
MicroVAX 3
VAXstation 3

MicroVAX 3/VAXstation 3 Upgrade

Installation Guide

Order Number: EK–MV3VS–IN–002

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Preface

This installation guide describes the 2T-KA650-xx kits and how to use them to upgrade:

- MicroVAX II to a MicroVAX 3 in an H9642-J System Enclosure
- VAXstation II/GPX to a VAXstation 3 in a BA123 System Enclosure

The MicroVAX II is a single-user or multi-user, standalone, 32-bit microcumputer based on the MicroVAX II processor (KA630).

The VAXstation II/GPX System is a single-user, standalone, 32-bit workstation based on the MicroVAX II processor (KA630). In **some** cases the VAXstation II, which uses the QVS(VCB01) graphics modules, **may have to be upgraded** to a VAXstation II/GPX before the system can accept the 2T-KA650 upgrade. The information for that upgrade is available from DMEIC Engineering through your Computer Special Systems Sales Specialist .

Intended Audience

This guide is intended for use by Digital Field Service personnel only.

Organization

This guide provides a step-by-step format for each upgrade, and it is organized as follows:

Chapter 1—provides the hardware configurations for the enclosures, and lists the contents of each upgrade kit.

Chapter 2—contains the detailed procedures for performing the upgrade on MicroVAX II (dual BA23) System.

Chapter 3—contains the detailed procedures for performing the upgrade on VAXstation II /GPX (BA123) System.

Chapter 4—contains the detailed procedures for performing the required ROM upgrade on the TQK50 Controller Module.

Chapter 5—describes how to test an upgraded system using the MicroVAX Diagnostic Monitor (MDM) software.

Chapter 6—describes the functionality changes after the upgrade has been completed.

Appendix A—provides the required forms Field Service needs to complete after performing a system upgrade.

Related Documentation

- *KA650 CPU Module Technical Manual*—PN EK-KA650-UG
- *MicroVAX Systems Maintenance Guide*—PN EK-001AA-MG
- *MicroVAX 3500 and MicroVAX 3600 Systems Maintenance Guide*—PN EK-159AA-UD
- *MicroVAX 3500 and MicroVAX 3600 Systems Maintenance Update*—PN EK-159AA-UD
- *VAXstation II/GPX Upgrade Installation Guide* – PN EK-GPXUP-IN
- *VAXstation 3200 and VAXstation 3500 Maintenance Advisory*—PN EK-VAXST-MA
- *TQK50/TK50 Tape Drive Subsystem Manual*— PN EK-0TK50-TM

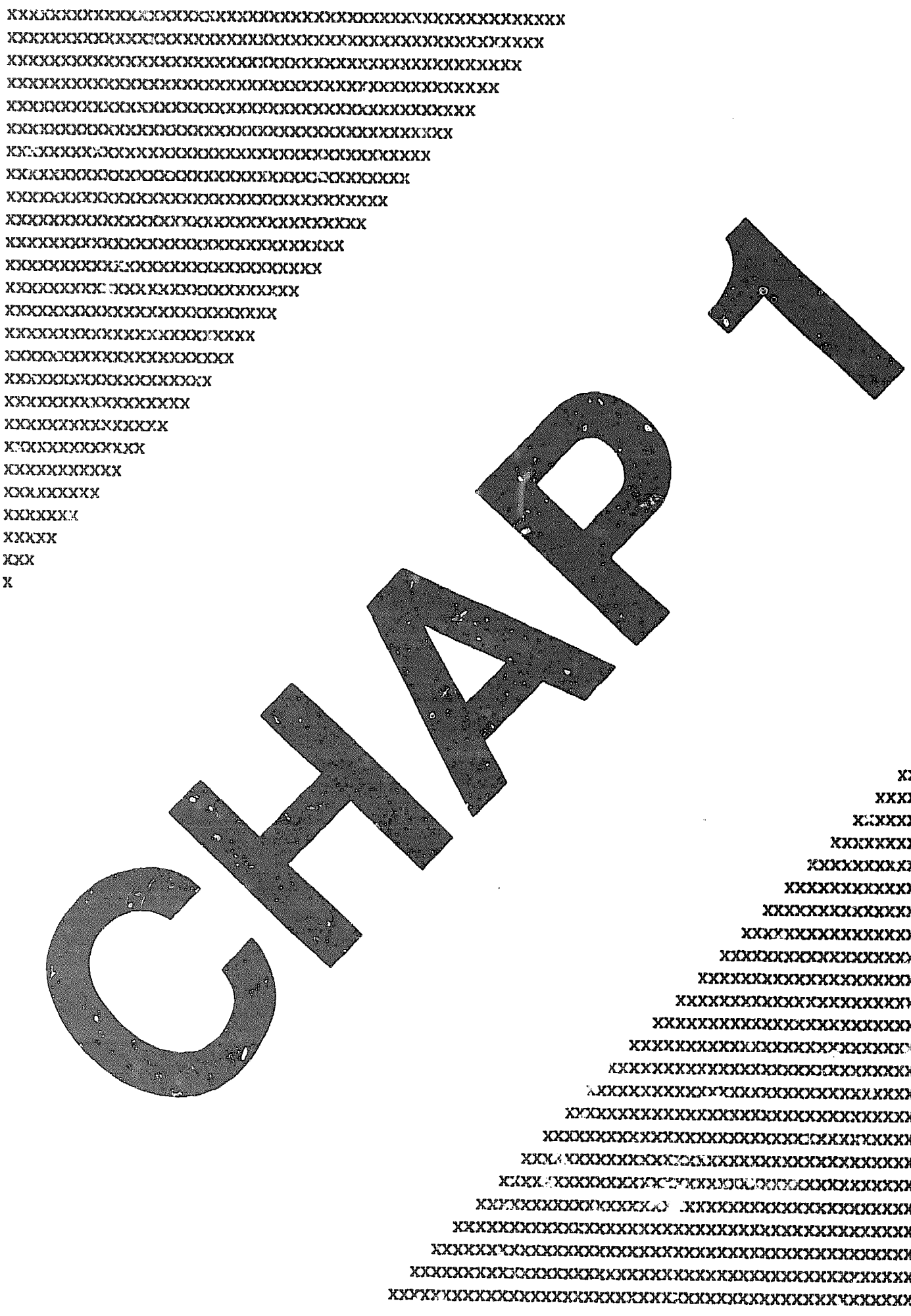
NOTES, CAUTIONS AND WARNINGS

Where notes, cautions and warnings are used in this document, they highlight specific types of information as follows:

NOTE—Calls the attention to any item of information that may be of special importance to the reader.

CAUTION —Contains essential information to avoid damage to the equipment.

WARNING —Contains essential information for the safety of the user.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Chapter 1

Determining System Needs

1.1 The Current System

To upgrade a MicroVAX II or a VAXstation II/GPX system to a MicroVAX 3 or VAXstation 3 respectively, you must first determine the type enclosure on the customer's present system. To do so, compare the customer's system to those shown in Figure 1–1 (MicroVAX II) and Figure 1–2 (VAXstation II/GPX). Then proceed to Section 1.1.1 to determine the hardware revision levels of the modules in the customer's system.

1.1.1 Revision Levels

This section shows you how to determine the revision levels of certain modules in the customer's system. If you have already checked the revision levels of the system and you know that they are at the minimum revision for this upgrade, skip this section and continue with Section 1.1.2. Otherwise, check the revision levels of the modules listed in Table 1–1 with the revision levels of the modules in the system you plan to upgrade. The modules in Table 1–1 apply to both the MicroVAX II and the VAXstation II/GPX systems.

NOTE

In some cases the VAXstation II, which uses the QVS(VCB01) graphics modules, may have to be upgraded to a VAXstation II/GPX before the system can accept the 2T-KA650 upgrade. The information for that upgrade is available from CSS-ISG Engineering through Computer Special Systems Sales Specialist.

Refer to the MicroVAX Maintenance Guide and remove the necessary panels to gain access to the system's modules. Check the revision level of the modules in the system with the revision levels of the modules listed in Table 1–1. All modules in the system must be brought up to these minimum revision levels before the upgrade can be performed.

Figure 1–1: H9642-J Enclosure - MicroVAX II

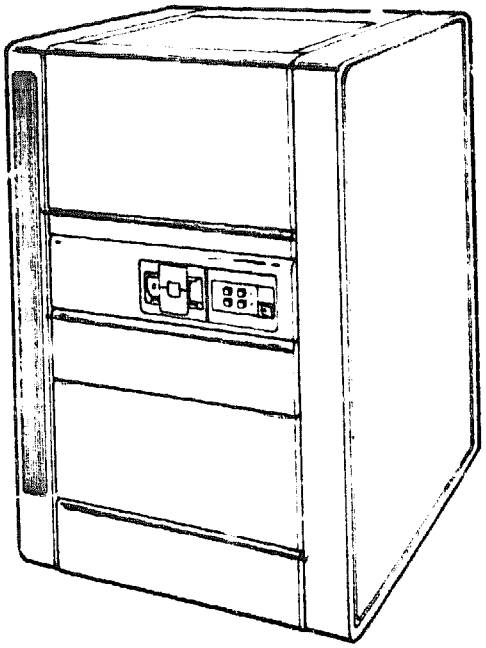

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Figure 1–2: BA123 Enclosure - VAXstation II and VAXstation II/GPX

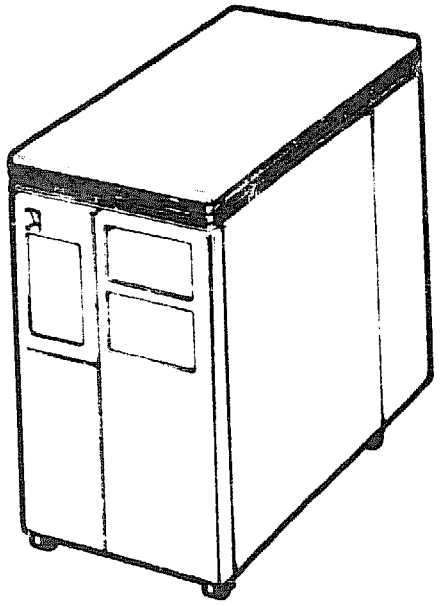

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Table 1–1: Minimum Revision Levels

Module Number	Option Type	Minimum Revision Level
A1003-00	AAV11-DA	B1
A030-00	ADQ32-AA/AF	A1
A8000	ADV11-C	H
A1008-00	ADV11-DA	B1
A026-00	AXV11-CP	H1
M3118-YA	CXA16-AA/AF	D2
M3123	CXF32-AA	E1
M3119-YA	CXY08-AA	D2
M7504-00	DEQNA	N4
M3121-00	DFA01-AA	C1
M3107-00	DHF11-M	A2
M3107-00	DHQ11-M	D1
M3104-00	DHV11-M	B1
M8043-00	DLVJ1-M	L1
M8053-00	DMV11-M	G1
M8064-00	DMV11-N	G1
M8020-00	DPV11-M	B1
M7658-00	DRQ3B-AA	A6
M7941	DRV11-00	K3
M7950	DRV11-BP	C
M8049-PA	DRV11-JP	C1
M7651-00	DRV11-WA	C1
M3108-00	DSV11-M	D1
—	DTC04 (The DTC04 module does not operate with the KA650.)	—
M7951	DUV11-M/CR	C1
M3106-00	DZQ11-M	C1
M7957	DZV11-M	B1
M8634-00	IEQ11-AD/AF	H1

Table 1–1 (Cont.): Minimum Revision Levels

Module Number	Option Type	Minimum Revision Level
M7164	KDA50-AA processor board	H4
M7165	KDA50-AA I/O board	B14
—	KIV32 (Not supported)	—
M7740-PA	KLESI-AA/SA	C3
M7500	KMV1A-xx	A1
M7635	KN210 processor board (Not supported)	—
M7636	KN210 I/O board (Not supported)	—
—	KRQ50-AA (Not supported)	—
M4002-00	KWV11-CP	M1
M7616-00	KXJ11-CA (Not supported)	—
—	KXT11 (Not supported)	—
M7138	LNV21-AA (Not supported)	—
M8027	LPV11-AA	A1
M8578-00	MRV11-D/F	A1
—	RQDX2 (MF1 PEP needs to be updated with RQDX3 module.)	—
M7513-00	RQDXE	A1
M7555	RQDX3-AA	D1
M7546-00	TQK50-AA/AF	J2
M7559-00	TQK70-AA/AF	A2
M7196	TSV05-AA->AN (See note below.)[1]	B3
M7169	VCB02-AA base	C1
M7168	VCB02-AA 4pln	A3

[1]Note: The performance of TSV05 will decrease with the use of the KA650 CPU. Contact Computer Special Systems Sales for further information.

