VAX 6000: Installing Model 600 Processors

Order Number EK–660EA–UP–001

This manual tells how to install Model 600 processor modules in a VAX 6000 system.

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Preface

Intended Audience

This manual is written for Digital customer service engineers and for self-maintenance customers installing a VAX 6000 Model 600 processor in a VAX 6000 series system.

Document Structure

This manual presents information in small units (enough to do one task) on facing pages, so that you do not have to flip pages in the middle of a task. The left-hand page begins with an abstract and is followed by a figure or an example. The right-hand page elaborates on the material in the left-hand page.

This manual has six chapters and two appendixes, as follows:

- **Chapter 1, Introduction**, shows the major upgrade paths possible when installing a Model 600 processor.

- **Chapter 2, Preparing for the Installation (All Upgrades)**, tells what to do before beginning the upgrade.

- **Chapter 3, Upgrading a Model 300 or 400 with +3.3V: Removing the +3.3V Inhibit Cable**, tells how to upgrade a VAX 6000 Model 300 or 400 that supplies +3.3V power, but inhibits it for older configurations. Removing the inhibit cable supplies the +3.3V necessary for the KA66A processor.

- **Chapter 4, Upgrading a System without +3.3V by Installing an H9657-CX Kit**, explains how to upgrade a Model 200, 300, or 400 to a Model 600 by installing a power regulator module.

- **Chapter 5, Installing the KA66A Processor (All Upgrades)**, shows how to install the module into the XMI cage.

- **Chapter 6, Verifying the System (All Upgrades)**, explains how to verify the system and how to set and save system parameters.

- **Appendix A, VAX 6000 Model 600 General Configuration Rules**, gives general rules for where to install processor, memory, and I/O

modules in the XMI card cage. Configuration rules for the H9657-CX upgrade, which are different, are described in Section 4.2.

- **Appendix B, Description of KA66A LEDs**, tells how to interpret the error LEDs on the KA66A.

Conventions Used in This Document

The icons shown below are used in illustrations for designating part placement in VAX 6000 series systems. A shaded area in the icon shows the location of the component or part being discussed.

FRONT   REAR
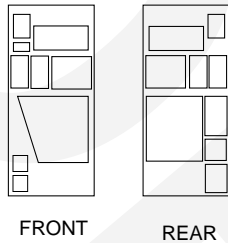
VAX 6000 Series Documents

There are two sets of documentation: manuals that apply to all VAX 6000 series systems and manuals that are specific to a VAX 6000 model. Table 1 lists the manuals in the VAX 6000 series documentation set.

Table 1:   VAX 6000 Series Documentation

Title	Order Number
Operation	
VAX 6000 Series Owner's Manual	EK–600EA–OM

Table 1 (Cont.):   VAX 6000 Series Documentation

Title	Order Number
Service and Installation	
VAX 6000 Platform Technical User's Guide	EK–600EA–TM
VAX 6000 Series Installation Guide	EK–600EB–IN
VAX 6000 Installationsanleitung	EK–600GB–IN
VAX 6000 Guide d'installation	EK–600FB–IN
VAX 6000 Guia de instalacion	EK–600SB–IN
VAX 6000 Platform Service Manual	EK–600EA–MG
Options and Upgrades	
VAX 6000: XMI Conversion Manual	EK–650EA–UP
VAX 6000: Installing MS65A Memories	EK–MS65A–UP
VAX 6000: Installing the H7236-A Battery Backup Option	EK–60BBA–IN
VAX 6000: Installing the VAXBI Option	EK–60BIA–IN

Manuals specific to models are listed in Table 2.

Table 2:   VAX 6000 Model Level Documentation

Title	Order Number
Model 600	
VAX 6000 Model 600 Mini-Reference	EK–660EA–HR
VAX 6000 Model 600 Service Manual	EK–660EA–MG
VAX 6000 Model 600 System Technical User's Guide	EK–660EA–TM
VAX 6000: Installing Model 600 Processors	EK–660EA–UP
Model 500	
VAX 6000: Installing Model 500 Processors	EK–KA65A–UP-001

Table 2 (Cont.): VAX 6000 Model Level Documentation

Title	Order Number
Models 200/300/400	
VAX 6000 Model 300 and 400 Service Manual	EK–624EA–MG
VAX 6000: Installing Model 200/300/400 Processors	EK–6234A–UP
VAX 6000 Model 500 Mini-Reference	EK–650EA–HR
VAX 6000 Model 500 Service Manual	EK–650EA–MG
VAX 6000 Model 500 System Technical User's Guide	EK–650EA–TM
VAX 6000: Installing Model 500 Processors	EK–KA65A–UP

Associated Documents

Table 3 lists other documents that you may find useful.

Table 3: Associated Documents

Title	Order Number
System Hardware Options	
VAXBI Expander Cabinet Installation Guide	EK–VBIEA–IN
VAXBI Options Handbook	EB–32255–46
System I/O Options	
CIBCA User Guide	EK–CIBCA–UG
CIXCD Interface User Guide	EK–CIXCD–UG
DEC LANcontroller 200 Installation Guide	EK–DEBNI–IN
DEC LANcontroller 400 Installation Guide	EK–DEMNA–IN
InfoServer 100 Installation and Owners Guide	EK–DIS1K–IN
KDB50 Disk Controller User's Guide	EK–KDB50–UG
KDM70 Controller User Guide	EK–KDM70–UG

Table 3 (Cont.): Associated Documents

Title	Order Number
System I/O Options	
RRD40 Disc Drive Owner's Manual	EK–RRD40–OM
RA90/RA92 Disk Drive User Guide	EK–ORA90–UG
SA70 Enclosure User Guide	EK–SA70E–UG
Operating System Manuals	
Guide to Maintaining a VMS System	AA–LA34A–TE
Guide to Setting Up a VMS System	AA–LA25A–TE
Introduction to VMS System Management	AA–LA24A–TE
ULTRIX–32 Guide to System Exercisers	AA–ME96B–TE
VMS Upgrade and Installation Supplement: VAX 6000 Series	AA–LB36C–TE
VMS Networking Manual	AA–LA48A–TE
VMS System Manager's Manual	AA–LA00A–TE
VMS VAXcluster Manual	AA–LA27B–TE
Peripherals	
HSC Installation Manual	EK–HSCMN–IN
H4000 DIGITAL Ethernet Transceiver Installation Manual	EK–H4000–IN
Installing and Using the VT320 Video Terminal	EK–VT320–UG
RV20 Optical Disk Owner's Manual	EK–ORV20–OM
SC008 Star Coupler User's Guide	EK–SC008–UG
TA78 Magnetic Tape Drive User's Guide	EK–OTA78–UG
TA90 Magnetic Tape Subsystem Owner's Manual	EK–OTA90–OM
TK70 Streaming Tape Drive Owner's Manual	EK–OTK70–OM
TU81/TA81 and TU/81 PLUS Subsystem User's Guide	EK–TUA81–UG

Table 3 (Cont.):   Associated Documents

Title	Order Number
VAX Manuals	
VAX Architecture Reference Manual	EY–3459E–DP
VAX Systems Hardware Handbook — VAXBI Systems	EB–31692–46

Chapter 1
Introduction

The VAX 6000 Model 600 processor is the KA66A. The KA66A processor uses +3.3V power[1] , which is available on VAX 6000 systems that use the H9657 cabinet or that have one of the cabinet upgrades described in this manual installed. Section 1.1 tells how you determine whether +3.3V power is available on the system you are working with.

If the system does not supply +3.3V power, you must tailor it so that it does before you can install the KA66A processor, in one of two ways. The easiest way uses the H9657-CX kit, which is supplied with all orders for KA66A processors for upgrades from Model 200, 300, or 400 systems. **You may or may not need the H9657-CX kit.** Section 1.2 describes the conditions that determine whether to use the H9657-CX kit or the full power and packaging upgrade comprising the H9657-CU kit.

This chapter describes the possible upgrade paths for installing the Model 600 processor and gives preparatory steps for all upgrade paths. Sections include:

- KA66A Upgrade Paths

- Upgrading from a system without +3.3V Power: Comparing the H9657-CX and H9657-CU Kits

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[1] The KA65A processor used in the Model 500 system also requires +3.3V power; other VAX 6000 systems do not.

1.1 KA66A Upgrade Paths

There are three starting points from which to upgrade to a VAX 6000 Model 600 system.

Figure 1–1: KA66A Upgrade Paths

msb-0761A -91
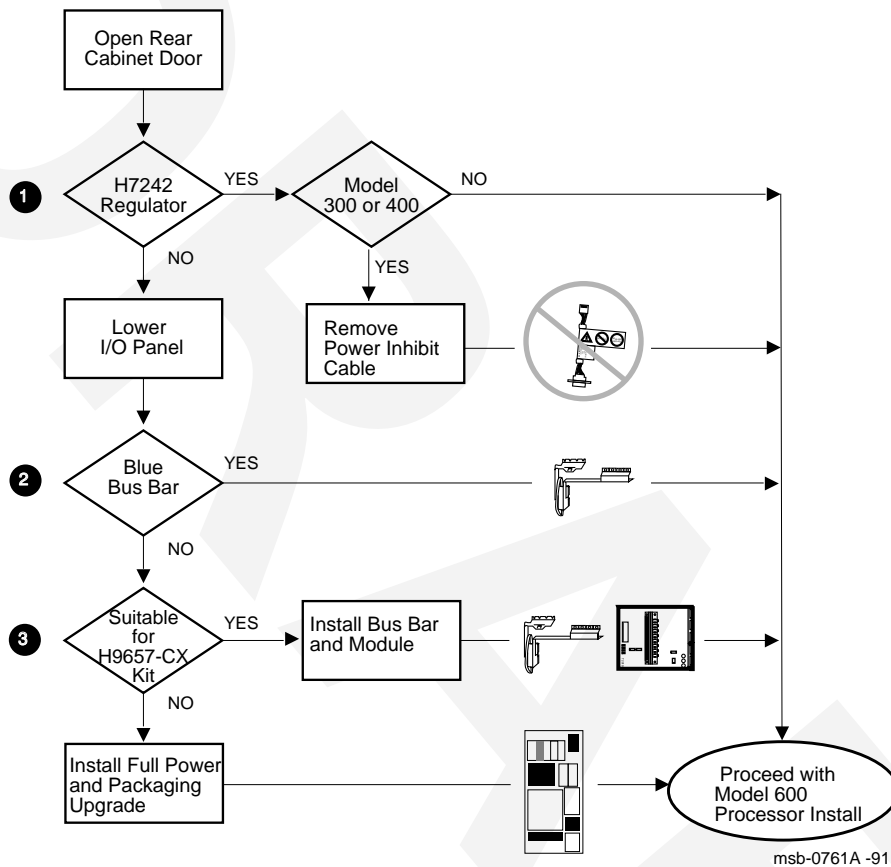
Upgrading a VAX 6000 system with KA66A modules requires some checking to ensure that the system supplies the +3.3V power needed by the KA66A processor. The best way to tell involves opening the rear cabinet door and examining the system. Three cases are possible:

❶ The system has an H7242 power regulator. This regulator supplies +3.3V power, and you can upgrade the system without concern for changing the power supply.

