
VAX 9000
FAMILY

VAX 9000 Family KA940-UB Upgrade Installation Guide

Order Number EK-KA94B-IN-001

Digital Equipment Corporation

First Edition, March 1991

The postpaid Reader's Comment Card included in this document requests the user's critical evaluation to assist in preparing future documentation.

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

The following are trademarks of Digital Equipment Corporation:

BI	KDB50	RSTS	VAX FORTRAN
CI	KDM	RSX	VAX MACRO
DEC	KLESI	RT	VAXBI
DECmate	MASSBUS	RV20	VAXcluster
DECUS	MicroVAX	RV64	VAXELN
DECwindows	NI	TA	VAXsimPLUS
DECwriter	PDP	TK	VMS
DHB32	P/OS	UDA50	VT
DIBOL	Professional	ULTRIX	Work Processor
DRB32	RA	UNIBUS	XMI
EDT	Rainbow	VAX	
	RD	VAX C	digital™

™ Mate-N-Lok is a trademark of AMP, Inc.

® TORX is a registered trademark of the CAMCAR Division of TEXTRON, Inc.

® Velcro is a registered trademark of Velcro USA, Inc.

This document was prepared and published by Educational Services Development and Publishing, Digital Equipment Corporation.

Contents

3 Upgrade Acceptance Tests

Figures

Tables

PAGE vi INTENTIONALLY LEFT BLANK

About This Manual

Introduction

This document provides the KA940-UB CPU upgrade procedures.

Intended Audience

The content, scope, and level of detail in this document assumes that the reader:

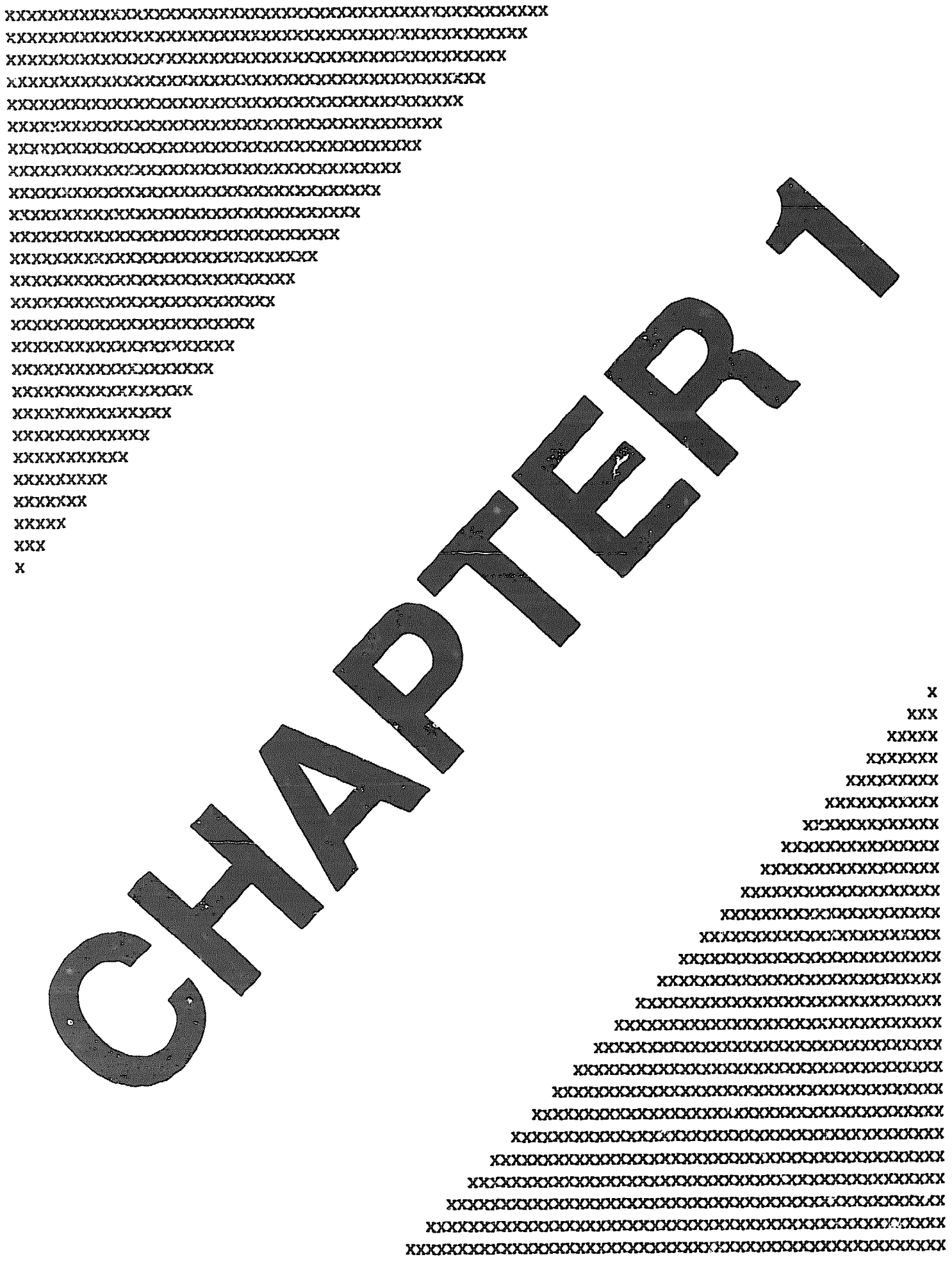
- Is familiar with the VAX architecture and VMS operating system at a user level
- Has experience installing and maintaining midrange and large VAX systems

Document Structure

Chapter 1 provides the upgrade preparation, unpacking, and inspection procedures.

Chapter 2 provides the upgrade installation procedures.

Chapter 3 provides the file revision and upgrade acceptance procedures.


CHAPTER 1

1
Upgrade Preparation and Unpacking

1.1 Introduction

The following subsections provide upgrade preparation and unpacking information.

1.2 System Revision Check

Execute the following command line:

$ SHOW CONFIGURATION/CPU [Return]

Assure that all MCUs are at a B5-compatible revision level.

1.3 Cabinet Placement

Before unloading the CPB and IOB cabinets from the truck, note where the cabinets are to be installed in the computer room. Also note the access to the room to determine the order that the cabinets should be rolled into place. Place the cartons in the deskidding area and unpack them in that order. This allows each cabinet to be unpacked and rolled into place without other system cartons being in the way.

NOTE

See the site installation plan to determine where the shipping company's responsibility ends and Digital Customer Services responsibility begins. Determine who is responsible for:

- **Unloading the cabinets from the truck onto the loading dock**
- **Moving the cabinets from the loading dock into the building**
- **Moving the cabinets to the deskidding area**
- **Deskidding and unpacking**
- **Moving the cabinets to the installation location**

1.4 Unpacking and Inspection

Three cabinets are shipped for the upgrade: CPB, UPC, and IOB. These units are shipped in cartons on skids. Figure 1–1 shows a cabinet carton as it is shipped to the installation site. Use the following procedure to unpack and inspect the cabinets in the order determined in Section 1.3.

1. Count the boxes verifying that the number agrees with the number of boxes listed on the bill of lading. Note any discrepancies on the bill of lading.
2. Check all boxes for external damage (dents, holes, smashed corners). Note any discrepancies on the bill of lading.

   NOTE
   If there is damage, stop unpacking the system until the customer notifies the insurance company and gives permission to continue with the installation.

3. Notify the customer of any damage, open boxes, or open cabinets. List the information on the labor activity reporting system (LARS) report form. Include a note to clarify the extent of the damage.
4. Remove the content list from the Customer Services box and check the contents of the boxes against the content list. This Customer Services box is identified by the international information symbol — a blue circle containing the letter i. Notify the branch manager or branch supervisor of any missing, incorrect, or damaged items.

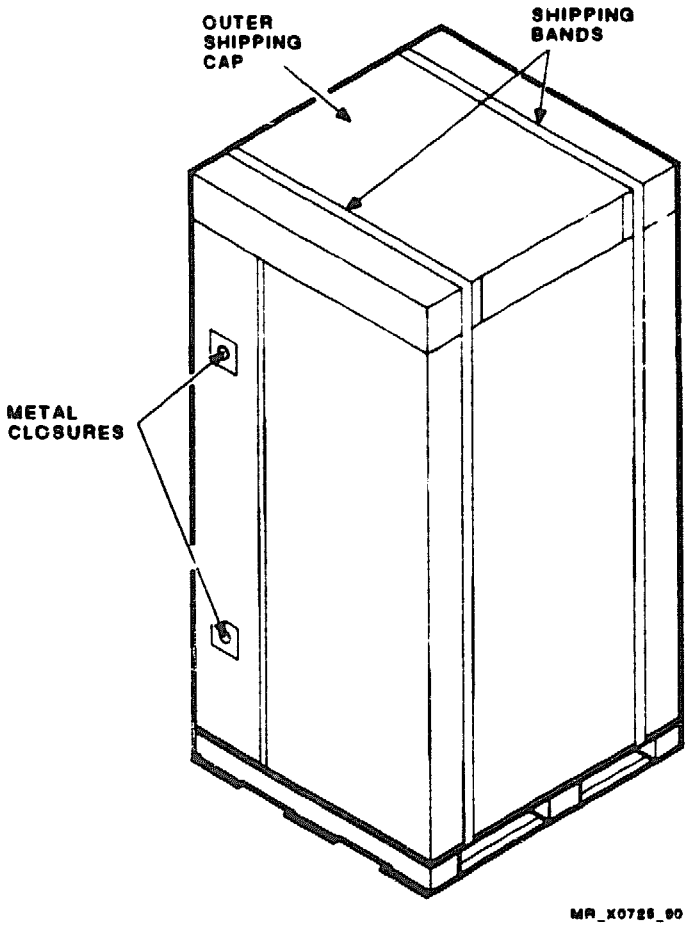


Figure 1–1 Cabinet Shipping Carton

NOTE
There may be unpacking illustrations provided on the cartons.

5. Remove all shipping bands (Figure 1–1).
6. Remove the outer shipping cap.
7. Use a 7/16-inch wrench to remove the machine screws and metal closures that secure the short carton flaps over the front and back sides of the cabinet. There are four metal closures, two on opposite sides of the carton.
8. Remove the shipping carton.
9. Cut the tape that secures the ramps and accessories box to the unit (Figure 1–2).
10. Remove the deskidding ramps from the front of the unit.

NOTE
The Z-flex cable box is taped to the front of the CPB cabinet.

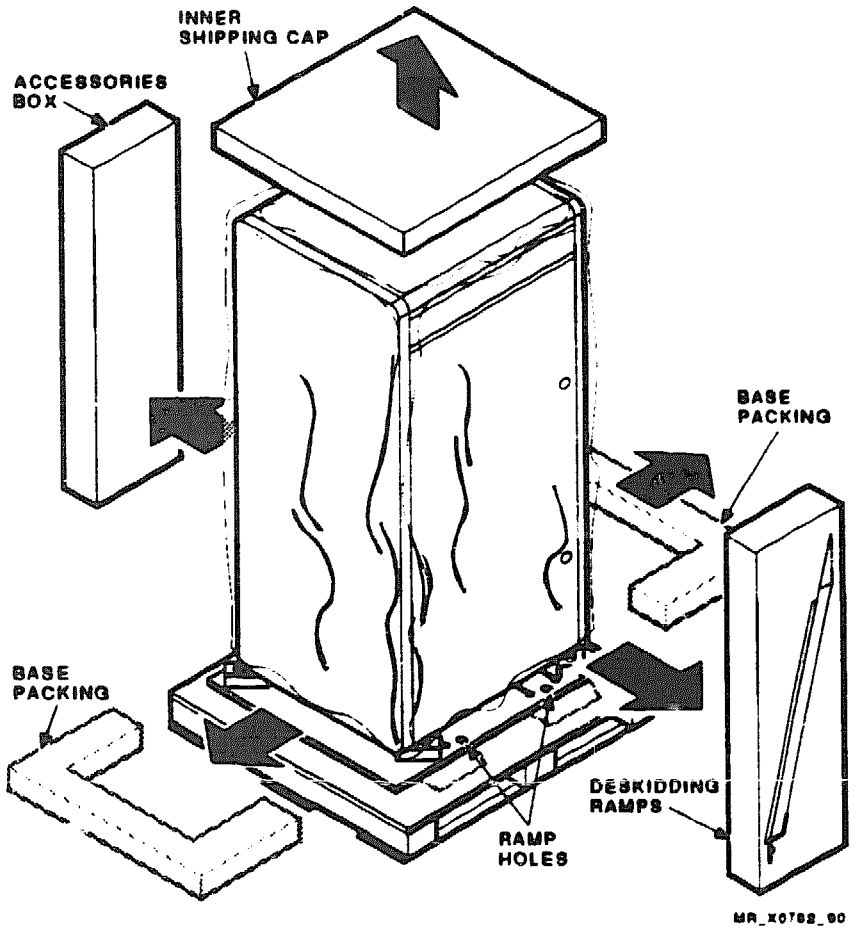


Figure 1–2 Unpacking the Shipping Cartons

11. Remove the accessories box taped to the back of the IOB cabinet. The following items are packaged in the accessories boxes:
    - Tie wraps
    - Three operator control panel (OCP) keyswitches
    - DC cable grounding clamp, if applicable
    - Documentation for optional adapters, such as the DEMNA, CIXCD, or KDM70 interfaces
12. Remove the inner cap.

