DEC 3000 ™ Systems and TURBOchannel™ Options

Update Utility Procedures

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Preface

Purpose of This Guide

This guide is intended for all users of the following systems:

- DEC 3000 Model 300/300L/300X/300LX
- DEC 3000 Model 400/400S/600/600S/700
- DEC 3000 Model 500/500S/500X/800/800S/900
- TURBOchannel options: AV300-AA, KZTSA, PMAF-FA, PMAF-FS, PMAF-FD, PMAF-FU, PMAGB-BA, PMAGC-AA, PMAGC-BA, PMAZB-AA, PMAZC-AA, PMAGD, PMAGD-AA, PMAT-AA, DGLTA.

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

Purpose and Responsibility of the Loadable Firmware Update Utility

The Loadable Firmware Update Utility has been developed to allow the owner of existing and new DEC 3000 systems or TURBOchannel options a method to maintain firmware on their system or options. Firmware exists on the main system board(s) and on many existing options. 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 Loadable 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.

Convention	Description
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 System Revisions

Note

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.

Note

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

The following tables show the compatibility between the firmware revisions and revisions of OpenVMS and DIGITAL UNIX.

Table 1 DEC 3000 Model 300/300L

Firmware Rev	OpenVMS	DIGITAL UNIX
5.2	6.1, 6.1-1H1	2.1, 3.0
6.0	6.1, 6.1-1Hx,	3.0, 3.0B, 3.2
6.1	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2
6.2	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.4	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.5	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.6	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.7	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.8	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.9	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x
7.0	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x

Table 2 DEC 3000 Model 300X/300LX

Firmware Rev	OpenVMS	DIGITAL UNIX
5.2	6.1, 6.1-1H1	2.1, 3.0
6.0	6.1, 6.1-1Hx,	3.0, 3.0B, 3.2
6.1	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2
6.2	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.4	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.5	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.6	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.7	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.8	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.9	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x
7.0	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x

Table 3 DEC 3000 Model 400/400S/600/600S

Firmware Rev	OpenVMS	DIGITAL UNIX
5.2	6.1, 6.1-1H1	2.1, 3.0
6.0	6.1, 6.1-1Hx,	3.0, 3.0B, 3.2
6.1	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2
6.2	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.4	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.5	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.6	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.7	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.8	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.9	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x
7.0	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0x

Table 4 DEC 3000 Model 500/500S/500X/800/800S

Firmware Rev	OpenVMS	DIGITAL UNIX
5.2	6.1, 6.1-1H1	2.1, 3.0
6.0	6.1, 6.1-1Hx,	3.0, 3.0B, 3.2
6.1	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2
6.2	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.4	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.5	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.6	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.7	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.8	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.9	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0b
7.0	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0b

Table 5 DEC 3000 Model 700 and Model 900

Firmware Rev	OpenVMS	DIGITAL UNIX
5.2	6.1, 6.1-1H1	2.1, 3.0
6.0	6.1, 6.1-1Hx,	3.0, 3.0B, 3.2
6.1	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2
6.2	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.4	6.1, 6.1-1Hx, 6.2H-1Hx	3.0, 3.0B, 3.2, 3.2c
6.5	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.6	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.7	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.8	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0	3.0, 3.2x, 4.0
6.9	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0b
7.0	6.1, 6.1-1Hx, 6.2H-1Hx, 7.0, 7.1	3.0, 3.2x, 4.0, 4.0b

TURBOchannel Firmware Revisions

The TURBOchannel Update Utility Version 1.4 supports the devices shown in Table 6.

Table 6 TURBOchannel Device Firmware

Device	Revision
AV300-AA	V1.1
KZTSA	A11
PMAF-FA	V3.1
PMAF-FS	V3.1S
PMAF-FD	V3.1D
PMAF-FU	V3.1U
PMAGB-BA	V1.1
PMAGC-AA	V1.2
PMAGC-BA	V1.2
PMAT-AA	V2.8
PMAZB-AA	V2.0
PMAZC-AA	V2.3
PMAGD	BL2.1
PMAGD-AA	BL2.1
DGLTA-FA	V1.1

Related 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.

Title	Part Number
DEC 3000 Model 300/300L Installation Card	EK–PELHW–IC
DEC 3000 Model 300/300L Hardware Reference Guide	EK–PELCN–OG
DEC 3000 Model 300/300L Service Guide	EK–PELCN–SV
DEC 3000 Model 400/400S Owner's Guide	EK–SNDPR–OG
DEC 3000 Model 400/400S Service Information	EK–SNDPR–SV
DEC 3000 Model 500/500S Owner's Guide	EK–FLAMI–OG
DEC 3000 Model 500/500S Pocket Service Information	EK–FLAMI–SV
DEC 3000 Model 500X Owner's Guide	EK–D5AXP–OG
DEC 3000 Model 500X Pocket Service Information	EK–HOTPI–SV
DEC 3000 Model 600/600S/700 and Model 800/800S/900 Service Information	EK–FLSPC–SV
DEC 3000 Model 600/600S/700 Owner's Guide	EK–SNDPL–OG
DEC 3000 Model 800/800S/900 Owner's Guide	EK–FLMUL–OG

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Digital Equipment Corporation
Shared Engineering Services
129 Parker Street
PKO3-2/E30
Maynard, MA 01754-2199

1

DEC 3000 Firmware Update Procedures

This chapter explains how to update DEC 3000 Model 300/300L/300X/300LX, 400/400S/600/600S/700, 500/500S/500X/800/800S/900 firmware. The following firmware update procedures are described in this chapter:

- Update from CD-ROM
- Update from MOP server
- Update from BOOTP server
- Update from InfoServer

Note

The ROM update jumper must be enabled to perform the firmware update. All models are shipped with the ROM update jumper enabled. Refer to Chapter 2 if your jumper is disabled.

If you are upgrading to a new operating system version, update the firmware first.

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 system inoperable.

1.1 Firmware Update Steps

Your system can be updated using four methods:

1. Booting the Firmware Update Utility from a CD-ROM drive.
2. Booting the Firmware Update Utility from a MOP network server.
3. Booting the Firmware Update Utility from a BOOTP network server.
4. Booting the Firmware Update Utility from an InfoServer.

If you plan to use the MOP procedure, go to Section 1.1.2. If you plan to use the BOOTP procedure, go to Section 1.1.3. If you plan to use the InfoServer procedure, go to Section 1.1.4.

1.1.1 Disk Upgrade

Table 1–1 indicates the steps required to update the firmware on your DEC 3000 system.

Table 1–1 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	Enter the `update` command to update the system firmware.
4	Exit from the Firmware Update Utility.
5	Initialize the firmware update.

1.1.1.1 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 1–1. A list of all device numbers on your system is displayed in the BOOTDEV column. Check the DEVNAM column for the device names.

Figure 1–1 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 1–1 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.

1.1.1.2 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. For instructions on how to boot from a TURBOchannel device, refer to Appendix B.

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

```
>>>   boot -fl 0,80 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 that you want to run, as follows:

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

The variable *[dir]filename* is one of the following:

- **[DEC3000]M300_v7_0.EXE** if you are updating a DEC 3000 Model 300/300L /300X/300LX system
- **[DEC3000]M400_v7_0.EXE** if you are updating a DEC 3000 Model 400/400S /600/600S/700 system
- **[DEC3000]M500_v7_0.EXE** if you are updating a DEC 3000 Model 500/500S /500X/800/800S/900 system

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.

After the boot process completes, the Firmware Update Utility menu is displayed as follows. Note the Update Utility prompt (UPD->).