❷ The system does not have an H7242 power regulator, but does have an H9657-CX kit installed. To see, loosen the six screws holding the I/O panel in place, lower the I/O panel, and see if a blue bus bar has been installed on the XMI backplane. If so, the system will deliver +3.3V power to up to 4 KA66A modules, and you can upgrade the system accordingly.

❸ The system does not have an H7242 power regulator nor an H9657-CX kit installed. In this case, you need to upgrade the system with either an H9657-CX kit or an H9657-CU kit, as described in Section 1.2.

1.2 Upgrading a System without +3.3V Power

A customer with a VAX 6000 system that does not supply +3.3V power has two choices for providing this power: the H9657-CX upgrade and the H9657-CU upgrade. Three factors guide the customer's choice between the H9657-CX and H9657-CU upgrades.

Figure 1–2: Tradeoffs Between the H9657-CX and H9657-CU Upgrades


```
    ❶  ◇ NEED        YES
         BATTERY  ──────────────────────────────────►
         BACKUP

          │ NO

    ❷  ◇ NEED        YES
         MORE THAN ──────────────────────────────────►
         4 CPUs

          │ NO

    ❸  ◇ NEED        YES
         MORE THAN 12 ────────────────────────────────►
         XMI SLOTS

          │ NO

    ❹  ┌──────────────────────┐    ❺  ┌──────────────────────┐
       │ INSTALL H9657-CX KIT │       │ INSTALL H9657-CU KIT │
       └──────────────────────┘       └──────────────────────┘
```
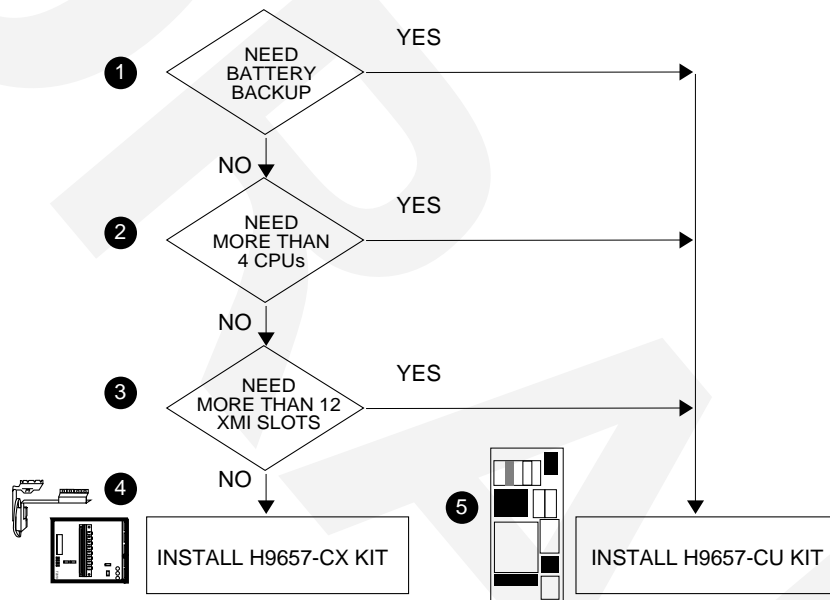
msb-0720-91

As Figure 1–2 shows, three factors affect the customer's choice between the two ways of upgrading a VAX 6000 system that does not have +3.3V power.

❶ **Need for Battery Backup**
The H7231-N battery backup unit (used with the VAX 6000 systems without +3.3V) is incompatible with the KA66A processor. An H7236-A battery backup unit is required, and its installation entails the full power and packaging upgrade (the H9657-CU kit).

❷ **Need for More Than Four CPUs**
The H9657-CX kit generates enough +3.3V power to run four KA66A CPUs. If you need more than four CPUs, you must perform the full power and packaging upgrade, where you install the H7242 power regulator.

❸ **Need for More Than 12 XMI Slots**
The H9657-CX power regulator module requires two XMI slots, leaving 12 slots for processors, memories, and adapters. If you need more than 12 slots, you must install the full power and packaging upgrade.

If the customer does not need the three items mentioned, option ❹, installing the H9657-CX kit, is probably the best choice. If the customer needs any of the three items, option ❺, installing the H9657-CU kit, is needed. This upgrade is described in detail in the *VAX 6000 XMI Conversion Manual*.

NOTE: *If the customer is upgrading from a Model 500 that was itself upgraded using the H9657-CX kit, the same restrictions listed above apply. That is, such a system can have no battery backup, can have no more than four CPUs, and can use no more than 12 XMI slots.*

Chapter 2
Preparing for the Installation (All Upgrades)

Before you install the KA66A processors in your VAX 6000 system, you need to make sure that the system will work after the physical installation has been done. This chapter describes the procedure. Sections include:

- Record System Parameters
- Shut Down the System
- Remove Old Modules
- Return Old Processor Modules
- Continuing the Installation

NOTE: *Make sure that the version of your installed operating system is one that supports the Model 600 (KA66A) processor. Otherwise, you will not be able to restart the system after installing the KA66A processor. VMS Version 5.5 or later supports the KA66A processor; for other operating systems, see Digital's Systems and Options Catalog.*

2.1 Record System Parameters

Save a printout of the system parameters, which you'll want to restore after installation.

Example 2–1:   Record System Parameters

```
>>> INIT      ❶              ! Resets the entire system.

#123456789 0123456789 0123456789 01234567#

F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #

    A   A   .   .   M   M   .   .   .   .   .   .   P   P   TYP
    o   o   .   .   +   +   .   .   .   .   .   .   +   +   STF
    .   .   .   .   .   .   .   .   .   .   .   .   E   B   BPD
    .   .   .   .   .   .   .   .   .   .   .   .   +   +   ETF
    .   .   .   .   .   .   .   .   .   .   .   .   E   B   BPD

.   .   .   .   .   .   .   .   .   .   +   .   +   +   .   XBI D +
.   .   .   .   .   .   .   .   +   .   +   .   +   +   .   XBI E +

    .   .   .   .   A2  A1  .   .   .   .   .   .   .   .   ILV
    .   .   .   .   128 128 .   .   .   .   .   .   .   .   256 Mb

Console = V2.00  RBDs = V2.00  EEPROM = 2.00/2.00  SN = SG01234567 ❷

>>> SHOW FIELD       ❷
  Saved boot specifications:
    DEFAULT /XMI:E /BI:4 DU0

  Console terminal parameters:
    /SCOPE     /SPEED: 9600  /BREAK

  Console error message language mode:
    English

  Memory configuration:
F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #

    .   .   .   .   A2  A1  .   .   .   .   .   .   .   .   ILV
    .   .   .   .   128 128 .   .   .   .   .   .   .   .   256 Mb
    /CONSOLE_LIMIT:01000000
    /INTERLEAVE:DEFAULT

  Power system:   A

  System serial number: SG01234567
```

Example 2–1 Cont'd on next page

Example 2–1 (Cont.):   Record System Parameters

```
>>> SHOW ALL    ❸
    Type          Rev       ! Lists all system parameters,
1+  KA65A   (8080) 0008     ! beginning with the system
2+  KA65A   (8080) 0008     ! configuration
9+  MS65A   (4001) 0002
A+  MS65A   (4001) 0002
D+  DWMBB/A (2001) 0002
E+  DWMBB/A (2001) 0002

XBI D
1+  DWMBB/B (2107) 000A
2+  CIBCA-B (0108) 41C2
4+  DEBNI   (0118) 0100

XBI E
1+  DWMBB/B (2107) 000A
2+  DEBNI   (0118) 0100
4+  KDB50   (010E) 0F1C
6+  TBK70   (410B) 0307

Current Primary: 1            ! Shows the status of CPUs
/NOENABLED-
/NOVECTOR_ENABLED-
/NOPRIMARY-
                              ! Shows the memory interleave
F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #
    .   .   .   .   A2  A1  .   .   .   .   .   .   .   .       ILV
    .   .   .   .  128 128  .   .   .   .   .   .   .   .       256 Mb
/INTERLEAVE:DEFAULT
/SCOPE    /SPEED: 9600 /NOBREAK
English
XMI:D BI:4  08-00-2B-0B-8E-94
XMI:E BI:2  08-00-2B-15-7F-C3
DEFAULT    /XMI:E /BI:4 DU0
>>>
```

To print the console terminal output, use the Print Screen key (the second key at the top left of the keyboard) on the VT320 terminal. Store these printouts in the *Site Management Guide* for later reference.

❶ At the console prompt, enter INIT to reset the entire system. The power-up self-test shows configuration and interleave information.

❷ For Model 500 and 600 processors, use SHOW FIELD; it includes information on the power system, which is not included in the SHOW ALL command.

❸ Use SHOW ALL to record all other relevant information.

2.2 Shut Down the System

Before doing anything more to install KA66A processors, shut down the operating system and turn off the upper key switch. If you are installing an H9657-CX or an H9657-CU kit, you also need to turn off the AC power supply and unplug the machine.

Figure 2–1: Power Down the System
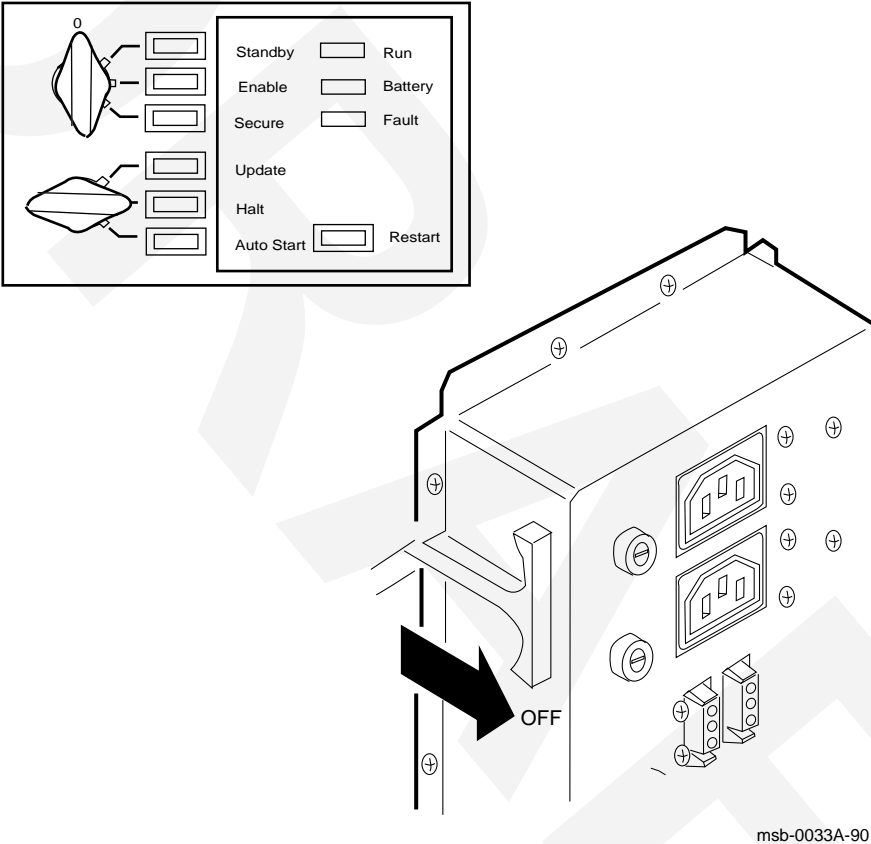
msb-0033A-90

1. Perform an orderly shutdown of the operating system.

2. Turn the upper key switch on the front control panel to the Off (0) position (see Figure 2–1).

3. Open the front cabinet door.

4. Remove the clear plastic door in front of the XMI card cage.

For all systems except those using the H9657-CX kit or the H9657-CU kit to provide power, further work will involve taking modules in and out of the XMI card cage, and you can proceed while electrical power is being supplied to the system.