CAUTION
For cold weather installations, cabinets protected in vapor barrier bags should be brought up to the installation temperature before breaking the vapor barrier seal. This avoids condensation on the cabinets.

13. The CPB cabinet is protected in a vapor barrier bag; cut this bag at the base of the unit and remove the bag by lifting it up and off the unit. IOB and UPC units are protected with polyethylene bags; remove the bag by lifting it up and off the unit.
14. Locate and remove any dessicant bags shipped with the unit (these are located on the shipping pallet).
15. Untie the ac input cable secured to the rear of the UPC cabinet.
16. The unit can be deskidded in two directions. This is done by removing the wheel stops on the pallet with a Phillips screwdriver.
17. Open the ramp carton and remove its contents.
18. Verify that the number of the ramp arrows match with the number of the skid arrows. This ensures that the ramps are on the correct side, with the ramp guard rails on the inside. Place the brackets on the edge of the skid, placing the tabs in the skid holes and press into place using your foot (Figure 1–3).
19. Using a 9/16-inch wrench, at the base of the unit, remove the four shipping brackets from the unit's leveling feet.
20. Before deskidding a unit, the leveling feet should be fully retracted. If not, use the wrench part of the shipping bracket to fully retract the leveling feet.

WARNING
Four people are required to deskid a CP or UPC cabinet. Two people are required to deskid an IO cabinet. Use extreme care to prevent the cabinet from rolling uncontrolled down the ramps or off either side of the pallet when releasing the leveling feet.

21. Carefully roll the cabinet off the shipping pallet.

WARNING
If it is necessary to move either the CP or IO cabinet in a front-to-back direction, remove the cabinet stabilizer assembly (PN 70-28933-01) from the Customer Services box. The cabinet stabilizer assembly (Figure 1–4) attaches to the center of the lip on the cabinet base at the rear of the cabinet. The remaining steps of this procedure describes how to install the cabinet stabilizer assembly.

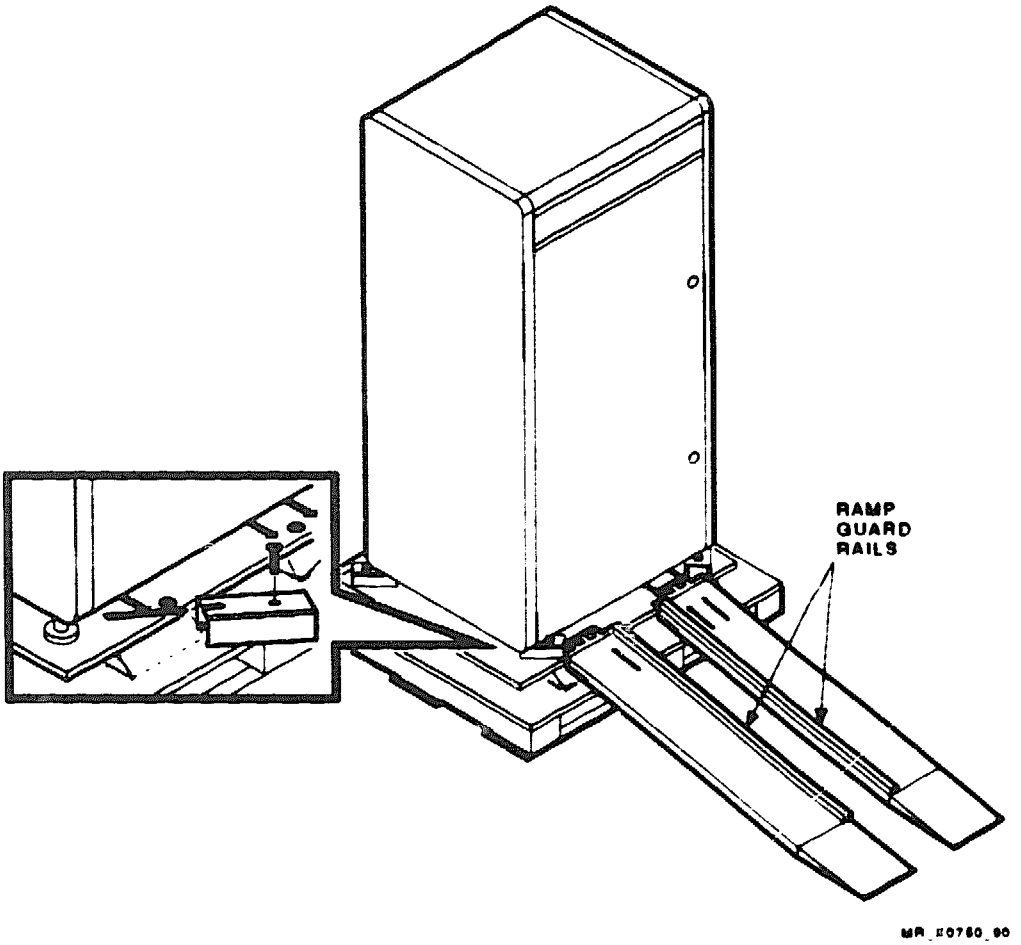
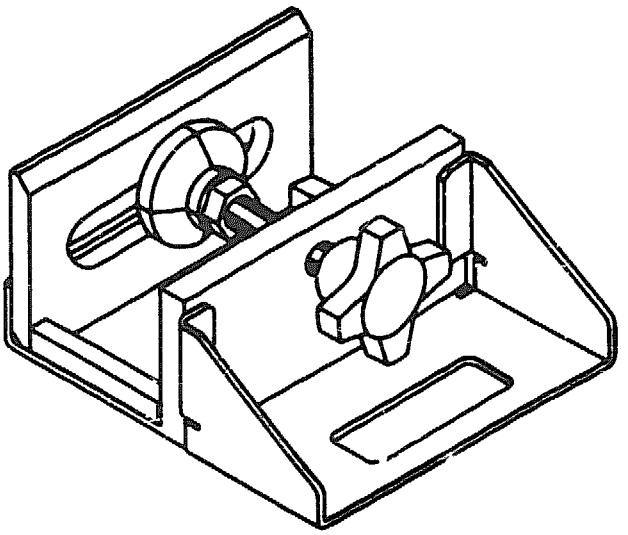


Figure 1–3 Deskidding Preparations



MR_X0002_91.RAGS

Figure 1–4 Cabinet Stabilizer Assembly

22. Place the cabinet stabilizer assembly under the center of the lip on the cabinet base (Figure 1–5) at the rear of the cabinet.
23. Push up on the cabinet stabilizer assembly until it bottoms out on the lip.
24. Secure the cabinet stabilizer assembly by tightening the locking screw and then position the cabinet.
25. After the cabinet is correctly positioned, loosen the locking screw and remove the cabinet stabilizer assembly.

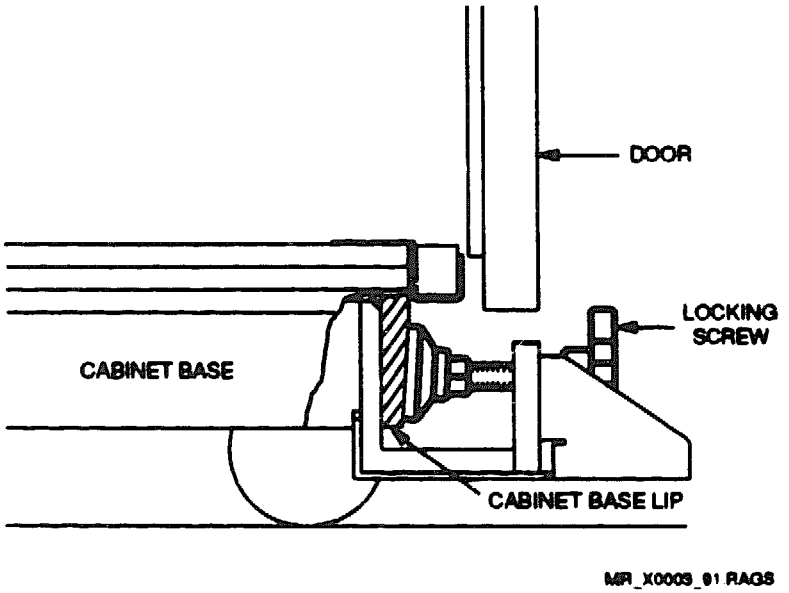


Figure 1–5 Cabinet Stabilizer Assembly Attachment

1.5 Point of Distribution Process

A European variation to the unpacking procedure is the point of distribution (POD) process used in shipping systems to European customers. Reduced packaging for the system consists of a cushioned pallet, hold down brackets, and an antistatic plastic cover (for CPs and SCUs, this is in addition to the vapor barrier bag). System units are then shipped in dedicated customer trucks. Reduced packaging eliminates the corrugated and cushion packaging (wraparounds, cap, and inside laminates).

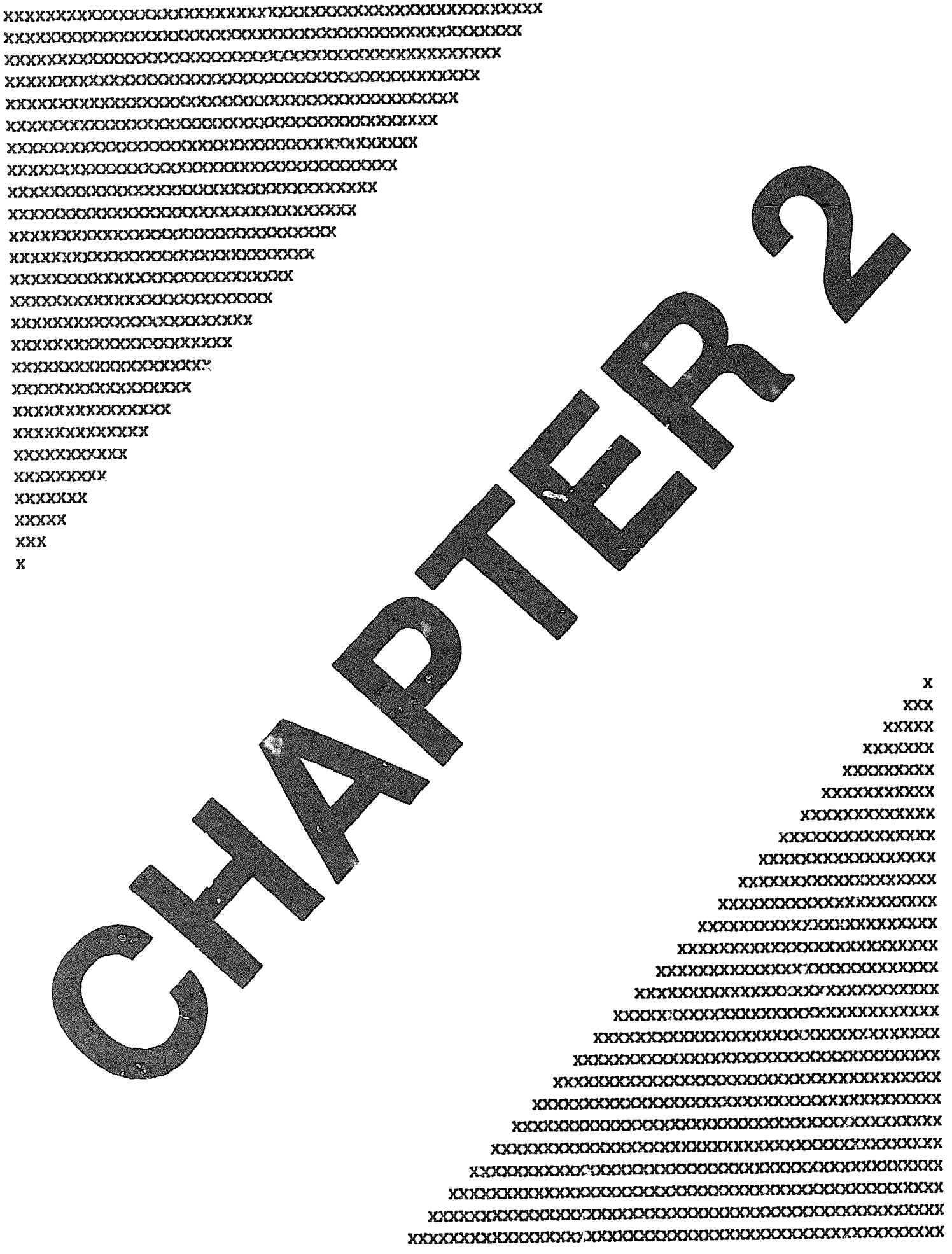
1.6 System Power Down

Perform the following procedure to power down the system.