```
*** FIRMWARE UPDATE UTILITY V2.ba ***
*** SYSTEM TYPE: M500 ***
UPDATE
VERIFY
LIST
SHOW
SET
?

UPD->
```

Table 1–2 describes the functions available from the menu. You will use the update function to update the firmware, as described in the next section.

Table 1–2 The Update Utility Menu

Function	Description
update	Updates the current firmware to the new version.
verify	Verifies that the firmware in flash ROM is the same as the firmware on the Update Utility disc.
list	Lists the devices that the Update Utility can update.
show	Shows the current version of firmware installed on your system.
set	Sets the current system type.
?	Provides help on each of the Update Utility functions.

1.1.1.3 Step 3: Enter the Update Command

To update the firmware on your DEC 3000 system, type the `update` command at the Update Utility prompt and press the Return key. The Update Utility displays messages similar to the following:

```
UPD-> update Return

Read IO ROM Device ID
UPD-I VERIFY LOADED ROM IMAGE
.............................
UPD-I VERIFY LOADED ROM IMAGE DONE
MANUFACTURER = INTEL (0x89)
DEVICE CODE  = 28F020  (0xbd) 256K x 8
UPDATE SYSTEM ROM DEVICE
UPD-I VERIFY LOADED ROM IMAGE
.............................
UPD-I VERIFY LOADED ROM IMAGE DONE
FIRMWARE REVISION: V6.2 LENGTH: 0x35F50 -> 221008 BYTES CHECKSUM: 0x91
MANUFACTURER = INTEL (0x89)
DEVICE CODE  = 28F020  (0xbd) 256K x 8
UPD-I *** ROM CONTENTS WILL BE DESTROYED ***
UPD-I ARE YOU READY TO PROGRAM DEVICE ? (Y/N)
```

If you are ready to update the firmware on your system, enter y at the prompt and press the Return key as follows:

```
UPD-I ARE YOU READY TO PROGRAM DEVICE ? (Y/N)y Return
```

The Update Utility continues as follows:

```
UPD-I PRECHARGING DEVICE
.............................................................
UPD-I ERASING ROM DEVICE
.............................................................
UPD-I PROGRAMMING DEVICE
.............................................................
UPD-I PROGRAMMING COMPLETED
.............................
SYSTEM ROM UPDATE SUCCESSFUL
UPDATE IO ROM DEVICE
UPD-I VERIFY LOADED ROM IMAGE
.............................
UPD-I VERIFY LOADED ROM IMAGE DONE
FIRMWARE REVISION: V6.2 LENGTH: 0x35bd8 -> 220120 BYTES CHECKSUM: 0x43
MANUFACTURER = INTEL (0x89)
DEVICE CODE  = 28F020  (0xbd) 256K x 8
UPD-I PRECHARGING DEVICE
.............................................................
UPD-I ERASING ROM DEVICE
.............................................................
UPD-I PROGRAMMING DEVICE
.............................................................
UPD-I PROGRAMMING COMPLETED
.............................
IO ROM UPDATE SUCCESSFUL
UPD->
```

Note

If the Update Utility returns an error message, refer to Appendix B for information on messages produced by the Firmware Update Utility.

1.1.1.4 Step 4: Exit the Utility

When the Update Utility is complete, enter quit at the prompt and press Return:

```
UPD->  quit Return
?05 HLT INSTR
>>>
```

1.1.1.5 Step 5: Initialize the Firmware Update

To load the new firmware into system memory, restart your system as follows:

1. Turn off your system unit. Press the On/Off switch to the Off (O) position.
2. Wait 10 to 15 seconds.
3. Turn on the system unit. Press the On/Off switch to the On (|) position.
4. After the system is restarted, boot the operating system.

1.1.1.6 After Completing the Update

Accidental writes to the flash ROMs may render your system inoperable. If you think that applications or development efforts on your system may inadvertently address flash ROM space, then refer to the appropriate section in Chapter 2 and move the ROM update jumper to the disabled position (Off).

- Section 2.1, Model 300/300L/300X/300LX ROM Update Jumper Procedure
- Section 2.2, Model 400/400S/600/600S/700 ROM Update Jumper Procedure
- Section 2.3, Model 500/500S/500X/800/800S/900 ROM Update Jumper Procedure

1.1.2 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 DEC 3000 system to be updated (target system) must be powered on and at the console prompt (>>>).

Table 1–3 indicates the steps required to update the firmware on your DEC 3000 system from the network.

Table 1–3 Procedure for Updating System Firmware (Method 2)

Step	Description
1	If the host system is VMS, ULTRIX, or DIGITAL UNIX, copy the update file from the Firmware Update Utility compact disc.
2	Set up the host system.
3	Enter a network boot command from the target system.
4	Refer to Section 1.1.1.3 to complete the update procedure.

1.1.2.1 Step 1: VMS, ULTRIX, or DIGITAL UNIX File Copy Instructions

If your host system is VMS, copy the file from the Firmware Update Utility compact disc by entering the following commands at the VMS $ prompt:

```
$ mount dka400 update_v50
$ copy dka400:[dir]filename mom$load:
```

The variable *[dir]filename* is one of the following:

- **[sys0.sysexe]M300_v7_0.SYS** if you are updating a DEC 3000 Model 300 /300L/300X/300LX system

- **[sys0.sysexe]M400_v7_0.SYS** if you are updating a DEC 3000 Model 400 /400S/600/600S/700 system
- **[sys0.sysexe]M500_v7_0.SYS** if you are updating a DEC 3000 Model 500 /500S/500X/800/800S/900 system

If your host system is ULTRIX or DIGITAL UNIX, copy the file from the Firmware Update Utility compact disc by entering the following commands at the ULTRIX or DIGITAL UNIX # prompt:

```
#  mount -rt cdfs -o noversion /dev/rz4c /mnt
#  cp /mnt/DEC3000/filename /usr/lib/mop/filename
```

The variable *filename* is one of the following:

- **M300_v7_0.SYS** if you are updating a DEC 3000 Model 300/300L/300X/300LX system
- **M400_v7_0.SYS** if you are updating a DEC 3000 Model 400/400S/600/600S /700 system
- **M500_v7_0.SYS** if you are updating a DEC 3000 Model 500/500S/500X/800 /800S/900 system

1.1.2.2 Step 2: Set Up Host

Execute the following when updating a DEC 3000 using a VMS host. You must use NCP to set up the host 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 a DEC 3000 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
```

1.1.2.3 Step 3: Boot the Firmware Update Utility

To start the Firmware Update Utility, enter the `boot` command at the console prompt of the target system. The following display illustrates how to start a boot process:

```
>>> boot esa0 -fi "filename.sys"
```

Note

The variable *"filename.sys"* is the file copied in step 1. If booting on an Ultrix host, the filename must be entered exactly as displayed by the Utrix host. For more information, refer to Appendix B.

1.1.2.4 Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.1.1.3.