WARNING: *If you are using the H9657-CX or the H9657-CU kit, you will be working directly with power bus bars; turn off the power supply.*

1. Open the rear cabinet door.

2. At the rear of the cabinet, pull out the circuit breaker on the AC power controller to the Off position (see Figure 2–1).

3. Unplug the system power cord; wait 2 minutes for capacitors to discharge.

2.3 Remove Old Modules

Before installing new processor modules, take out the old ones.

Figure 2–2: Removing Old Modules from the XMI Card Cage
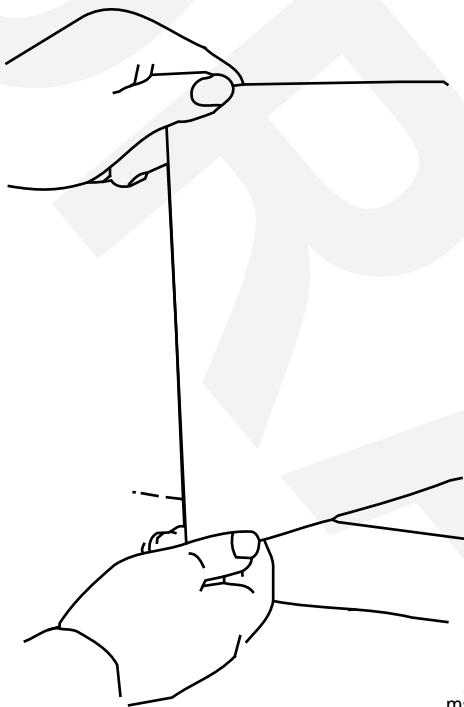
msb-0762-91

Upgrading a VAX 6000 to a Model 600 may require changing some other modules. If you have BI or CI I/O options, for example, you may need to change adapters for those modules. Table 2–1 tells what modules can and cannot be used with the H9657-CX upgrade and with all other upgrades.

Table 2–1: Upgrading Modules for the Model 600

Module	Upgrade with H9657-CX Kit	Other Upgrades
MS62A memory	No	No
MS65A memory	Yes	Yes
DWMBA adapter	Yes	No
DWMBB adapter	Yes	Yes
CIBCA-A adapter	No	No
CIBCA-B adapter	Yes	Yes
KA64A vector module	No	No

CAUTION: *You must wear an antistatic wrist strap attached to the cabinet when you handle any modules.*

When you take out a module from the XMI card cage, follow these rules:

1. Lift the card cage handle for the slot being dealt with and make sure it is firmly in place. (You may need to hold the handle up until you have started sliding the module out.)

2. Remove the old module, holding it by the corners as shown in Figure 2–2.

3. Make sure that no part of the module touches another module or a cable.

4. Place the module in an electrostatic discharge (ESD) box or on an ESD mat. If a mat, make sure the mat is on a stable, uncluttered surface. Side 1 of the module (with the heat sinks) should face up.

5. Return processor modules, as described in Section 2.4.

2.4 Return Old Processor Modules

Processor modules removed from machines are to be returned to the Returns Sort Center.

CAUTION: *Use proper ESD procedures when handling these modules.*

These instructions for the return of modules apply to the U.S. area only. Those installing upgrades in other areas should follow procedures for those countries.

1. Package the modules removed from the VAX systems in the same container(s) in which the upgrade option was shipped. Be sure to remove the return address label from inside the box prior to packing.

2. Seal the container securely with packing tape.

3. Attach the return address label. Be sure to cover all previous shipping information with the label and/or packing tape.

4. Contact your district Customer Administration Services (CAS) representative for a Return Authorization Number (RA number). CAS will need the Digital order number and customer name. CAS will arrange for pickup of this material. (If you do not know the district CAS representative, contact the district sales office for instructions.)

5. Write the RA number on the return address label. Be sure this is legible.

6. Customers should be advised that they will be billed for modules not returned to Digital.

7. Send the package to the customer shipping area for pickup.

8. Digital customer service must fill out the LARS form as follows:

System/Processor Type:	6XXX
Activity:	N
Call Type:	I
Module/Fail Area:	63XUX–XX RA# _ _ _ _

   (Fill in "X" with information from shipping paperwork and give the RA number.)

2.5 Continuing the Installation

You are now ready to proceed with the installation of the VAX 6000 Model 600 processors. As noted in Chapter 1, you read only the chapters that apply to your installation.

- **Upgrading a Model 500 or 600 System.** Proceed to Chapter 5 (Installing the KA66A Processor) and Chapter 6 (Verifying the System).

- **Upgrading a Model 300 or 400 System with +3.3V XMI.** Proceed to Chapter 3 (Upgrading a Model 300 or 400 with +3.3V: Removing the +3.3V Power Inhibit Cable) and then to Chapters 5 and 6 (Installing the KA66A Processor and Verifying the System).

- **Upgrading a System without +3.3V by Installing an H9657-CX Kit.** Proceed to Chapter 4 (Installing the H9657-CX Kit) and then to Chapters 5 and 6 (Installing the KA66A Processor and Verifying the System).

- **Upgrading a System with an H9657-CU Kit.** See the *VAX 6000 XMI Conversion Manual* for directions on how to convert the power system. You can then refer to Chapters 5 and 6 of this manual to tell you how to install KA66A processor(s) and verify the installation.

Upgrading a Model 300 or 400 with +3.3V: Removing the +3.3V Inhibit Cable

To upgrade a VAX 6000 Model 300 or 400 that has a +3.3V XMI, go to the back of the cabinet and remove the power inhibit cable (part number 17-02522-01). This cable must be removed from connection J1 of the H7242 regulator and from the main cable to the H7206-B (see Figure 3–1). Plug the end of the main cable back into connection J1 of the H7242 regulator.

Figure 3–1: Removing the +3.3V Inhibit Cable (Part No. 17-02522-01)

Chapter 4
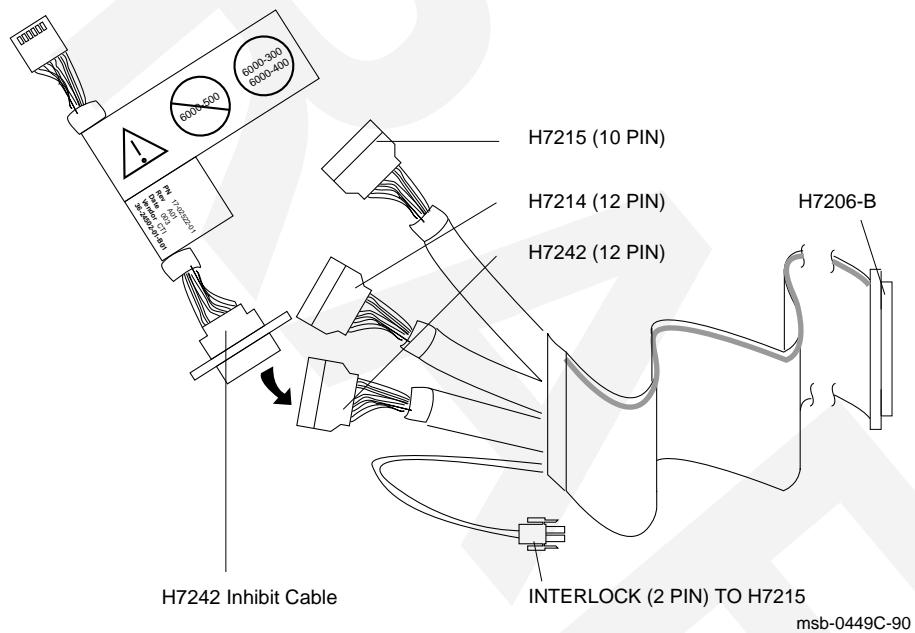
Upgrading a System without +3.3V by Installing an H9657-CX Kit

If you have a system that does not have a +3.3V XMI, the H9657-CX kit lets you upgrade the system to a Model 600 without going through the full power and packaging upgrade (kit H9657-CU).

This chapter assumes that you have powered the system down as described in Chapter 2. Sections include:

- Contents of the H9657-CX Kit
- Configuration Rules for the H9657-CX Kit
- Installing the Bus Bar
- Installing the T2019 Module

NOTE: *The H9657-CX kit, consisting of a power regulator module and a bus bar, is provided with KA66A processor modules for upgrades from Model 200, 300, or 400 systems.* **You do not use the kit in all cases, however.** *The H9657-CX kit is only used for an upgrade from a system that does not supply +3.3V, and where the following conditions hold:*

- *No battery backup is needed*
- *No more than 4 processors are needed*
- *No more than 12 XMI slots are needed*

4.1 Contents of the H9657-CX Kit

The H9657-CX kit contains a blue bus bar (with four screws) and a T2019 power regulator module.