1.1.2 Operating System and Related Software

In addition to determining the module revision levels, you must also determine the operating system version level. The minimum version level of the operating systems for both the MicroVAX 3 and the VAXstation 3 are listed below.

VAXstation 3:

VMS Version 4.7A and VWS 3.2 or higher
ULTRIX 32 Version 2.2-1 with UWS 1.1 or higher

MicroVAX 3:

VMS Version 4.7A or higher
ULTRIX-32 Version 2.2-1 or higher

1.2 Matching the Upgrade to the System

There are two major versions of upgrade kits. One version for transforming H9642-J-based MicroVAX II systems to MicroVAX 3 systems, and another version for transforming BA123-based VAXstation II/GPX systems to VAXstation 3 systems. These upgrade kits and the systems that each one upgrades are listed in Table 1–2.

NOTE

In some cases the VAXstation II, which uses the QVS(VCB01) graphics modules, may have to be upgraded to a VAXstation II/GPX before the system can accept the 2T-KA650 upgrade. The information for that upgrade is available from CSS-ISG Engineering through your Computer Special Systems Sales Specialist.

Use Table 1–3 and Figure 1–3 to identify the contents of the VAXstation 3 upgrade kit. The checklist numbers in the table correspond to the numbered items in the figure.

Upon arrival at the customer site, always check the upgrade kit contents (all versions) and make sure the additional modules (if any) are at the site before powering down the customer's system. If any component is damaged or missing, do not power down the system (causing the customer further inconvenience).

Check and make sure you have the following:

1. The correct kit and all of its required parts
2. Any additional required modules (because of the minimum revision levels)
3. Required software and licenses

Table 1–2: Possible Upgrades

Original System	Upgraded System	Upgrade Kit	Description
In a BA123 Enclosure			
VAXstation II/GPX	VAXstation III	2T-KA650-UB	Single user, 8-Meg, 1 to 2 VMS with DECnet
		2T-KA650-UE	Single user, 16-Meg, 1 to 2 VMS with DECnet
		2T-KA650-UP	Single user, 8-Meg, VAXELN Target LIC with DECnet
In an H9642-J Enclosure			
MicroVAX II	MicroVAX III	2T-KA650-UA	Multi-user, 16-Meg, 1 t0 20 VMS with DECnet
		2T-KA650-UC	Multi-user, 16-Meg, 1 t0 10 VMS with DECnet
		2T-KA650-UK	Multi-user, 16-Meg, 1 t0 2 ULTRIX with DECnet
		2T-KA650-UL	Multi-user, 16-Meg, 1 t0 8 ULTRIX with DECnet
		2T-KA650-UM	Multi-user, 16-Meg, 1 t0 16 ULTRIX with DECnet
		2T-KA650-UN	Multi-user, 16-Meg, 1 t0 32 ULTRIX with DECnet
		2T-KA650-US	Multi-user, 16-Meg, 1 to 40 VMS with DECnet

Table 1–3: 2T-KA650 Checklist

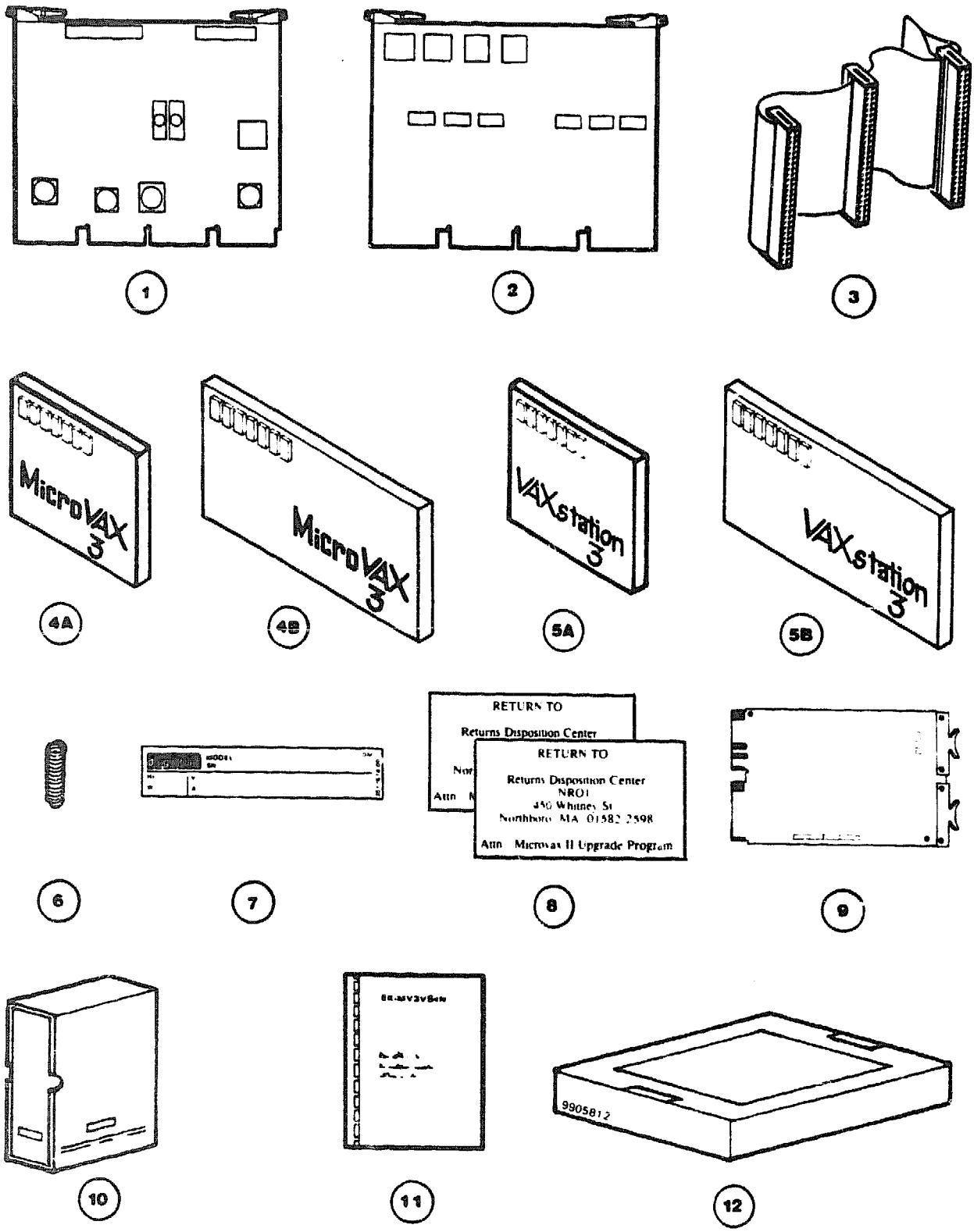
Item	Part Description	Part Number	Qty
1[1]	KA650-AA multi-user CPU module	M7620-AA	1
	KA650-BA single-user CPU module	M7620-BA	
2[2]	MS650-AA 8-Meg CPU memory module	M7621-AA	1
	MS650-BA 16-Meg CPU memory module	M7622-AA	
3	CPU to memory cable	17-01898-01	1
4A[3]	MicroVAX 3 medallion for BA23	74-37202-01	1
4B[3]	MicroVAX 3 medallion for BA123	74-31480-18	1
5A[4]	VAXstation 3 medallion for BA23	74-29910-21	1
5B[4]	VAXstation 3 medallion for BA123	74-31480-12	1
6	Medallion spring	12-20113-01	1
7	Upgrade kit, product serial number label	36-17674-00	1
8	Return label	36-26123-04	2
9	Grant card	36-26123-04	1
10	Hardware Information Kit	ZNAEF-C5	1
11	MicroVAX 3/VAXstation 3 Upgrade Installation Guide	EK-MV3VS-IN	1
12[5]	TQK50 upgrade ROM	23-331E5-00	1
	TQK50 upgrade ROM	23-330E5-00	1
	TQK50 upgrade ROM	23-065L1-00	1

The following items are included in additional kits. Additional kits are not limited to the items listed below.

Diagnostics tape cartridge	ZNA01-C5
VAXstation 3 Owner's Manual, BA123 Enclosure	EK-155AA-OW

[1]The CPU Module packed in the kit depends on the kit ordered.
[2]The Memory Module packed in the kit depends on the kit ordered.
[3]This medallion is included in multi-user upgrade kits for MicroVAX II systems.
[4]This medallion is included in single-user upgrade kits for VAXstation II/GPX systems.
[5]The three ROMs are packed in one box.

Figure 1–3: 2T-KA650 Kit Contents



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1.3 Software Backup and Operating System Shutdown

NOTE

It is the customer's responsibility to perform a software backup and then to shut down the operating system software.

Before the existing system is powered down, the customer should back-up the operating system and all related software. Make sure the customer performed a software backup and also shut down the operating system software before you continue. Detailed instructions for the backup are included in the customer's operating system documentation (VMS or Ultrix-32).

1.3.1 Systems Running MicroVMS

The MicroVMS operating system software is not supported on the MicroVAX 3 or the VAXstation 3 system. A system that was running MicroVMS before the upgrade kit installation must have VMS version 4.7A software installed. Refer to the software installation guide for directions on installing VMS on the MicroVAX 3 or the VAXstation 3.

1.3.2 Special Instructions for Systems Running ULTRIX-32

There are a few ULTRIX software procedures that the customer must be aware of before upgrading a MicroVAX II to a MicroVAX 3 or a VAXstation II/GPX to VAXstation 3. The customer must also be aware of the revision level of the ULTRIX software. The minimum revision level of ULTRIX software that supports this upgrade is ULTRIX-32 V2.2-1 or ULTRIX Worksystems Software (UWS) V1.1. Any prior version of the ULTRIX software will not support this upgrade.

CAUTION

It is recommended that the customer backs up all file system areas (as described in the installation guide for installing ULTRIX-32 V2.2-1 or UWS V1.1) before shutting the system down for the hardware upgrade.

The procedure that customers must use before upgrading systems that run the ULTRIX operating system depends on one of three cases:

1. ULTRIX-32 V2.2-1 or UWS V1.1 is already installed prior to upgrading the system. Refer Section 1.3.2.1.
2. A version of ULTRIX software prior to ULTRIX-32 V2.2-1 or UWS V1.1 is running prior to upgrading the system. Refer Section 1.3.2.2
3. ULTRIX software is not installed prior to upgrading the system but the customer now plans to have it installed after the upgrade is complete. Refer to Section 1.3.2.3

1.3.2.1 Upgrading the System with V2.2-1 or UWS V1.1 Installed

The customer must build a new kernel before shutting the system down for the hardware upgrade. This new kernel must be built because the CPU type in the system configuration file needs to be changed. Have the customer perform the following steps before upgrading the system.

1. Run the doconfig command to configure and build a new kernel with the proper CPU type. See the chapter that describes building the kernel, in the Guide to System Configuration File Maintenance.
2. Choose the option to edit the config file, and change the CPU type from "MVAX" to "VAX3600".
3. After building the new kernel, save the old kernel and copy the new one to the root directory as described in the Guide to System Configuration File Maintenance.
4. Shut the system down once the new kernel has been copied to the root directory. The system can now be upgraded.

NOTE

After the hardware upgrade is complete, boot the new kernel.

1.3.2.2 Upgrading the System without V2.2-1 or UWS V1.1 Installed

The customer must upgrade the ULTRIX operating system to ULTRIX-32 V2.2-1 or UWS V1.1 after the hardware upgrade in order to have support for the new processor. Have the customer perform the following steps before upgrading the system.

1. Back up all file system areas, if not already done, (as described in the installation guide for installing ULTRIX-32 V2.2-1 or UWS V1.1) before shutting the system down for the hardware upgrade.
2. Shut the system down. The system can now be upgraded.

NOTE

After the hardware upgrade is complete, install ULTRIX-32 V2.2-1 or UWS V1.1 as described in the appropriate installation guide then restore the user file systems that you saved.

1.3.2.3 Upgrading the System without ULTRIX-32 Software Installed

This section is for the customer who does not have any ULTRIX-32 software installed on the system, but they do want ULTRIX-32 V2.2-1 or UWS V1.1 installed after the hardware upgrade. Have the customer shut the system down. The system can now be upgraded.

NOTE

After the hardware upgrade is complete, install ULTRIX-32 V2.2-1 or UWS V1.1 as described in the appropriate installation guide.


CHAP 2

Chapter 2

Upgrading the Dual BA23 Systems

Typically, dual BA23 systems are known as H9642-J Enclosures. They may also be called System 5 cabinets, 630QE systems, or MicroVAX II systems, although MicroVAX II systems can be based on BA123 Enclosures. To eliminate confusion in the following procedures, the dual BA23 system will be referred to as the H9642-J Enclosure.

NOTE

When the upgrade is being performed to a pedestal mount BA23, this section can be used as a guide during the board swap.