1.1.3 BOOTP Network Upgrade

1. Mount the Firmware Update Utility CD-ROM.

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

2. Modify or create the client database in the /etc/bootptab file.

```
<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 ethernet.
- filename is the name of the default bootfile image:
  - If you are updating a DEC 3000 Model 300/300L/300X/300LX system:

    ```
    /mnt/DEC3000/M300_v7_0.BTP
    ```

  - If you are updating a DEC 3000 Model 400/400S/600/600S/700 system:

    ```
    /mnt/DEC3000/M400_v7_0.BTP
    ```

  - If you are updating a DEC 3000 Model 500/500S/500X/800/800S/900 system:

    ```
    /mnt/DEC3000/M500_v7_0.BTP
    ```

- ip_address is the corresponding Internet protocol address of the system name in /etc/hosts.

The following is an example of a bootptab file:

```
sfbtga:ht=1:ha=08002b236423:bf=/mnt/DEC3000/M500_v7_0.BTP:ip=16.123.0.88
```

3. Invoke bootpd and tftpd daemons:
   - Modify the /etc/inetd.conf file. Uncommon the tftp and bootps process. It should look like the following:

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

- Find the process of /usr/sbin/inetd daemon. In the following example, you must replace <ine process number> with the ine process number.

```
#  ps aux | grep ine
#  kill <ine process number>
```

- 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.

4. Enter the following command from the DEC 3000 system to boot from the BOOTP server:

```
>>>  boot ez0
```

1.1.3.1 Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.1.1.3.

1.1.4 InfoServer Upgrade

Insert the Firmware Update Utility disc into the InfoServer. The InfoServer kernel must be at a minimum revision of 2.2 and MOP must be enabled on the InfoServer.

To perform an upgrade using the InfoServer, enter the following command line:

```
>>> boot esa0 -fi filename
```

The *filename* must be entered in uppercase and is one of the following:

- **M300_v7_0** if you are updating a DEC 3000 Model 300/300L/300X/300LX system
- **M400_v7_0** if you are updating a DEC 3000 Model 400/400S/600/600S/700 system
- **M500_v7_0** if you are updating a DEC 3000 Model 500/500S/500X/800/800S /900 system

The following example uses the Model 500.

```
>>> b esa0 -fi m500_v7_0

INIT-S-CPU...
AUDIT_BOOT_STARTS ...
AUDIT_BOOT_REQUEST M500_v7_0
AUDIT_BSERVER_FOUND
AUDIT_LOAD_BEGINS
AUDIT_LOAD_DONE
*** FIRMWARE UPDATE UTILITY V2.ba ***
*** SYSTEM TYPE: M500 ***
UPDATE
VERIFY
LIST
SHOW
SET
?