Figure 4–1: T2019 Power Regulator Module and Bus Bar

4 SCREWS

BLUE BUS BAR

T2019 MODULE

T2019

msb-0702D-91
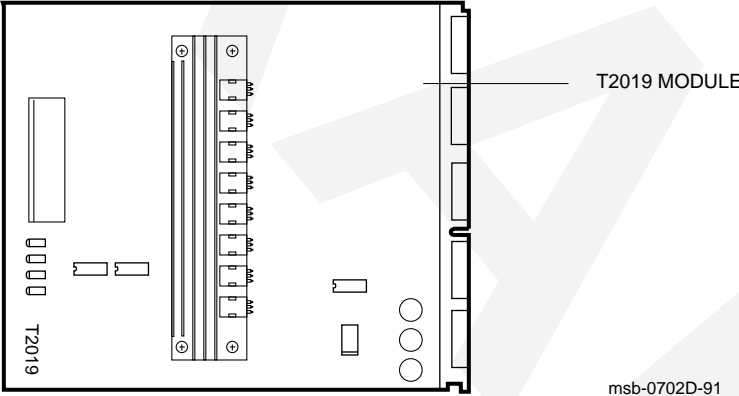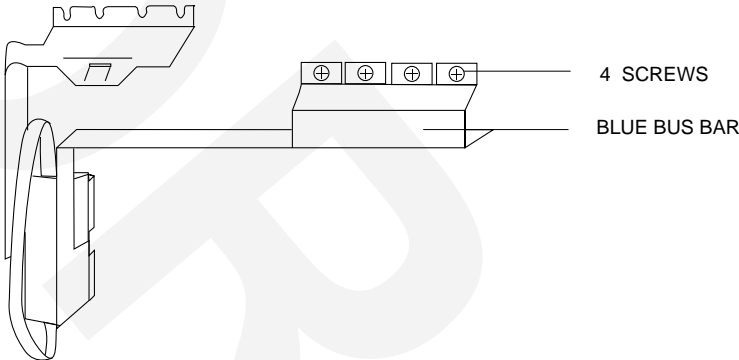
The H9657-CX kit contains:

- A T2019 power regulator module that you install in the XMI card cage. This module converts the +5V power supplied to the XMI backplane to +3.3V required by the KA66A processor.

- A blue bus bar that routes the +5V and +3.3V power to the appropriate places. Four screws to install the bus bar are attached.

4.2 Configuration Rules for the H9657-CX Kit

**Install the T2019 power regulator module in slot 2 of the XMI
card cage. Slot 1 must be vacant, since the T2019 has heat
sinks that protrude into slot 1 space.**

Figure 4–2: XMI Configuration When Using the H9657-CX Kit

XMI CARD CAGE

E D C B A 9 8 7 6 5 4 3 2 1

❶

❷ T2019

Processor Slots ❸

Memory Slots ❹

I/O Slots ❺ I/O Slots

msb-0133C-90
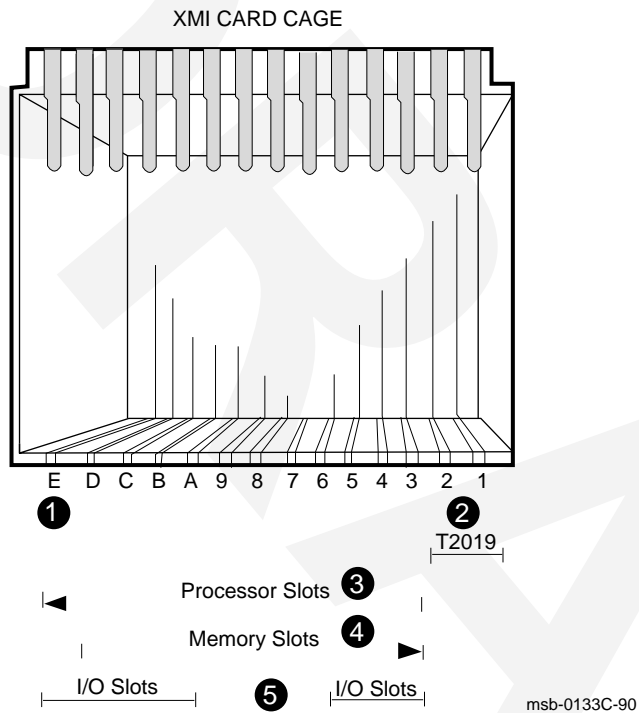
Figure 4–2 shows the XMI configuration rules that apply to systems with a T2019 power regulator module installed.

❶ Slot E of the XMI must be filled for the system to operate. **Slot E may contain a processor or an I/O adapter, but not a memory module.** For systems with VAXBI buses, a DWMBx-A module is typically in this slot, to be close to a corresponding DWMBx/B module in the VAXBI card cage. [1] Note that the VAX 6000 Model 600 supports the DWMBA *only* when the H9657-CX kit is installed. Other Model 600 systems use the DWMBB for communication with the VAXBI.

❷ The T2019 module is installed in slot 2. Heat sinks on the module protrude into the space allotted for slot 1. **Do not insert the T2019 in any other slot.**

❸ By convention, install processor modules at slot 3 and proceed to the left. A maximum of four processors can be installed when you upgrade using the H9657-CX kit.

❹ Memory modules can be placed in slots 3 through D. By convention in Model 600 systems, memory modules are first placed at slot 9 and then proceed to the right. Additional memory would then be installed beginning at slot A and proceeding to the left to slot D.

❺ No I/O adapters can be placed in slots 6, 7, 8, and 9.

---

[1] The DWMBx/A and /B modules enable data to be transferred between the XMI and VAXBI buses.

4.3 Installing the Bus Bar

The blue bus bar in the H9657-CX kit transfers the incoming +5V power to the T2019 module and delivers the +3.3V power produced by that module to the appropriate place on the XMI backplane.

Figure 4–3: Installing the H9657-CX Bus Bar
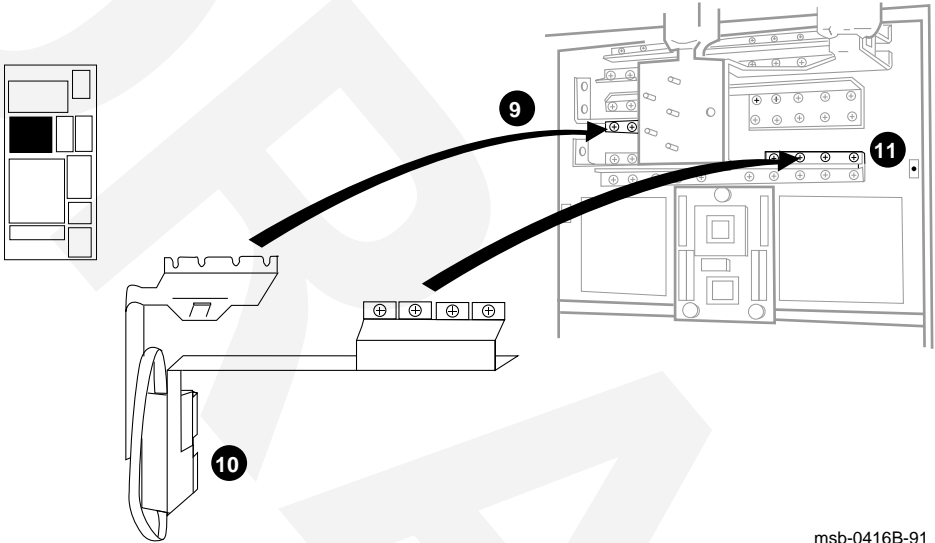
msb-0416B-91

To install the H9657-CX components, you should:

1. Perform an orderly shutdown of the operating system.

2. Turn the upper key switch on the front control panel to the 0 (Off) position.

3. Open the front and rear doors.

4. At the rear of the cabinet, pull the circuit breaker on the AC power controller to the Off position. The AC power controller is at the bottom rear of the cabinet.

5. Unplug the system power cord.

    WARNING: *Wait at least 2 minutes after unplugging the system before touching any components of the machine. Voltage discharges slowly and can hurt you if you touch some of the components. Damage can also occur to the modules.*

6. At the front of the system, remove the clear plastic door in front of the XMI cage.

    CAUTION: *Always wear an antistatic wrist strap before handling XMI modules.*

7. Remove the old processor (and memory) modules and put them in ESD boxes. (See Chapter 5 for module handling procedures.)

8. At the rear of the cabinet, remove the six screws holding up the I/O tray, and lower the I/O tray to gain access to the back of the XMI.

9. Loosen the four screws on the +5V rail at the upper left of the XMI card cage and slide the left part of the bus bar under the four screws. Tighten the screws. (See ❾ in Figure 4–3.)

10. Install the connectors at the bottom of the bus bar into slot 2 segments D and E. (See ❿.)

11. Using a flat screwdriver, screw the right portion of the new bus bar onto the +3V rail on the XMI backplane. Position the bus bar so that the screws go in the four holes at the far right of the rail. (See ⓫.)

12. With the bus bar in place, tighten the four screws on the +5V rail. Torque the screws to 9 (+/-1.8) inch-pounds.

13. Fold up the I/O tray to its original position and replace the six screws. Close the rear cabinet door.

4.4 Installing the T2019 Module

The T2019 power regulator module transforms the +5V supplied to the XMI backplane to the +3.3V needed by the KA66A processor. Install the T2019 in slot 2 of the XMI cage.

Figure 4–4: Installing the T2019 Power Regulator Module

msb-0702C-90
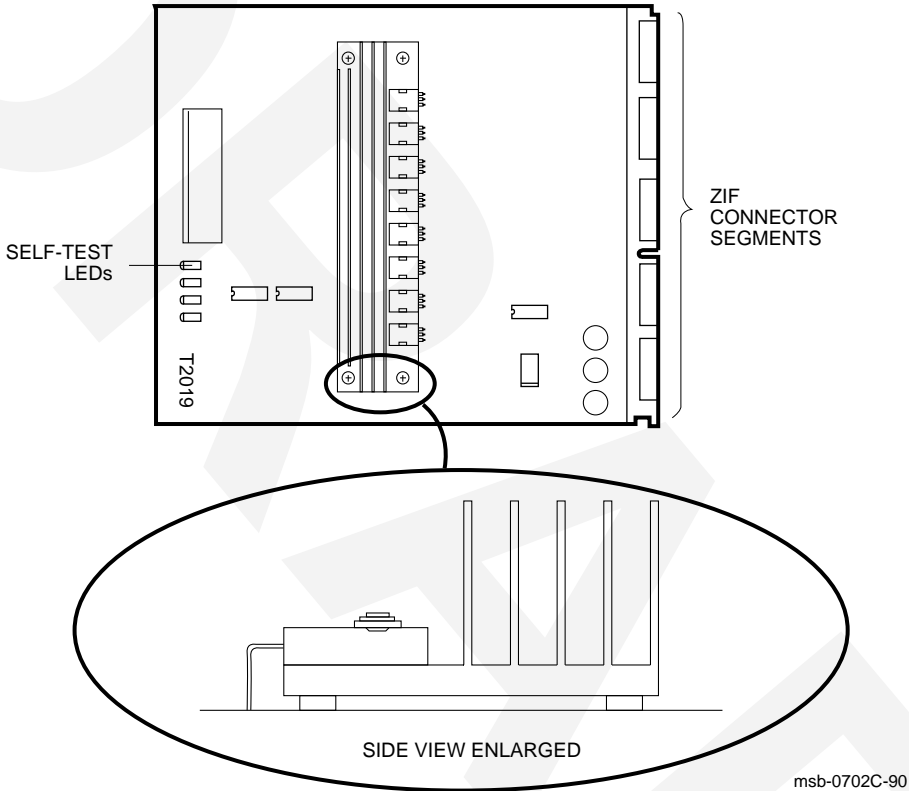
Figure 4–4 shows the T2019 power regulator module. It must be inserted in slot 2 of the XMI cage with slot 1 empty. (The heat sinks on the T2019 protrude into slot 1, as shown in the enlargement in Figure 4–4.)