2.1 Installing the Upgrade in an H9642-J Enclosure

This chapter describes how to install a 2T-KA350 upgrade kit in an H9642-J Enclosure. To upgrade the system, follow the steps outlined below:

1. Check the upgrade kit contents to make sure each item is included.
2. Make sure the customer backs up all media and performs an orderly system shutdown (refer to Section 1.3).
3. Load MDM diagnostics and test the system.
4. Turn the system power off at the top BA23 Enclosure ON/OFF switch and disconnect the ac power.
5. Replace the modules that need to be brought up to the minimum revision levels (refer to the *MicroVAX Systems Maintenance Guide*).
6. Reconnect the ac power cord, power up, and retest the system using MDM diagnostics to ensure the replaced modules operate properly.
7. Turn the system power off at the top BA23 Enclosure ON/OFF switch and disconnect the ac power.

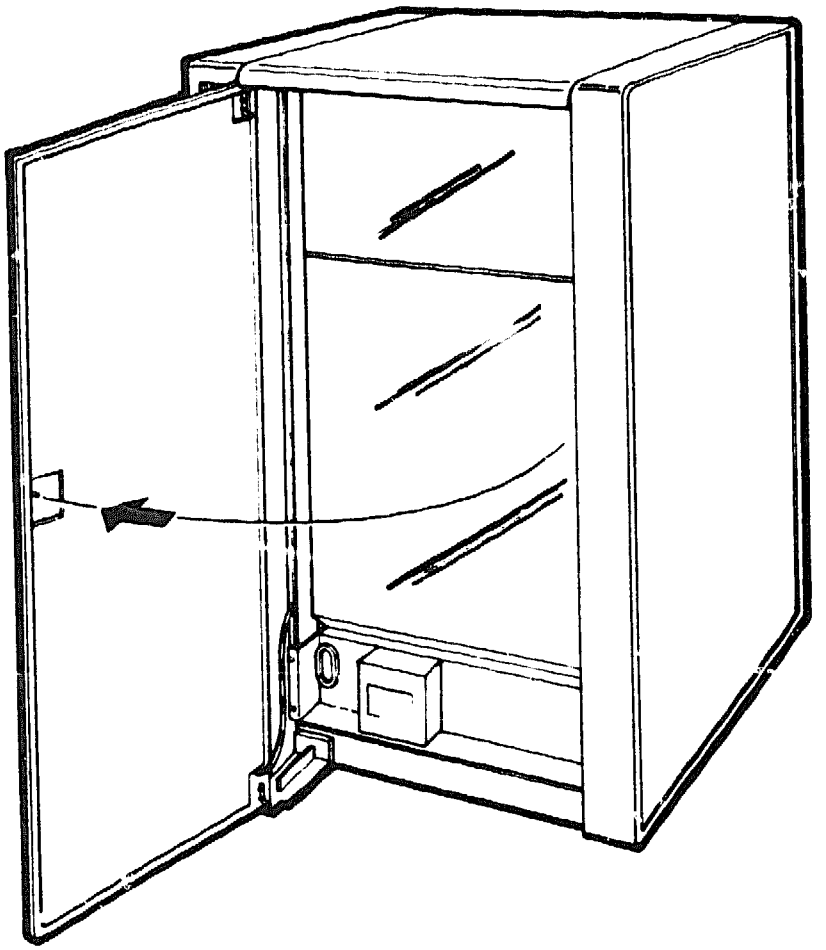
8. Perform the upgrade using the procedures in this chapter (Section 2.2 through Section 2.7).
9. Perform the TQK50 Controller Module ROM upgrade described in Chapter 4. Then reconnect the power cord, power-up, and retest the system using MDM diagnostics (release 122 or greater) as described in Chapter 5.

2.2 Removing the Rear Door

To remove the rear door, see Figure 2–1 and proceed as follows:

1. Unlock the rear door using a hex wrench.
2. Open the rear door and locate the ground wire between the door and the cabinet main frame.
3. Remove the ground wire at the door and press down on the upper right spring clip. Lift the door up and off the cabinet main frame.

Figure 2–1: Rear Door Removal



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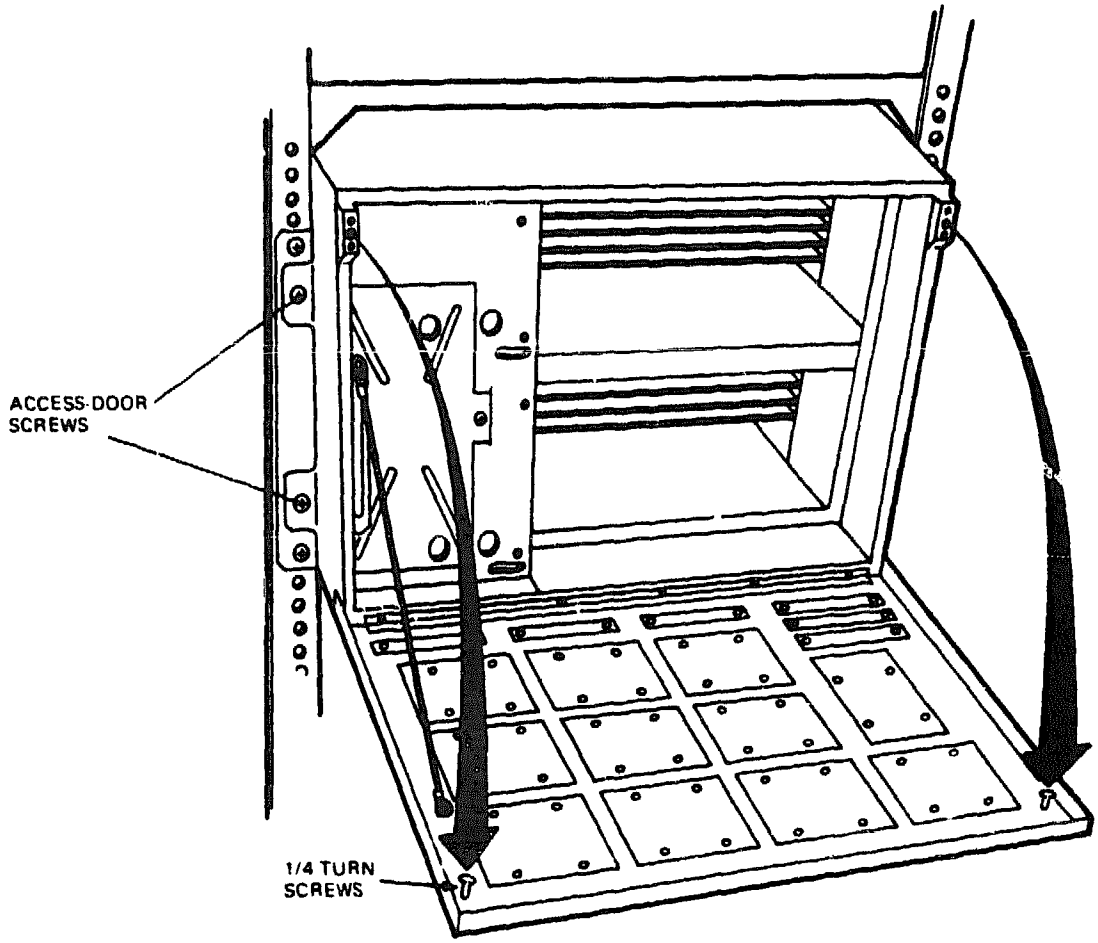
2.3 Lowering the Rear I/O Panel

To lower the rear I/O panel, see Figure 2–2 and proceed as follows:

1. Use a screwdriver to loosen the two quarter-turn fasteners in the upper left and right corners of the rear I/O panel.
2. Open the rear I/O panel and lower it gently to the limit of the restraint cable.

Figure 2–2: Lowering Rear I/O Panel



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2.4 Removing the KA630 and MS630 Modules

To remove modules from the H9642-J Enclosure, see Figure 2–3 and perform the following steps:

CAUTION

Static electricity can damage modules. Always use a grounded wrist strap and grounded work surface when working with or around modules. A static kit (P/N 29-11762-00) provides the appropriate tools for removing and replacing modules. Remove and install modules carefully to prevent damage to other modules or changes to the switch settings.

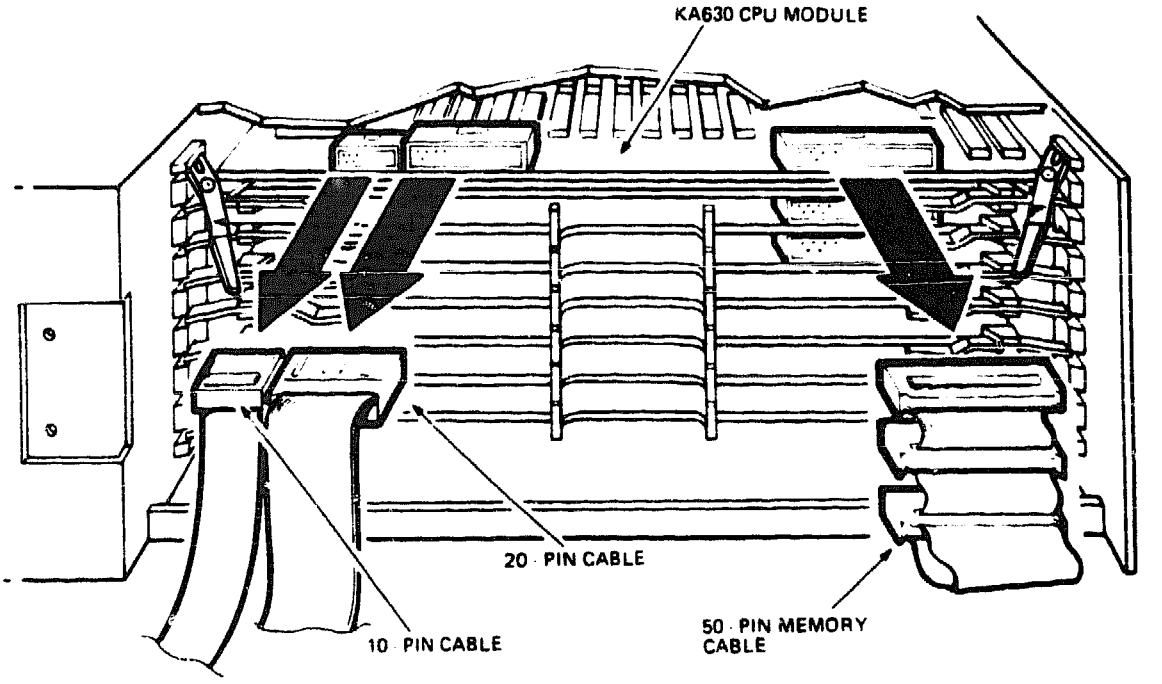
NOTE

When removing a module, note the orientation of the internal cables. When installing a new module, be sure to reinstall the cables the way they were

before they were removed. Incorrect cabling is a common cause of system problems after a module is replaced.

1. Locate the KA630 CPU module in slot 1 (top slot) of the chassis and the two MS630 memory modules in slots 2 and 3.
2. Remove the 10-pin and 20-pin cables from the KA630 CPU module, making sure to note the orientation of the cables.
3. Remove the 50-pin memory cable that connects the KA630 module to the two MS630 modules.
4. Slide the KA630 module partially out of the backplane by firmly pulling the levers toward you. **Apply pressure evenly to both levers.**
5. Remove the KA630 module from the system.
6. Remove the two MS630 modules from the system in the same manner.