UPD->
```

1.1.4.1 Perform Update and System Initialization

To complete the update procedure of your system, refer to Section 1.1.1.3.

2

DEC 3000 ROM Update Jumper

This chapter covers the following topics:

- Moving the ROM update jumper for the Model 300/300L/300X/300LX
- Moving the ROM update jumper for the Model 400/400S/600/600S/700
- Moving the ROM update jumper for the Model 500/500S/500X/800/800S/900

DEC 3000 systems contain a ROM update jumper which controls flash ROM writes. The ROM update jumper must be enabled (On) to perform the firmware update. DEC 3000 systems are shipped with the ROM update jumper in the enabled (On) position.

Note

Accidental writes to the flash ROMs may render your system inoperable. If you think that applications or development efforts on your system may inadvertently address flash ROM space, refer to the appropriate section in this chapter and disable the ROM update jumper.

Caution

Static electricity can damage integrated circuits. An antistatic wrist strap (12–36175–01) is packaged with the DEC 3000 system. Wear the antistatic strap when you work with internal parts of a system.

2.1 Model 300/300L/300X/300LX ROM Update Jumper Procedure

This section shows you how to either enable or disable the DEC 3000 Model 300/300L/300X/300LX ROM update jumper.

2.1.1 Task Overview

Table 2–1 lists the steps required to move the ROM update jumper.

Table 2–1 Procedure for Moving ROM Update Jumper

Step	Description
1	Turn off system.
2	Remove system unit cover.
3	Move ROM update jumper.
4	Replace system unit cover.
5	Turn on system.

2.1.2 Step 1: Turn Off the System

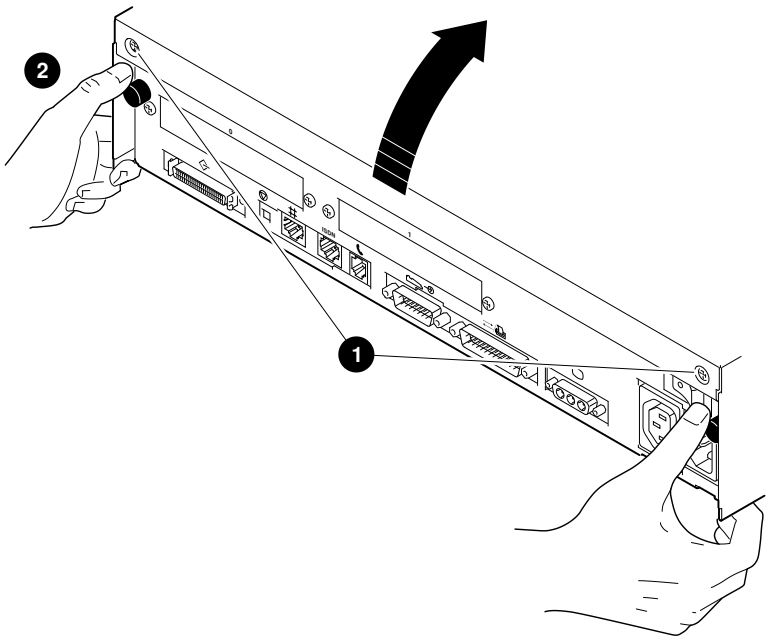
Turn off the system unit, by pressing the On/Off switch to the off (O) position.

2.1.3 Step 2: Remove System Unit Cover

Remove the system unit cover as described in the following steps and shown in Figure 2–1.

1. Remove the two Phillips screws on the right and left back corners of the system unit cover ❶.
2. Place the system unit so that the back edge extends over the edge of your table or desk.
3. Place your thumbs on the two black caps on the back of the system unit, and at the same time place your fingers under the cover's bottom edge ❷. Press down with your thumbs and at the same time press up against the cover's edge with your fingers to lift the cover.
4. Pivot the cover on the tabs that run along the system unit's front edge.
5. Pull the system unit cover up and away until it releases from the system unit.

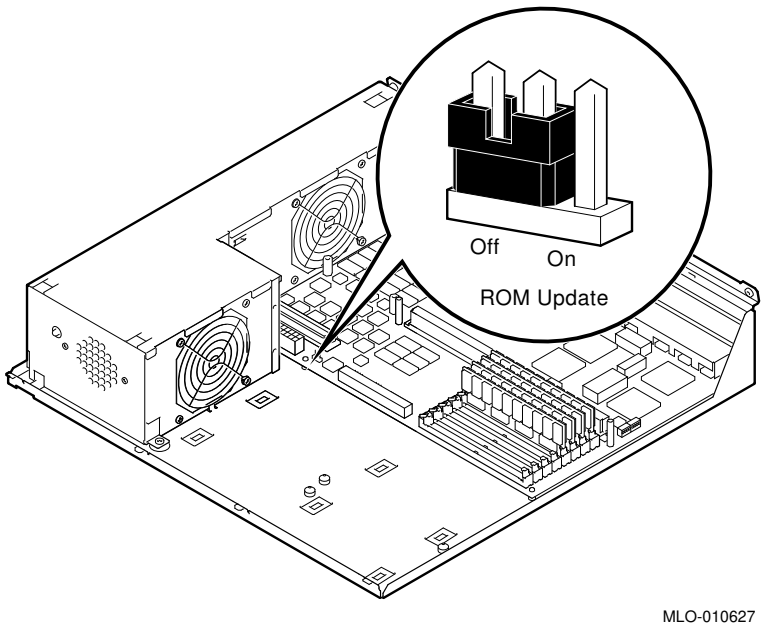
Figure 2–1 Removing the System Unit Cover



2.1.4 Step 3: Move ROM Update Jumper

Figure 2–2 shows the ROM jumper location. Move the ROM jumper to either the On (enabled) or Off (disabled) position.

Figure 2–2 Moving the ROM Jumper



2.1.5 Step 4: Replace System Unit Cover

Replace the system unit cover by reversing the procedure in step 2.

2.1.6 Step 5: Turn On the System

Turn on the system unit by pressing the On/Off switch to On (|).

2.2 Model 400/400S/600/600S/700 ROM Update Jumper Procedure

This section shows you how to either enable or disable the DEC 3000 Model 400/400S/600/600S/700 ROM update jumper.

2.2.1 Task Overview

Table 2–2 lists the steps required to move the ROM update jumper.

Table 2–2 Procedure for Moving ROM Update Jumper

Step	Description
1	Turn off system.
2	Remove system unit cover.
3	Release drive plate.
4	Move drive plate.
5	Move ROM update jumper.
6	Replace system unit cover.
7	Turn on system.

2.2.2 Step 1: Turn Off the System

Turn off the system unit by pressing the On/Off switch to the Off (O) position.

Warning

Wait 15 seconds to allow power supply capacitors time to discharge safely. Failure to allow the capacitors to discharge will put you at risk of an electrical shock.

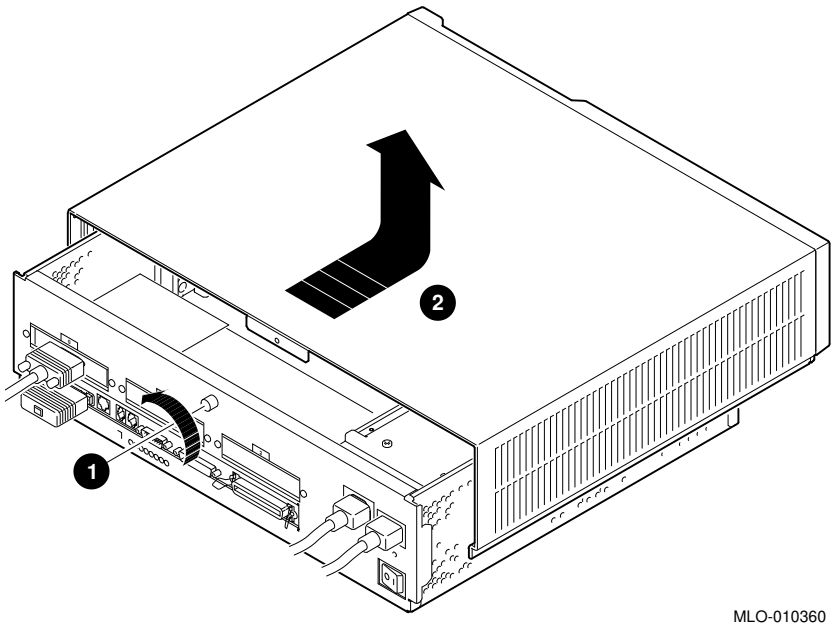
2.2.3 Step 2: Remove System Unit Cover

If you have a monitor or a terminal on top of the system unit, move it aside now.

Remove the system unit cover as shown in Figure 2–3:

1. Loosen the thumbscrew located in the center of the rear of the system unit ❶.
2. Slide the cover away from you and upward ❷, until it releases from the system unit.