1. Notify affected personnel of the system shutdown.
2. Execute the system shutdown command file (when appropriate):

   $ @SYS$SYSTEM:SHUTDOWN Return
3. Set the OCP Power keyswitch to Off (0).
4. Open the rear UPC cabinet doors.
5. Set the REMOTE/LOCAL switch to OFF.
6. Set CB1 of the A1 module to OFF, and lockout the circuit breaker.
7. Set the DC DISCONNECT circuit breaker on module A12 to OFF.
8. Set the +24 volt power supply switch to OFF.
9. Repeat steps 4 through 8 for the second UPC.
10. Set the utility service switch to OFF.
11. Lockout the utility service switch.
12. Disconnect the main power cable from the utility power source.

NOTE
Allow at least 5 minutes after power is removed from the system before starting the upgrade installation.


CHAPTER 2

2
Upgrade Installation

2.1 Introduction

Three cabinets require installation for the upgrade.

CPB
IOB
UPC2

The assembly instructions include the following:

Cabinet positioning (Section 2.2)
Door removal (Section 2.3)
Bulkhead cable unpackaging and routing (Section 2.4)
Bolting cabinets together (Section 2.5)
Intercabinet system cabling (Section 2.6)
Cabinet leveling (Section 2.7)
Door replacement (Section 2.8)

2.2 Cabinet Positioning

WARNING
If it is necessary to move either the CP or IO cabinet in a front-to-back direction, remove the cabinet stabilizer assembly (PN 70-28933-01) from the Customer Services box. The cabinet stabilizer assembly (Figure 1–4) attaches to the center of the lip on the cabinet base at the rear of the cabinet. Section 1.4 provides instructions that describe how to install the cabinet stabilizer assembly.

Position the CPB and IOB cabinets as shown in Figure 2–1. Facing the SCU from the front, the CPB cabinet is positioned to the left of the SCU cabinet and the IOB cabinet is positioned to the left of the CPB cabinet. As with the model 410/420 systems, the second UPC can be either positioned away from the system cabinets or in line with the cabinets. The UPC must not be bolted to any other system cabinets; it must stand alone.

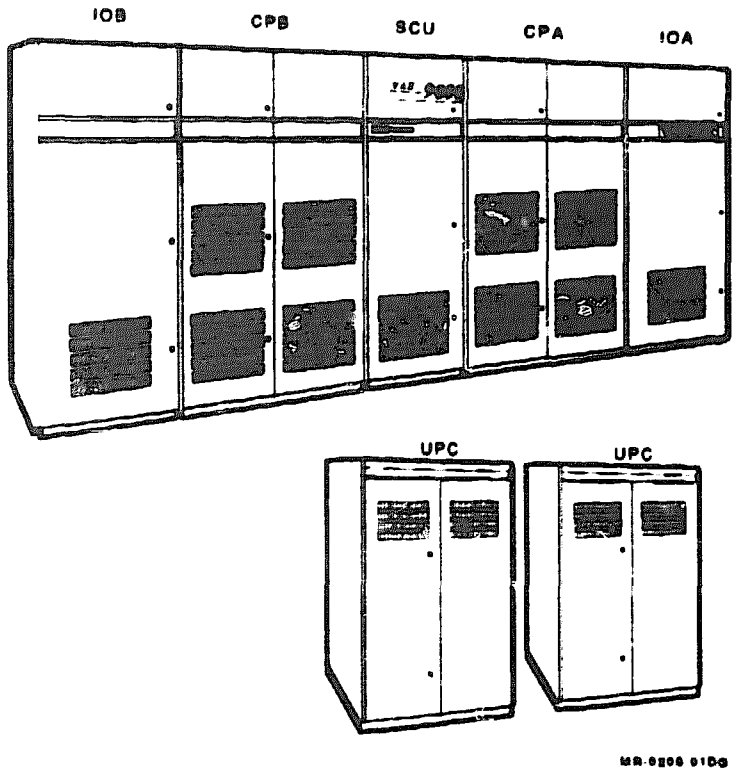


Figure 2–1 System Cabinet Positioning

2.3 Door Removal

Each cabinet's front and back doors must be removed before the cabinets are bolted together. It is not necessary to remove the doors on the UPC cabinet. The system cabinets use door lock keys for internal access to the cabinets. One key (to be used by Customer Services) fits all cabinet door locks. Use the following procedure to remove all cabinet doors.

1. Unlock the cabinet front and back doors.
2. The UPC cabinet doors and the back door of the IOB cabinet all have two latches. The CPB cabinet doors have three latches.
3. Remove the ESD pouch from the door, attached with a Velcro strip, and leave inside the cabinet.
4. Use a 5/16-inch nut driver to disconnect the hardware securing the ground strap to the cabinet frame, remove the ground strap from the frame, and then reattach the hardware just removed to the frame.
5. Remove the door hinge pins and lift the doors off the hinges by lifting up each door (it is not necessary to remove the rear door of the IOB cabinet). Leave the cabinet doors off until the upgrade cabling is complete.
6. At the front of the CPB cabinet, use a Phillips screwdriver to remove and then discard the two retaining screws that secure the plenum assembly during shipment (Figure 2–2).

7. Remove the end panel from the left side of the SCU (as viewed from the front of the cabinets) and install it on the left side of the IOB cabinet.

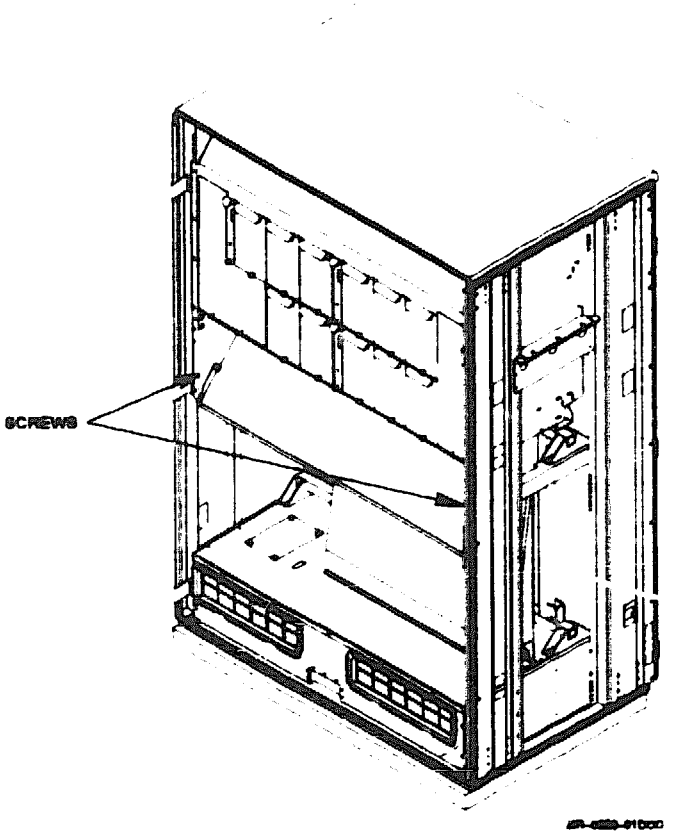


Figure 2–2 Plenum Assembly Retaining Screws

2.4 Bulkhead Cable Unpackaging and Routing

Certain interface and power cables that are routed between the CPB and IOB cabinets are bundled in bubble wrap and tie-wrapped to the cabinet EMI barrier panels. The packaging material should be removed from the cables and then route the individual cable assemblies to the adjacent cabinet through its respective barrier cutout (for example, as viewed from the rear of the cabinets, cables leaving the top left cutout of the IOB cabinet would be routed through top right cutout on the right side of the CPB cabinet). After the packaging material has been removed from all cables, the cabinets can be positioned approximately 4 inches apart to route the cables.

1. Remove packaging material from all cables attached to the cabinet bulkheads.
2. Position the cabinets approximately 4 inches apart.
3. Route each cable assembly through the adjacent barrier cutout into the adjacent cabinet.

2.5 Bolting Cabinets Together

After all bulkhead intercabinet cables have been routed through their respective EMI barrier cutouts, the cabinets should be carefully rolled to within approximately 4 inches of each other for the purpose of bolting the cabinets together. Cabinets are positioned according to the floor plan (CCD) of a location. Therefore, if working from the SCU, the CPB is located next to (to the left of) the SCU, followed by positioning the IOB.

CAUTION
Exercise extreme caution when moving the cabinets together to avoid pinching either the cables or the connectors between the frames.

The CPB cabinet (Figure 2–3) has an EMI barrier panel and an expander frame on the right side (facing the front) and is open on the left side.

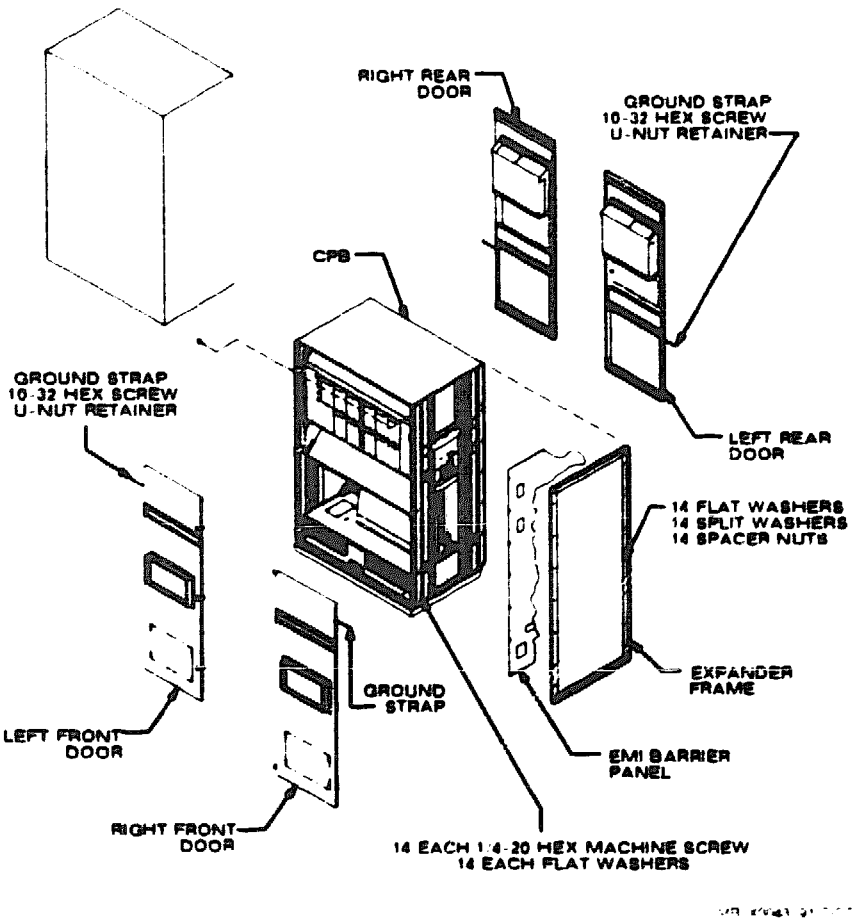


Figure 2–3 CPB Cabinet

The IOB cabinet (Figure 2–4) has an EMI barrier panel and an expander frame on the right side (facing the front) and has an end panel on the left side.