Follow these steps to install the T2019 module:

1. At the front of the cabinet, insert the T2019 module in slot 2 of the XMI card cage.

2. Power up the system with only the T2019 module in the XMI card cage. The four LEDs on the module indicate status, as listed in Table 4–1.

Table 4–1 lists the meaning of the LEDs. The top two lights should be lit to indicate that the H9657-CX kit has been properly installed and is working.

Table 4–1: T2019 Power Regulator Module LEDs

LED Top to Bottom	Color	Meaning
1	Clear	+3.3V supplied
2	Clear	+5V supplied
3	Red	+3.3V not supplied
4	Red	System shutdown

Chapter 5

Installing the KA66A Processor (All Upgrades)

This chapter tells how to install the KA66A processor in the XMI card cage.

CAUTION: *At this point, it is believed that a few H7242 regulators (which supply the +3.3V power to the KA66A processor board) may produce voltage high enough to damage the chip. Before installing the KA66A, measure the voltage at the remote sense connection points on the XMI backplane for the +3.3V bus bar (the top left bar is the +3.3V bar and the third from top left bar is the ground bar). The voltage must be in the range 3.26–3.43V. A higher voltage may damage the chip. If the voltage is out of range, replace the H7242 regulator with one that does test within the proper range.*

Chapter 4 gives configuration rules for systems upgraded with an H9657-CX kit. See Appendix A for configuration rules for all other cases.

Note that the KA66A processor will only work with MS65A memories. The manual *VAX 6000: Installing MS65A Memories describes the installation of MS65A memories.*

NOTE: *The H9657-CX kit, consisting of a power regulator module and a bus bar, is provided with KA66A processor module upgrades from VAX Model 200, 300, or 400 systems.* ***You do not use the kit in all cases, however.*** *The H9657-CX kit is only used for an upgrade from a system that does not supply +3.3V, and where the following conditions hold:*

- *No battery backup is needed*

- *No more than 4 processors are needed*

- *No more than 12 XMI slots are needed*

5.1 Inserting the KA66A Processor in the XMI Card Cage

Use an anti-static wrist strap and grasp the KA66A module by the back corners to avoid contact with components.

Figure 5–1: Inserting the KA66A Processor in an XMI Card Cage
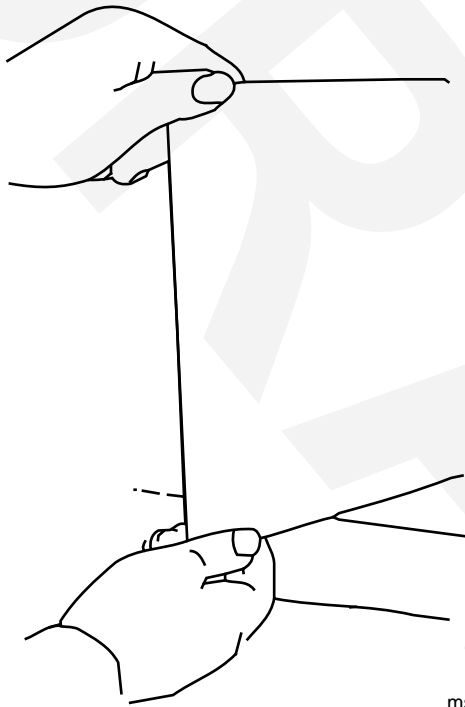
msb-0762-91

To insert the KA66A module in or remove it from the XMI card cage:

1. **Always** wear an antistatic wrist strap.

2. Raise the XMI card cage lever at the appropriate slot and make sure it is set firmly in the up position. (You may need to hold it up as you start to slide the module in.)

3. Do not let any module touch other modules or cables when you are putting it in or taking it out of the XMI card cage.

   CAUTION: *If you temporarily leave a module in an unused XMI slot, be sure to remove the module before powering up the system.*

   If you put the module on an ESD mat, make sure the mat is on a stable, uncluttered surface. Do not put it on the top of the system cabinet. And never slide the module across any surface.

4. Before removing the new module from its ESD box, place the box on a clean, stable surface.

5. To remove the KA66A module from the ESD box, grasp it firmly by the back corners (away from the connector edge), lift it and rotate it to vertical, and insert it in the slot in the XMI card cage, as shown in Figure 5–1.

6. Make sure that the module is seated firmly in the XMI slot and engaged with the XMI backplane. Then lower the lever to close the connector.

7. When all new modules have been installed and old modules repositioned (if necessary), note the new configuration, and replace the clear door in front of the XMI card cage.

NOTE: *If you are doing a full power and packaging upgrade (H9657-CU kit), the installation will entail changing DWMBA/A modules in the XMI card cage to DWMBB/A modules.*

Chapter 6

Verifying the System (All Upgrades)

The steps in verifying the correct operation of the upgraded system are described in this chapter. Sections include:

- Verification Overview

- Power Up the System

- Examine the Power-Up Test Display

- Set System Parameters (Mandatory)

- Run EVUCA to Apply Current ROM and PCS Patches (Mandatory)

- Print System Parameters

- Save EEPROM to Tape (Optional)

- Verify System Under Operating System

- Change System Number Plate

If you want to run ROM-based diagnostics, see the diagnostics chapter of the *VAX 6000 Model 600 Service Manual* for more information.

6.1 Verification Overview

To verify the new processors, turn the system on and let the power-up tests run. Set system parameters. Apply current ROM and PCS patches with EVUCA. Then save system parameters, boot the operating system, and run applicable tests.

To be supplied.

Figure 6–1: Verification Flowchart

To verify the upgraded system:

❶ Power up the system. The power-up tests run and test all individual modules. CPU/memory interaction, multiprocessor tests, additional memory tests, and DWMBB tests are also part of the power-up testing. See Section 6.2 and Section 6.3.

❷ Set the system serial number on all processors. (Error messages show that processor serial numbers have not been initialized.) See Section 6.4. Set system parameters. As part of the preparation for the upgrade, you issued a SHOW ALL console command (see Chapter 2). Using this listing, restore system-specific parameters such as boot specifications, console baud rate, memory interleave, and so forth. See Section 6.4.

❸ Boot the VAX Diagnostic Supervisor and run the EVUCA program to apply current ROM and PCS (Patchable Control Store) patches. See Section 6.5.

❹ Record and save the new customized parameters. First make a hardcopy record for future maintenance with the SHOW FIELD and SHOW ALL commands. Then, if your system has a TK tape, use the SAVE EEPROM command. See Sections 6.6 and 6.7.

❺ Verify the system under the operating system. See Section 6.8.

6.2 Power Up the System

For the H9657-CX and H9657-CU upgrades, you now restore power to the system. For all upgrades, turn the upper key switch on the front panel to the Enable position.

Figure 6–2:   Return Power to the System

REAR

ON

OFF

msb-0405-90
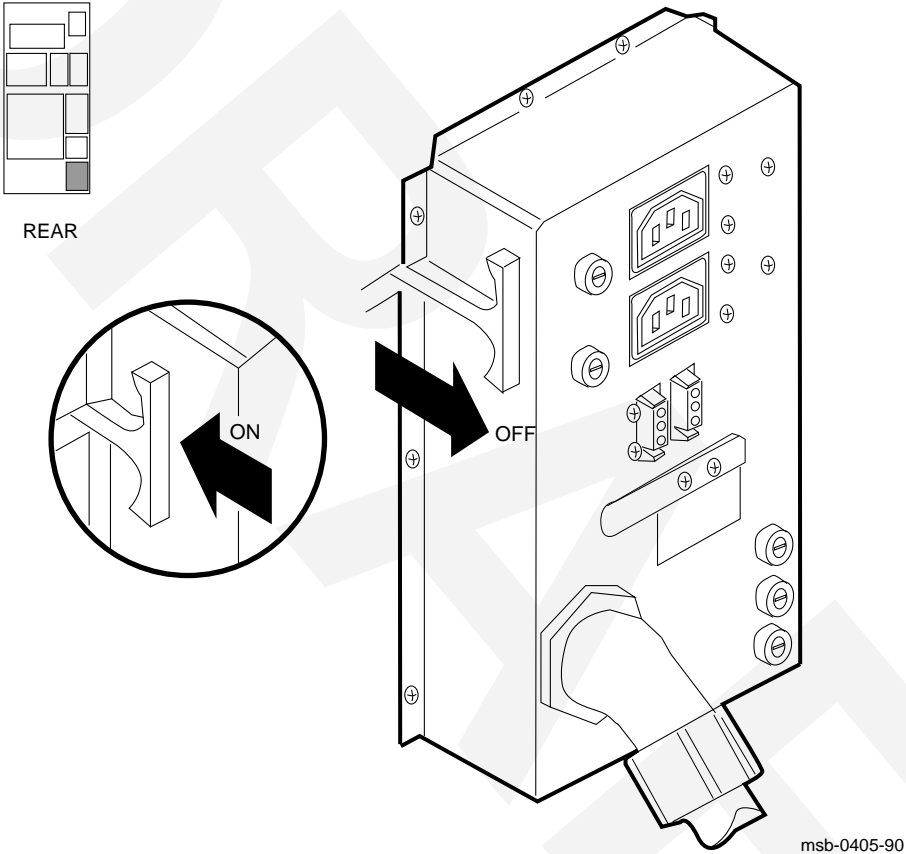
For system upgrades using the H9657-CX and H9657-CU kits, restore power to the system by:

1. Plugging in the system power cord.

2. Pushing the circuit breaker on the AC power controller to the On position. The AC power controller is at the bottom rear of the cabinet, as shown in Figure 6–2.

For all upgrades, turn the upper key switch on the front control panel to the Enable position. The lower key switch should be set at Update position. The system should run self-test, as described in Section 6.3.

6.3 Examine the Power-Up Test Display

At system power-up, check test results on the display.