3. Place the cover aside.

Figure 2–3 Removing the System Unit Cover



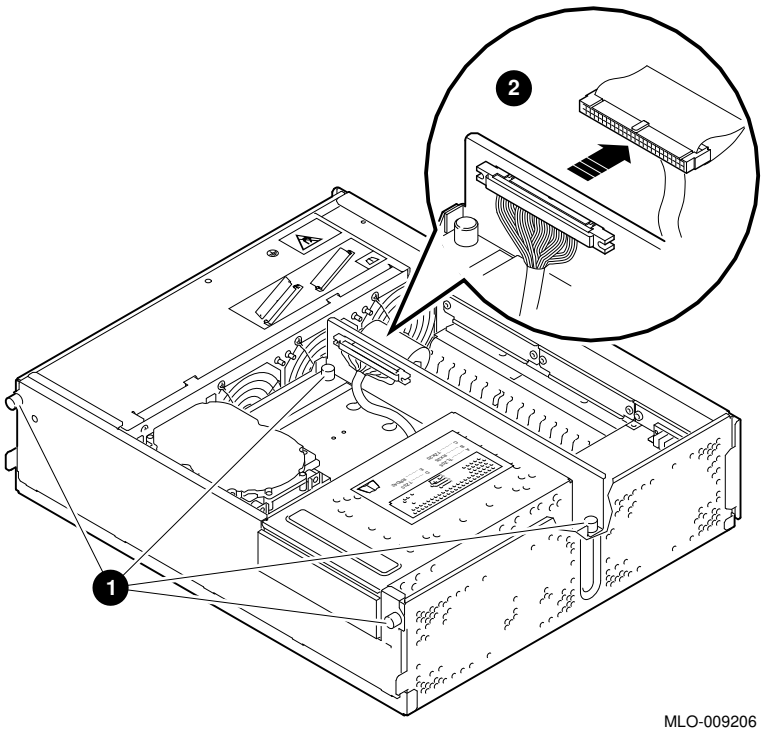
MLO-010360

2.2.4 Step 3: Release Drive Plate

After removing the system unit cover, locate and loosen the four thumbscrews that hold the drive plate in place ❶, as shown in Figure 2-4.

Remove the drive cable from the drive to release the drive plate ❷.

Figure 2–4 Releasing the Drive Plate

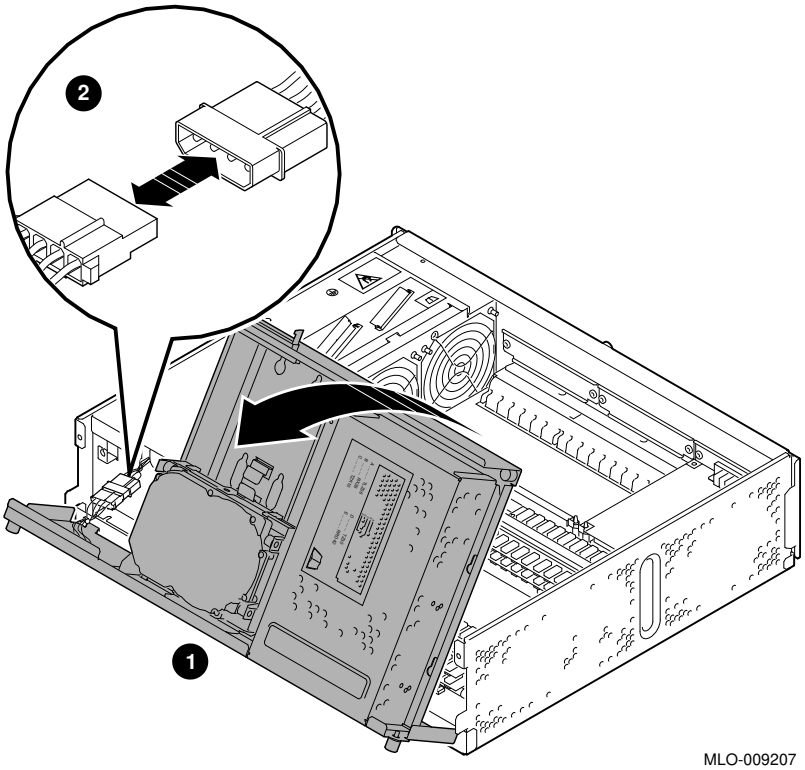


2.2.5 Step 4: Move Drive Plate

Make sure that the system unit is placed on the table or desk with enough room at the front of the unit to accommodate the drive plate as you remove it.

Grasp the rear of the drive plate and gently tilt the entire plate forward ❶, as shown in Figure 2-5. Disconnect the drive plate power connector ❷. Release the drive plate from the system unit and place it aside.

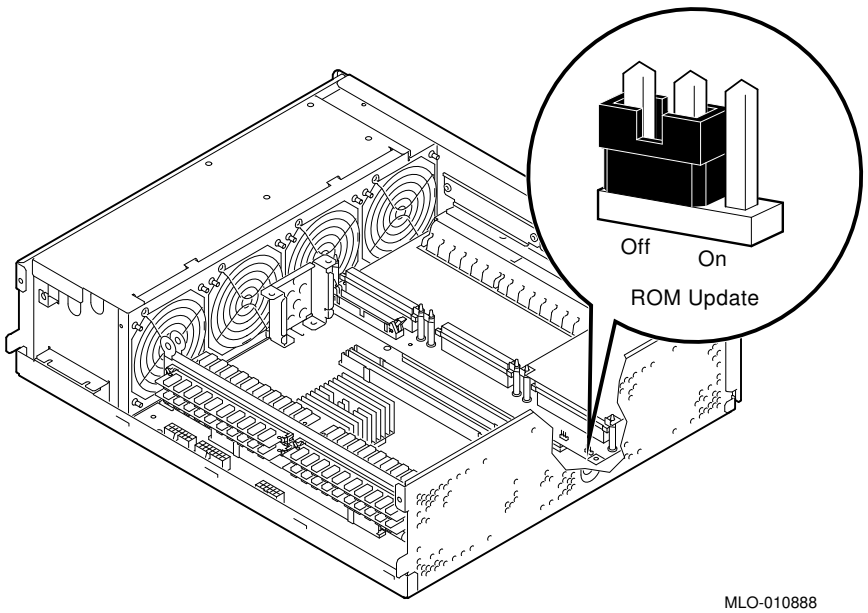
Figure 2–5 Moving the Drive Plate



2.2.6 Step 5: Move ROM Update Jumper

Figure 2–6 shows the ROM jumper location. Move the ROM jumper to either the On (enabled) or Off (disabled) position.

Figure 2–6 Moving the ROM Update Jumper



2.2.7 Step 6: Replace System Unit Cover

Replace the system unit cover by reversing the procedure in steps 2–4.

2.2.8 Step 7: Turn On the System

Turn on the system unit by pressing the On/Off switch to On (|).

2.3 Model 500/500S/500X/800/800S/900 ROM Update Jumper Procedure

This section shows you how to either enable or disable the DEC 3000 Model 500/500S/500X/800/800S/900 ROM update jumper.

2.3.1 Task Overview

Table 2–3 lists the steps required to move the ROM update jumper.

Table 2–3 Procedure for Moving the ROM Update Jumper

Step	Task
1	Turn off system.
2	Unlock system unit.
3	Remove system unit cover.
4	Remove left panel.
5	Move ROM update jumper.
6	Replace system unit cover.
7	Turn on system.

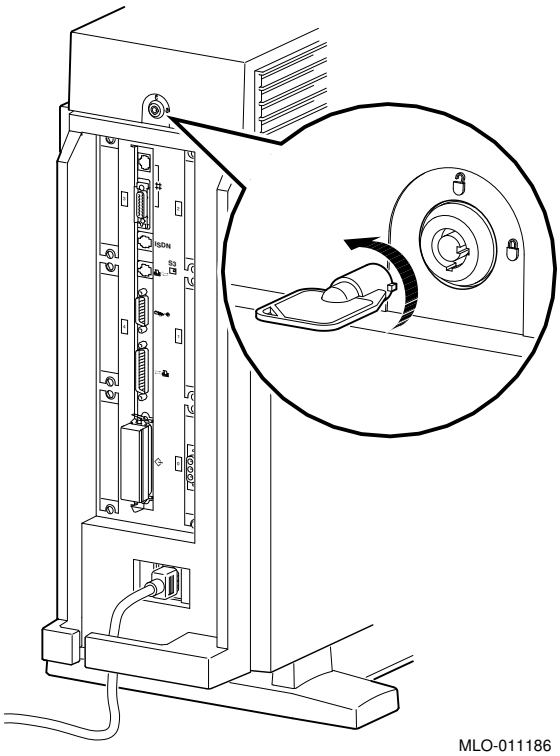
2.3.2 Step 1: Turn Off the System

Turn off the system unit by pressing the On/Off switch on the front of the unit to the Off (O) position.

2.3.3 Step 2: Unlock the System Unit

Unlock the system unit, as shown in Figure 2–7.

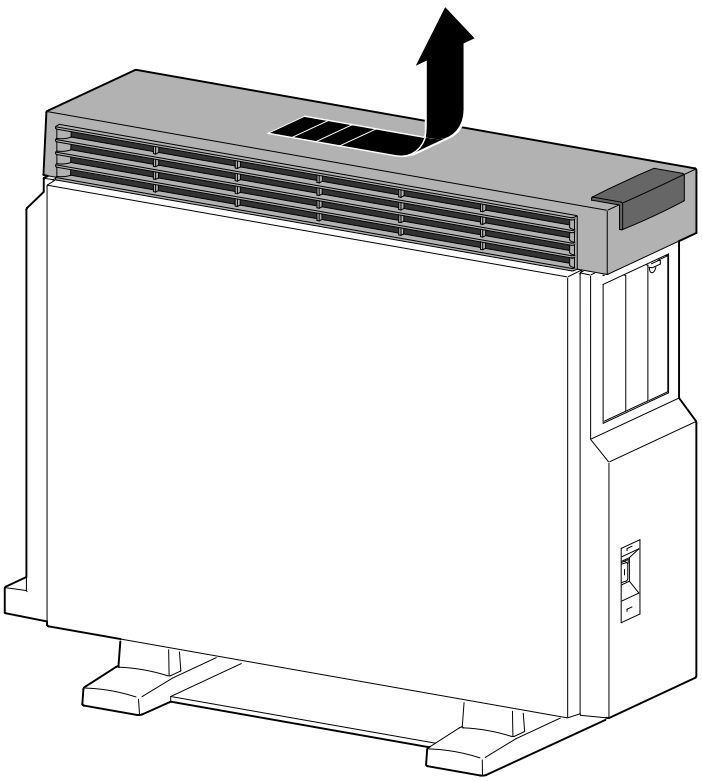
Figure 2–7 Unlocking the System Unit



2.3.4 Step 3: Remove the System Unit Cover

Remove the system unit cover by sliding it forward and lifting it off, as shown in Figure 2–8. You must remove the cover before you can remove the left panel.

Figure 2–8 Removing the System Unit Cover



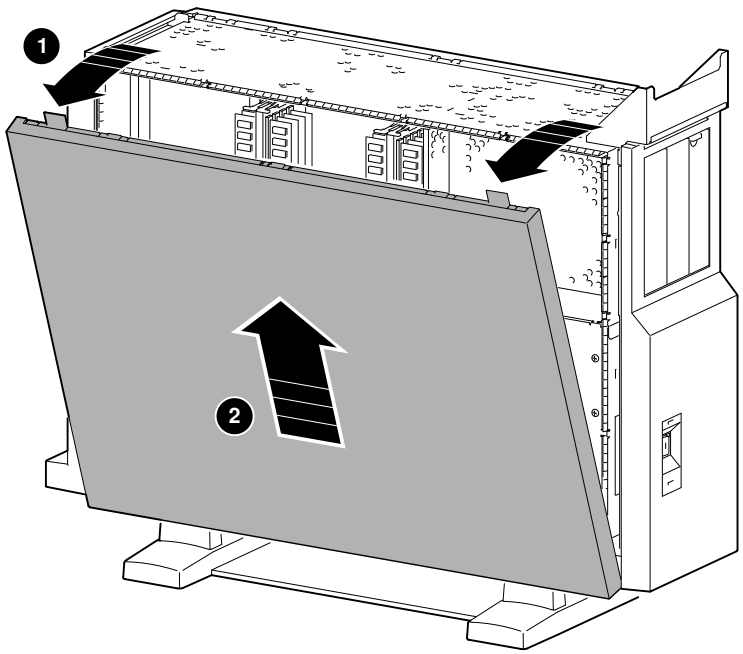
Note

Wait at least 2 minutes from the time the system is turned off until you remove the left panel. This delay gives the power supply capacitors time to discharge safely. Failure to allow the capacitors to discharge will put you at risk of an electrical shock.

2.3.5 Step 4: Remove the Left Panel

To remove the left panel, pull the metal tabs on the top edge of the panel away ❶ and lift the bottom edge off the track ❷, as shown in Figure 2–9.

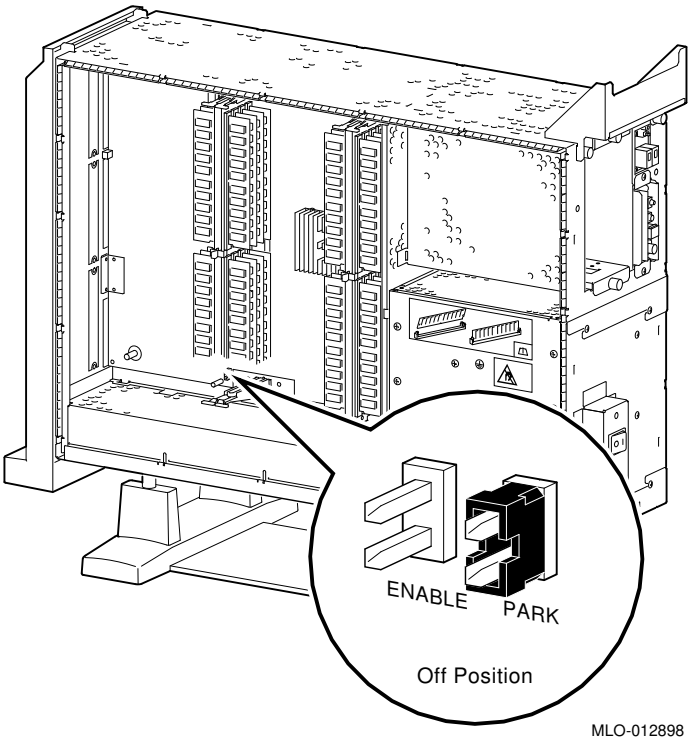
Figure 2–9 Removing the Left Panel



2.3.6 Step 5: Move ROM Update Jumper

Figure 2–10 shows the ROM jumper location. Move the ROM jumper to either the On (enabled) or Off (disabled) position.

Figure 2–10 Locating the Firmware Update Jumper



Note

DEC 3000 Model 500/500S/500X systems have only one jumper position. If the jumper is on, the system is enabled for ROM updates. If there is no jumper present, then the system is disabled.

2.3.7 Step 6: Replace System Unit Cover

Replace the system unit cover by reversing the procedure in steps 3–4.

2.3.8 Step 7: Turn On System

Turn on the system unit by pressing the On/Off switch to the On (|) position.

3

TURBOchannel Options Update Utility Procedures

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

- Updating the TURBOchannel option firmware
- Using the TURBOchannel 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 TURBOchannel 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. For instructions on how to boot from a TURBOchannel device, refer to Appendix B.

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