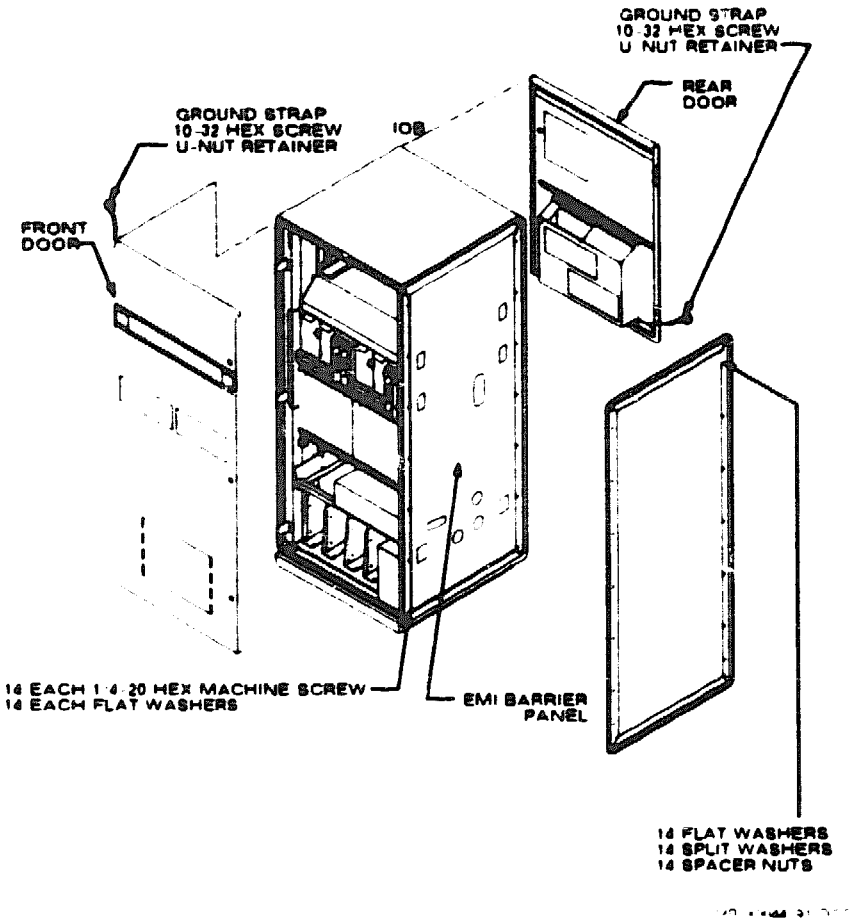


Figure 2–4 IOB Cabinet

1. Repeat the next three steps until the CPB and IOB cabinets are attached together.
2. Remove the intercabinet hardware. The intercabinet hardware consists of 14 sets of the following:

   Spacer nuts (PN 74-41149-01)
   Flat washers (PN 90-06646-00)
   Lock washers (PN 90-07797-00)
   1/4 × 20 machine hex screws (PN 90-06245-09)

   NOTE
   On installation sites where the floors are uneven, the following hints may help:

   1. **Normally, bolt from top to bottom, but if the bottom edges of the cabinet are closer together than the top edges, then bolt from the bottom up.**
   2. **Using extreme caution, not to damage the holes, a screwdriver can be used to help align mounting holes.**

3. Use the top two screws as guide pins and carefully slide the two cabinets together and reattach the spacer nuts, washers, and lock washers to the screws. (Do not tighten until all hardware is reattached.)
4. Work from the top down and reattach all remaining screws, flat washers, lock washers, and spacer nuts. When all hardware is in place, use a 7/16-inch wrench to secure all 14 sets of screws, flat washers, lock washers, and spacer nuts.

   NOTE
   If a third and fourth VAXBI cabinet is to be installed, these two would be positioned adjacent to the left side of the IOB cabinet. See the *VAXBI Cabinet Installation Manual* for assembly instructions.

2.6 Intercabinet System Cabling

This section provides instructions for routing and connecting the cables between the system cabinets. These cables are found tie-wrapped into position, usually with one end connected, inside the system cabinets. Certain cables however, are located in but not connected, inside the CP cabinet: these cables are routed to the IO and SCU cabinets.

Figure 2–5 shows the cutouts in the EMI barrier panels for the model 430/440 system. The SCU, CP, and IO cabinets are used for installing interconnecting cables between the system cabinets. The cutouts for the EMI barrier panel located between the CPA and the IOA cabinets are numbered from 1 to 10. The cutouts for the EMI barrier panel located between the SCU and CPA cabinets are numbered from 21 to 29. The cutouts for the EMI barrier panel located between the SCU and CPB cabinets are numbered from 31 to 39. The cutouts for the EMI barrier panel located between the CPB and IOB cabinets are numbered from 41 to 48.

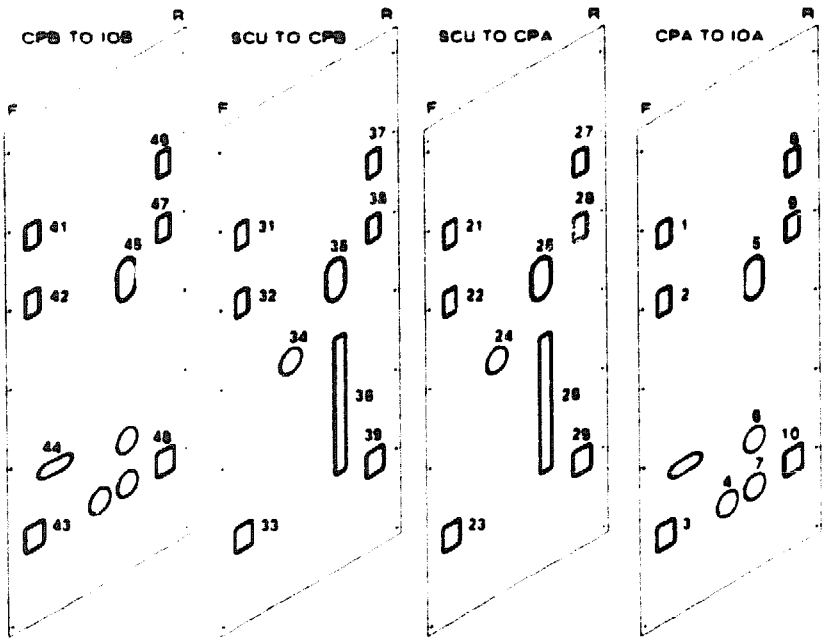


Figure 2–5 Model 430/440 EMI Barrier Panel Cutout Identification

2.6.1 CPU and SCU Plenum Removal

Before connecting the flex cables between the CPB and SCU cabinets, it is necessary to remove the plenums.

To remove the CPU2 plenum, perform the following procedure:

1. Disconnect the two Mate-N-Lok connectors for the motor speed control sensor.
2. Disconnect the Mate-N-Lok connector for the air flow sensor.
3. Use the 5/16-inch nutdriver to remove the hardware (two screws and two washers) that secures the plenum to the cabinet frame.
4. Remove the plenum assembly.

To remove the SCU plenum, perform the following procedure:

1. Disconnect the two Mate-N-Lok connectors for the motor speed control sensor.
2. Disconnect the Mate-N-Lok connector for the air flow sensor.
3. Disconnect the Mate-N-Lok connector for the thermistor.
4. Use the 5/16-inch nutdriver to remove the two screws that secure the plenum mounting bracket to the cabinet frame.
5. Remove the plenum and mounting bracket.

2.6.2 CPB and IOB Cable Installation

The following list summarizes and references the CPB and IOB cabinet cable installation procedures:

Flex print cable installation (Section 2.6.2.1)
Flexible clock cable installation (Section 2.6.2.2)
Scan cable installation (Section 2.6.2.3)
Clock control cable installation (Section 2.6.2.4)
PIP1/2 cable installation (Section 2.6.2.5)
JXDI cable installation (Section 2.6.2.6)
PIP-JB, PIP-JG cable installation (Section 2.6.2.7)
IOB to CPB power cable installation (Section 2.6.2.8)
RICBUS C, IOB filter cable installation (Section 2.6.2.9)
XJA 2/3 clock cable installation (Section 2.6.2.10)
CPB ground rail cable installation (Section 2.6.2.11)
IOB filter switch cable installation (Section 2.6.2.12)
UPC2 cable installation (Section 2.6.2.13)

2.6.2.1 Flex Print Cable (Z-Flex) Installation

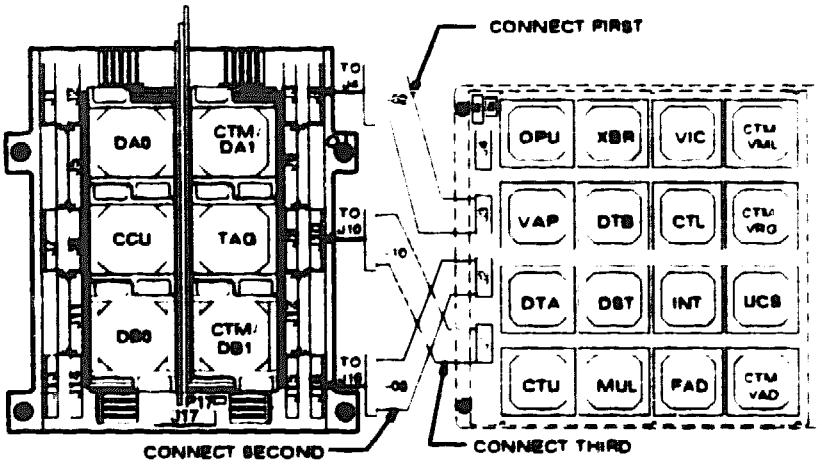
Table 2–1 lists the flex print cable installation information. Figure 2–6 shows the flex print cable routing.

Table 2–1 Flex Print Cable FRU Information

Parameter	Specification
FRU part number	12-28459-02, 12-28459-06, 12-28459-10
FRU handling	Two people required
Tools required	TORX T-20 screwdriver (PN 29-28089-01)
	Z-flex and mem-flex torque tool (PN 29-28143-01)
	Cleaning sticks (PN 29-28267-01)
	Penlight

CAUTION

To avoid damaging the planar, two Customer Services engineers are required to perform this procedure. When removing or installing the Z-flex connector, keep a protective cover on the connector when it is not actually being mated to its appropriate jack.



CPU 2 TO SCU CONNECTION

Figure 2–6 Z-Flex Cable Connection

CAUTION
Z-flex cables should not be pre-bent for installation. These cables should develop their own forming as the connector housings are seated on its mated planar surface. During cable installation, avoid bending cable beyond its normal form.

Install the Z-flex cables through EMI barrier panel cutout 36 in the following order. (The remainder of the procedure is a generic installation procedure; perform it three times to complete the cable installation for each configured CPU.)

1. SCU-J4 to CPU2-J3 (PN 12-28459-02)
2. SCU-J16 to CPU2-J2 (PN 12-28459-06)
3. SCU-J10 to CPU2-J1 (PN 12-28459-10)

CAUTION
Use approved cleaning swabs (PN 29-28267-01) for cleaning contact pads on the planars and Z-flex cable connectors.

1. Clean the contact pads on both the SCU planar module and the CPU planar module using a cleaning swab.
2. Check that the contact pads and the connector are clean (free of particles, fiber, dust, and any foreign matter) using a bright light. Do not continue until both surfaces are clean.
3. Remove the protective cover from the SCU and CPU cable connectors.
4. Clean the connectors using a cleaning swab (wipe from the cable side of the connector out).
5. Check that the connectors are clean (free of particles, fiber, dust, and any foreign matter) using a bright light. Do not continue until both surfaces are clean.
6. Place the protective covers back on the SCU and CPU connectors if space allows for the cable installation.

7. Feed the Z-flex cable through EMI barrier p l cutout 36.

CAUTION
When removing or installing the Z-flex connector, keep the surface of the connector parallel to the surface of the PWB at all times. Alternately turn each screw, 1/2 turn at a time, while relieving the strain on the cable.

8. Align and seat the Z-flex connector into the SCU jack. The screw should be pushed into the connector to act as a guide.
9. Alternately hand-tighten (do not torque the screws down until the next step) the top and bottom connector TORX head screws using the Z-flex torque tool (PN 29-28143-01). The torque tool is a preset device.
10. Alternately torque the top and bottom connector TORX head screws to 27 ± 1 inch-pounds using the Z-flex torque tool.

CAUTION
When removing or installing the Z-flex connector, it is important to keep the surface of the connector parallel to the surface of the planar at all times. Alternately turn each screw, 1/2 turn at a time while relieving the strain on the cable.

11. Align and seat the Z-flex connector into the CPU jack. Note that the screw should be pushed into the connector to act as a guide.
12. Use the torque tool (PN 29-28143-01)to alternately **hand-tighten** the top and bottom connector TORX head screws.
13. Use the torque tool to alternately torque the top and bottom connector TORX head screws to 27 inch-pounds.
14. Repeat this procedure for each Z-flex cable installation.

2.6.2.2 Flexible Clock Cable Installation

Table 2–2 lists the flexible clock cable installation information.