Example 6–1: Power-Up Test Display for Upgrade from 610 to 620

```
#123456789 0123456789 0123456789 0123456789 012345#

F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #

    A   A   .   .   .   M   M   .   .   .   .   .   P   P       TYP
    +   +   .   .   .   +   +   .   .   .   .   .   +   +       STF
    .   .   .   .   .   .   .   .   .   .   .   .   E   B       BPD
    .   .   .   .   .   .   .   .   .   .   .   .   +   +       ETF
    .   .   .   .   .   .   .   .   .   .   .   .   E   B       BPD

    .   .   .   .   .   A2  A1  .   .   .   .   .   .   .       ILV
    .   .   .   .   .   128 128 .   .   .   .   .   .   .       256 Mb

Console = V1.00 RBDs = V1.00 EEPROM = 1.00/1.00  SN = GA14012345

?002D  For Secondary Processor n
?005A  System serial number mismatch
       Secondary Processor has xxxxxxxx
>>>
```

Example 6–2: Power-Up Test Display for an H9657-CX Upgrade

```
#123456789 0123456789 0123456789 0123456789 012345#

F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #

    A   A   .   .   .   M   M   .   P   P   P   P   .   .❶      TYP ❷
    o   o   .   .   .   +   +   .   +   +   +   +   .   .       STF ❷
    .   .   .   .   .   .   .   .   E   E   E   B   .   .       BPD ❸
    .   .   .   .   .   .   .   .   +   +   +   +   .   .       ETF ❸
    .   .   .   .   .   .   .   .   E   E   E   B   .   .       BPD

.   .   .   .   .   .   .   .   .   .   .   +   .   +   +   .   XBI D + ❹
.   .   .   .   .   .   .   .   .   +   .   +   .   +   +   .   XBI E +

    .   .   .   .   .   A2  A1  .   .   .   .   .   .   .       ILV
    .   .   .   .   .   128 128     .   .   .   .   .   .       256 Mb

Console = V1.00 RBDs = V1.00 EEPROM = 2.00/2.00  SN =  000000000

?004F System serial number has not been initialized. ❺

>>>
```

The first phase of verification involves checking the power-up test display. When you power up the system, various tests run, showing the state of each module in the XMI card cage. (Entering the INITIALIZE command at the console prompt also generates power-up testing.) Example 6–1 shows a power-up test display for an upgrade from a VAX 6000 Model 610 to a Model 620. Another processor has been added. Example 6–2 shows an upgrade using the H9657-CX kit.

NOTE: *If you are replacing a single processor, or the boot processor of a multiprocessor system, and no display appears on power-up, the console baud rate and your terminal baud rate may not be set the same. Press the* BREAK *key, which steps the terminal baud rate in the available increments, until you get the console prompt (>>>). Change the console terminal speed at the keyboard or by using the SET TERMINAL/SPEED:n console command. Then type INIT to start self-test.*

❶ Examine the power-up test display. Note that for the H9657-CX upgrade, the TYP line shows XMI slots 1 and 2 as empty (see ❶ of Example 6–2. The T2019 module actually occupies slot 2, and its components (heat sinks) protrude into slot 1.

❷ Check the STF line to see that all Model 600 processors and other modules passed their on-board self-test.

❸ Check the ETF line to see that all CPUs passed the extended testing. For Model 600 systems, extended testing includes CPU/ memory interaction and multiprocessor tests.

❹ Check the XBI lines for self-test results for VAXBI modules.

❺ The system serial number error message appears, indicating that the processors do not have the system serial number in their EEPROMs. (This is done in the next step, described in Section 6.4.

If a KA66A processor module fails power-up testing, as shown by a minus (–) rather than a plus in the STF or ETF rows, the most likely problem is that the module is improperly seated in the XMI slot. Power the system down, reseat the failed module, and power the system up again.

If the KA66A module still fails power-up testing, it should probably be replaced. You can further isolate the problem by looking at the KA66A LEDs. See Appendix B for a discussion of the KA66A LEDs.

6.4 Set System Parameters (Mandatory)

You must set the system serial number in EEPROM on all new processors and enter the power indication on H9657-CX or -CU upgrades.

Example 6–3: Setting the System Serial Number and Parameters

```
>>> SET CPU n                            ! Make the rightmost new CPU
                                         ! the boot processor.
>>> ESC DEL SET SYSTEM SERIAL ❷
Enter system serial number? aannnnnnnn   ! System prompts for serial
                                         ! number; enter 2-alpha,
                                         ! 8-numeric digit serial number.
  Update EEPROM?  (Y or N) >>> Y         ! System prompts for response.
  ?0073 System serial number updated.    ! Enter Y to update the boot
                                         ! processor's serial number.
>>> ESC DEL SET POWER            ❸
  Power System >>> A                     ! For H9657-CX (A) and -CU (C)
  Power System Read as  A                ! upgrades, set system power.

  Update EEPROM?  (Y or N) >>> Y         ! System prompts for response.
  ?011B Power System updated.            ! Enter Y to update the boot
>>> UPDATE m      ❹                      ! Use the UPDATE command to
Now updating the EEPROMS of node m       ! specifically update the EEPROM
                                         ! on any other new processors.
                                         ! UPDATE takes several minutes
                                         ! per CPU.
>>> SET BOOT DEFAULT /XMI:E /BI:4 DU0 ❺
```

You now need to set parameters within the EEPROM of the new processors that define their context in the system in which they have been installed. In particular, you must set the system serial number in the EEPROM of the newly-installed processors. And, if you have upgraded using an H9657-CX or -CU kit, you must also set the power indication in all the new processors.

❶ Set the lower key switch to Update and issue the SET CPU command to make the rightmost new processor the boot processor. If you forget to set the key switch, you will receive a console error message.

❷ Set the system serial number. To issue the SET SYSTEM SERIAL command, depending on your keyboard, you enter one of the following:

```
>>> CTRL/I  DEL  SET SYSTEM SERIAL  ! VT200 terminals and higher

>>> ESC  DEL  SET SYSTEM SERIAL     ! VT100 and hardcopy terminals
```

At the prompt, enter the serial number.[1] The console program prompts
for confirmation to update the EEPROM. Type *Y*.

❸ If you have gone through an H9657-CX or H9657-CU upgrade, you
must use the SET POWER command to store the power conversion
information in EEPROM. Otherwise, proceed to ❹. The SET POWER
command accepts three options:

    A — Power system upgraded with an H9657-CX kit
    B — Power system includes a battery backup system
    C — Power system upgraded with an H9657-CU kit (default)

Again, the console prompts for EEPROM update, and then confirms the
setting.

❹ Issue an UPDATE m command to propagate the system serial number
and power information to each new CPU's EEPROM.

Note that UPDATE will not work if the ROM revision levels are
different on the boot processor and the processor being updated.
UPDATE will print an error message to that effect.

Revisions to ROM code are generally of such an extent that major
new capabilities or fixes are included in the latest revision, and ideally
all of a system's processors should have the latest (highest-numbered)
ROM revisions. However, the console code does not preclude running
processors with different ROM revisions.

If you decide to bring the system up with processors with different ROM
revisions, you will then have to use individual SET commands to set
the system serial number and power on each newly installed processor.

❺ Now issue other console commands to customize system parameters.
These commands include SET BOOT, SET TERMINAL, SET
LANGUAGE. Refer to the printout you created in Section 2.1, Record
System Parameters.

---

[1] The system's serial number will have been recorded and saved in the *Site Management
Guide* during the preparation steps described in Chapter 2. Or, you can find the correct
serial number by issuing a SET CPU command to a previously installed CPU and then the
command:

    CTRL/I DEL SHOW SYSTEM SERIAL

6.5 Run EVUCA to Apply Current ROM and PCS Patches (Mandatory)

You must run EVUCA to ensure that all modules are up to the latest patch revision. Boot the VAX Diagnostic Supervisor (VAX/DS), run the autosizer EVSBA, and load and run the EVUCA program.

Example 6–4: Using VAX/DS to Run EVUCA to Patch EEPROMs on All Modules

```
>>> BOOT /XMI:A /R5:10 /FILENAME:ISL_LVAX_B EX0      ❶
          .
          .
          .
  [Initial Display]

          .
          .
          .
Network Initial System Load Function                 ❷
Version 1.1

  FUNCTION          FUNCTION
    ID
    1      -        Display Menu
    2      -        Help
    3      -        Choose Service
    4      -        Select Options
    5      -        Stop

Enter a function ID value: 3                          ❸

  OPTION            OPTION
    ID
    1      -        Find Services
    2      -        Enter known Service Name

Enter an Option ID value: 1                           ❹

Working
```

EVUCA Functions

EVUCA checks the patch revision level on the latest diagnostic CD or tape against the EEPROM patch revision level on the newly installed processors.

If EVUCA finds different patch revision levels, it prompts you to ask if the patches should be made; that is, if the revisions on the diagnostic media should be written to EEPROM on the newly installed processors where it will be usedto augment or correct code in the Console and Diagnostic ROMs and PCS (Patchable Control Store) on the processor chip itself.

In general, a higher patch number means a later revision. For example, Revision 1.06 was made at a later time than 1.01, and includes the most complete and comprehensive changes. (You may want to run EVUCA to check EEPROM patch revision levels on all processors, not just those newly installed, to make sure all are running at the same level.)

This section shows a sample console session, starting with booting the VAX Diagnostic Supervisor (VAX/DS) from the console prompt. EVUCA is one of the programs that can be run under VAX/DS.

❶ Boot VAX/DS from the diagnostic media. This example shows a boot from an Ethernet-based compact disk (CD) server connected to a DEMNA (indicated by EX0) located at XMI node A. The /FILENAME qualifier identifies the Initial System Load (ISL) program, needed for booting from CD servers. The general form for the filename is ISL_LVAX_n, where n is the revision letter noted on the diagnostic CD.

For a CD server connected to a DEBNI or DEBNA, an example is:

```
>>> BOOT/XMI:m/FILENAME:ISL_LVAX_B/BI:n/R5:10 ET0
```

An example of booting from a TK50, TK70, or TF85 console load device is:

```
>>> BOOT/R5:10 CSA1
```

❷ For CD servers only: the ISL program prompts for responses to load and run VAX/DS. These prompts are discussed in items ❸ through ❻. If you boot from another device, VAX/DS is booted and run immediately; go to step ❼.

❸ The ISL program presents presents options; type 3 to select a service.

❹ You can select a service in two ways: Option 1 lists the services available. Option 2 lets you enter a known service name.

Example 6–5: Using VAX/DS to Run EVUCA to Patch EEPROM on All Modules (Part 2)

```
Servers found:: 6        ❺

Service Name Format:
        Service Number
        Service Name
        Server Name
        Ethernet ID

#1
NSS_SYSDISK
ESS_08002B15FCE1
08-00-2B-15-FC-E1

#2
600_DIAG_B
ESS-08002B15FCE1
08-00-2B-15-FC-E1

Enter a Service Number or <CR> for more: 2      ❻

                    Copyright Digital Equipment Corporation
                                  1991.
                          All Rights Reserved.

  DIAGNOSTIC SUPERVISOR.  ZZ-EXSAA-X15.0-191   1-JAN-1991 00:00:13

DS> RUN EVSBA  ❼


********************************************************************************
                  Copyright Digital Equipment Corporation
                         1981, 1989, 1990, 1991.
                           All Rights Reserved.

 ********************************************************************************


 .. Program: EVSBA - AUTOSIZER  level 3, revision 7.65, 3 tests,
    at 00:02:04.68.

 .. End of run, 0 errors detected, pass count is 1,
    time is  1-JAN-1991 00:02:54.36
```

❺ In this example, the ISL program finds six CDs on the Ethernet CD server. ISL then lists identification information for each CD. In this example, two of the six disks are listed and a prompt asks you to choose between selecting one of the two disks listed or seeing more identification information for the remaining CDs. The diagnostic disk name is 600_DIAG_n, where n is the revision letter for the CD. So in this example, the user typed "2" to select 600_DIAG_B. (If no name beginning 600_DIAG_n had yet been printed, the correct choice response would have been a carriage return, to see the rest of the CD names.)

