console firmware for the DIGITAL UNIX and OpenVMS operating systems. See Table 1 and Table 2 for compatible firmware and operating system versions.

Note

If you are upgrading from pre-V3.4 CD firmware to V3.4 CD or later firmware, please refer to Chapter 4, Section 4.5.1 for very important information and procedures to follow.

1.1.2 Update Utility

Use the update utility to update your ARC and SRM firmware. The update utility contains three images: the update utility itself, the SRM image, and the ARC image. See Chapter 4, section 4.4, for limitations.

1.1.3 Flash Enable Jumper

Before you can update your system firmware, the flash ROM enable jumper must be in the write-enabled position. This is the default position. See the DIGITAL AlphaStation 200 and 400 Series User Information Documents for details.

1.2 Updating an OpenVMS or DIGITAL UNIX System

The procedure to update firmware using the Alpha Firmware CD from the SRM console is shown below.

Table 1–1 Update Firmware from the SRM Console

Update Steps		
Insert Alpha Firmware CD into CD-ROM drive	>>> show device	Find the CD-ROM device ID e.g dka400
Boot the Alpha Firmware CD	>>> Boot dka400	Boot code determines AlphaStation type then displays the firmware update file and a Bootfile: prompt.
Press the enter-key after the Bootfile prompt	Bootfile:	Use the default firmware update file
Using the serial port type update at the Update utility prompt	APU-> update	Update console and option firmware
Using the Graphic Terminal select Update using the cursor arrow keys	APU-> update	Update console and option firmware
Type exit after the firmware update is complete	APU->exit	Exit the APU and initialize the system

```
Example (from Serial Port):

>>> show device
...
... dka400.1.0.1.0  DKA400      RRD43  1084
...
>>> boot dka400
(boot dka400.1.0.1.0)
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]

    ***  AlphaStation 250/166 -- Firmware Update V7.0  ***

 Use HELP or ? for help
```

```
Update
Verify
List
Show
DEbug
NDebug
?
Apu-> update
APU-I ARE YOU READY TO PROGRAM (SRM  ) ROM DEVICE ? (Y/N) y
APU-I PRECHARGING (SRM  ) ROM DEVICE
APU-I ERASING (SRM  ) ROM DEVICE
APU-I PROGRAMMING (SRM  ) ROM DEVICE
APU-I VERIFY LOADED (SRM  ) ROM IMAGE
APU-I VERIFY LOADED (SRM  ) ROM IMAGE DONE
APU-I PROGRAMMING (SRM  ) ROM COMPLETED
APU-I PRECHARGING (ARC  /AlphaBIOS) ROM DEVICE
APU-I ERASING (ARC  /AlphaBIOS) ROM DEVICE
APU-I PROGRAMMING (ARC  /AlphaBIOS) ROM DEVICE
APU-I VERIFY LOADED (ARC  /AlphaBIOS) ROM IMAGE
APU-I VERIFY LOADED (ARC  /AlphaBIOS) ROM IMAGE DONE
APU-I PROGRAMMING (ARC  /AlphaBIOS) ROM COMPLETED
Apu-> exit
```

Cycle power on the system.

1.3 Updating a Windows NT system

This section describes how to update a system running the Windows NT operating system.

Caution

For this release you can NOT update the AlphaStation/Server 400 SRM firmware via the ARC 4.41 "Install new firmware" utility. The AlphaStation/Server 400 SRM firmware can only be updated from the SRM console (Section 1.2 in this document).

1.3.1 Step 1: Shutdown Windows NT and Powerup system

1.3.2 Step 2: Go to the Supplementary menu

This menu selection is the last choice in the `Boot Menu`.

1.3.3 Step 3: Go to the Install New Firmware selection

When selected the CDROM will be checked for the firmware update utility. This command will timeout if the proper media is not present.

1.3.4 Step 4: Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.2, steps 5-7.

2

Network and InfoServer Upgrades

This chapter explains how to perform network updates:

- MOP network upgrades
- BOOTP network upgrades
- InfoServer upgrades

2.1 MOP Network Upgrade

Note

You can use a DIGITAL UNIX system to copy the file from the Firmware Update Utility CD-ROM, but MOP is not supported under DIGITAL UNIX.

The AlphaStation 200 and 400 series of systems to be updated (target system) must be powered on and at the console prompt (>>>).

Table 2–1 lists the steps required to update the firmware on your AlphaStation 200/400 system from the network.

Table 2–1 Updating System Firmware

Step	Description
1	Place the Firmware Update Utility compact disc into the CD drive on the host system.
2	If the host is a VMS, ULTRIX, or DIGITAL UNIX system, copy the update file from the Firmware Update Utility compact disc.
3	Set up the host system.
4	Enter a network boot command from the target system.
5	Refer to Section 1.2, steps 5-7 to complete update procedure.

2.1.1 Step 1: Load the Firmware Update Utility Compact Disc

1. Remove any compact disc that may already be loaded into the CD drive.
2. Load the Firmware Update compact disc into the drive.