Table 2–2 Flexible Clock Cable FRU Information

Parameter	Specification
FRU part number	17-01982-01, red flex, master clock
	17-01982-02, blue flex, reference clock
FRU handling	Two people recommended (one for cabinet front; one for cabinet rear)
Tools required	Clock cable torque tool (PN 29-27973-01)
	Cable tie wraps
	Diagonal cutters

1. Route each clock cable through EMI barrier cutout 34 to the master clock module (MCM).
   a. Red flex to MCM J32, J34, J36, and J38 (PN 17-01982-01)
   b. Blue flex to MCM J33, J35, J37, and J39 (PN 17-01982-02)

2. Suggested cable routing:
   a. Bring the eight cables from the top of the planar to the right.
   b. Route the cables to the right CPB cable rail. Coil excess cable here.
   c. Route the cable through the EMI barrier cutout 34 across the top of the memory card cage duct and down to the MCM.
   d. Use pushmounts and tie wraps to secure the cable to the rail.
3. Connect and hand-tighten the clock cable connections at their associated positions on the MCM and the CPU planar as specified in Table 2–3.

Table 2–3 Clock/CPU Cable Connections

MCM	Route	CPU2
Blue flex		
MCM J33	To	CPU2 JBM15
MCM J35	To	CPU2 JBM11
MCM J37	To	CPU2 JBM7
MCM J39	To	CPU2 JBM3
Red flex		
MCM J32	To	CPU2 JAM15
MCM J34	To	CPU2 JAM11
MCM J36	To	CPU2 JAM7
MCM J38	To	CPU2 JAM3

CAUTION
While torquing the clock connectors, keep the SMA connector housing free of the cable (no binding) by wiggling the cable. This prevents the cable from winding up and subsequently causing the SMA connector to loosen.

4. Use the clock cable torque tool (PN 29-27973-01) and a 1/4-inch open end wrench (as a backing wrench on the female connector) to torque each cable connector to a value of 8 inch-pounds.

NOTE
Using a backing wrench will help prevent the female connector from twisting off the coax cable.

CAUTION
It is possible for the clock cables to unwind after they are apparently torqued to the correct value. To avoid this problem, it is necessary to recheck the torque on the clock cables.

5. Repeat step 4 to verify that all cable connectors are torqued to a value of 8 inch-pounds.

2.6.2.3 Scan Cable Installation

1. Route the scan cable (PN 17-01788-01) from CPU2 to the SPU backpanel.
2. Suggested cable routing:
   a. Route the cable from CPU2-P1 in the CPB cabinet through the EMI barrier cutout 35 into the SCU cabinet.
   b. Continue routing the cable across the back of the SCU cabinet and tie wrap it to the two stick mounts.
   c. Continue routing the cable through the EMI barrier 25 cutout into the CPA cabinet.
   d. Finally, route the cable across the cable trough above the CPA plenum (tie wrap it into the cable trough).
3. Connect the SPU cable end to SCM J1E2.
4. Connect the CPU2 cable end to CPU2-P1.

2.6.2.4 Clock Control Cable Installation

1. Route the clock control cable (PN 17-01787-01) from CPU2 to the MCM.
2. Suggested cable routing:
   a. Route the cable from CPU2 to the left (coil any excess cable here) and then through the EMI barrier cutout 34 into the SCU cabinet.
   b. Continue routing the cable across the memory card cage trough and down to the MCM.
3. Connect the MCM cable end to MCM J3 and the CPU end to CPU2-P2.

2.6.2.5 PIP1/2 Cable Installation

1. Route the PIP1/2 cable (PN 17-02436-01) from the IOB cabinet PIP power supply to the IOA cabinet PIP power supply.
2. Suggested cable routing:
   a. From the IOB cabinet, route the PIP-to-PIP power cable from the rear of IOB PIP2JF, through cutout 48 into the CPB cabinet.
   b. Route the cable to the front of planar 2 keeping the cable below CPU2 (leaving room in case its planar is ever removed).
   c. On the other side of the planar, route the cable back toward the rear and through EMI barrier cutout 39 into the SCU cabinet.
   d. Route the cable behind the plenum on top of the coax and though EMI barrier cutout 29 into the CPA cabinet.
   e. Route the cable behind and under the CPA CPU1 planar (tie wrapping to two existing stick mounts).
   f. Finally, route the cable through EMI barrier cutout 4 to the PIP power supply.
3. Connect the cable from IOB PIP2JF to IOA PIP1JF.

2.6.2.6 JXDI Cable Installation

The following JXDI cables are located in the CPB cabinet (no connection in the CPB cabinet) and are connected from the IOB cabinet to the SCU cabinet.

1. Suggested cable routing:
   a. Access to the IOB cabinet is through barrier cutout 47.
   b. Route the eight cables to the right and down.
   c. Route four cables through the first stick mount tie wrap point to XJA2. The stick mount is located on the panel just above the XMI backpanel.
   d. Route the other four cables through the second stick mount tie wrap point to XJA3. This stick mount is also located on the panel just above the XMI backpanel.
   e. Access to the SCU cabinet is through barrier cutout 35 or 39.
   f. Eight cables are routed above the CPB planar module.
   g. The four cables that enter the SCU cabinet through EMI barrier cutout 35 connect to the SCU connectors P9 through P12.
   h. The remaining four cables are routed from the planar module down the side rail and enter the SCU cabinet through EMI barrier cutout 39. These cables connect to the SCU connectors P18 through P21.
2. Connect the JXDI cable (PN 17-01786-02) from IOB XJA2-J8E1 through barrier cutouts 47 and 39 to SCU SCU-P19 (Figure 2–7).
3. Connect the JXDI cable (PN 17-01786-02) from IOB XJA2-J8E2 through barrier cutouts 47 and 39 to SCU SCU-P18.
4. Connect the JXDI cable (PN 17-01786-02) from IOB XJA3-J8E1 through barrier cutouts 47 and 39 to SCU SCU-P21.
5. Connect the JXDI cable (PN 17-01786-02) from IOB XJA3-J8E2 through barrier cutouts 47 and 39 to SCU SCU-P20.
6. Connect the JXDI cable (PN 17-01786-02) from IOB XJA2-J8D2 through barrier cutouts 47 and 35 to SCU SCU-P12.
7. Connect the JXDI cable (PN 17-01786-02) from IOB XJA2-J8D1 through barrier cutouts 47 and 35 to SCU SCU-P11.
8. Connect the JXDI cable (PN 17-01786-02) from IOB XJA3-J8D2 through barrier cutouts 47 and 35 to SCU SCU-P10.
9. Connect the JXDI cable (PN 17-01786-02) from IOB XJA3-J8D1 through barrier cutouts 47 and 35 to SCU SCU-P09.

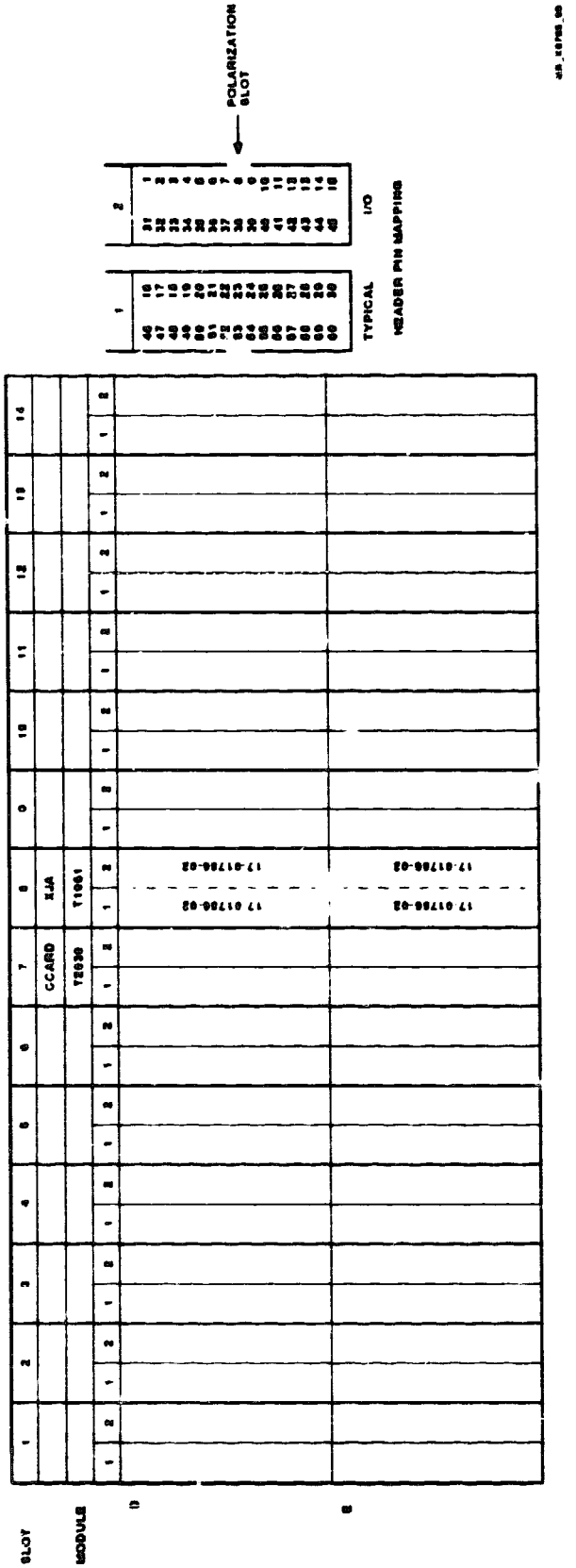


Figure 2–7 XMI Backpanel

2.6.2.7 PIP-JB, PIP-JG Cable Installation

The following two PIP power cables originate in the CPB cabinet from the right rear distribution panel and are connected in the IOB cabinet to the PIP power supply.

1. Suggested cable routing:
   a. Route the IOB dc power cable (PN 17-02733-01) from the right rear distribution panel in the CPB cabinet through EMI barrier panel cutout 44 to the IOB cabinet PIP power supply connector IOB PIP-JB.
   b. Route the IOB dc power cable (PN 17-02734-01) from the right rear distribution panel in the CPB cabinet through EMI barrier panel cutout 44 to the IOB cabinet PIP power supply connector IOB PIP-JG.
2. Connect cable PN 17-02733-01 from right rear CPB power distribution panel to the power supply connector IOB PIP-JB.
3. Connect cable PN 17-02734-01 from right rear CPB power distribution panel to the power supply connector IOB PIP-JG.

2.6.2.8 IOB to CPB Power Cable Installation

The following cables originate in the IOB cabinet and connect in the CPB cabinet.

1. Connect the bus M bias cable (PN 17-02116-05) from IOB PSH-J10 through EMI barrier cutout 46. Route this cable through the tie wrap stay (mounted under the CPB blower housing) to CPB BUSM/RIC13-J12 (bottom bus).
2. Connect the bus N bias cable (PN 17-02116-05) from IOB PSG-J10 through EMI barrier cutout 46. Route this cable through the tie wrap stay (mounted under the CPB blower housing) to CPB BUSN/RIC23-J12 (top bus).
3. Connect the OVP bias cable (PN 17-02116-04) from the IOB cabinet IOB PSH-J11 through EMI barrier cutout 46 and through the first CPB cabinet tie wrap stay to CPB OVP2-J1.
4. Connect the ground current cable (PN 17-02801-01) from the IOB cabinet bulkhead connector UPC2J1 through EMI barrier cutout 46 and behind the bus bar to the connector CPB BUSM/RIC13-J7 (bottom bus).
5. Connect the power cable (PN 17-02735-01) from the IOB cabinet CPU-P2 through EMI barrier cutout 46 to the CPB right rear power distribution panel Mate-N-Lok connector CPB CPU-J2.
6. Connect the power cable (PN 17-02735-01) from the IOB cabinet IOB XMI-P5 through EMI barrier cutout 46 to the CPB right rear power distribution panel Mate-N-Lok connector CPB CPU-J5 (this connector should be located near EMI barrier cutout 45).
7. Connect the CPB power distribution panel (PN 17-02735-01) from the IOB cabinet connector IOB XMI-J3 through EMI barrier cutout 46, to the right rear distribution panel of the CPB cabinet CPB XMI-P3.
8. Connect the cabinet ground rail cable (PN 12-13756-07) from the IOB rail through the EMI barrier cutout 43 to the CPB rail (the hardware is in place on the CPB rail to install the ground cable).

2.6.2.9 RICBUS C, IOB Filter Cable Installation

Two cables in IOB, the RICBUS C cable and the filter cable, are routed through CPB (where RICBUS C connects to both bus M and bus N), then through the SCU and CPA to the SIP board in the IOA cabinet.