❻ The ISL program loads the VAX Diagnostic Supervisor (VAX/DS) and runs it. VAX/DS displays its diagnostic banner.

❼ Type RUN EVSBA (the Autosizer program) to tell VAX/DS how the system is configured.

Example 6–6: Using VAX/DS to Run EVUCA to Patch EEPROM on All Modules (Part 3)

```
DS> LOAD EVUCA            ❽
        .
        .
        .
  [Copyright banner prints]


DS> SELECT ALL                         ❾
DS> SET TRACE                          ❿
DS> START                              ⓫

.. Program: EVUCA - VAX 6000 EEPROM Update Utility, revision 2.0, 5 tests,
   at 00:04:03.27.
Testing: _KA0

Please put the front panel switch in the update position.    ⓬
Press <RET> when ready.

Test 2: Load data from media

Data file? <EXUCA.BIN>            ⓭

Searching for data file...
Data file loaded.

Looking for patch for CPU 09 - ROM 1.00 EEPROM 1.00.
Patch image is revision 01.01
Do you really want to apply this patch [(No), Yes] yes     ⓮

Test 3: Determine Typecodes Updated
Test 4: Update EEPROM data

Getting selectable boot primitives for CPU 09, ROM 1.00
Updating CPU 09
Primary CPU 09 Done
```

❽ Load the EVUCA program to check for patch revision and request patch updates.

❾ Type SELECT ALL to request that all processors be checked. In this case, there is only one at XMI node 9, as will appear later in the listing.

❿ The SET TRACE command requests that VAX/DS display information on the console terminal so that you can tell when a test is running.

⓫ Type START to begin execution of the EVUCA program.

⓬ This request only appears if the front panel switch is not in the UPDATE position. The program will wait until you turn the switch, and then type RETURN to continue the program.

⓭ Type EXUCA.BIN, the name of the file on the diagnostic media containing the patches for the processors. The file is loaded, and its information checked against current information in EEPROM. In this case, the EEPROM revision is 1.00 and the patch on the diagnostic media is 01.01, a later revision.

⓮ EVUCA prompts to see if you want to apply the patch. The default is NO. Type yes to apply the patch.

In the example, the patch is made to CPU 09 (the only one in this example), and EVUCA displays status information to that effect.

Example 6–7:   Using VAX/DS to Run EVUCA to Patch EEPROM on All Modules (Part 4)

```
Test 5: Show Boot primitives              ⑮

ROM boot primitives for CPU 09, revision 00.06 are:

1       This boot primitive supports the following:
        - boot primitive designation DU
          Device KDB50, device type 010E
          Device KDM70, device type 0C22

2       This boot primitive supports the following:
        - boot primitive designation ET
          Device DEBNI, device type 0118
          Device DEBNA, device type 410F

3       This boot primitive supports the following:
        - boot primitive designation EX
          Device DEMNA, device type 0C03

4       This boot primitive supports the following:
        - boot primitive designation FX
          Device DEMFA, device type 0823

No boot primitives found in EEPROM for CPU 09

The primary cpu was succesfully updated.   ⑯


Current ROM and EEPROM revisions for each CPU are:    ⑰
CPU 09 - ROM 1.00 EEPROM 01.01

.. End of run, 0 errors detected, pass count is 1,
   time is  1-JAN-1991 00:07:10.93
DS> EXIT          ⑱
```

⑮ The EVUCA listing shows the *boot primitives* available in ROM and EEPROM for the system. A boot primitive for a particular device is a routine to read the system bootstrap program, VMB, from the device into memory and start it running.

This information, then, tells what devices you can boot from with a particular CPU. In this example, four boot primitives exist in ROM on CPU 09 and none in EEPROM.

⑯ EVUCA displays the current ROM and EEPROM revisions. Note that EEPROM has been patched; the revision level is 1.01.

⑰ Type EXIT to terminate VAX/DS and return to console mode.

6.6 Print System Parameters

Using the SHOW FIELD and SHOW ALL commands, print the system parameters in effect for this system. Using console commands, print the parameters to the console terminal printer and save the printout in two places: the maintenance envelope attached to the back door of the cabinet and in your Site Management Guide.

Example 6–8:   System Parameters Printout

```
❶ >>> SHOW FIELD
  Saved boot specifications:
    DEFAULT /XMI:E /BI:4 DU0

  Console terminal parameters:
    /SCOPE    /SPEED: 9600  /BREAK

  Console error message language mode:
    English

  Memory configuration:
  F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #

      .   .   .   .   .   A2  A1  .   .   .   .   .   .   .   .       ILV
      .   .   .   .  128 128  .   .   .   .   .   .   .   .       256 Mb
     /CONSOLE_LIMIT:01000000
     /INTERLEAVE:DEFAULT

  Power system:   A

  System serial number: SG01234567

❷ >>> SHOW ALL
        Type              Rev
   3+   KA66A    (8087)   0008
   4+   KA66A    (8087)   0008
   5+   KA66A    (8087)   0008
   6+   KA66A    (8087)   0008
   8+   MS65A    (4001)   0084
   9+   MS65A    (4001)   0084
   D+   DWMBB/A  (2001)   0002
   E+   DWMBB/A  (2001)   0002

   XBI D
   1+   DWMBB/B  (2107)   000A
   2+   CIBCA-B  (0108)   41C2
   4+   DEBNI    (0118)   0100
```

Example 6–8 Cont'd on next page

Example 6–8 (Cont.): System Parameters Printout

```
    XBI E
    1+  DWMBA/B    (2107)    000A
    2+  DEBNI      (0118)    0100
    4+  KDB50      (010E)    0F1C
    6+  TBK70      (410B)    0304

    Current Primary:  3
    /NOENABLED-
    /NOPRIMARY-
F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #
    .   .   .   .   .   A2  A1  .   .   .   .   .   .   .   .   ILV
    .   .   .   .   . 128 128  .   .   .   .   .   .   .   .   256 Mb

    /CONSOLE_LIMIT: 01000000
    /INTERLEAVE:DEFAULT
    /SCOPE     /SPEED:  9600  /BREAK
    English
    XMI:D BI:4  08-00-2B-0B-8E-94
    XMI:E BI:2  08-00-2B-15-7F-C3
    DEFAULT   /XMI:E  /BI:4 DU0
```

For future troubleshooting and maintenance, record system parameters.
This step is especially important for single-processor systems and systems
that have a CD load device. Use hardcopy printout and save the printout
in two places: the maintenance envelope attached to the back door of the
cabinet and in your *Site Management Guide*.

❶ SHOW FIELD

Enter the SHOW FIELD command at the console prompt. This display
includes the system serial number and power system, which are not
included in the SHOW ALL command.

❷ SHOW ALL

Use the SHOW ALL command to record all other relevant information for
the system for future reference.

6.7 Save EEPROM to Tape (Optional)

If your system has a TK50 or TK70 tape drive, save EEPROM to the tape. This tape would be used in case the EEPROM contents become corrupted and must be restored.

Example 6–9: Saving EEPROM to Tape

```
>>> SAVE EEPROM    ❶
Proceed with save to tape?  (Y or N) >>> Y  ❷
  ?006B EEPROM saved to tape successfully
>>>
```

Put a blank cartridge in the tape drive, write-enabled. The following steps save the contents of the EEPROM to tape:

❶ Enter the SAVE EEPROM command (see ❶).

❷ The console program queries you (see ❷). Enter *Y* to save the EEPROM contents to tape. The console program then confirms that the save operation completed successfully.

Label the cartridge and store on site. Leave the cartridge with the system manager, in case EEPROM contents become corrupted and need to be restored.

NOTE: *Use this cartridge with this system only. Tapes are not transferable, since the parameters saved are system-specific.*

6.8 Verify System Under Operating System

After you have started the operating system, run any appropriate tests. For VMS, as noted in Chapter 2, you need to have Version 5.4 or later to be able to use the Model 600 processors. With VMS, you can use a set of programs called UETP (User Environment Test Package). First log in and check the devices. Then start the tests.

Example 6–10: Running UETP

```
  Username:  SYSTEST   ❶
  Password:

$ @UETP   ❷
          Welcome to VAX/VMS UETP Version V5.3   ❸

  Run "ALL" UETP phases or a "SUBSET" [ALL]?
  How many passes of UETP do you wish to run  [ 1 ]?
  How many simulated user loads do you want [145]?
  Do you want Long or Short report format [Long]?

UETP starting at 14-NOV-1991 13:12:23.00 with parameters:
DEVICE LOAD DECNET CLUSTER  phases, 1 pass, 145 loads, long report.
```

❶ Enter SYSTEST as the username. Obtain the password from the system manager. After you log in, check all devices.

❷ Enter the command @UETP to start the program.

❸ The VAX/VMS UETP banner appears and UETP prompts you with questions. The default answer for each question is in square brackets. Press Return if you wish to enter the default answer. UETP testing begins when the final question is answered. For more information, refer to *VMS Upgrade and Installation Supplement: VAX 6000 Series*.

6.9 Change System Number Plate

On the system cabinet front door, change the number plate to reflect the number of your system upgrade.

Figure 6–3: Front Door (Inside View)

msb-0092-89
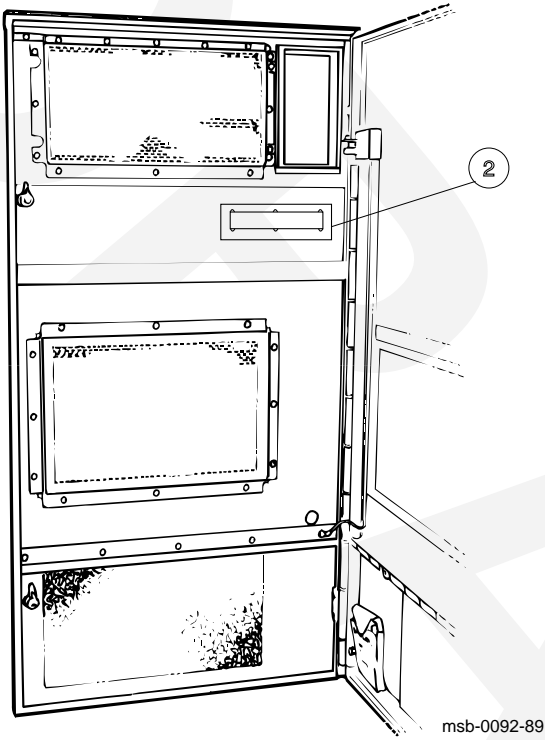
1. Locate the number plate (74-39700-XX) in your upgrade kit.