Figure 2–3: Removing Cables/Modules from the H9642-J Enclosure



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2.5 Installing the KA650 and MS650 Modules

To install a module in an H9642-J Enclosure, see Figure 2–4 and perform the following steps:

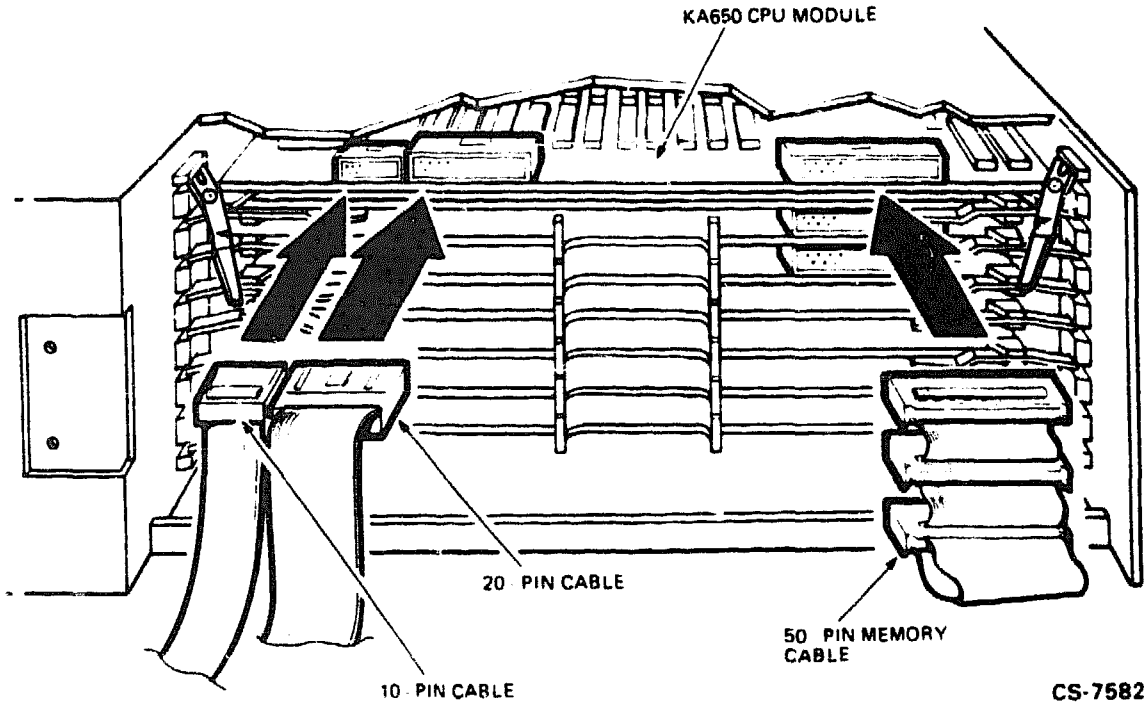
1. Slide the KA650 CPU module completely into slot 1 (top slot). Make sure to connect the ejector levers properly.
2. In the same manner, install the MS650 memory module in slot 2.

3. Connect the KA650 and MS650 modules together using the 50-pin memory cable provided in the upgrade kit.
4. Connect the 10-pin and 20-pin cables to the corresponding 10-pin and 20-pin connectors on the KA650 CPU module, while making sure that they are properly orientated.

NOTE

Do not close the rear I/O panel or reinstall the rear door at this time. You will need to access the top BA23 Enclosure again to upgrade the ROMs on the TQK50 controller module as described in Chapter 4.

Figure 2–4: Installing Cables/Modules in an H9642-J Enclosure



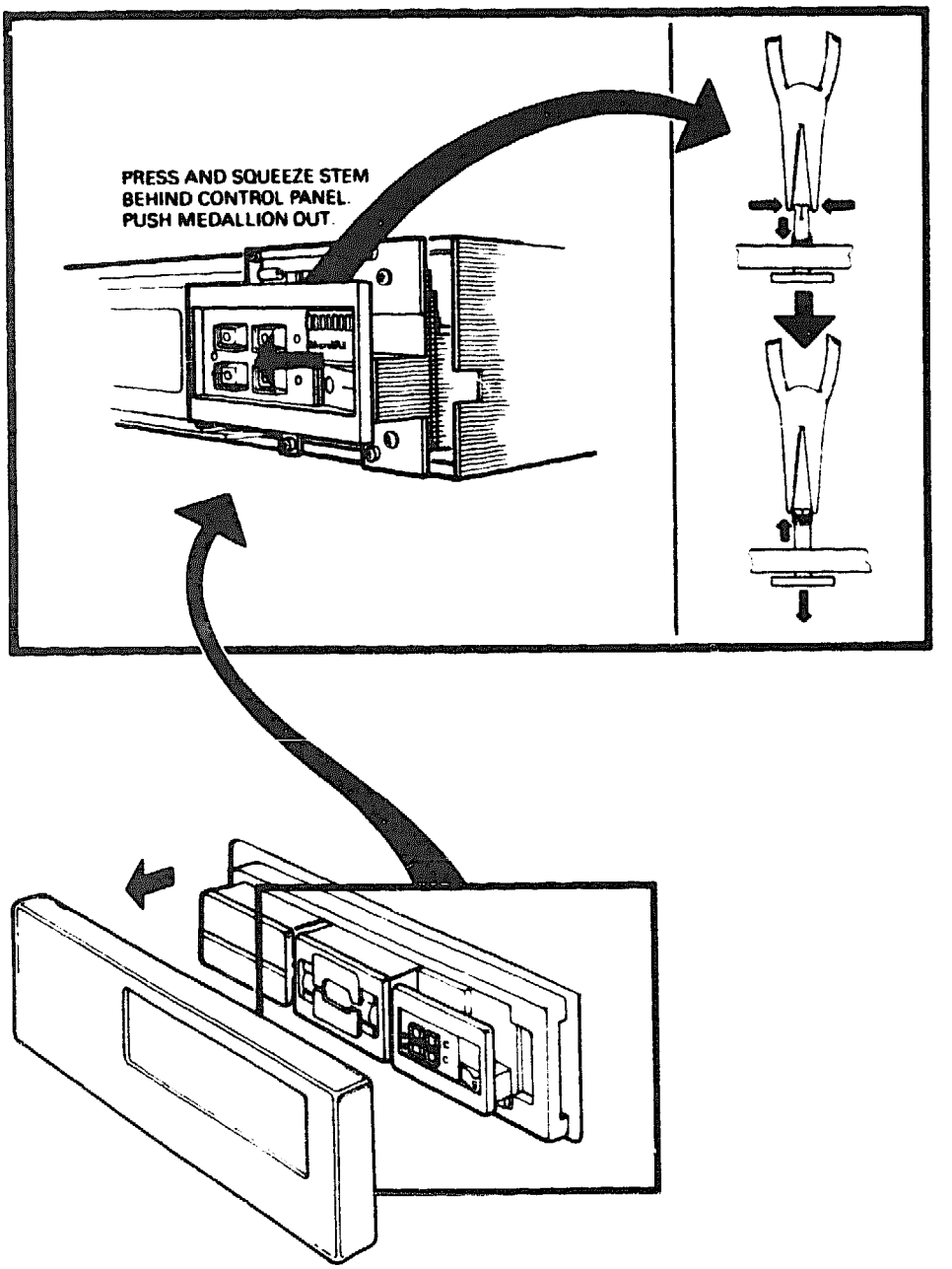
2.6 Changing the Medallion

To change the medallion, see Figure 2–5 and proceed as follows:

1. Remove the front cover from the BA23 Enclosure.
2. Look behind the plate on which the medallion is mounted and locate the spring that holds the medallion in place.
3. Push the spring away from the flanged neck of the medallion, and squeeze the flange together with a pair of pliers.
4. Gently slide the spring over the neck of the medallion.
5. Choose the appropriate new medallion from the upgrade kit and push it into place.

6. Squeeze the neck of the medallion together with a pair of pliers, and slide the spring over the neck to secure the medallion.
7. Replace the front cover of the BA23 Enclosure.

Figure 2–5: Changing the Medallion



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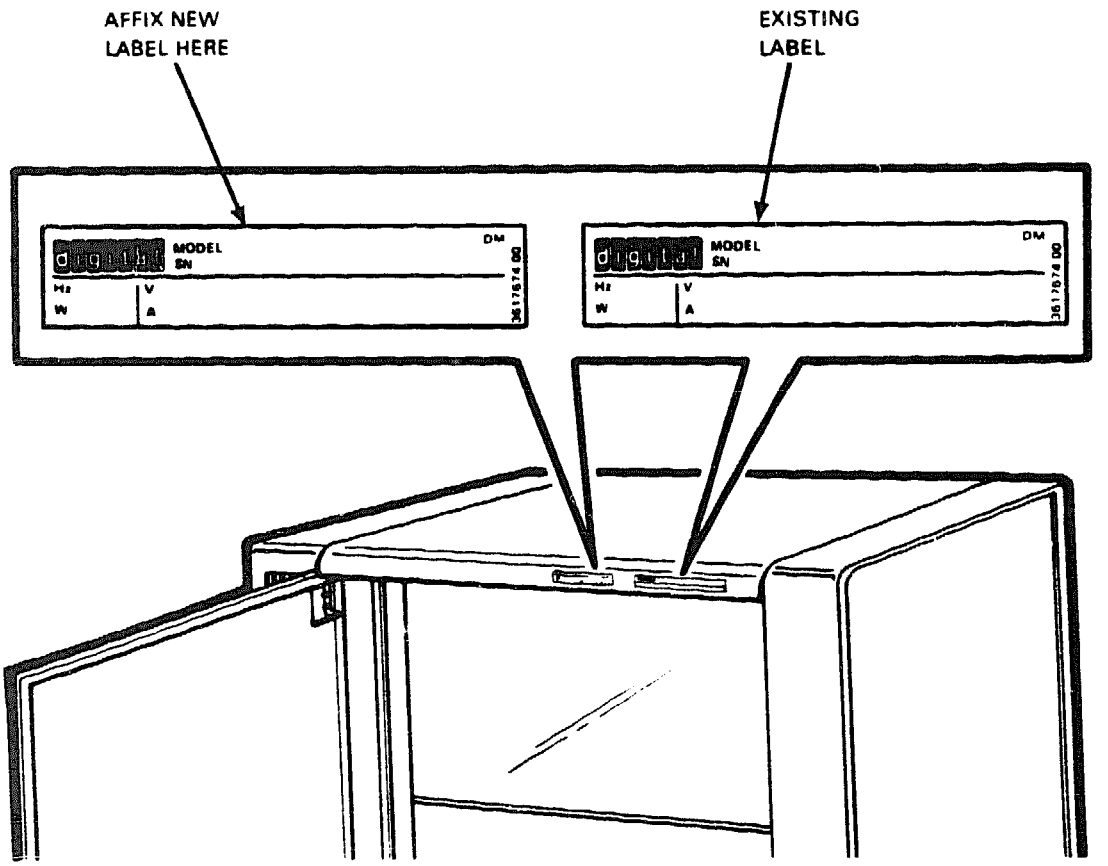
2.7 Installing the New Product Serial Number Label

A new product serial number label must be placed on the back of the H9642-J Enclosure to document the changes to the system. To do this, proceed as follows:

1. Locate the new product serial number label in the upgrade kit.
2. Affix the new product serial number label to the H9642-J Enclosure as shown in Figure 2–6.

Figure 2–6: Placing New Product Serial Number Label




CHAP 3

Chapter 3

Upgrading BA123 Systems

This chapter describes how to install the VAXstation 3 upgrade in a BA123 system enclosure.

In the past, BA123 systems were known as either MicroVAX II or VAXstation II/GPX systems. For ease of reference in this chapter, the VAXstation/GPX system, also known as the World Box and 630QB systems, will be referred to as a BA123.

3.1 Installing the Upgrade in a BA123 Enclosure

To upgrade the system, follow the steps outlined below:

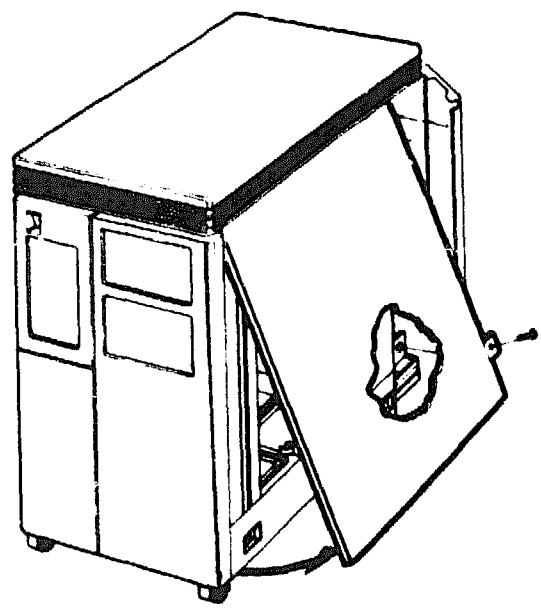
1. Check the upgrade kit contents to make sure each item is included.
2. Make sure the customer has backed up all media and performed an orderly system shutdown (refer to Section 1.3).
3. Load MDM diagnostics and test the system.
4. Turn the system OFF and unplug the ac power cord from the wall socket.
5. Replace all the modules that need to be brought up to the minimum revision levels (refer to the MicroVAX Maintenance Guide for installation procedures). In some cases the VAXstation II system, which uses the QVS (VCB01) graphics module, may have to be upgraded to a VAXstation II/GPX system before it can accept the 2T-KA650 upgrade. Information for the upgrade to a VAXstation II/GPX system is available from DMEIC Engineering through your Computer Special Systems Sales Specialist.
6. Perfom the upgrade using the procedures in this chapter (Section 3.2 through Section 3.6).
7. Reconnect the power cord, power-up, and retest the system using MDM (release 122 or greater) as described in Chapter 5.