1. Suggested cable routing:
   a. Route the RICBUS C cable (PN 17-02064-01) from IOB RIC52-J4 through EMI barrier panel cutout 46 to CPB BUSM/RIC13-J14 (bottom bus) and to CPB BUSN/RIC23-J14 (top bus), through EMI barrier cutout 37, through EMI barrier cutout 27, through EMI barrier cutout 8 to IOA SIP-J24 (where possible, route cable through tie wrap stays located under the blowers in CPB, SCU, and CPA).
   b. Route the IOB filter cable (PN 17-02801-01) from the IOB cabinet IOB RIC52-J8 and the DPB filters through EMI barrier cutouts 46, 37, 27, and 8 to IOA SIP-J6.
2. Connect the RICBUS C cable from IOB RIC52-J4 to CPB BUSM/RIC13-J14 (bottom bus) and to CPB BUSN/RIC23-J14 (top bus), and also connect the RICBUS C cable to IOA SIP-J24.
3. Disconnect the jumper from IOA SIP-J6 and connect the IOB filter cable from IOB RIC52-J8 to IOA SIP-J6.

2.6.2.10 XJA 2/3 Clock Cable Installation

The XJA 2/3 clock cable originates in the IOB cabinet and is connected in the SCU cabinet.

1. Suggested cable routing:
   a. Route the clock cable (PN 17-02454-01) from IOB XJA2/3-J2 through their respective stick mounts (the stick mounts should be positioned to allow board removal).
   b. Route the clock cable through EMI barrier panel cutout 43 into the CPB cabinet, behind the planar of CPU2, through EMI barrer panel cutout 33 into the SCU cabinet.
   c. Route the clock cable behind the filter bracket, and under the memory card cage door to the master clock module.
2. Connect the cable from IOB XJA2/3-J2 to SCU MCM-J9 (leave any excess cable coiled in the IOB cabinet).

2.6.2.11 CPB Ground Rail Cable Installation

Connect the cabinet ground rail cable (PN 12-13756-07) from the SCU rail through the EMI barrier cutout 33 to the CPB rail (the hardware is in place on the CPB rail to install the ground cable).

2.6.2.12 IOB Filter Switch Cable Installation

During the uni/dual installation, the following connection was made: connect the SCU filter switch cable (PN 17-02923-01) from the IOA SIP board, IOA SIP-J1 and IOA IPA-JX (this cable connects to the IOA filter switch via 17-02523-01) through EMI barrier panel cutouts 10 in the CPA cabinet and 29 in the SCU cabinet to SCU UPA-JX and SCU UPB-JX.

1. Suggested cable routing:
   a. The remaining filter switch cable stored adjacent to the EMI barrier cutout 29, is now routed through EMI barrier cutout 39 across the back of the CPB cabinet (tie wrapped to the existing clock coax cable).
   b. Route the cable through EMI barrier cutout 48, then up the side rail to connector IOB IPB-JX. Tie wrap this cable to the side rail as required.
2. Connect the IOB filter switch cable from SCU UPA-JX and SCU UPB-JX to IOB IPB-JX.

2.6.2.13 UPC2 Cable Installation

Model 430/440 configurations require two UPCs to supply power to the system: UPC1 and UPC2. UPC1 (or UPC for model 410/420 configurations) supplies power to the IOA cabinet and UPC2 supplies power to the IOB cabinet.

The following two cables originate in the UPC2 cabinet and are connected in the IOB cabinet (unlike UPC1, there is no ac cable connection made between UPC2-J2 and the I/O bulkhead). The PN suffix xx equals cable length in feet.

1. Connect the UPC2 dc power cable (PN 17-02761-xx) from the UPC UPC-J3 (Figure 2–8) to the I/O bulkhead IOB IOB-J1. The dc cable contains three color-coded lines; each line has a heavy duty terminal. If required, assemble this cable as follows.
   a. Remove the dc cable from the kit.
   b. Remove the hardware that secures the cable cover plate (adjacent to J3) from the rear of the UPC. The cable cover plate is secured with four screws. Nineteen additional screws for this plate are located in the ESD bag taped to the cable cover plate.
   c. Remove the J3 metal boot by unscrewing the four attaching screws.
   d. Loosen the two screws on the boot strain relief clamp (two additional screws for this clamp are also located in the ESD bag).
   e. Loosen the two screws on the boot cable clamp.
   f. Locate the UPC end of the dc cable. The stripped wires on the UPC end of the cable are 2 inches longer than those on the IOB end. The wires on the UPC end are marked POS, NEG, and GND.
   g. Feed the three cable lines through the J3 boot and into the UPC. Using a 7/16-inch wrench, bolt the terminals on the three lines to the terminals in the UPC (Table 2–4).

Table 2–4 DC Cable Connections

	UPC Marking			IOB Marking	
Wire Color	Wire	Terminal	Internal Cable	Wire	Terminal
Red	POS	POS	E15	FETB1-01	+140
Black	NEG	NEG	E16	FETB1-02	-140
Green/yellow	GND	GND	E14	FETB1-03	GND

h. Replace the J3 boot on the UPC rear panel with the four attaching screws. Secure the boot strain relief with the four screws. Tighten the cable clamp over the dc cable with two screws.

i. Secure the cable cover plate with the 23 screws.

j. Remove the dc power-in metal boot from the rear of the IOB cabinet by unscrewing the four attaching screws.

k Loosen the three screws on the boot strain relief clamp and the two screws on the boot cable clamp.

l. Feed the three cable lines into the IOB cabinet.

m. After removing the six screws that secure the access cover to the power box, connect the three IOB cable lines in the power box to the terminals in the box (Table 2–4). Use a 9/16-inch deep-socket wrench (PN 29-28499-01) to connect the terminals.

n. Connect any shielded ground wires to the casing of the housing.

o. Secure the boot strain relief with the three screws. Tighten the cable clamp over the dc cable with the two screws.

p. Replace the power box access cover.

q. Replace the metal boot on the IOB cabinet rear panel with the four attaching screws.

2. Connect the UPC2 signal cable (PN 17-02117-xx) labeled B-END to UPC UPC-J10 and the A-END to the I/O bulkhead IOB IOB-JC.

More detailed UPC cabling specification information is provided on Figure 2–8.

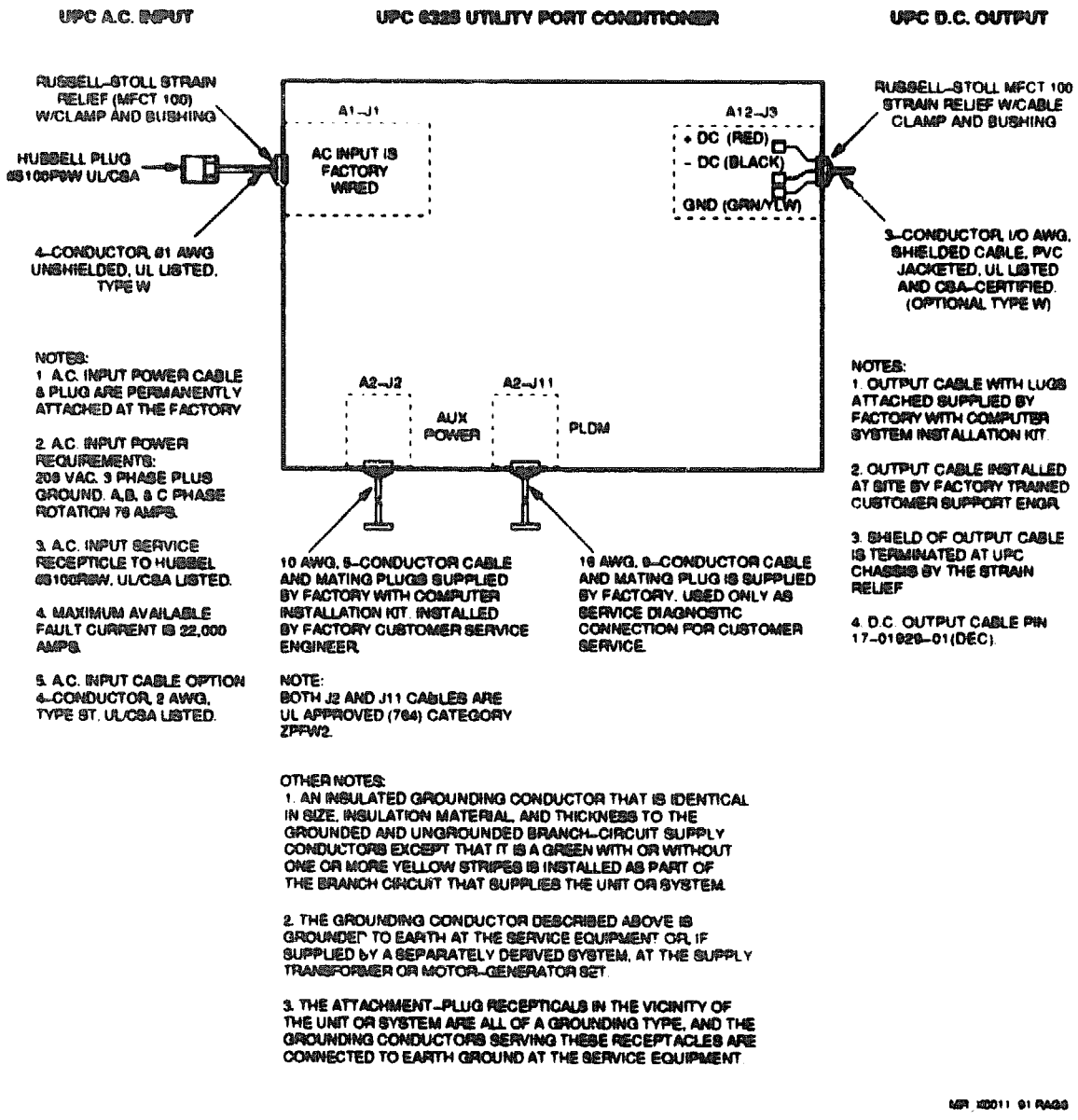


Figure 2–8 UPC Cable Specification Notes

2.6.3 CPU and SCU Plenum Installation

After all CPU and SCU cables have been connected, it is necessary to install the plenums.

To install the CPU2 plenum, perform the following procedure:

1. Install the plenum assembly.
2. Connect the Mate-N-Lok connector for the air flow sensor.
3. Connect the two Mate-N-Lok connectors for the motor speed control sensor.
4. Use the 5/16-inch nutdriver to install the hardware (two screws and two washers) that secures the plenum to the cabinet frame.

To install the SCU plenum, perform the following procedure:

1. Install the plenum leaving the middle two tabs exposed to prevent the plenum from bowing.
2. Connect the Mate-N-Lok connector for the air flow sensor.
3. Connect the two Mate-N-Lok connectors for the motor speed control sensor.
4. Connect the Mate-N-Lok connector for the thermistor.
5. Use the 5/16-inch nutdriver to install the two screws and washers that secure the plenum mounting bracket to the cabinet frame.

2.6.4 Plate Installation

1. Remove the model 420 system identification plate from the front door of the SCU cabinet.
2. Using two push-on fasteners, carefully install the new model 430 system identification plate.