2.1.2 Step 2a: VMS File Copy Instructions

If your host system is VMS, copy the file from the Firmware Update Utility compact disc. Use Table 2–2 to select the proper file for your system.

Table 2–2 Filenames for VMS Host

System Model	File Name
AlphaStation 200/250	AS200_V7_0.SYS
AlphaStation 255	AS255_V8_1.SYS
AlphaStation 400	AS400_V7_0.SYS

Copy the file from the Firmware Update Utility compact disk by entering the following commands at the VMS $ prompt.

```
$ mount dka400: update_v54

$ copy dka400:[SYS0.SYSEXE]"FILENAME" mom$load:
```

2.1.3 Step 2b: ULTRIX or DIGITAL UNIX File Copy Instructions

If your host system is ULTRIX or DIGITAL UNIX, copy the file from the Firmware Update Utility compact disc. Use Table 2–3 to select the proper path and filename for your system.

Table 2–3 Filenames for ULTRIX or DIGITAL UNIX Host

System Model	Path/File Name
AlphaStation 200/250	ALPHA200/AS200_V7_0.sys
AlphaStation 255	ALPHA255/AS255_V8_1.sys
AlphaStation 400	ALPHA400/AS400_V7_0.sys

Copy the file from the Firmware Update Utility compact disk by entering the following commands at the ULTRIX or DIGITAL UNIX # prompt.

```
# mount -rt cdfs -o noversion /dev/rz4c /mnt
```

Use the Path/Filename from table in order to update your system:

```
# cp /mnt/PATH/filename/usr/lib/mop/filename
```

2.1.4 Step 3: Set Up Host

Execute the following when updating an AlphaStation 200/400 using a VMS host. You must use NCP to define the characteristics of the host and target system. You will need OPER privileges.

```
$ MCR NCP set circ CIRC_NAME state off
$ MCR NCP set circ CIRC_NAME serv enabled
$ MCR NCP set circ CIRC_NAME state on
```

Note

CIRC_NAME is the logical name of the circuit used by the network.

Execute the following only when updating an AlphaStation 200 or 400 series system using an ULTRIX host. Please note that MOP is not supported under DIGITAL UNIX.

Make sure the mop_mom process is running. If `ps aux | grep mop` does not show a `mop_mom` process, then you must start one by issuing the following command as a superuser:

```
# mop_mom
```

2.1.5 Step 4: Boot the Firmware Update Utility

To start the Firmware Update Utility, enter the `boot` command at the console prompt on the target system. The following command starts a boot process:

```
>>> boot ewa0 -fi filename
```

Note

The filename must be entered exactly as displayed by the host if you are using ULTRIX or DIGITAL UNIX.

After the boot process completes, the Firmware Update Utility menu is displayed. Note the Update Utility prompt (APU->). The following is an example of booting the AlphaStation/Server 400 update utility.

```
bootstrap code read in
base = 180000, image_start = 0, image_bytes = 800000
initializing HWRPB at 2000
initializing page table at 7de000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

 ***  AlphaStation 250/166 -- Firmware Update V7.0  ***

 Use HELP or ? for help

Update
Verify
List
Show
DEbug
NDebug
?
Apu->
```

2.1.6 Step 5: Perform Update

To complete the update procedure of your system, refer to Section 1.2, steps 5-7.

2.2 BOOTP Network Upgrade

2.2.1 Step 1: Mount the Firmware Update Utility CD-ROM

```
# mount -rt cdfs -o noversion /dev/rz4c /mnt
```

2.2.2 Step 2: Modify or Create the Client Database in the /etc/bootptab File

Use Table 2–4 for selecting proper filename used in upgrade.

Table 2–4 Filenames for BOOTP Network Upgrade

System Model	File Name
AlphaStation 200/250	AS200_V7_0.EXE
AlphaStation 255	AS255_V8_1.EXE
AlphaStation 400	AS400_V7_0.EXE

```
<host_name>:ht:<hw_type>:ha=<hw_address>:bf=<filename>:ip=<ip_address>
```

where:

- host_name is the system name in /etc/hosts.
- hw_type is the hardware type. Proteon is ht = 4. Ethernet is ht = 1. Regular token-ring (IEEE 802) is ht = 6.
- hw_address is the hardware address: use the console command show device.
- ip_address is the corresponding Internet protocol address of the system name in /etc/hosts.

The following is an example of a bootptab file:

```
bigsox:ht=1:ha=08002b236423:bf=/mnt/ALPHA200/AS200_V6_7.EXE;1:ip=16.182.0.87
```

2.2.3 Step 3: Invoke bootpd and tftpd daemons

- Modify the /etc/inetd.conf file. Uncommon the tftp and bootps process. It should look like the following example:

```
tftp   dgram udp wait root    /usr/sbin/tftpd   tftpd /mnt
bootps dgram upd wait root    /usr/sbin/bootpd  bootpd
```

- Find the process /usr/sbin/inetd daemon:

```
# ps aux | grep ine
# kill process#
```

- Restart the `inetd` daemon:

```
# /usr/sbin/inetd
```

Note

The `bootpd` and `tftp` daemon will be removed if the system is rebooted. Refer to the manual pages: bootpd(8) or tftpd(8) for more information.