3.2 Right Side Panel Removal

To remove the right side panel, proceed as follows:

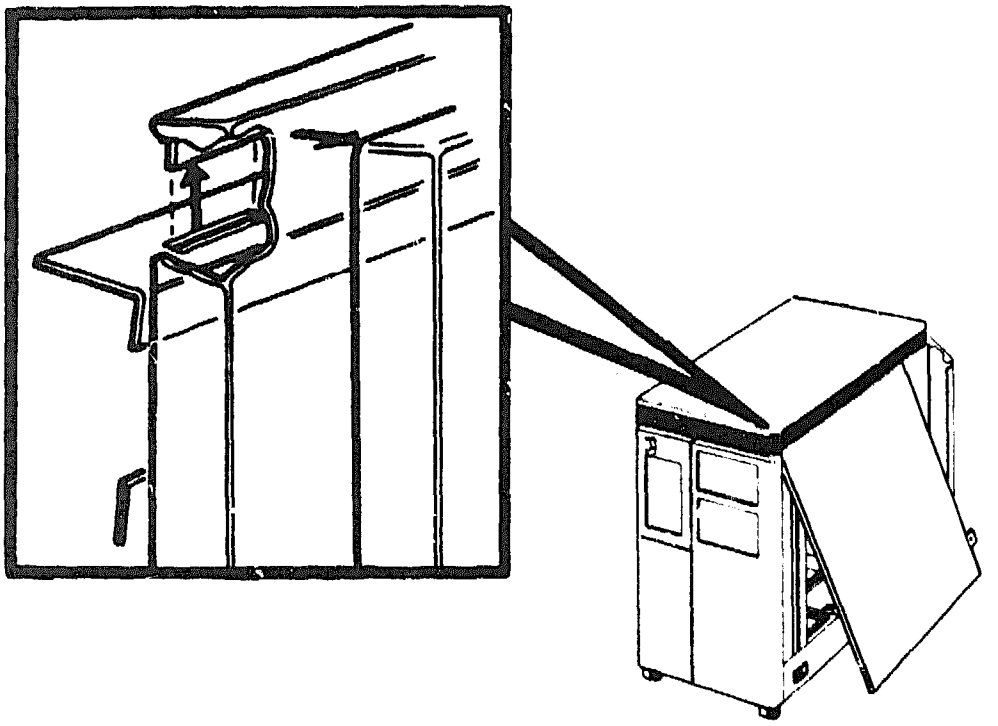
1. Open the rear door.
2. Loosen the captive screw that connects the right side panel to the rear of the enclosure frame (Figure 3–1).
3. The panel is attached to the bottom of the enclosure frame by two snap fasteners. Pull the bottom of the panel out until the panel detaches from the bottom of the enclosure.
4. Lift the panel slightly to release it from the lip at the top of the frame and remove the panel (Figure 3–2).

Figure 3–1: Unhooking the Right Side Panel



CS-7585

Figure 3–2: Removing the Right Side Panel



CS-7586

3.3 Removing the KA630 and MS630 Modules

To remove modules from the BA123 enclosure, refer to Figure 3–3 and proceed as follows:

CAUTION

Static electricity can damage modules. Always use a grounded wrist strap and grounded work surface when working with or around modules. A static kit (P/N 29-11762-00) provides the appropriate tools for use in module removal and replacement.

Remove and install modules carefully to prevent damage to module components on other modules or possible changes to the switch settings.

NOTE

When removing a module, note the orientation of the internal cables. Some have a red stripe; others are keyed. When installing a new module, be sure to reinstall the cables the way they were before they were removed. Incorrect cabling is a common cause of system problems after replacing a module.

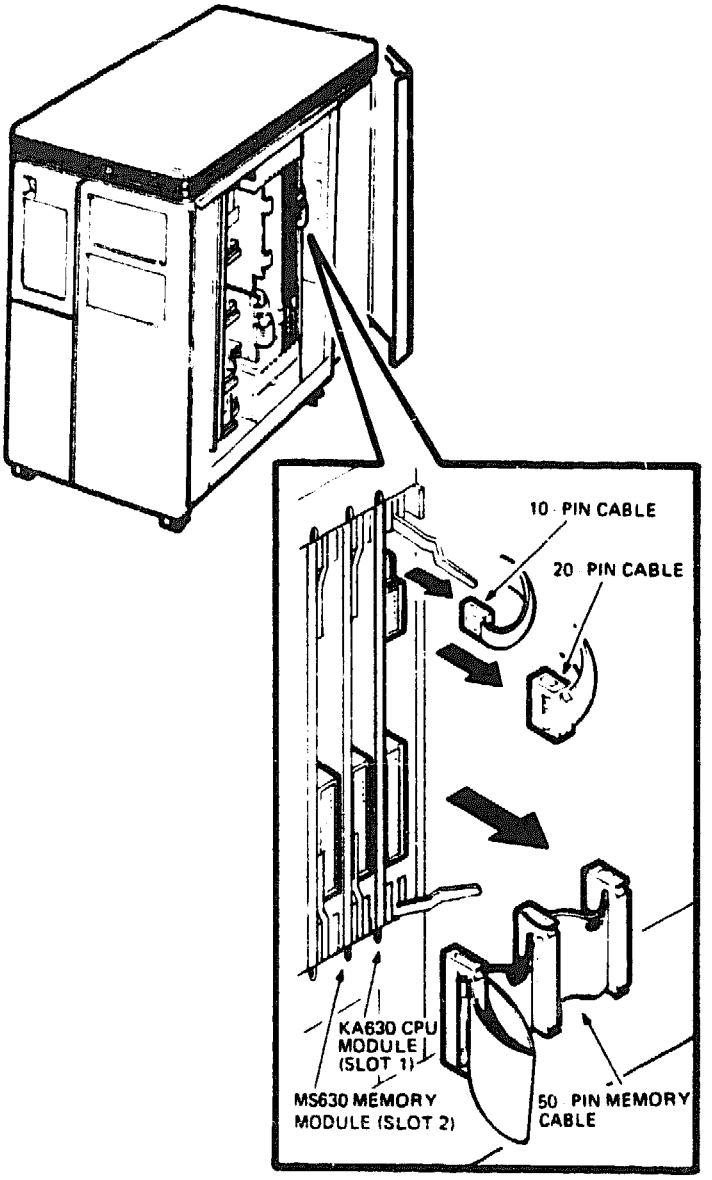
1. Remove the card cage door.
2. Locate the KA630 CPU module in slot 1 (the right-most slot) of the chassis and the MS630 memory module in slot 2.
3. Remove the 10-pin and 20-pin cables from the KA630 CPU module, making sure to note the orientation of the cables.
4. Remove the 50-pin memory cable connecting the KA630 CPU module to the MS630 memory module.
5. Slide the module partially out of the backplane by pulling the ejector levers that hold the module in place (Figure 3–3).
6. Remove the KA630 CPU module from the system.
7. Remove all the MS630 memory modules from the system in the same manner.

3.4 Installing the KA650 and MS650 Modules

To install a module in a BA123 enclosure, refer to Figure 3–4 and proceed as follow:

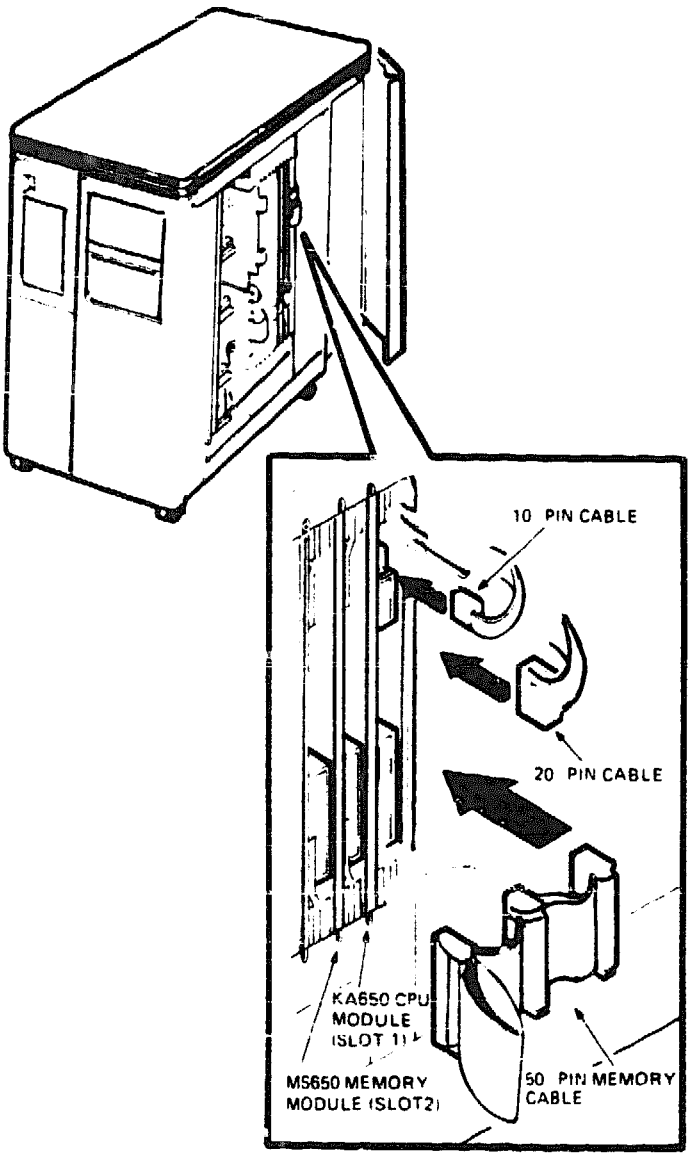
1. Slide the KA650 CPU module completely into slot 1 (the right-most slot. Make sure to connect the ejector levers properly.
2. Install the MS650 memory module into slot 2 in the same manner.
3. Connect the KA650 CPU module to the MS650 memory module using the 50-pin cable provided in the upgrade kit, making sure to use correct orientations.
4. Connect the 10-pin and 20-pin cables to the corresponding 10-pin and 20-pin connectors on the KA650 CPU module, while making sure that they are properly orientated.
5. Install the card cage door.
6. Install the right side panel.

Figure 3–3: Removing the KA630 CPU Module



CS-7587

Figure 3–4: Installing the KA650 CPU Module and Memory Cable



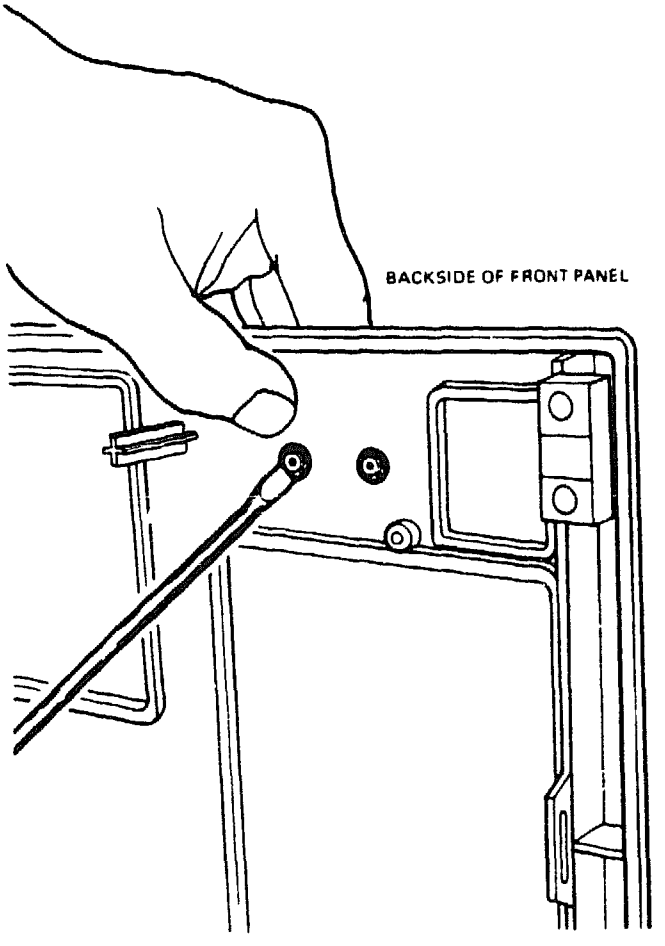
CS-7588

3.5 Changing the Medallion

To change the medallion, see Figure 3–5 and proceed as follows:

1. Pop off the front cover containing the old medallion.
2. Using a flat-blade screwdriver, pry off the two clips that hold the medallion on the cover.
3. Remove the old medallion.
4. Choose the appropriate new medallion from the upgrade kit and install it as shown in Figure 3–5.
5. Install the front cover.