2.7 Cabinet Leveling

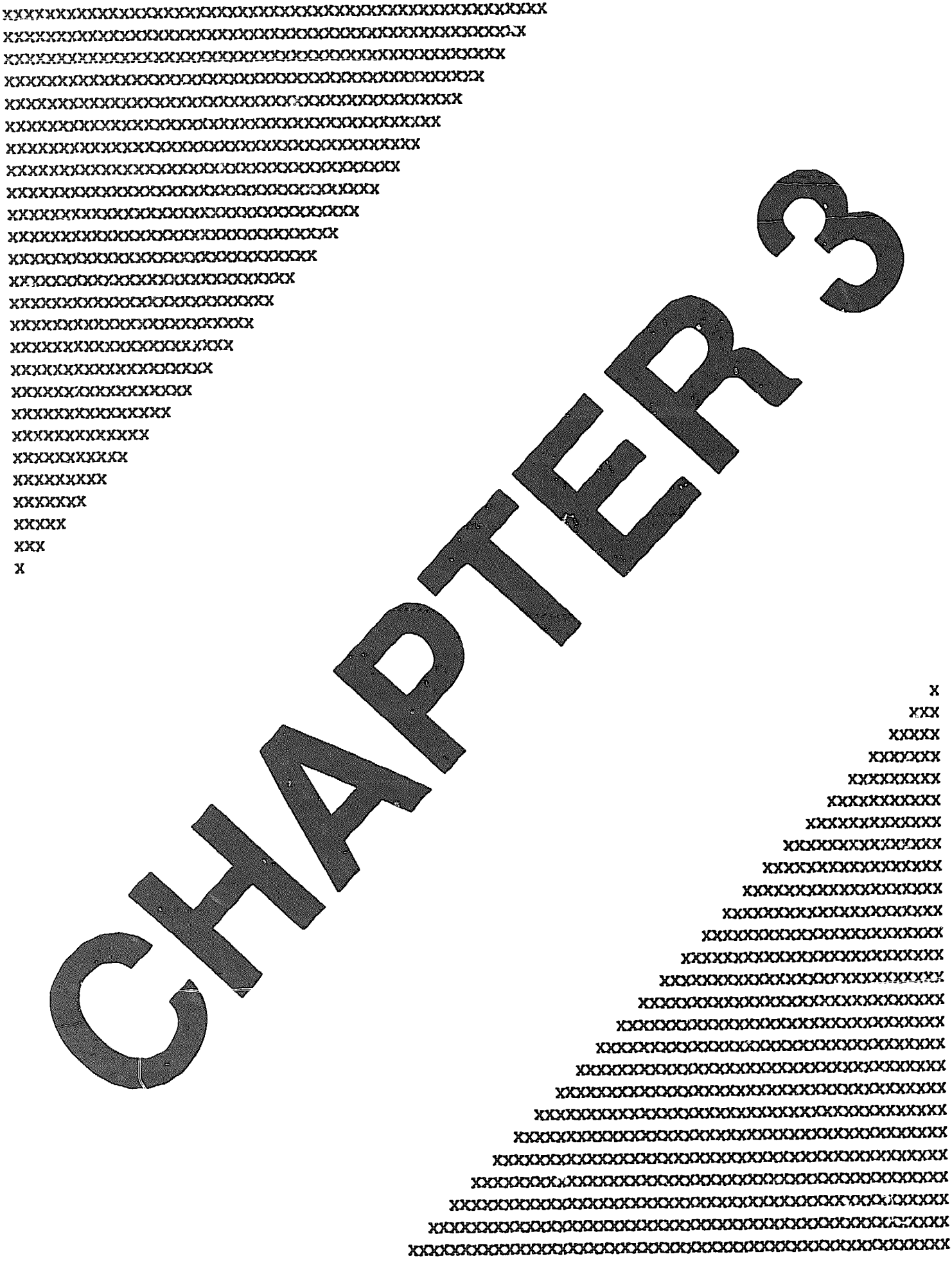
Level each cabinet using a 9/16-inch wrench. Lower each of the four cabinet leveling feet while observing that the spirit level indicates that it is parallel to the floor.

2.8 Door Replacement

After the cabinet assembly and system cabling procedures are complete, the cabinet front and rear doors can be installed using the following procedure.

NOTE
Check all the internal cable connections, hardware, and modules to be sure they are installed securely. Check the front thumbscrews of all the system power supplies.

1. Install the cabinet front door by sliding the door into place on the hinge pins. Install the cabinet back door by aligning the door and the hinges, then insert the hinge pins to lock the door in place.
2. Use a 5/16-inch nutdriver to remove the screw from the frame that secures the ground strap.
3. Install the ground strap securing the hardware with the nutdriver.
4. Remove the ESD pouch from the cabinet and attach it to the Velcro strip on the door.
5. Use the key to lock the cabinet doors.


CHAPTER 3

3
Upgrade Acceptance Tests

3.1 System Power Up

3.1.1 H7392 Utility Port Conditioner

Perform the following procedure with an H7392 UPC installed.

1. Notify affected personnel of system power up
2. Connect the main power cable to the utility power source.
3. Remove the lockout tag from the utility service switch.
4. Set the service utility switch to ON.
5. Open the rear UPC cabinet doors.
6. Set the DC DISCONNECT circuit breaker on module A12 to ON.
7. Set the +24 volt power supply switch to ON.
8. Remove the lockout tag from CB1 of the A1 module, and set CB1 ON.
9. Set the REMOTE/LOCAL switch to ON.
10. Close the rear UPC cabinet doors.
11. Repeat steps 4 through 10 for the second UPC, UPC2.
12. Set the OCP Power keyswitch to On (1).

3.1.2 CPU2 Installation Verification

To verify CPU2 installation perform the following steps.

Edit and revise the following logicals in the [SYSEXE]SITESPECIFIC.CMD file.

NOTE
Do not edit the logicals at the CLI level. Edits must be performed on the command file.

1. CDB$DEFAULT_CPU

   Refer to the related comments contained in SITESPECIFIC.CMD, and/or the SPU Release Notes.

2. SYS$CPU_MASK

   Revise MASK from 3 to 7.

3. SYS$VBOX_MASK

   Refer to Table 3–1 and revise the VBOX_MASK as it applies to the upgraded configuration.

Table 3–1 CPU VBox Mask Settings

VBox Installed In			
CPU2	**CPU1**	**CPU0**	**Mask**
No	No	No	0
No	No	Yes	1
No	Yes	No	2
No	Yes	Yes	3
Yes	No	No	4
Yes	No	Yes	5
Yes	Yes	No	6
Yes	Yes	Yes	7

4. SYS$CPU_REVISION

   Refer to the related comments contained in SITESPECIFIC.CMD and/or the SPU Release Notes.

5. SYS$KERNEL_REVISION

   Refer to the related comments contained in SITESPECIFIC.CMD and/or the SPU Release Notes.

6. SYS$PRIMARY

   Refer to the related comments contained in SITESPECIFIC.CMD and/or the SPU Release Notes.

The scan pattern diagnostics (SPDs) test the CPU by executing SPU-based patterns and checking the results. Patterns are used to make sure the MCUs are installed correctly. The SPD is designed to detect solid faults in the system logic.

SPD diagnostics run under field test release versions do not supply accurate results.

User action:

>>>SENSE SYSTEM

>>>TEST

Reboot the SPU to incorporate the [SYSEXE]SITESPECIFIC.CMD changes.

Execute the following command lines:

1. >>>SENSE SYSTEM
2. >>>SHOW CONFIG/RINGS

   There should be no mismatches.
3. >>>TEST/SCAN/CPU:2/LOG/TRACE/ISOLATION

   There should be no failures.
4. >>>TEST/STRUCTURE/ALL/CPU:2

   If any structures fail, see buglist.
5. >>>I/K

3.2 JXDI Diagnostics

To run JXDI diagnostics, type the following:

User action:

>>>SET CLOCK/SCU/CPU:ALL OFF

>>>TEST/JXDI:0

Computer response:

```
%CLI-I-TXJA, starting XMI adapter interconnect test
%TEST-I-XJATEST, Executing XMI adapter interconnect test 1
%TEST-I-XJATEST, Executing XMI adapter interconnect test 2
%TEST-I-XJATEST, Executing XMI adapter interconnect test 3
%TEST-I-XJATEST, Executing XMI adapter interconnect test 4
%TEST-I-XJATEST, Executing XMI adapter interconnect test 5
%TEST-I-XJATEST, Executing XMI adapter interconnect test 6
%TEST-I-XJATEST, Executing XMI adapter interconnect test 7
%TEST-I-XJATEST, Executing XMI adapter interconnect test 8
%TEST-I-XJATEST, Executing XMI adapter interconnect test 9
%TEST-I-XJATEST, Executing XMI adapter interconnect test 10
%TEST-I-XJATEST, Executing XMI adapter interconnect test 11
%TEST-I-XJATEST, Executing XMI adapter interconnect test 12
%TEST-I-XJATEST, Executing XMI adapter interconnect test 13
%TEST-I-XJATEST, Executing XMI adapter interconnect test 14
%TEST-I-XJATEST, Executing XMI adapter interconnect test 15
%TEST-I-XJATEST, Executing XMI adapter interconnect test 16
%TEST-I-XJATEST, Executing XMI adapter interconnect test 17
%TEST-I-XJATEST, Executing XMI adapter interconnect test 18
%TEST-I-XJATEST, Executing XMI adapter interconnect test 19
%TEST-I-XJATEST, Executing XMI adapter interconnect test 20
%TEST-I-XJATEST, Executing XMI adapter interconnect test 21
%TEST-I-XJATEST, Executing XMI adapter interconnect test 22
%TEST-I-XJATEST, Executing XMI adapter interconnect test 23
%TEST-I-XJATEST, Executing XMI adapter interconnect test 24
%TEST-I-XJATEST, Executing XMI adapter interconnect test 25
%TEST-I-XJATEST, Executing XMI adapter interconnect test 26
%TEST-I-XJATEST, Executing XMI adapter interconnect test 27
%TEST-I-XJATEST, Executing XMI adapter interconnect test 28
```

```
%TEST-I-XJATEST, Executing XMI adapter interconnect test 29
%TEST-I-XJATEST, Executing XMI adapter interconnect test 30
%TEST-I-XJATEST, Executing XMI adapter interconnect test 31
%TEST-I-XJATEST, Executing XMI adapter interconnect test 32
%TEST-I-XJATEST, Executing XMI adapter interconnect test 33
%TEST-I-XJATEST, Executing XMI adapter interconnect test 34
%TEST-I-XJATEST, Executing XMI adapter interconnect test 35
%TEST-I-XJATEST, Executing XMI adapter interconnect test 36
%TEST-I-XJATEST, Executing XMI adapter interconnect test 37
%TEST-I-XJATEST, Executing XMI adapter interconnect test 38
%TEST-I-XJATEST, Executing XMI adapter interconnect test 39
%TEST-I-XJATEST, Executing XMI adapter interconnect test 40
%TEST-I-XJATEST, Executing XMI adapter interconnect test 41
%TEST-I-XJATEST, Executing XMI adapter interconnect test 42
%TEST-I-XJATEST, Executing XMI adapter interconnect test 43
%TEST-I-XJATEST, Executing XMI adapter interconnect test 44
%TEST-I-XJATEST, Executing XMI adapter interconnect test 45
%TEST-I-XJATEST, Executing XMI adapter interconnect test 46
%TEST-I-XJATEST, Executing XMI adapter interconnect test 47
%TEST-I-XJATEST, Executing XMI adapter interconnect test 48
%TEST-I-XJATEST, Executing XMI adapter interconnect test 49
%TEST-I-XJATEST, Executing XMI adapter interconnect test 50
%TEST-I-XJATEST, Executing XMI adapter interconnect test 51
%TEST-I-XJATEST, Executing XMI adapter interconnect test 52
%TEST-I-XJATEST, Executing XMI adapter interconnect test 53
%TEST-I-XJATEST, Executing XMI adapter interconnect test 54
%TEST-I-XJATEST, Executing XMI adapter interconnect test 55
%TEST-I-XJATEST, Executing XMI adapter interconnect test 56
%TEST-I-XJATEST, Executing XMI adapter interconnect test 57
%TEST-I-XJATEST, Executing XMI adapter interconnect test 58
%TEST-I-XJATEST, Executing XMI adapter interconnect test 59
%TEST-I-XJATEST, Executing XMI adapter interconnect test 60
%TEST-I-XJATEST, Executing XMI adapter interconnect test 61
%TEST-I-XJATEST, Executing XMI adapter interconnect test 62
%TEST-I-XJATEST, Executing XMI adapter interconnect test 63
%TEST-I-XJATEST, Executing XMI adapter interconnect test 64
%TEST-I-XJATEST, Executing XMI adapter interconnect test 65
%CLI-I-TXJAEND, XMI adapter interconnect test complete
>>>
```

User action:

To test JXDI:1, enter the following command:

>>>TEST/JXDI:1

To test JXDI:2, enter the following command:

>>>TEST/JXDI:2

To test JXDI:3, enter the following command:

>>>TEST/JXDI:3

3.3 XJA Diagnostics

To run XJA0 diagnostics, type the following:

User action:

>>>I/K

>>>TEST/XJA:0/LOG

Computer response:

```
%TEST-I-XJADONE, XJA 0 selftest completed successfully
>>>
```

To run XJA1 diagnostics, type the following:

User action:

>>>TEST/XJA:1/LOG

Computer response:

```
%TEST-I-XJADONE, XJA 1 selftest completed successfully
>>>
```

To run XJA2 diagnostics, type the following:

User action:

>>>TEST/XJA:2/LOG

Computer response:

```
%TEST-I-XJADONE, XJA 2 selftest completed successfully
>>>
```

To run XJA3 diagnostics, type the following:

User action:

>>>TEST/XJA:3/LOG

Computer response:

```
%TEST-I-XJADONE, XJA 3 selftest completed successfully
>>>
```

3.4 Diagnostic Testing

3.4.1 EVKAA

EVKAA verifies the diagnostic supervisor kernel instruction set and the exception and interrupt mechanism of the CPU.