2.2.4 Step 4: Enter the Following Command

Prior to entering the `>>> boot ewa0` command, the user must perform the generic bootp setup as described in Section 4.5, SRM Firmware Limitations.

2.2.5 Step 5: Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.2, steps 5-7.

2.3 InfoServer Upgrade

Be certain to:

- Insert the compact disc into a CD-ROM reader that is connected to the InfoServer.
- The InfoServer kernel must be at a minimum revision of 2.2 and MOP must be enabled on the InfoServer.

2.3.1 Step 1: Enter the Following Command

To perform an upgrade using the InfoServer, select the proper file name from Table 2–5 for your system.

Table 2–5 Filenames for InfoServer Upgrade

System Model	File Name
AlphaStation 200/250	AS200_V7_0
AlphaStation 255	AS255_V8_1
AlphaStation 400	AS400_V7_0

Enter the following command line. The filename **must** be in uppercase.

```
>>> boot ewa0 -fi FILENAME
```

The following is an example of updating an AlphaStation 250:

```
bootstrap code read in
base = 180000, image_start = 0, image_bytes = 800000
initializing HWRPB at 2000
initializing page table at 7de000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

   ***  AlphaStation 250/166 -- Firmware Update V7.0  ***

 Use HELP or ? for help

Update
Verify
List
Show
DEbug
NDebug
?
Apu->
```

2.3.2 Step 2: Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.2, steps 5-7.

3

PCI Options Update Utility Procedures

This chapter explains how to update the firmware in PCI options that contain flash ROMs. The topics are as follows:

- Updating the PCI option firmware
- Using the PCI Update help commands

Note

Some modules require an update jumper be in place before the flash ROM can be updated. Refer to the installation procedure supplied with the option.

Caution

It is important that you follow the steps for updating the system firmware carefully. Failure to perform the update procedure correctly may render your option inoperable.

3.1 Firmware Update Steps

Your option can be updated using two methods:

1. Booting the Update Utility from a CD-ROM drive
2. Booting the Update Utility from the network

If you plan to use the network procedure, go to Section 3.2.

3.1.1 Disk Upgrade

Table 3–1 indicates the steps required to update the firmware on your PCI option.

Table 3–1 Procedure for Updating System Firmware (Method 1)

Step	Description
1	Use the `show device` command to determine the device number of the compact disc drive on your system.
2	Boot your system from the Firmware Update Utility disc.

3.1.1.1 Step 1: Determine Device Number for the CD-ROM Drive

To run the Firmware Update Utility, you need to boot your system from the compact disc drive and the system must be in console mode. To do this, you need the device number of the disc drive.

To obtain the device number of the CD-ROM drive, enter a `show device` command at the console prompt and press the Return key as shown in Figure 3–1. A list of all device numbers on your system is displayed in the BOOTDEV column. Check the DEVNAM column for the device names.

Figure 3–1 The show device Display

```
>>>  show device Return
  BOOTDEV    ADDR      DEVTYPE    NUMBYTES    RM/FX   WP  DEVNAM   REV
  -------    ----      -------    --------    -----   --  ------   ---
  ESA0       08-00-2B-12-00-9C
  DKA100     A/1/0     DISK       426.25MB    FX          RZ25     0700
  DKA400     A/4/0     RODISK       .....     RM      WP  RRD42    4.3d
  ..HostID.. A/7       INITR
  DKB400     B/4/0     RODISK       .....     RM      WP  RRD43    0064
  ..HostID.. B/7       INITR
```

In Figure 3–1, the device number of the RRD42 drive is DKA400 and the RRD43 drive is DKB400. You would use either device number to boot your system. For more information about the `show device` command, see the owner's guide for your system.

3.1.1.2 Step 2: Boot from the Firmware Update Utility Compact Disc

To start the Firmware Update Utility, type the `boot` command, flags, and device number, then press the Return key.

You will see a display similar to the following as your system starts the boot process:

```
>>>  boot -fl 0,A0 dka400 Return
INIT-S-CPU...
AUDIT_CHECKSUM_GOOD
AUDIT_LOAD_BEGINS
AUDIT_LOAD_DONE
```

The Firmware Update Utility will then prompt you for the name of the boot file that you want to boot, as follows:

```
BOOTFILE:
```

Enter the file name of the Firmware Update Utility as follows:

```
BOOTFILE:  [dir]filename Return
```

The following is the PCI update directory and filename on the CD-ROM for the AlphaStation 200 and AlphaStation 250:

[ALPHA200]AS200_PCI_V1_4.EXE

The following is the PCI update directory and filename on the CD-ROM for the AlphaStation 255:

[ALPHA255]AS255_PCI_V1_4.EXE

The following is the PCI update directory and filename on the CD-ROM for the AlphaStation/Server 400:

[ALPHA400]AS400_PCI_V1_4.EXE

Note

The file name of the Firmware Update Utility will change with each new release. Refer to the documentation that comes with your Firmware Update Utility compact disc for the correct file name.