Figure 3–5: Changing the Medallion



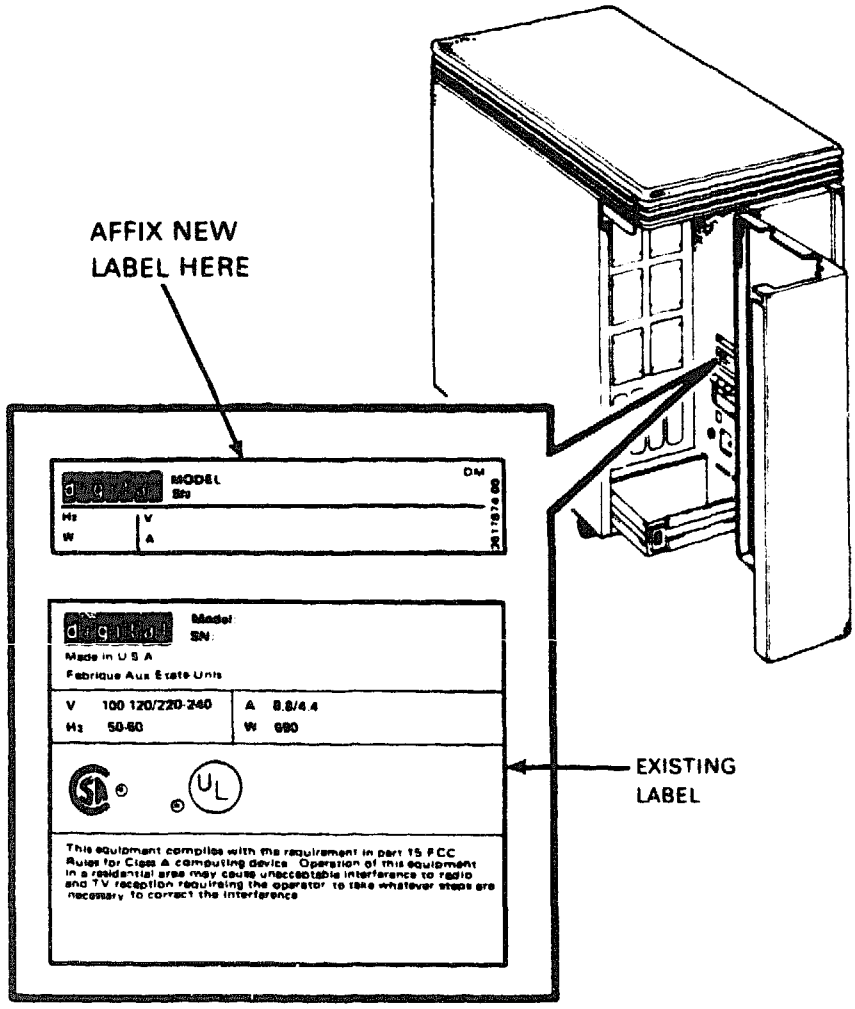
CS-7589

3.6 Installing the New Product Serial Number Label

A new product serial number label must be placed on the system to document the changes made to the system. To do this, refer to Figure 3–6 and proceed as follows:

1. Open the rear door on the unit being upgraded.
2. Locate the serial number label on the unit.
3. Locate the new product serial number label supplied in the upgrade kit.
4. Affix the new product serial number label above the existing serial number label as shown in Figure 3–6.

Figure 3–6: Placing the New Product Serial Number Label



CS-7590


CHAP 4

Chapter 4

Upgrading the TQK50 Controller Module

4.1 TQK50 ROM Upgrade Kit Installation Instructions

The following instructions describe the installation of the TQK50 Controller Module ROMs from the TQK50 ROM upgrade kit, P/N EQ-01494-01.

CAUTION

The TQK50 controller contains electrostatic discharge sensitive devices. The use of the Velostat kit is essential when handling the TQK50 Controller Module and the ROMs/PAL provided in this kit.

1. Remove the interface cable (P1) from the TQK50 Controller Module (M7546).
2. Remove the TQK50 Controller Module from the system.
3. Using Figure 4-1 as a reference for component location, replace the following components with the parts supplied in the TQK50 ROM upgrade kit (P/N EQ-01494-01).
   a. Check location E3 for P/N 23-065L1-00. If it is not P/N 23-065L1-00, then remove the chip from location E3 and replace it with P/N 23-065L1-00 from the kit. In some modules, component E3 can not be removed because it is soldered in place. In this case, E3 is the correct value and you are not required to change it.
   b. Remove the chips from location E28 and E29. Replace them with the supplied chips as follows:

      E28 (high byte ROM) P/N 23-331E5-00
      E29 (low byte ROM) P/N 23-330E5-00

   c. Update the module revision with Brady markers as shown in Table 4-1.

Table 4–1: Module Revision Chart

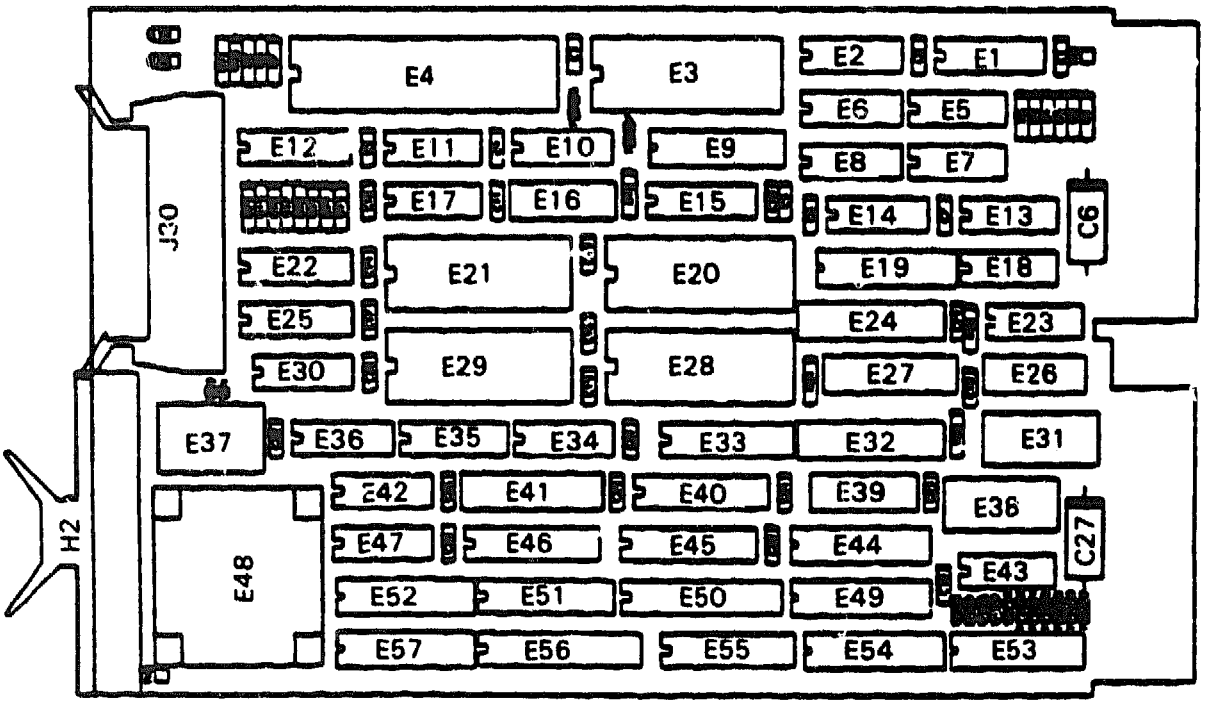
Etch Revision	Module Revision	Change to:
D1	C1	J1
D1	D1	J1
D1	E1	J1
D1	F1	J1
C1	F2	J2
D1	H1	K1
C1	H2	K2
E1	H3	K3

4. Reinstall the TQK50 Controller Module and reconnect the interface cable.
5. Replace all covers, panels and doors.
6. Reconnect the power cord. Power-up and retest the system using MDM (release 122 or greater) as described in Chapter 5.

NOTE

Watch the TK50 tape drive for normal power-up diagnostic completion. Refer to Section 4.4.1.7 and 4.4.1.8 in the *TQK50/TK50 Tape Drive Subsystem Manual*.

Figure 4–1: Component Location on TQK50 Controller Module



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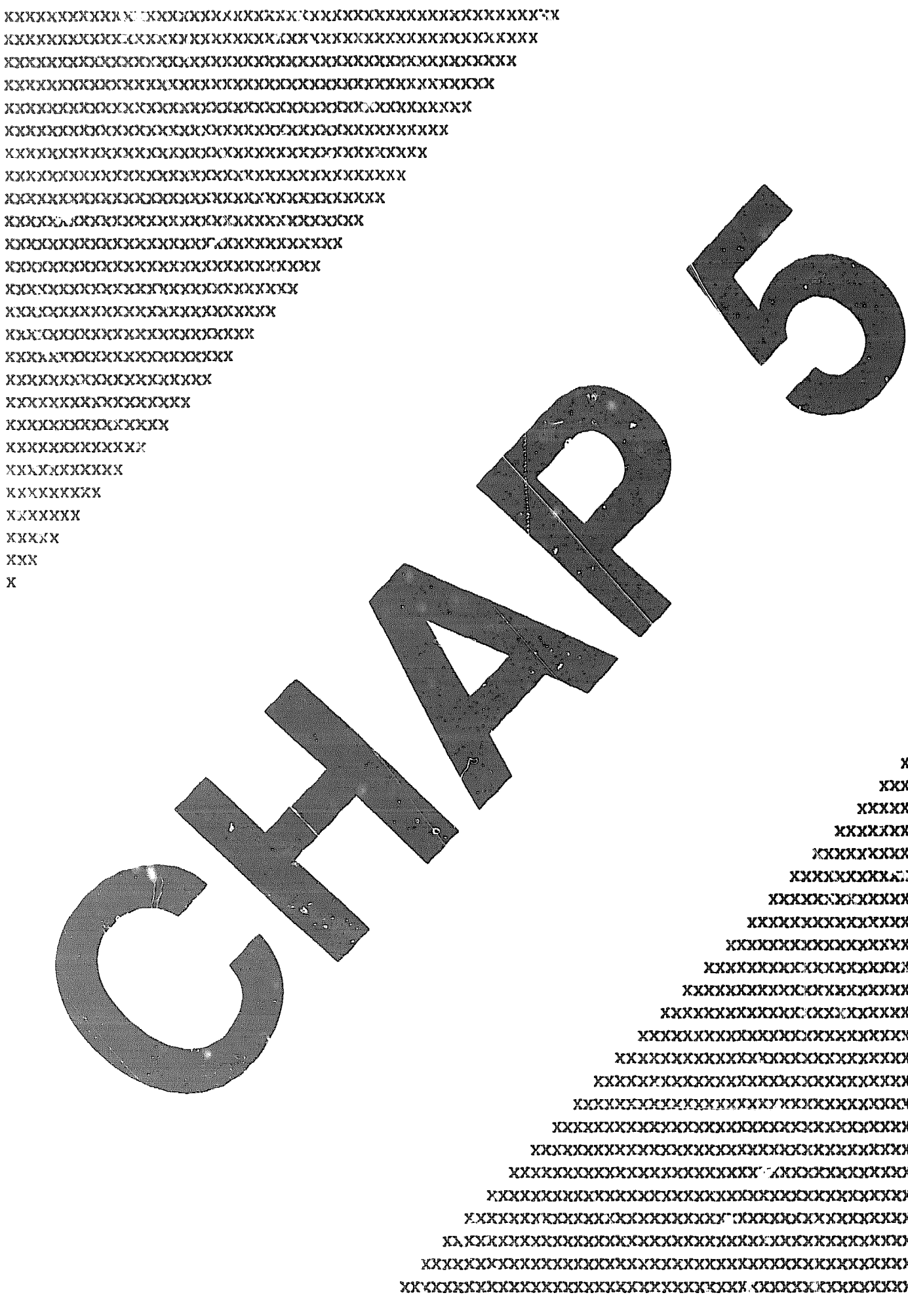
TQK50 ROM upgrade kit: EQ-01494-01
Box part number: 99-005812-00
High byte ROM (E28) 23-331E5-00
Low byte (E29): 23-330E5-00
FPLS chip: 23-065L1-00

Brady marker part numbers:
1—36-19208-01
2—36-19208-02
3—36-19208-03
J—36-19209-10
K—36-19209-11


CHAP 5

Chapter 5

Testing the New Configuration

This chapter outlines the tests and procedures you should use to complete the installation.

5.1 Testing the System

After the system successfully completes the power-up self-test (refer to the applicable Systems Maintenance Guide for more detailed information), use the MicroVAX diagnostic monitor (MDM) (release 122 or greater), to test the complete system. The MDM software provides the following five groups of menu-driven tests.