Run EVKAA to verify the instructions required by the VAX diagnostic supervisor (VDS).

User action:

>>> I/K

>>> SET BOOTSET/PRIMARY:2

>>> SHOW BOOTSET

CPU0, CPU1, CPU2, (PRIMARY)

>>> LOAD [SYSMAINT]EVKAA.EXE

>>> START 200

Computer response:

```
[Entering PIO terminal mode, type ^P to return to the SPU]
EVKAA XX.XX Hardcore Inst Exerciser
```

The system pauses; press any key (except Return) to continue.

Type Ctrl/P to return to the console prompt and then type HALT to end the session.

3.4.2 Boot the VAX Diagnostic Supervisor

The following commands initiate a brief system initialization, clear memory, and boot VDS.

User action:

>>>SET KEEP/CPU:ALL OFF

>>>I/K

>>>BOOT VDS

```
[Testing memory]
[Complete initialization]
XMI @0, node 01, device type 0C22, self test succeeded
XMI @0, node 04, device type 0C05, self test succeeded
XMI @0, node 08, device type 1001, no self test
XMI @0, node 0E, device type 0C03, no self test
XBI @0, all nodes self test done
XBI @1, all nodes self test done
XBI @2, all nodes self test done
XBI @3, all nodes self test done
XBI @4, all nodes self test done
XBI @5, all nodes self test done
XBI @6, all nodes self test done
XBI @7, all nodes self test done
XBI @8, all nodes self test done
XBI @9, all nodes self test done
XBI @10, all nodes self test done
XBI @11, all nodes self test done
XBI @12, all nodes self test done
XBI @13, all nodes self test done
```

```
            Copyright Digital Equipment Corporation
                              1989
                      All Rights Reserved.

DIAGNOSTIC SUPERVISOR.  ZZ-EWSAA-xx.x-xxxx  x-mmm-yyyy hh:mm:ss
DS>
```

VDS invokes the DS> prompt.

NOTE
VDS automatically clears memory and correctly resets memory before booting VDS in standalone mode.

Run all level 3 CPU macrodiagnostics.

3.4.3 Autosizer — EVSBA

To run autosizer enter the following commands.

User action:

DS> SET VERIFY,TRACE

RUN EVSBA.EXE

There are three tests in this diagnostic.

Computer response:

```
... Program: EVSBA - AUTOSIZER   level 3 ... 3 tests,
...

Test 1: DEFAULT MODE
.. End of run, 0 errors detected, pass count 1,
   time is ...
```

User action:

DS> SELECT ALL

DS> SHOW SELECT

This prints a list of the attached devices.

3.4.4 Macrodiagnostics

Execute the following diagnostics on the system.

If autosizer is not run, use the following diagnostics.

3.4.4.1 EVKAQ — VAX Basic Instruction Exerciser Level 3

Memory management must be on the system for this diagnostic to run. EVKAQ tests most of the non-privileged VAX instruction set. The following commands select the CPU for testing, set VDS flags trace and halt and enable memory management, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAQ.EXE
DS> SET MM ON
DS> START
DS> SET MM OFF
```

There are 92 tests in this diagnostic.

3.4.4.2 EVKAR — VAX Basic Instruction Exerciser Level 3

Memory management must be on the system for this diagnostic to run. EVKAR tests most of the non-privileged VAX instruction set. The following commands select the CPU for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAR.EXE
DS> SET MM ON
DS> START
DS> SET MM OFF
```

There are 69 tests in this diagnostic.

3.4.4.3 EVKAS — VAX Floating Point Instruction Exerciser I Level 3

EVKAS tests the non-privileged VAX 9000 floating point instruction set. The following commands select the CPU for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAS.EXE
DS> START
```

There are 46 tests in this diagnostic.

3.4.4.4 EVKAT — VAX Floating Point Instruction Exerciser II Level 3

EVKAT tests the non-privileged VAX 9000 floating point instruction set. The following commands select the CPU for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAT.EXE
DS> START
```

There are 52 tests in this diagnostic.

3.4.4.5 EVKAU — VAX Privileged Architecture Exerciser I Level 3

EVKAU tests the major portion of the privileged VAX 9000 architecture privileged being beyond normal user program running privileges. The following commands select the CPU for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> SET MM OFF
DS> LOAD EVKAU.EXE
DS> START
```

There are six tests in this diagnostic.

3.4.4.6 EVKAV — VAX Privileged Architecture Exerciser II Level 3

EVKAV tests the major portion of the privileged VAX 9000 architecture privileged being beyond normal user program running privileges. The following commands select the CPU for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

Memory management must be off for this diagnostic to run.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 NO
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAV.EXE
DS> START
```

3.4.4.7 EWKAX — VAX 9000 Architecture Diagnostic Level 3

EWKAX tests various areas of the CPU, XJA, VBox and SPU interfaces. The following commands attach CPU3 with VBox, attach XJA0, select the CPU and XJA for testing, set VDS flags trace and halt, and start the diagnostic. When attaching KA2, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA2 2 Y
DS> ATTACH XJA HUB XJA0 0
DS> SEL KA2,XJA0
DS> SET T,H
DS> LOAD [SYSMAINT]EWKAX.EXE
DS> START
```

There are 11 tests in this diagnostic (some test runs register eight tests).

3.4.4.8 EWKMP — Multi-Port SCU Exerciser

EWKMP tests the SCU, including any connection to the CPU and XJA. The following commands attach CPU0, CPU1, CPU2, XJA0, XJA1, XJA2, and XJA3. This test selects the CPU and XJA for testing, sets VDS flags trace and halt, and runs the diagnostic for 10 minutes. When attaching KA0, KA1, and so on, respond either Y (yes) if a VBox is configured or N (no) if no VBox is configured.

User action:

```
DS> ATTACH KAWWW HUB KA0 0 Y
DS> ATTACH KAWWW HUB KA1 1 Y
DS> ATTACH KAWWW HUB KA2 2 Y
DS> ATTACH XJA HUB XJA0 0
DS> ATTACH XJA HUB XJA1 1
DS> ATTACH XJA HUB XJA2 2
DS> ATTACH XJA HUB XJA3 3
DS> SEL KA0,KA1,KA2,XJA0,XJA1,XJA2,XJA3
DS> SET T,H
DS> CLEAR QUICK
DS> LOAD EWKMP
DS> START/SECTION:MULTI
```

There are 12 tests in this diagnostic.

3.4.4.9 EVKAG — VAX Vector Diagnostic Level 2R

Run EVKAG when a vector processor option is installed. The Y (yes) response to the attach command indicates that a VBox is configured. Enter N (no) if no VBox is configured.

User action:

```
DS> SET VERIFY
DS> ATTACH KAWWW HUB KA2 2 YES
DS> SEL KA2
DS> SET T,H
DS> LOAD EVKAG.EXE
DS> START/PASS=1
```

There are 35 tests in this diagnostic.

3.4.4.10 EVKAH — VAX Vector Diagnostic Level 2R

Run EVKAH when a vector processor option is installed. The Y (yes) response to the attach command indicates that a VBox is configured. Enter N (no) if no VBox is configured.

User action:

```
DS> SET VERIFY
DS> ATTACH KAWWW HUB KA2 2 YES
DS> SEL KA2
DS> SET T,H
DS> SET MM OFF
DS> LOAD EVKAH.EXE
DS> START/PASS=1
```

There are 22 tests in this diagnostic.

3.5 I/O Subsystem Diagnostics

The following describes the I/O subsystem XJA diagnostics.

3.5.1 Boot VDS

The following commands initiate a brief system initialization, clear memory, and boot VDS.

User action:

```
>>>I/K/B
>>>B VDS
```

3.5.2 XJA EVCLB Diagnostic

Type the following to run the XJA DIAG EVCLB test. This test selects the CPU and XJA for testing, sets the VDS flag trace, and loads and starts the diagnostics. To test XJA2 and XJA3, enter the following.

User action:

DS> ATTACH XJA HUB XJA2 0

DS> SEL XJA2

DS> SET TRACE

DS> LOAD EVCLB.EXE

DS> START

There are seven tests in this diagnostic.

User action:

DS> ATTACH XJA HUB XJA3 0

DS> SEL XJA3

DS> SET TRACE

DS> LOAD EVCLB.EXE

DS> START

There are seven tests in this diagnostic.

3.6 Booting the VMS Operating System

Boot VMS at the console prompt:

>>>BOOT

DEFBOO.CMD is invoked to execute the sequence to load and start VMS.

3.7 Running UETP

This section summarizes the procedure for running all phases of UETP with default values.

1. Log in to the SYSTEST account as follows:

   Username: systest
   Password:

2. Make sure no user programs are running and no user volumes are mounted. UETP assumes and requests exclusive use of system resources. Unpredictable results could occur if this restriction is ignored.

3. After you log in, check all devices to be sure the following conditions exist:
   a. All devices to be tested are powered up and on-line to the system.
   b. Scratch disks are mounted and initialized.
   c. Disks contain the directory name [SYSTEST] with OWNER_UIC=[1,7]. If not, create the directory with the DCL command CREATE/DIRECTORY.
   d. Scratch tape cartridges are inserted into each drive to be tested and are initialized with the label UETP.
   e. Printers have plenty of paper.
   f. Terminal characteristics and baud rates are correctly set. (See the corresponding user guide for your terminal.)
4. To start UETP, enter the following commands and press RETURN after each action.

   User action:

   ```
   $ @UETP
   ```

   Computer response:

   ```
   Run "ALL" UETP phases or a "SUBSET" [ALL]?
   ```

   User action:

   Press RETURN to choose the default response enclosed in brackets.

   Computer response:

   ```
   How many passes of UETP do you wish to run [1]?
   How many simulated user loads do you want [n]?
   Do you want Long or Short report format [Long]?
   ```

   User action:

   Press RETURN after each prompt. After you answer the last question, UETP initiates its entire sequence of tests, which runs to completion without further input.

   Computer response:

   ```
   ************************************************************************
   *                                                                      *
           END OF UETP PASS 1 AT DD-MMM-YYYY HH:MM:SS.SS
   *                                                                      *
   ************************************************************************
   ```

5. After UETP runs, check the log file for errors. If testing completes successfully, the VMS operating system is in working order.

NOTE

After a run of UETP, always run the error log utility to check for hardware problems that can occur during a run of UETP. For information on running the error log utility, see the *VMS Error Log Utility Manual*.

In order to run device tests on disks, the disk must be initialized, mounted, and a top level directory called systest must be created.

3.8 Setup Quotas and Privileges for UETP

Before running UETP, ensure that the privileges and quotas are set up properly. The printout below indicates the correct privileges and quotas:

```
$ set default sys$system
$ mcr authorize

UAF> show SYSTEST

No access restrictions
Expiration:            (none)    Pwdminimum:  8   Login Fails:     0
Pwdlifetime:           (none)    Pwdchange:       (pre-expired)
Last Login: 30-MAR-1990 18:01 (interactive),           (none) (non-interactive)
MaxJobs:         0  Fillm:       100  Bytlm:        32768
MaxAcctJobs:     0  ShrFillm:      0  Pbytlm:           0
MaxDetach:       0  BIOlm:        18  JTquota:       1024
Prclm:           8  DIOlm:        55  WSdef:         1024
Prio:            4  ASTlm:       100  WSquo:         2048
QuePrio:         0  TQElm:        20  WSextent:      4096
CPU:        (none)  Enqlm:       300  Pgflquo:      20480
Authorized Privileges:
  CMKRNL CMEXEC SYSNAM GRPNAM DETACH DIAGNOSE LOG_IO GROUP
  PRMCEB PRMMBX SETPRV TMPMBX NETMBX VOLPRO PHY_IO SYSPRV
Default Privileges:
  CMKRNL CMEXEC SYSNAM GRPNAM DETACH DIAGNOSE LOG_IO GROUP
  PRMCEB PRMMBX SETPRV TMPMBX NETMBX VOLPRO PHY_IO SYSPRV
UAF> Exit
```

3.9 Execute UETP

To execute UETP enter the following DCL command:

```
$ @UETP
```

The UETP responds with the following prompts:

$ Run all UETP phases of a subset [ALL] ? ALL

$ How many passes of UETP do you wish to run [1] ? Enter number of passes

$ How many simulated user loads do you want [n] ? Use the default

$ Do you want long or short report format [long] ? short

After you have answered the last question, the UETP initiates its entire sequence of tests, which run to completion without further input.

NOTE
Run UETP for 12 hours.