The following information is displayed after the boot file is loaded:

```
*** PCI Loadable Firmware Update Utility V1.4 ***
------------------------------------------------------------------------
 Function    Description
------------------------------------------------------------------------

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

UPD>
```

3.1.2 Using the PCI Update Help Commands

To enter the help display, enter `help` at the UPD-> prompt:

```
UPD-> help

*** PCI Loadable Firmware Update Utility V1.4 ***
------------------------------------------------------------------------
 Function    Description
------------------------------------------------------------------------

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

UPD>
```

The `help` command displays a brief description of the update-related commands. The `help` commands are described in the following table:

You may also get help on a selected item in the HELP table. For example to get help for UPDATE, enter `help update` at the UPD-> prompt:

```
UPD->help update

Update a particular device with LFU's firmware.
   The command format is: UPDATE [DEVICE] [-PATH FILENAME]
   For example:

           update *
       or  update

   Will update all LFU supported devices found in this system

           update io

   Will update the device named IO
   Use the LIST command to see the supported LFU devices

   You can optionally update a device with different firmware than
   defaulted to by LFU, by using the -PATH switch.
   For example:

           update io -path mopdl:new_firm/eza0

   Will update the device named IO with firmware NEW_FIRM from the
   network.

UPD>
```

- Use the `list` command to show a list of memory-loaded images, plus a list of currently supported flash ROMs:

Enter the `list` command as shown in the following example:

```
UPD-> list

Device       Current Revision    Filename        Update Revision

fwa0             2.46            dfpaa_fw            2.46

pka0           A06               kzpsa_fw            A07
```

Note

Currently there are only two PCI devices supported by this PCI Update Utility. They are the PCI FDDI option (device: fwa0) and the PCI KZPSA option (device: pka0).

- Use the `update` command to update the adapter ROM, as shown in the following example:

```
UPD-> update pka0

Confirm update on:
pka0
[Y/(N)]Y

WARNING: updates may take several minutes to complete for each device.
                          DO NOT ABORT!
pka0      Updating to A07...  Verifying A07...  PASSED.

UPD>
```

- Use the `verify` command to verify the adapter ROM, as shown in the following example:

```
UPD-> verify

fwa0            Verifying 2.46...  PASSED.

pka0            Verifying A07...  PASSED.

UPD>
```

3.2 Network Upgrade

The procedure to update from a network is the same procedure used for the AS 200 systems. Use the instructions in Section 2.1 MOP Network Upgrade and Section 2.2 BOOTP Network Upgrade to update the firmware in your PCI option. The following information will detail any differences between procedures.

In Section 2.1, MOP Network Upgrade, the VMS copy command for the AlphaStation 200 and AlphaStation 250 is:

```
$ copy dka400:[SYS0.SYSEXE]AS200_PCI_V1_4.SYS mom$load:
```

The VMS copy command for the AlphaStation 255 is:

```
$ copy dka400:[SYS0.SYSEXE]AS255_PCI_V1_4.SYS mom$load:
```

The VMS copy command for the AlphaStation/Server 400 is:

```
$ copy dka400:[SYS0.SYSEXE]AS400_PCI_V1_4.SYS mom$load:
```

In Section 2.1, MOP Network Upgrade, the ULTRIX/ DIGITAL UNIX copy command AlphaStation 200 and the AlphaStation 250 is:

```
#  cp /mnt/ALPHA200/AS200_PCI_V1_4.SYS /usr/lib/mop/filename
```

The ULTRIX/ DIGITAL UNIX copy command AlphaStation 255 is:

```
#  cp /mnt/ALPHA255/AS255_PCI_V1_4.SYS /usr/lib/mop/filename
```

The ULTRIX/ DIGITAL UNIX copy command AlphaStation/Server 400 is:

```
#  cp /mnt/ALPHA400/AS400_PCI_V1_4.SYS /usr/lib/mop/filename
```

In Section 2.2, BOOTP Network Upgrade, the correct path for the PCI Update Utility for the AlphaStation 200 and the AlphaStation 250 is:

```
/mnt/ALPHA200/AS200_PCI_V1_4.EXE
```

The correct path for the PCI Update Utility for the AlphaStation 255 is:

```
/mnt/ALPHA255/AS255_PCI_V1_4.EXE
```

The correct path for the PCI Update Utility for the AlphaStation/Server 400 is:

```
/mnt/ALPHA400/AS400_PCI_V1_4.EXE
```

4

AlphaStation 200/400 Series Firmware Information

This section describes new features and limitations of the present firmware upgrade.

4.1 New Features

- Added support for HSG forced failover
- Added SRM2ctrl env var

4.2 Support for Auto Negotiation on DE500-AA,BA,FA Fast Ethernet Controllers.

A new feature has been added to the firmware ethernet driver which enables the de500-*a controllers to be configured for auto negotiation of link speed. This is currently supported on the DE500-AA,BA,FA only.

A new selection for EWXX_MODE = auto-negotiate will enable the DE500-*A to start auto negotiation. This will be initiated when

```
>>> set ewxx_mode auto-negotiate
```

command is issued at the console. Once set, the controller will auto negotiate the speed with the remote partner during every powerup and for every soft/hard inits.