```
>>>  boot -fl 0,80 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 TURBOchannel update directory and filename on the CD-ROM:

[TURBOCHANNEL]TC_V2_2.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:

```
*** TURBOchannel Firmware Update Utility V2.2 ***
UPDATE n
REPAIR n
VERIFY n
SHOW n
LIST
HELP
EXIT/QUIT
TC_UPD->
```

Note

The variable *n* represents the logical TURBOchannel slot number.

3.1.2 Using the TURBOchannel Help Commands

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

```
TC_UPD-> help
```

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

Command	Description
update *n*	Updates the option ROM in TURBOchannel slot *n*. The module name in the adapter's ROM header must match one of the loaded images.
repair *n*	Repairs (updates) an adapter ROM that is not properly recognized by the system. Use the `repair` command to modify the module name in the adapter ROM header.
verify *n*	Verifies the option ROM checksum in TURBOchannel slot *n*. If an option is already at the same revision as found in this Firmware Update Utility and the verify command is entered, prior to updating the option's firmware, the verify command may report mismatched checksums. This is due to the method in which ROMs are loaded during the manufacturing process.
show *n*	Shows the checksum and ROM revision for the slot *n* option ROM and its corresponding loaded image.
list	Displays the loaded images and flash memories supported.

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

```
*** TURBOchannel Firmware Update Utility V2.2 ***
UPDATE n
REPAIR n
VERIFY n
SHOW n
LIST
HELP
EXIT/QUIT
TC_UPD->
```

Note

The variable *n* represents the logical TURBOchannel slot number.

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

```
TC_UPD-> list
```

```
Image name      Revision
---------       --------
 AV300-AA        V1.1
 KZTSA           A11
 PMAF-FA         V3.1
 PMAF-FD         V3.1D
 PMAF-FS         V3.1S
 PMAF-FU         V3.1U
 PMAGB-BA        V1.1
 PMAGC-AA        V1.2
 PMAGC-BA        V1.2
 PMAT-AA         V2.8
 PMAZB-AA        V2.0
 PMAZC-AA        V2.3
 PMAGD           BL2.1
 PMAGD-AA        BL2.1
 DGLTA-FA        V1.1

Flash memory devices supported:
        AMD:28F020 (256Kx8)
      Intel:28F512 (64Kx8), 28F010 (128Kx8), 28F020 (256Kx8)
            28F256A, 28F256B, 28F256X
```

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

```
TC_UPD-> update 5
UPDATE TURBOchannel slot 5 ROM
.....................
MANUFACTURER = AMD (0x01) DEVICE CODE = 28F020 (0x2a) 256K x 8
   Slot 5 ROM: PMAGB-BA V1.0
 Loaded image: PMAGB-BA V1.1
TC_UPD-I *** ROM CONTENTS WILL BE DESTROYED ***
TC_UPD-I ARE YOU READY TO PROGRAM DEVICE (Y/N)? Y

TC_UPD-I PRECHARGING DEVICE
.............................
TC_UPD-I ERASING ROM DEVICE
.............................
TC_UPD-I PROGRAMMING DEVICE
.................
TC_UPD-I PROGRAMMING COMPLETED
TC_UPD-I *** Slot 5 ROM update successful ***
```

Note

Slot 5 ROM: PMAGB-BA V1.1 indicates the current ROM revision.
Loaded image: PMAGB-BA V1.2 indicates the new ROM revision.