2. To change the VAX number plate, working from the inside of the front cabinet door, remove the retainer and push out the system numbers. See ❷. Install the new number for your upgraded system.

Appendix A

VAX 6000 Model 600 General Configuration Rules

This appendix gives general configuration rules for the installation of VAX 6000 Model 600 modules. It does not include systems using the H9657-CX upgrade. See Chapter 4 for configuration rules when installing the H9657-CX kit.

A.1 General Configuration Rules

Figure A–1 gives the general XMI configuration rules for VAX 6000 Model 600 systems.

Figure A–1: Configuration Rules for VAX 6000 Model 600 Systems

XMI CARD CAGE

E D C B A 9 8 7 6 5 4 3 2 1

I/O Slots ❸ I/O Slots

❹ Processor Slots

❺ Memory Slots

msb-0133H-91
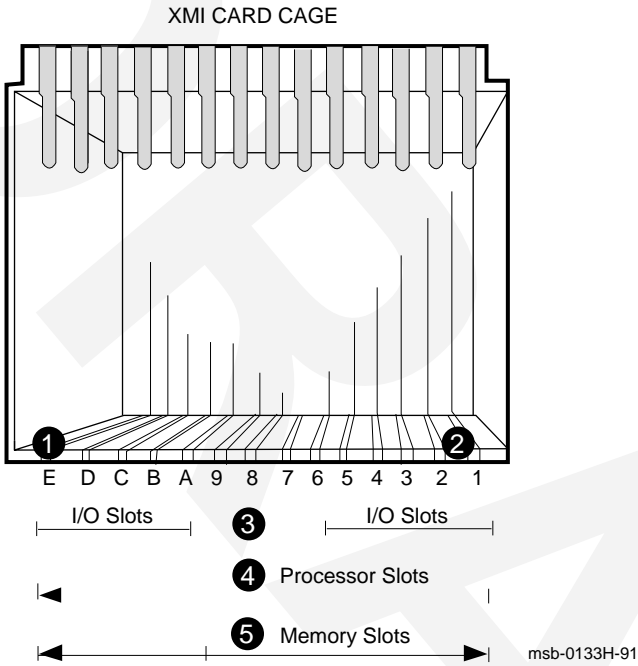
Figure A–1 gives an overview of the general rules for installing modules in the XMI card cage.

❶ ❷ An XMI module must be in either slot E or slot 1 for electrical reasons. See Figure A–1, at callouts ❶ and ❷.

❸ I/O adapters should be configured first, from left to right, in I/O slots E through A and then in slots 5 through 1.

❹ Processors should be configured next. Start with the rightmost available slot and continue right to left, installing each processor in the next available slot.

❺ Memories are installed last. Fill available slots from left to right, slots 9 through 1, and then right to left, slots A through E.

Appendix B
Description of KA66A LEDs

This appendix tells what the KA66A processor module LEDs indicate. You can use this information to isolate a problem in a CPU or DWMBB module that fails self-test.

B.1 Overview of KA66A LEDs

System power-up self-test runs four sets of tests. The results of these tests are displayed on the LEDs of the KA66A processor.

Figure B–1:   KA66A LEDs After Power-Up Self-Test

SELF-TEST PASSED

SELF-TEST FAILED

MOST SIGNIFICANT BIT

FAILING TEST NUMBER (BINARY-CODED DECIMAL)

RED

ON
ON

OFF

OFF

ON
ON

OFF

ON

YELLOW

ON

ON

OFF (Indicates failure in KA66A tests)

ON (With DWMBB yellow LED off, indicates failure in DWMBB tests)

BOOT CPU

SECONDARY CPU

msb-0710B-91
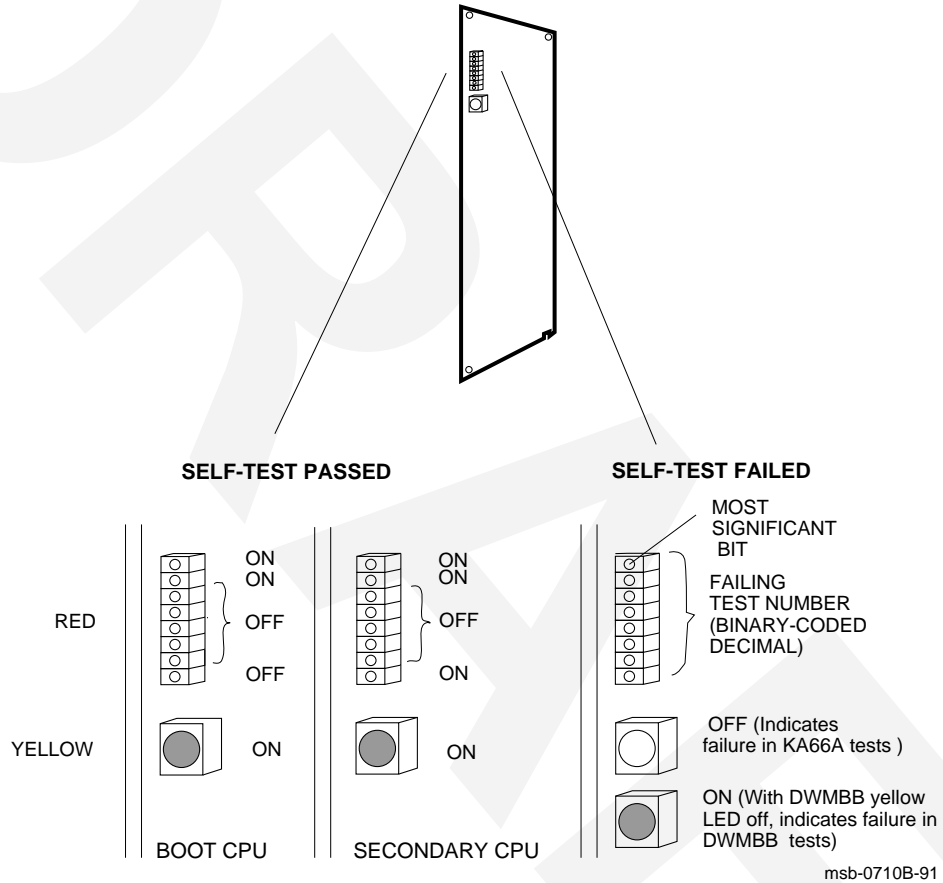
The large yellow LED at the bottom of the KA66A LEDs lights when the KA66A modules pass on-board power-up tests (each CPU module is tested individually, followed by CPU/memory interaction tests and CPU multiprocessing tests.)

Self-test also checks DWMBB/A modules, if any. If a DWMBB/A module passes self-test, its yellow light and the KA66A yellow light are on.

In either of the above two cases, the red lights of the KA66A are set as shown in the left-hand part of Figure B–1. The bottom red light of the KA66A is off if the KA66A is the boot processor, and on if it is a secondary processor.

If a DWMBB/A module fails self-test, its yellow light is off and the KA66A yellow light is on. The red lights of the KA66A indicate the error number of the failing test.

If self-test fails for the KA66As or DWMBB/As, the eight red LEDs contain an error code that corresponds to the number of the failing test. The test number is represented in binary-coded decimal, with the most significant bit at the top. A bit is ONE if the light is ON.

For example, assume a processor fails self-test (yellow LED is OFF) and shows the following pattern in the eight red LEDs:

```
TOP
    (MSB) off      0
          off      0   =  3
          on       1
          on       1

          off      0
          off      0
          on       1   =  2
    (LSB) off      0
BOTTOM
```

The failing test number decodes to 0011 0010 (binary-coded decimal 32).

Section B.2 gives more detail on the failing tests indicated by the KA66A red leds.

Description of KA66A LEDs   **B–3**

B.2 Determining Failing Test from LEDs

When power-up tests fail, the red LEDs on the KA66A contain the failing test and subtest number.

Table B–1: KA66A Status LEDs: KA66A Problems

KA66A Red LEDs	Diagnostic and Test Number	Device Failing	Power-Up Test Line
1–45	CPU self-test (RBD 0) T0001–T0045	KA66A	STF
51–65	CPU/memory test - Memory 1 (RBD 1) T0001–T0015	KA66A or MS65A 1 (module with lowest XMI node number)	ETF
70	CPU/memory test - Memory 2 (RBD 1) T0003 (equivalent to ST1/T=3)	MS65A 2 (module with next-lowest XMI node number[1])	ETF
71	CPU/memory test - Memory 3	MS65A 3	ETF
72	CPU/memory test - Memory 4	MS65A 4	ETF
73	CPU/memory test - Memory 5	MS65A 5	ETF
74	CPU/memory test - Memory 6	MS65A 6	ETF
75	CPU/memory test - Memory 7	MS65A 7	ETF
76	CPU/memory test - Memory 8	MS65A 8	ETF
81–87	Multiprocessor test (RBD 5) T0001–T0007	KA66A	ETF

[1]Values 70 - 76 indicate a failure of RBD 1 Test 3 in a particular memory module. The tests are run on modules proceeding from right to left, so a value of 70 indicates the module with the lowest XMI node number; 71, the next-lowest XMI node number, and so forth.

Table B–2: KA66A Status LEDs: DWMBB/A Problems

KA66A Red LEDs	Diagnostic and Test Number	Device Failing	Power-Up Test Line
1–44	DWMBB test T001–T0044	DWMBB	XBI

If a processor's yellow LED is OFF and the red LEDs show an error code in the range 1–45, the power-up self-test failed and the processor board is bad. If this test fails, a minus sign (–) shows for the processor on the self-test console display on the STF line.

After the power-up tests, each processor runs the CPU/memory interaction tests and the multiprocessor tests. If a test fails, the processor shows a minus sign (–) on the ETF line of the console display. The LED error codes are numbered from 51 to 65, which is the failing CPU/memory test number (1 through 15) plus 50, or 81 to 87, which is the failing multiprocessor test number (1 through 7) plus 80.

Each processor, after testing with the first memory, runs the CPU/memory interaction tests on every other good memory module. (However, only CPU/memory interaction test T0003 is run.) If a failure occurs, the memory module is probably bad, although the processor's yellow light is OFF and the memory module's yellow light is ON. If several processors fail on the same memory, that memory module is certainly bad. Try using SET MEMORY [1] to configure the bad module out of the interleave set. For error codes 70 through 76, consult Table B–1 to determine the failing memory.

If the DWMBB/A yellow LED is off, the module has failed self-test, The yellow LED of the KA66A will be on, and the KA66A red LEDs give the number of the failing DWMBB test, as shown in Table B–2.

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[1] See the *VAX 6000 Series Owner's Manual* for a discussion of the SET MEMORY console command.

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