If the remote partner does not have auto negotiation abilities, the de500-*a will default to it's full capability ie, 100Mb/Full-duplex. The ewxx_mode will however still remain set to auto-negotiate.

Once a link has been established , the controller will remain in that mode until it is reset by OS drivers. To perform renegotiation after the link has been disconnected, a soft/hard init has to be done.

4.3 Running the NT ARC or AlphaBIOS Console

The SRM console has the ability to run either the NT ARC or AlphaBIOS consoles without having to re-flash the system via the firmware update utility. When following the steps below, a temporary NT ARC or AlphaBIOS runtime environment will be created. The console environment will return to the normal SRM console following a power cycle of the system. This temporary NT ARC or AlphaBIOS environment can be used to boot the NT operating system or to run ARC or AlphaBIOS based utilities.

To Start the NT ARC or AlphaBios Console Environment perform the following steps:

```
ff.fe.fd.fc.fb.fa.f9.f8.f7.f6.f5.
ef.df.ee.ed.ec.f4.eb.....ea.e9.e8.e7.e6.e5.
V6.7-1, built on Sep 1 1997 at 14:53:34
>>>
```

4.3.1 Step 1: Determine the Device ID of the CD-ROM Drive

At the console prompt (>>>), enter the `show device` command.

```
>>>show device

dka0.0.0.6.0           DKA0                            RZ26L  440C
dka400.4.0.6.0         DKA400     TOSHIBA CD-ROM XM-4101TA  0064
dva0.0.0.0.1           DVA0
ena0.0.0.1.1           ENA0              08-00-2B-38-67-6B
pka0.7.0.6.0           PKA0                  SCSI Bus ID 7
```

In the example, the CD-ROM drive has a device ID of DKA400.

4.3.2 Step 2: Change the OS type environment variable

At the console prompt (>>>), enter the following command `set os_type nt`

4.3.3 Step 3: Load the Firmware Update Utility Compact Disc

1. Remove any compact disc that may already be loaded into the CD drive.
2. Load the Firmware Update compact disc into the drive.

4.3.4 Step 4: Boot the ARC or AlphaBios Console

Boot the system from the update utility disk, using the device ID determined in step 2.

Use Table 4–1 to select the correct file to be used to boot your system.

Table 4–1 Bootfiles for AlphaStation 200/400 Series

Model	Bootfile
AlphaStation 200, 250	[ALPHA200]ARCBOOT.EXE
AlphaStation 255	[ALPHA255]ABBOOT.EXE
AlphaStation 400	[ALPHA400]ARCBOOT.EXE

Note: If the system has new been run in the ARC or AlphaBIOS environment before, certain environment variables will need to be set up.

4.3.5 ARC Console Setup

Typically the ARC console starting up in this temporary environment for the first time will require set up of its configuration tree and certain environment variables. To proceed with setup follow these steps:

- Select language from the language setup screen
  - Select Supplementary Menu
  - Select Set up the System
  - Select Set default environment variables

In order to boot Windows NT you will need to enter the default media where Windows NT can be located, the scsi bus number, scsi id, and partition information.

- Select Set default Configuration

In this menu you will need to set up the monitor type, floppy drive configuration, keyboard type, and scsi host id.

- Select Supplementary menu, and save changes

Note: If you do not wish to boot Windows NT but only need to execute a utility program, select "Run a program" from the Boot menu and then enter the proper path and file name.

At this point you may be required to set up the boot device. If so follow these remaining steps:

- Select Supplementary menu again
- Select Set up the System
- Select Manage boot selection menu
- Select Add a boot selection

Identify the boot partition information, osloader directory, the operating system root directory, and finally a unique name for this boot selection.

- Select Setup menu
- Select Supplementary menu, and save changes
- Select Boot menu

At this point the system is ready to boot Windows NT. The setup information will remain intact any time you re-enter the ARC environment. Note: When the system is power cycled it will return to the SRM console environment.

At the console prompt `(>>>)`, enter the following command `set os_type unix` or `set os_type vms`

4.3.6 AlphaBIOS Console Setup

Typically the AlphaBIOS console starting up in this temporary environment for the first time will require some set up. If NT has never been run on the system the following message may appear: AlphaBios determines that the NVRAM data is not Valid

- Press F2 to enter setup and configure the system.
- Select Utilities
- Select OS Selection Setup (see note)

Enter Boot Name, Boot File, and OS Path partition information using the menu provided.

Note

Alternatively, if you wish to run a utility program select the "Run Maintenance Program" menu item from the "Utilities" menu and enter the path and filename info.

4.4 Adding a DEC EtherWORKS 3 Turbo Plus Ethernet Controller to an AlphaStation System

The DEC EtherWORKS 3 Turbo Plus board is an Ethernet Controller that plugs into an ISA bus expansion slot. This release note covers the specific configuration tasks required to install the board into an AlphaStation system. Use this release note in conjunction with the ‘‘DEC EtherWORKS 3 Turbo Ethernet Controller User Information’’ (EK-LEMAC-OM).