- Use the show command to compare the option ROM firmware revision to that of its corresponding loaded image. The utility will tell you if the option ROM header name does not match the loaded images, or if the command does not apply to that specific adapter.

```
TC_UPD-> show 5
SHOW TURBOchannel slot 5 ROM Revision
     Slot 5 ROM: PMAGB-BA V1.1
   Loaded image: PMAGB-BA V1.1
```

- Use the `repair` command when one of the following occurs:
  - The host system does not recognize the adapter, or the adapter has an empty flash ROM.

Image Name	Revision
AV300-AA	V1.1
KZTSA	A11
PMAF-FA	V3.1
PMAF-FS	V3.1S
PMAF-FD	V3.1D
PMAF-FU	V3.1U
PMAGB-BA	V1.1
PMAGC-AA	V1.2
PMAGC-BA	V1.2
PMAT-AA	V2.8
PMAZB-AA	V2.0
PMAZC-AA	V2.3
PMAGD	BL2.1
PMAGD-AA	BL2.1
DGLTA-FA	V1.1

  - The `update` command returns a failure message indicating that a repair may be necessary.
  - The information to be changed in the adapter flash ROM includes the name of the adapter (stored in the ROM header).

Note

If a power failure occurs during an update, you may need to enter the `repair` command to update the option.

The following is an example of using the `repair` command:

```
TC_UPD-> repair 5
TC_UPD-I *** REPAIR command entered ***
select an image:

Image name      Revision
---------       --------
 AV300-AA        V1.1
 KZTSA           A11
 PMAF-FA         V3.1
 PMAF-FS         V3.1S
 PMAF-FD         V3.1D
 PMAF-FU         V3.1U
 PMAT-AA         V2.8
 PMAZB-AA        V2.0
 PMAZC-AA        V2.3
 PMAGD           BL2.1
 PMAGD-AA        BL2.1
 DGLTA-FA        V1.1
```

```
Image name (Q to quit this function)? pmagb-ba

.......................
MANUFACTURER = AMD (0X01)
DEVICE CODE = 28F020 (0X2A) 256K X 8
      Slot 5 ROM: - Not a valid ASCII string-
    Loaded image: PMAGB-BA V1.1
TC_UPD-I *** ROM CONTENTS WILL BE DESTROYED ***
TC_UPD-I ARE YOU READY TO PROGRAM DEVICE (Y/N)? Y
TC_UPD-I PRECHARGING DEVICE
.........................
TC_UPD-I ERASING ROM DEVICE
.........................
TC_UPD-I PROGRAMMING DEVICE
.............
TC_UPD-I PROGRAMMING COMPLETED
TC_UPD-I *** SLOT 5 ROM UPDATE SUCCESSFUL ***
```

3.2 Network Upgrade

The procedure to update from a network is the same procedure used for the DEC 3000 systems. Use the instructions in Section 1.1.2 and Section 1.1.3 to update the firmware in your TURBOchannel option. The following information will detail any differences between procedures.

In Section 1.1.2.1, the VMS copy command is:

```
$ copy dka400:[sys0.sysexe]TC_V2_2.SYS mom$load:
```

In Section 1.1.2.1, the ULTRIX/DIGITAL UNIX copy command is:

```
#  cp /mnt/TURBOCHANNEL/TC_V2_2.SYS /usr/lib/mop/filename
```

In Section 1.1.3, the correct path for the TURBOchannel Update Utility is:

```
/mnt/TURBOCHANNEL/TC_V2_2.BTP
```

A

DEC 3000 Firmware Information

A.1 Bug Fixes

Version 7.0 of the DEC 3000 firmware includes the following changes or fixes:

- No changes with this release

B

DEC 3000 Troubleshooting Information

B.1 Initialization Information

You must issue the following command to reset the DEC 3000 system on every boot:

```
>>> SET BOOT_RESET ON
```

This tells the firmware to initialize the kernel hardware and reset TURBOchannel to initialize all TURBOchannel options.

A part of the initialization sequence is a SCSI bus reset. Some SCSI devices take a while to recover from a SCSI bus reset. They can fail to boot if you do not have a long enough delay after the reset.

To ensure sufficient recovery time, enter the following command to tell the SCSI code how long to wait after the SCSI reset before continuing the system initialization.

```
>>> SET SCSI_RESET n
```

where n = 1–8.

This tells the SCSI driver to wait 2^n seconds after SCSI reset before proceeding. A value of 3 or 4 is usually needed to boot a floppy drive.

Note

System defaults are:

```
>>> SET BOOT_RESET ON
>>> SET SCSI_RESET 4
```

B.2 POWERUP_TIME Environment Variable

There are three settings for this variable which only effect the powerup test path. The default and recommended setting is STD. The settings are as follows:

- powerup_time = MIN: Device initialization only
- powerup_time = STD: Default, standard powerup self tests
- powerup_time = MAX: Standard powerup self tests but with additional SCSI and NI testing. All removable media drives must have media installed and data must have been written on the media. The NI test requires that the system be on a live network.

B.3 Help with Operating System Boots

If you have a problem booting your operating system, it may be because a device on your system has the same ID value as your system's host ID. As of Version 2.1 of the firmware, the TOY/NVR self-test will set the `scsi_a` and `scsi_b` environment variables to 7 when NVRAM gets corrupted. This will cause problems if you have a SCSI device with a target ID of 7. To check the IDs, enter the following at the console prompt:

```
>>> show device
>>> show scsi_a
>>> show scsi_b
```

If a device and host ID share an ID value, be sure to change one or the other using the commands `set scsi_a` *x* or `set scsi_b` *x*. The *x* should be an ID variable value not used by any of the devices on the bus.

B.4 Passing Bootfile Parameters

To avoid problems with named boots, your file must be typed exactly as the system expects to see it, and it must be enclosed in quotes.

For example, to boot the file `Test_File.sys` found on an ULTRIX system, enter the following boot command:

```
>>> boot esa0 -fi "Test_File.sys"
```

B.5 TURBOchannel Boot Command

To boot the Firmware Update Utility from a TURBOchannel device, use the following format:

```
>>> boot -fl 0,80 "#/device"
```

where # is the slot number of the TURBOchannel option and `device` is the logical name of the disc drive.

For example, to boot the Firmware Update Utility from a device connected to TURBOchannel slot 2:

```
>>> boot -fl 0,80 "2/dka400"
```

B.6 DEC 3000 Memory Diagnostics

Because of increased memory test coverage, erroneous memory errors may be reported. To avoid this condition, turn off MOP when running memory diagnostics on a DEC 3000 Model 300/300L/300X/300LX.