- Verify-mode functional tests - user or Field Service
- Verify-mode exerciser tests - user or Field Service
- Service-mode functional tests - Field Service
- Service-mode exerciser tests - Field Service
- Utility tests - field service

1. Plug the ac power cord into the wall outlet and turn the I/O Power Switch on (1).
2. Insert the MDM tape cartridge into the TK50 or TK70 tape drive.
3. Boot the MDM media by typing ***BOOT MUA0***.
4. Type ***2*** at the main menu to allow the diagnostics to identify the new controller modules and add them to the configuration file.
5. Run the verify-mode functional tests and exerciser tests.

These tests should complete without error. If an error occurs, consult the *MicroVAX Systems Maintenance Guide* for troubleshooting procedures.

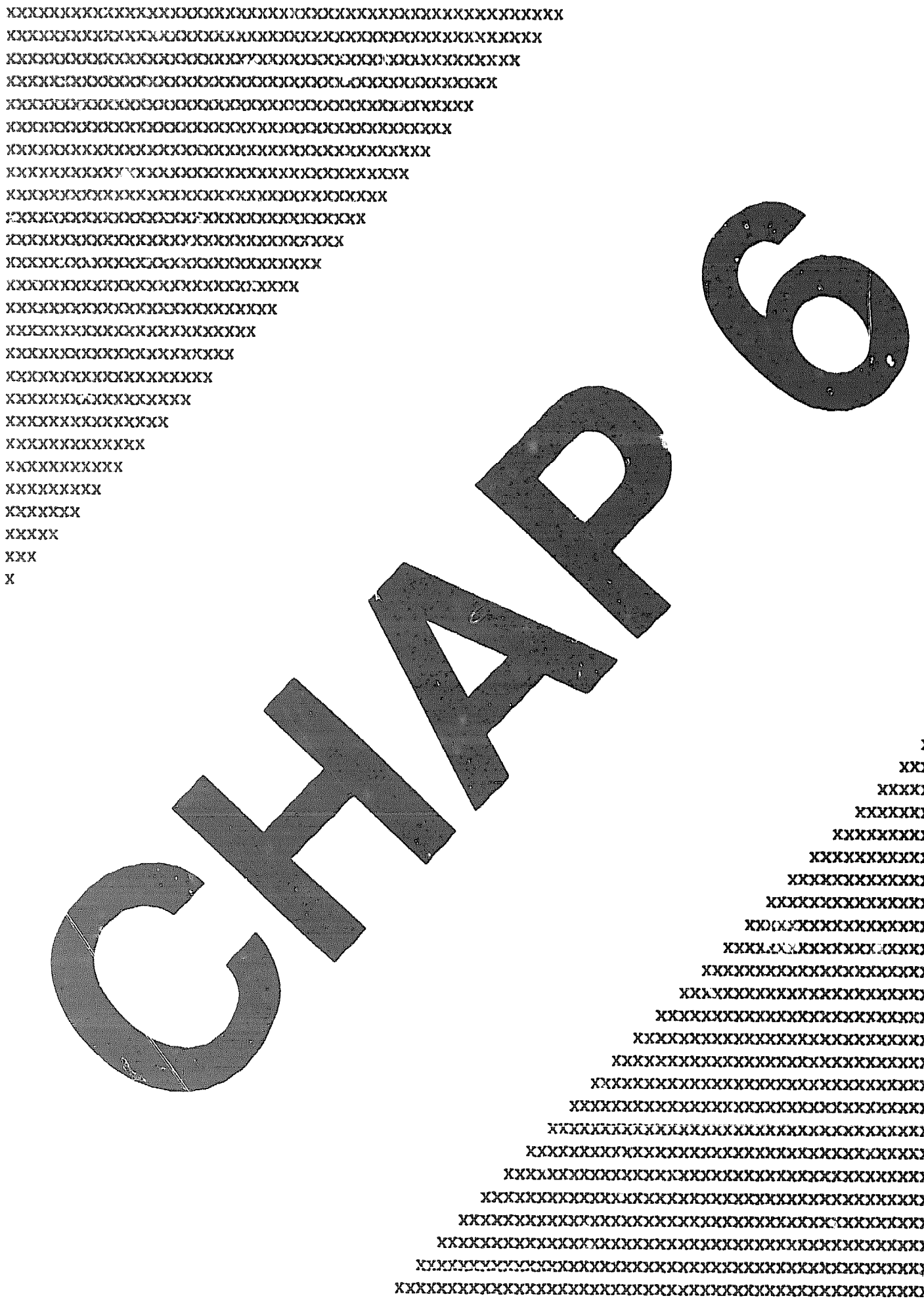
5.2 Completing the Installation

1. After the testing has completed successfully, replace any existing covers you may have removed to gain access to the back plane or mass storage area.
2. Bring up the operating system software. The hardware installation procedure is now complete.

5.3 Functionality Changes

Halt Enable/Disable switch: Like the KA630 CPU, the KA650 CPU autoboots if the Halt Enable/Disable switch on the CPU panel is set to disable. However, this switch does not affect the operation of the Halt switch on the front panel as it did with the KA630 CPU

Restart Button: The Restart button on the front panel does not restart the system at the power-up stage as it did with the KA630 CPU. Pressing the Restart button with the KA650 CPU now restarts the system at the boot stage and power-up tests are not run.


CHAP 6

Chapter 6

Functionality Changes

6.1 Halt Switch Functionality

The Halt Switch provides the same behavior as MicroVAXII with the following exceptions:

- The Halt Enable/Disable Switch on the rear panel will not affect the operation of the front panel Halt Switch on BA23, BA123 and BA213 Enclosures (because the BHALT enable bit must be left set to recognize the negation of DCOK.)

  In essence, this switch has become a break enable/disable switch. The setting of this switch will still determine the action to be taken on power-up after self-test is completed. If the switch is enabled it is in halt mode, if it is disabled, the switch is in boot mode.

- If the system is running, pressing the Restart button or negating DCOK by some other means will cause the firmware to reboot rather than power-up.

- If the system is halted, pressing the Restart button or negating DCOK by some other means will have no effect on KA650's with pass three CQBIC's and will cause the firmware to power-up on KA650's with pass five CQBIC's.

  NOTE

  KA650 with pass three CQBIC's precludes the ability to remote boot a halted system as well as use a Q-bus sanity timer to reboot a halted system. It also makes a console continue command yield unpredictable results if the Restart button is pressed while the CPU is halted..

- The front panel Halt switch will behave in the same manner on KA650 CPU (Mayfair) based systems as it currently does on the VAXstation II/GPX. The system "hangs" when the Halt Switch is pressed, and the system doesn't halt until it is released.

6.2 External Events

The three possible external events are listed below:

1. A console terminal break is defined in the spec of the SSC chip as the reception of 20 consecutive space bits on the console serial line. Traditionally, this event has caused the processor to go into a halt state.
2. The assertion of the Q22-bus BHALT line is defined in the Digital Standard 160 as causing the processor to go into its halt state.
3. The negation of the BDCOK for between 100 ns and 10 us is defined in Digital Standard 160 as a boot or restart protocol. The use of the word restart in Digital Standard 160 is inconsistent with its definition in the Digital Standard 32. The use of restart in Digital Standard 160 is more consistent with the definition of reboot given above (for example, initialize processor and I/O, then boot.) Although this inconsistency exists, as long as this event is not allowed to corrupt the state of main memory, none of the possible firmware actions have been precluded (except for halt which you expect to continue.) This means that the firmware has the option of performing either a restart (per Digital Standard 032), a reboot, or a power-up on the occurrence of this event. There is no clear precedent for the effect of this event since it has had different affects on different processors. Refer to Section 8.0 of Digital Standard 032 for details of MicroVAX I and MicroVAX II behavior.)

6.3 Passing Control to the Firmware

Explanations of the two possible methods for passing control to the firmware are listed as follows:

1. Asserting the HALTIN signal maintains the state of the CPU and main memory, but this signal is blocked when the firmware is executing out of the Halt Protected Addressed Space (for example, it cannot be used to pass control to the firmware on events that have to be recognized when the system is halted.)
2. Asserting the SYSRESET signal always causes control to be passed to the firmware, but it corrupts the state of the CPU and main memory (for example, it cannot be used to pass control to the firmware for events where the desired action is a restart.)

Since it is necessary to recognize the negation of DCOK when halted and it is desirable to support the restart capability on the negation of DCOK (as long as you are not already halted), the firmware needs to be able to dynamically change the effect the negation of DCOK has on the board.

6.4 Firmware Action

Explanations of the four possible firmware actions are listed below:

1. A HALT is when the firmware emulates a halted state by executing a program that provides the standard VAX console functionality. Since this implies the ability to continue, the state of the entire system must be unaltered by any external event that is supposed to cause the system to halt.

2. A restart (as defined by the Digital Standard 32) is when the firmware searches memory for a valid Restart Parameter Block (RPB) and passes control to the restart routine whose address is stored in the RPB. The restart routine can only assume that the contents of main memory is unaltered. Therefore, the state of main memory must be preserved by an external event that is supposed to cause the system to restart. Processor and I/O device state need not be preserved by the event, but intelligent I/O devices should be allowed to preserve the state of any critical resources such as data caches and buffers, so that they can restart.
3. A reboot is when the firmware initializes the processor and I/O devices and then loads and starts the operation system (boots). Since the entire state of the system is modified by this operation, only the state required for the firmware to operate must be preserved by an external event that is supposed to cause the system to reboot.
4. A power-up is when the firmware initializes the board and I/O devices, runs diagnostics, then either boots or halts, depending on the state of the state of the Halt enable switch.

6.5 MicroVAX System Behavior on the Negation of DCOK

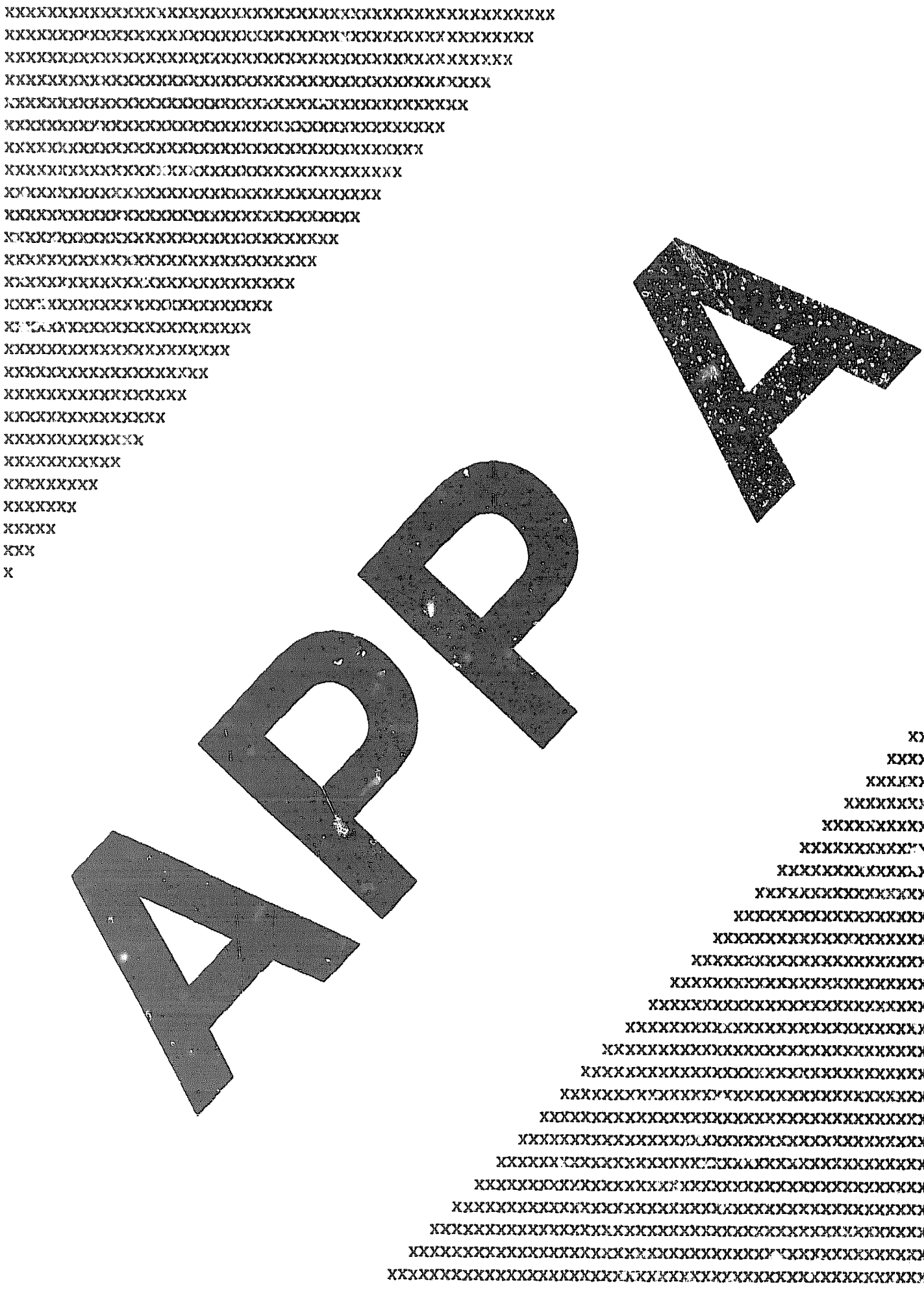
A history of MicroVAX system behavior on the negation of DCOK is listed below.