The Turbo Plus (DE205) contains an EEPROM that holds device configuration information such as the I/O Base address, IRQ value, and memory address. Your Turbo Plus board is shipped with the following pre-programmed factory-default settings:

- I/O Base address: 300h (h = hexadecimal)
- Interrupt value (IRQ): 5
- Memory address: d0000h

When adding devices on the ISA bus, bus conflicts are a real possibility. There could already be another device using I/O address 300h, IRQ 5, or memory address d0000h. If there is not a conflict when adding your first Turbo Plus, there surely is if you decide to add an additional Turbo Plus since both boards have the same default settings.

To facilitate the installation of the Turbo Plus into an AlphaStation, you should use the procedures below. The procedures are divided into the following areas:

- Identifying your AlphaStation system’s current ISA bus configuration.
- Installing a Turbo Plus when there are no bus conflicts.
- Installing a Turbo Plus when there are conflicts.

4.4.1 Identifying your AlphaStation system’s current ISA bus configuration

1. Shut down the operating system.
2. From the SRM console prompt, type:

```
>>>show config
```

The system responds with a display similar to the following:

```
Firmware
SRM Console:   V7.0-7
ARC Console:   4.58
PALcode:       VMS PALcode X5.48-107, OSF PALcode X1.35-76
Serial ROM:    V4.6
Diag ROM:      V1.6

Processor
DECchip (tm) 21064-2    166Mhz 512KB Cache
```

```
MEMORY
     32 Meg of System Memory
     Bank 0 = 16 Mbytes(8 MB Per Simm) Starting at 0x0
     Bank 1 = 16 Mbytes(8 MB Per Simm) Starting at 0x1000000
     Bank 2 = No Memory Detected

PCI Bus
     Bus 00 Slot 06: NCR   810 Scsi Controller
                               pka0.7.0.6.0     SCSI Bus ID 7
                               dka0.0.0.6.0     RZ26L
                               dka400.4.0.6.0   RRD43

     Bus 00 Slot 07: Intel SIO 82378

     Bus 00 Slot 11: DIGITAL ZLXp Graphics Controller

     Bus 00 Slot 12: DIGITAL DE435 Network Controller

                                ewa0.0.0.12.0       08-00-2B-E2-1C-25

ISA
Slot   Device   Name    Type        Enabled     BaseAddr   IRQ    DMA
0      0        MOUSE   Embedded    Yes           60       12
       1        KBD     Embedded    Yes           60       1
       2        COM1    Embedded    Yes           3f8      4
       3        COM2    Embedded    Yes           2f8      3
       4        LPT1    Embedded    Yes           3bc      7
       5        FLOPPY  Embedded    Yes           3f0      6      2
2
       0        PCXBJ   Singleport  Yes           530      9      0
```

3. From the information displayed in the previous step you can see the I/O Base address (BaseAddr) and IRQ of the ISA devices that are known to the SRM console. Note that the Turbo Plus default base address (300) and IRQ (5) are available.

4. To check if there are any Turbo Plus boards installed, but not known to the console, use the EWRK3_CONFIG utility by typing:

   ```
   >>>ewrk3_config
   >>>
   ```

   If any Turbo Plus boards are present on your AlphaStation system, this command displays their I/O Base addresses, otherwise the prompt returns with no message as shown above.

5. The ISACFG utility is used to determine if any ISA devices are using memory. Type the isacfg command using the slot number of an ISA device from the show config command. (The slot number is a unique number used for device identification and does not relate to a physical slot number.) For example:

   ```
   >>>isacfg -slot 2
   ```

   The system responds with a display similar to the following: Note that I/O base address is equal to iobase0, IRQ is equal to irq0, and Memory address is equal to membase0.

```
============================================================
handle: PCBXJ
etyp: 1
slot: 2 dev: 0
enadev: 1
totdev: 1
iobase0: 530 membase0: 8000000000000000
iobase1: 388 memlen0: 8000000000000000
iobase2: 8000000000000000 membase1: 8000000000000000
iobase3: 8000000000000000 memlen1: 8000000000000000
iobase4: 8000000000000000 membase2: 8000000000000000
iobase5: 8000000000000000 memlen2: 8000000000000000
rombase: 8000000000000000
romlen: 8000000000000000
dmamode0/chan0: 0 irq0: 9
dmamode1/chan1: 1 irq1: 80000000
dmamode2/chan2: 80000000 irq2: 80000000
dmamode3/chan3: 80000000 irq3: 80000000
============================================================
```

Note that in the above display for the device in slot 2, the membase0 is 8000000000000000. This means memory is not being used by this device. None of the devices in slot 0 use memory, so there is no conflict if the Turbo Plus factory default memory address (d0000h) is used.