B.7 Firmware Downgrade Steps

If you are downgrading your firmware using CD-ROM Version 1.0 or Version 1.1, use the following example:

```
>>> b dka400-ns
>>> d/pm/u 50058 value
>>> c
```

The *value* is one of the following:

- 24 (for the Model 400/400S)
- 224 (for the Model 500/500S/500X)

B.8 84 Fail Error Message

84 Fail is a general-purpose failure message that is generated under two conditions.

1. Using the TEST command

   When an 84 code failure occurs, diagnostic error code information is displayed. Disregard the 84 Fail message and rely on the error code information.

2. Using the BOOT command

   When an 84 code failure occurs during a BOOT command, the probable cause for the failure is one of the following:

   - Boot device is not present.
   - Boot device is present but there is no media.
   - Boot block is not found on the media.
   - System/device error.

B.9 Firmware Update Utility Messages

The Update Utility displays a progress indicator (".") for each 4096 location successfully erased/programmed.

UPD-I *** ROM CONTENTS WILL BE DESTROYED ***

Explanation: The ROM device is to be erased or programmed.

UPD-I NO ROM IMAGE LOADED

Explanation: The Update Utility could not find the ROM image in the image loaded.

UPD-E ROM DEVICE JUMPER ON

Explanation: A jumper is required on the system ROM and I/O ROM modules for device erasure/programming.

UPD-I PRECHARGING DEVICE

Explanation: The ROM device is precharged. Precharge programs all locations to zero.

UPD-I ERASING ROM DEVICE

Explanation: The ROM device is erased. Erasing programs all locations to FF.

UPD-I PROGRAMMING DEVICE

Explanation: The ROM device is programmed.

UPD-I PROGRAMMING COMPLETED

Explanation: This message is generated at the end of a successful programming operation.

B.10 Help in Debugging Programs

The DEC 3000 console stores some memory-based data structures that may help in debugging certain crashes. These structures are:

- Impure area — This area contains the saved machine state on an entry into console.
- Machine check logout — This area contains the last machine check log caused by:
  - A system or processor correctable error (small frame)
  - A system or processor uncorrectable error (large frame)

If you get a MCHECK FR PAL console entry indicating a machine check from PALcode or if you immediately enter the console mode without doing a clean crash dump, then do the following:

1. Examine the contents of the impure area and machine check logout frame.
2. Report the details on the crash.

B.10.1 Examining the Impure Area

Enter the following command to examine the impure area:

```
>>> E -PM -Q -U -N 94  104000
```

You must use the Ctrl/s (XOFF) and Ctrl/q (XON) commands to stop and start the display. The following are the address and description of each element in the impure area.

Address	Description
104000h	Console flags
104008h	Console halt reason
104010h-104108h	Saved general purpose registers (contents of the general purpose register R0-R31 at time of console entry).
104110h-104208h	Saved floating-point registers (contents of the floating-point register FR0-FR31 at time of console entry).
104210h	Size of impure area
104218h-104310h	Saved PAL temporary registers (contents of PT0-PT31 on console entry). Operating system use.
104318h	Exception address
104320h	PAL base
104328h	Saved HIRR
104330h	Saved HIER
104338h	Saved MMCSR
104340h	Saved VA
104348h	Saved BIU_ADDR
104350h	Saved BIU_STAT
104358h	Saved DC_ADDR
104360h	Saved FILL_ADDR

Address	Description
104368h	Saved DC_STAT
104370h	Saved FILL_SYNDROME
104378h	Saved BC_TAG
104380h	Saved ABOX_CTL
104388h	Saved BIU_CTL
104390h	Saved FP_CSR
104398h	Console entered state variable
1043A0h-104498h	Saved values of the PAL temporary registers (contents of PAL temporary registers when in console mode).
1044A0h	Saved PAL base register

B.10.2 Examining the Machine Check Logout Area

This section explains how to examine the machine check logout area.

The small frame of the machine check logout has been modifed to include the TC_ERROR and FAILING_ADDRESS registers. This change moves the start of the large frame out by two quadwords.

Small Frame

Enter the following command to look at the small frame:

```
>>> E -PM -Q -U -N C  108000
```

You must use the Ctrl/s (XOFF) and Ctrl/q (XON) commands to stop and start the display.

The following are the address and description of each element in the small frame in the logout area:

Address	Description
108000h	Flag field. Contains the size of the frame in the low longword; the retry bit is represented by bit 63.
108008h	Offset field. Byte offset to the CPU-specific part of the logout frame in low longword. Offset to the system error code is in the high longword.
108010h	Machine check error code
108018h	BIU_STAT contents
108020h	BIU_ADDR contents
108028h	DC_STAT contents
108030h	FILL_SYNDROME contents
108038h	FILL_ADDR contents
108040h	BC_TAG contents
108048h	Machine check error code
108050h[1]	Saved TCASIC error register
108058h[1]	Saved TCASIC interrupt register

[1]Does not apply to Models 300/300L/300X/300LX

Large Frame

Enter the following to look at the large frame:

```
>>> E -PM -Q -U -N 3B  108060
```

You must use the Ctrl/s (XOFF) and Ctrl/q (XON) commands to stop and start the display.

The following are the address and description of each element in the large frame in the logout area:

Address	Description
108060h	Flag data. Low longword contains the size of the log in the log longword; bit63 is used as a retry bit.
108068h	Offset data. Low longword is offset to CPU-specific data; high longword is offset to system specific data.
108070h	Machine check code
108078h-108168h	Saved PAL temporary registers (contents of PT1-PT31 at the time of the error).
108170h	Saved exception address (address that was executing at the time of the machine check).
108178h	Saved exception summary register
108180h	Saved exception mask register
108188h	Saved ICSSR
108190h	Saved PAL base
108198h	Saved HIER
1081A0h	Saved HIRR
1081A8h	Saved MMCSR
1081B0h	Saved DC_STAT
1081B8h	Saved DE_ADDR
1081C0h	Saved ABOX_CTL
1081C8h	Saved BIU_STAT
1081D0h	Saved BIU_ADDR
1081D8h	Saved BIU_CTL
1081E0h	Saved FILL_SYNDROME
1081E8h	Saved FILL_ADDR
1081F0h	Saved VA
1081F8h	Saved BC_TAG
108200h	Saved machine check code
108208h	Saved memory configuration status
108210h[1]	Saved TCASIC SLOT MODE register
108218h[1]	Saved TCASIC CONFIG register
108220h[1]	Saved TCASIC failing address register

[1]For the Models 300/300L/300X/300LX, the systems table should read: 108210h—Saved Interrupt Register. 108218h—Saved TURBOchannel Control and Status Register. 108220h—Saved Memory Configuration Register.

Address	Description
108228h[2]	Saved TCASIC error register
108230h[2]	Saved TCASIC interrupt register
108238h[2]	Saved interrupt mask register

[2]Does not apply to Models 300/300L/300X/300LX

C

TURBOchannel Troubleshooting Information

C.1 TURBOchannel Boot Command

To boot the Firmware Update Utility from a TURBOchannel device, use the following format:

```
>>> boot -fl 0,80 "#/device"
```

where # is the slot number of the TURBOchannel option and `device` is the logical name of the disc drive.

For example, to boot the Firmware Update Utility from a device connected to TURBOchannel slot 2:

```
>>> boot -fl 0,80 "2/dka400"
```