On the negation of DCOK, the behavior of a MicroVAX I is dependent on the setting of a DIP switch on the CPU board. The switch can be configured for one of four options:

1. Attempt a VAX SRM restart and if that fails, attempt a reboot, and if that fails, halt.
2. Attempt a reboot and if that fails, halt.
3. Attempt a VAX SRM restart and if that fails, halt.
4. Halt.

On the negation of DCOK, the MicroVAX II will reset the CPU board (corrupting memory) then perform a power-up. There are two undesirable "features" of the MicroVAX II behavior relative to MicroVAX I as follows:

1. Restart capability is precluded due to the corruption of the main memory.
2. A power-up takes longer than a reboot.


APPA

Appendix A
Upgrade and Return Forms

The Field Service Engineer who performs the upgrade must complete and return each of the three forms contained in this appendix.

Return the Field Service Worksheet to the local contacts administrator.

Return one copy of the Field Service Installation Receipt to the local CAS group and one copy to the customer.

Return one copy of the Returns Material Checklist with each module and item that you return.

Call your local CAS office to obtain the Return Authorization Number and the address for returning the modules and items.

Call ISG ((603) 884-0056 or DTN: 264-0056) if you need help.

Parts to be returned for MicroVAX II Upgrade/VAXstation II/GPX upgrade:

- M7606 KA630 CPU Module
- M7608 or M7609, MS630 Memory Modules

A.1 Labor Activity Reporting

All labor activity associated with this upgrade must be charged in the following manner:

- System type: (See following chart for system type.)
- Activity code: I
- Type of call: I
- Action taken: D
- P/L segment code: 001

When a system is converted to a MicroVAX 3 or a VAXstation II or VAXstation II/GPX is converted to a VAXstation 3, the following table should be used to determine the correct MicroVAX 3/VAXstation 3 designation for the SMART/CHAMP SYSTEM type.

Table A–1: System Type

System Order Type	(Old) SMART/CHAMP System Type	(New) SMART/CHAMP System Type
MicroVAX II		
630QB-A2/A3	—	650TB-A2/A3
630QE-A2/A3	—	650TE-A2/A3
630QY-A2/A3	—	650TY-A2/A3
630QZ-A2/A3	—	650TZ-A2/A3
DH-630Q1-AA/A2/A3	—	650TY-AA/A2/A3
DH-630Q1-DA/D2/D3	—	650TY-AA/A2/A3
DH-630Q1-EA/E2/E3	—	650TY-AA/A2/A3
DH-630Q1-FA/F2/F3	—	650TY-AA/A2/A3
DH-630Q1-HA/H2/H3	—	650TY-AA/A2/A3
DA-630Q2-AA/A2/A3	—	650TY-AA/A2/A3
DA-630Q2-DA/D2/D3	—	650TY-AA/A2/A3
DA-630Q2-FA/F2/F3	—	650TY-AA/A2/A3
DH-630Q2-HA/H2/H3	—	650TY-AA/A2/A3
DH-630Q2-JA/J2/J3/JE	—	650TY/AA/A2/A3
DH-630Q3-AA/A2/A3	—	650TB-AA/A2/A3
DH-630Q3-DA/D2/D3	—	650TB-AA/A2/A3
DH-630Q3-EA/E2/E3	—	650TB-AA/A2/A3
DH-630Q3-FA/F2/F3	—	650TB-AA/A2/A3
DH-630Q3-HA/H2/H3	—	650TB-AA/A2/A3
DH-630Q3-JA/J2/J3	—	650TB-AA/A2/A3
DH-630Q4-AA/A2/A3	—	650TB AA/A2/A3
DH-630Q4-DA/D2/D3	—	650TB-AA/A2/A3
DH-630Q4-EA/E2/E3	—	650TB-AA/A2/A3
DH-630Q4-FA/F2/F3	—	650TB-AA/A2/A3
DH-630Q4-HA/H2/H3	—	650TB-AA/A2/A3

Table A–1 (Cont.): System Type

System Order Type	(Old) SMART/CHAMP System Type	(New) SMART/CHAMP System Type
DH-630Q4-JA/J2/J3	—	650TB-AA/A2/A3
DH-630Q4-KA/K2/K3	—	650TB-AA/A2/A3
DH-630Q5-AA/A2/A3	—	650TE-AA/A2/A3
DH-630Q5-EA/E2/E3	—	650TE-AA/A2/A3
DH-630Q5-FA/F2/F3	—	650TE-AA/A2/A3
DH-630Q5-HA/H2/H3	—	650TE-AA/A2/A3
DH-630Q5-JA/J2/H3	—	650TE-AA/A2/A3
DH-630Q6-BA/B2/B3	—	650TE-AA/A2/A3
DJ-630P1-AA/A3	—	650TY-AA/A3
DJ-630P1-AA/B3	—	650TY-AA/A3
DJ-630P5-AA/A3	—	650TE-AA/A3
DJ-630P5-BA/B3	—	650TE-AA/A3
DJ-630P5-CA/C3	—	650TE-AA/A3
VAXSTATION II, II/GPX		
SU/SV-LV55B-EK/EN	VS21W	VS31W
SU/SV-LV55C-EK/EN	VS21V	VS31V
SU/SV-LV55D-EK/EN	VS21W	VS31W
SV-LV55F-EK	VS21W	VS31W
SU/SV-LV55H-EK/EN	VS21V	VS31V
SV-LV55J-EK/EN	VS21V	VS31V
SU/SV-LV55K-EK/EN	VS21V	VS31V
SU/SV-LV55L-EK/EN	VS21W	VS31W
SU/SV-LV55N-EK/EN	VS21V	VS31V
SU/SV-LV55P-EK/EN	VS21V	VS31V
SU-LV55R-EK/EN	VS21W	VS31W
SU/SV-LV55U-EK/EN	VS21W	VS31W
SU/SV-LV55W-EK/EN	VS21V	VS31V
SU/SV-LV55Y-EK/EN	VS21V	VS31V

Table A–1 (Cont.): System Type

System Order Type	(Old) SMART/CHAMP System Type	(New) SMART/CHAMP System Type
SU/SV-LV59B-EK/EN	VS21W	VS31W
SU/SV-LV59C-EK/EN	VS21W	VS31W
SU/SV-LV59D-EK/EN	VS21W	VS31W
SV-LVXGA-EK/EN	VS21V	VS31V
SV-LVXGB-EK/EN	VS21V	VS31V
MicroVAX II/VAXSERVER UPGRADE		
630QB-A2/A3	—	650SB-A2/A3
630QE-A2/A3	—	650SE-A2/A3
630QY-A2/A3	—	650SY-A2/A3
630QZ-A2/A3	—	650SZ-A2/A3
DH-630Q1-AA/A2/A3	—	650SY-AA/A2/A3
DH-630Q1-DA/D2/D3	—	650SY-AA/A2/A3
DH-630Q1-EA/E2/E3	—	650SY-AA/A2/A3
DH-630Q1-FA/F2/F3	—	650SY-AA/A2/A3
DH-630Q1-HA/H2/H3	—	650SY-AA/A2/A3
DA-630Q2-AA/A2/A3	—	650SY-AA/A2/A3
DA-630Q2-DA/D2/D3	—	650SY-AA/A2/A3
DA-630Q2-FA/F2/F3	—	650SY-AA/A2/A3
DH-630Q2-HA/H2/H3	—	650SY-AA/A2/A3
DH-630Q2-JA/J2/J3/JE	—	650SY-AA/A2/A3
DH-630Q3-AA/A2/A3	—	650SB/AA/A2/A3
DH-630Q3-DA/D2/D3	—	650SB/AA/A2/A3
DH-630Q3-EA/E2/E3	—	650SB-AA/A2/A3
DH-630Q3-FA/F2/F3	—	650SB-AA/A2/A3
DH-630Q3-HA/H2/H3	—	650SB-AA/A2/A3
DH-630Q3-JA/J2/J3	—	650SB-AA/A2/A3
DH-630Q4-AA/A2/A3	—	650SB-AA/A2/A3
DA-630Q4-DA/D2/D3	—	650SB-AA/A2/A3

Table A–1 (Cont.): System Type

System Order Type	(Old) SMART/CHAMP System Type	(New) SMART/CHAMP System Type
DH-630Q4-EA/E2/E3	—	650SB-AA/A2/A3
DH-630Q4-FA/F2/F3	—	650SB-AA/A2/A3
DH-630Q4-HA/H2/H3	—	650SB-AA/A2/A3
DH-630Q4-JA/J2/J3	—	650SB-AA/A2/A3
DH-630Q4-KA/K2/K3	—	650SB-AA/A2/A3
DH-630Q5-AA/A2/A3	—	650SE-AA/A2/A3
DH-630Q5-EA/E2/E3	—	650SE-AA/A2/A3
DH-630Q5-FA/F2/F3	—	650SE-AA/A2/A3
DH-630Q5-HA/H2/H3	—	650SE-AA/A2/A3
DH-630Q5-JA/J2/J3	—	650SE-AA/A2/A3
DH-630Q6-BA/B2/B3	—	650SE-AA/A2/A3
DJ-630P1-AA-A3	—	650SY-AA/A3
DJ-630P1-AA/B3	—	650SY-AA/A3
DJ-630P5-AA/A3	—	650SE-AA/A3
DJ-630P5-BA/B3	—	650SE-AA/A3
DJ-630P5-CA/C3	—	650SE-AA/A3

FIELD SERVICE UPGRADE WORKSHEET

This form acts as a verification of the work performed on the system and as a check on the procedures used. It can also be used for repricing the customer's service contract. Return this form to your local contracts administration office for processing.

CUSTOMER: _____

OLD SYSTEM TYPE: _____ NEW SYSTEM TYPE: _____

SERIAL NUMBER: _____ SERIAL NUMBER: _____

MODULES/OPTIONS REMOVED:	MODULES/OPTIONS REPLACED:
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

CS-7664

FIELD SERVICE INSTALLATION RECEIPT

This document acts as a customer receipt and as verification for Field Service that the upgrade kit installation has been completed.

FIELD SERVICE:	Complete both copies of this form and give a copy to the customer and a copy to local CAS for filing with the customer documents.
CUSTOMER:	Digital will Contact you within the next few days. Keep this copy as your record of installation by Digital.

RETURN AUTHORIZATION NUMBER: _____

NAME OF CAS CONTACT: _____

FIELD SERVICE CONTACT: _____

FIELD SERVICE PHONE NUMBER: _____

CUSTOMER DEC NUMBER: _____

CUSTOMER CONTACT: _____

CUSTOMER ADDRESS: _____

CUSTOMER PHONE NUMBER: _____

SYSTEM UPGRADED: MicroVAXII ___ VAXstation II/GPX ___
(check one)

DATE INSTALLATION PERFORMED: _____

MODULES PACKAGED FOR RETURN: (fill in appropriate lines)

	MODULE/OPTION	SERIAL NUMBER
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
	_____	_____

(Customer Signature) (Field Service Signature)

CS-7663

RETURNS MATERIAL CHECKLIST

This form must be filled out and returned with the old modules(s) in order to clear the customer's account.

MODULE BEING RETURNED: _____

DATE MODULE PACKAGED: _____

RETURN AUTHORIZATION NUMBER: _____

CUSTOMER DEC NUMBER: _____

CUSTOMER (COMPANY) NAME: _____

CUSTOMER ADDRESS: _____

_____

_____

_____

CUSTOMER CONTACT: _____

CUSTOMER TELEPHONE NUMBER: _____

Include This Form With Each Module/Option Returned

CS-7665

MODULE RETURN PROCEDURE

1. Package modules in existing module packaging.

2. Seal shipping box with packaging tape and cover all previous shipping information.

3. Contact your local CAS representative for return information. That person will need the Digital order number and customer name and will give you a return authorization (RA) number.

4. Write the RA number on the return-address label, in the lower lefthand corner. Make sure the number is legible. (If a label is not available, return the module to the address shown below. Be sure to include the RA number.)

5. Advise the customer that the customer will be billed for the Modules if they are not returned to Digital. Then make sure the container is sent to the customer's shipping area for pickup.

6. If there are any questions, the customer should contact the appropriate sales representative.

Ship To:

Digital Equipment Corporation
Attention: Returns Sort Center
Route 127
Dock Area D001
Contoocook, NH 03229-9210

RA#_____

DEC#_____

Package #_____ of _____

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