6. If there are no conflicts proceed to section II. If there are conflicts, proceed to section III.

4.4.2 Installing a Turbo Plus when there are no bus conflicts

1. If there are no conflicts with the Turbo Plus default settings and the information you gathered in the previous section, type the following SRM console command:

   ```
   >>>add_de205
   ```

   This command executes a script containing the following isacfg command:

   ```
   >>>isacfg -mk -slot 1 -dev 0 -handle DE200-LE -irq0 5 -iobase0 300
   -membase0 e0000 -memlen0 10000 -etyp 1 -enadev 1
   ```

   Notes

   The above command script assumes that slot 1 is unused. If slot 1 is used on your system, enter the above command manually and choose an unused slot number. Refer to the ISA Configuration Utility section for more information.

2. At the SRM prompt, type:

   ```
   >>>init
   ```

   This saves the changes just made to the configuration database into non-volatile RAM.

3. Install the Turbo Plus board into the system. Refer to Chapter 1 of the DEC EtherWORKS 3 Turbo Ethernet Controller User Information for instructions.

4. After the board is installed, from the SRM console prompt, type:

```
>>>ewrk3_config
found board addr=300
```

The system responds with the I/O base address of the Turbo Plus board.

5. Boot the operating system.

4.4.3 Installing a Turbo Plus board where there are conflicts

You are in this section because adding your Turbo Plus board would result in conflicts among devices on the ISA bus. These conflicts could be caused by devices having the same I/O base address, IRQ, or memory address. One likely reason for conflict is that you are adding a second or third Turbo Plus board.

1. Using the I/O base address, IRQ, and memory address values that you gathered in the first section of this release note, and the list of available values for the Turbo Plus board from Appendix A of the DEC EtherWORKS 3 Turbo User Information, locate non-conflicting values. Note that IRQ11 is not available on AlphaStations.

Record the desired values here:	I/O Base address	_ _ _ _ _ _ _
	IRQ	_ _ _ _ _ _ _
	Memory Address	_ _ _ _ _ _ _

2. Enter the Turbo Plus data into the console database by typing:

Note

The isacfg command can be entered on multiple lines by typing a backslash at the end of the line. The up arrow can be used to recall previous commands.

```
>>>isacfg -slot 15 -irq0 10 -iobase0 320 -membase0 d0000 \
_> -mk -handle DE200-LE -etyp 1 -enadev 1 -memlen0 10000
```

Where for this example:

- The -slot number can be any unused slot number (15 in this example).
- The -irq0 value is an available IRQ (10).
- The -iobase0 value is an available I/O Base address (320h).
- The -membase0 value is an available Memory Address (d0000h).

Always enter the other parameters as shown, where:

- -mk specifies that this entry is being added to the database.
- -handle binds the name DE200-LE to the driver. The Turbo Plus board (DE205) uses the handle DE200-LE.
- -etyp specifies the type of option (1 = singleport device).
- -enadev specifies that the entry is being enabled (1).
- -memlen0 specifies the length of the memory region.

If you need to modify an existing entry, use the -mod option. For example, if the Turbo Plus IRQ was entered as 10, but should have been 15, type:

```
>>>isacfg -slot 15 -irq0 15 -mod
```

Slot 15 identifies the entry to be modified with the new value of irq0.

3. At the SRM prompt, type:

   ```
   >>>init
   ```

4. If the I/O Base address (default, 300) of the Turbo Plus board is in conflict with another ISA device, use a hardstrap override to temporarily change the board's address. Table 1-1 and Figure 1-6 in the DEC EtherWORKS 3 User Information describe how to do the override.

5. Install the Turbo Plus board into the system. Refer to Chapter 1 of the DEC EtherWORKS 3 Turbo Ethernet Controller User Information for instructions.

6. Use the EWRK3_CONFIG utility to modify the Turbo Plus board's values:

   ```
   >>>ewrk3_config -curaddr 200 -ioaddr 320 -irq 10 -memaddr d0000
   ```

   Where:

   - -curaddr is the temporary hardstrap override I/O Base address (W1 and W2 both in).
   - -ioaddr is the I/O Base address (320) that will be used when the hardstrap override is removed and was the I/O address entered as -iobase0 in step 2 of this section.
   - -irq is the value of the IRQ (10) and was the same IRQ entered as -irq0 in step 2 of this section.
   - -memaddr is the value of the Base memory address (d0000) and was the same address entered as -membase0 in step 2 of this section.

   The system responds with the message:

   ```
   Unit must be power cycled for these changes to take affect
   ```

7. Power off the system.

8. Remove the new Turbo Plus board and disable the hardstrap override by removing W1 and W2.

9. Re-insert the new Turbo Plus board, close the cover, and power on the system.

10. At the SRM prompt, type:

    ```
    >>>ewrk3_config
    found board addr=300
    found board addr=320
    ```

    The system indicates that two Turbo Plus boards were found.

    If you see an error message such as:

    ```
    *** Error (ena0), network station address ROM has a bad checksum,
    ```

    compare the I/O Base address reported by the ewrk3_config command with the I/O address displayed by the show config command. If the ewrk3_config command reported the address you expected, return to Section III, Step 2 and modify the I/O base address (iobase0) with the isacfg command.

If the ewrk3_config command reported an address you did not expect, return to Section III, Step 6 and modify the I/O base address with the ewrk3_config command.

4.4.4 Help Screens

Help screens are available for ISACFG and EWRK3_CONFIG. At the SRM console prompt, type:

```
>>>help isacfg
```

or

```
>>>help ewrk3_config
```

4.4.5 EWRK3_CONFIG Command Information

EWRK3_CONFIG is a utility that sets up the DE205 on board EEPROM.

Invoking "ewrk3_config" with no parameters searches the entire address space for DE205 modules and displays the addresses of all modules found.

The parameters for ewrk3_config command are:

none	Find all DE205 boards and display their I/O Base address
-curaddr	The current hex I/O base address of the module being changed
-ioaddr	The hex I/O base address to change the current module
-irq	The decimal IRQ value (valid values are 5, 10 or 15)
-fbus	Fast bus enable
-ena16	16 bit bus enable
-memaddr	Base memory address the board should respond to
-bufsize	Buffer size of the memory address (2K, 32K or 64K)
-swflag	Software flag field
-netmgt	Net management field
-default	Set the board back to the default settings

4.5 SRM Firmware Limitations

- Should a boot file ‘‘pathname’’ be necessary for either MOP or TCP/IP booting, you should enclose the pathname in quotes. For example:

```
>>>boot ewa0 -file "/dir1/dir2/filename"
```

- For this release you can NOT update the AlphaStation/Server 400 SRM firmware via the ARC 4.41 "Install new firmware" utility. The AlphaStation /Server 400 SRM firmware can only be updated from the SRM console (Section 1.2 in this document).

4.5.1 Upgrading from pre-V3.4 CD firmware

Problem:

When upgrading from pre-V3.4 CD firmware to V3.4 CD or later firmware the ISA data stored in NVRAM may become corrupted. As a result, operating systems may have difficulty configuring ISA devices, and may experience crashes.

Platforms:

AlphaStations 200/250/400

Solution:

Follow the procedure below:

1. Prior to upgrading the firmware:

From the console prompt, issue the following command, and record the device information:

```
>>> isacfg -all
```

Information about built-in ISA devices does not need to be recorded, since the default values will be written to NVRAM during initialization. For the AlphaStation 200, 250 and 400, the devices whose information DO NOT need to be recorded are:

```
MOUSE
KBD
COM1
COM2
LPT1
Floppy
```

Information about other ISA devices should be recorded, since their information will be lost during ISA NVRAM initialization.

Device fields which contain either 8000000000000000 or 80000000 do not need to be recorded, since these values represent default values.

For example, the following information might be printed for a DE200-LE device:

```
handle: DE200-LE
etyp: 1
slot: 1
dev: 0
enadev: 1
totdev: 1
iobase0: 300   iobase1: 8000000000000000
iobase2: 8000000000000000   iobase3: 8000000000000000
iobase4: 8000000000000000   iobase5: 8000000000000000
membase0: d0000   memlen0: 10000
membase1: 8000000000000000   memlen1: 8000000000000000
membase2: 8000000000000000   memlen2: 8000000000000000
rombase: 8000000000000000   romlen:   8000000000000000
dma0: 80000000          irq0: 5
dma1: 80000000          irq1: 80000000
dma2: 80000000          irq2: 80000000
dma3: 80000000          irq3: 80000000
```

The fields that should be recorded are:

```
handle, etyp, slot, dev, enadev, totdev, iobase0, membase0,
memlen0, & irq0.
```

2. Perform the firmware upgrade by following the firmware's update procedure.

3. Reinitialize the ISA data with the isacfg command:

```
>>>  isacfg -init
```

4. Use the isacfg command with the -mk qualifier to re-enter the information recorded in step 1, above. The fields should be entered as qualifiers, prepended with a dash, and followed by the fields values. The first fields should be -handle, -slot and -dev. The dma<0-7> field should be entered as -dmachan<0-7>. (i.e. for the field dma0, use the qualifier -dmachan0)

For example, the information for the DE200-LE in step 1 would be:

```
>>> isacfg -mk -handle DE200-LE -slot 1 -dev 0 -etyp 1 -enadev
1 \ -totdev 1 -iobase0 300 -membase0 d0000 -memlen0 10000 \ -irq0 5
```

Note

In the above example, a backslash is used for line continuation. This is just for illustration. The firmware does not allow line continuation, and the command must be entered on a single line.

After each isacfg command, the firmware will print the following message:

```
type >>>init to use these changes
```

This can be ignored until after all device isacfg information commands are entered, then use the init command to re-initialize the firmware.

```
>>> init
```

4.6 AlphaStation 255 Firmware Limitations

You can use the AlphaStation 255 sysytem configuration switches to clear the real-time clock memory and non-volatile RAM. On OpenVMS and DIGITAL UNIX systems, which use the SRM console), certain default environmental variables are assigned as a result of the clearing action. The current version of firmware (DROM V1.5) assigns the following default values:

- bus_probe_algorithm = old

Before rebooting the system, change the above values, as shown below:

If your system is running the DIGITAL UNIX V3.2c or higher, you must change the bus_probe_algorithm value to "new", using the following commands:

```
>>> set bus_probe_algorithm new
>>> init
```