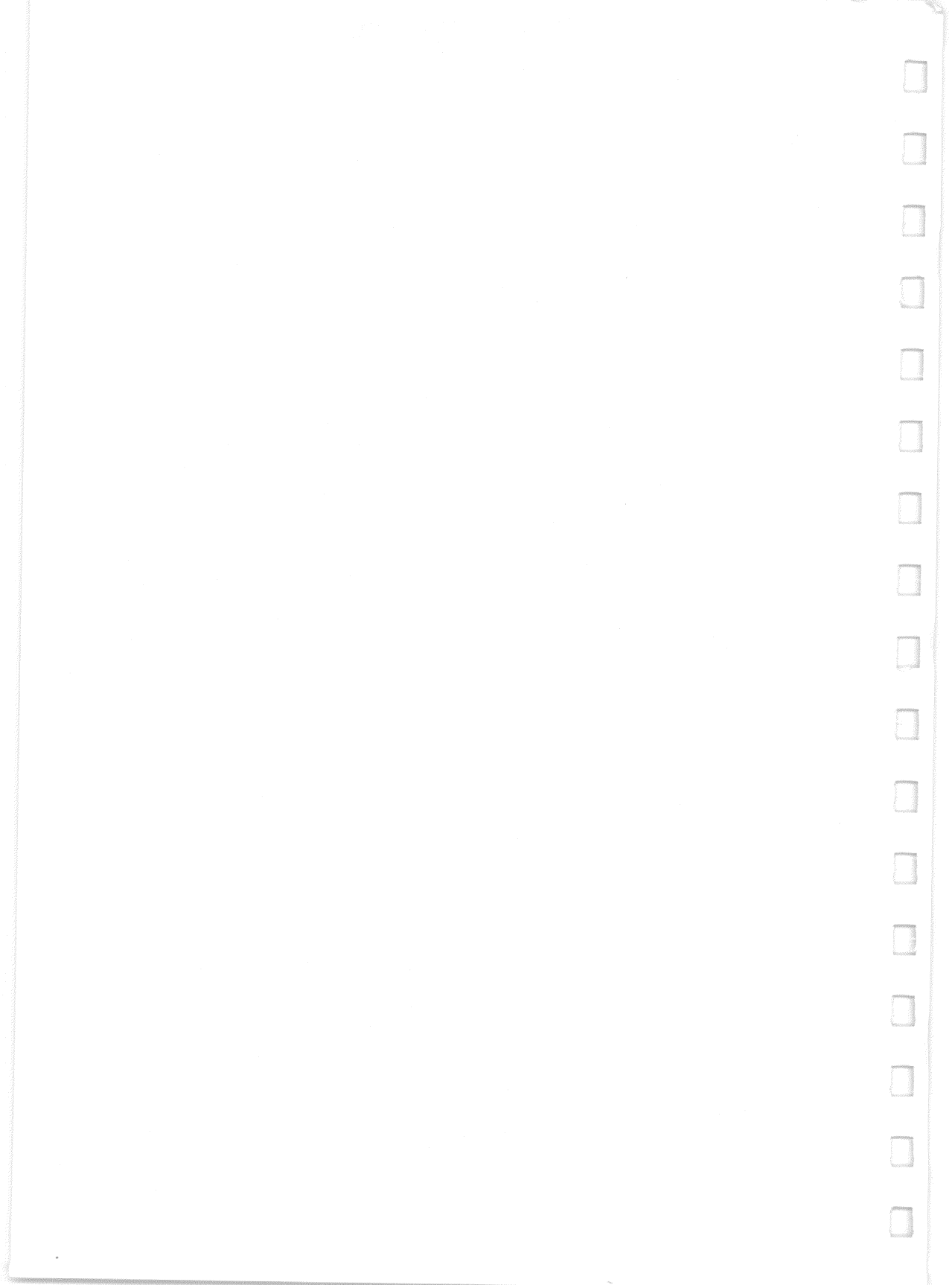


VAX 8200/8300
Installation Guide

digital™



AZ-GN5AC-TE

VAX 8200/8300
Installation Guide

Prepared by Educational Services
of
Digital Equipment Corporation

1st Edition, May 1986
2nd Edition, September 1986

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MANUAL STRUCTURE AND AUDIENCE

The *VAX 8200/8300 Installation Guide* contains installation and acceptance instructions for VAX 8200/8300 systems and options, and removal and replacement instructions for system components. These instructions are intended for DIGITAL field service personnel and for self-maintenance customers.

This manual is divided into three sections:

Section I – System Installation contains site preparation, installation, and acceptance procedures for 12-VAXBI slot and 24-VAXBI slot VAX 8200/8300 cabinets.

Section II – 12-VAXBI Slot Cabinet consists of chapters on options installation, hardware removal and replacement, and cable management in the 12-VAXBI slot VAX 8200/8300 cabinet.

Section III – 24-VAXBI Slot Cabinet contains options installation and hardware removal and replacement procedures for the 24-VAXBI slot VAX 8200/8300 cabinet.

RELATED DOCUMENTATION

The VAX 8200/8300 is one of a family of processors, memories, and adapters that use the 32-bit VAXBI bus. For a technical summary of all VAXBI modules and system components, see the *VAXBI Options Handbook* (EB-27271-46).

Document	Order Number
<i>VAX 8200/8300 Owner's Manual</i>	AZ-GN4AB-TE
<i>VAX 8200/8300 Minireference Manual</i>	AZ-GN6AB-TE
<i>KA820 Processor Technical Manual</i>	EK-KA820-TM
<i>MS820 Memory Technical Manual</i>	EK-MS820-TM
<i>DWBUA UNIBUS Adapter Technical Manual</i>	EK-DWBUA-TM
<i>KDB50 Disk Controller User Guide</i>	EK-KDB50-UG
<i>KDB50 Disk Controller Service Manual</i>	EK-KDB50-SV
<i>DMB32 User Guide</i>	EK-DMB32-UG
<i>KLESI-B User and Installation Guide</i>	EK-LESIB-UG
<i>DRB32 Installation Guide</i>	EK-DRB32-IN
<i>DEBNT Ethernet Tape Controller Technical Manual</i>	EK-DEBNT-TM

Section I System Installation

Site Preparation 1

1.1 OPERATING ENVIRONMENT REQUIREMENTS (Table 1-1)

Table 1-1: Operating Environment

Condition	Temperature	Relative Humidity	Altitude
RX50 installed and in use	15° to 32°C 59° to 90°F	20% to 80%	0 to 2.4 km 0 to 8000 ft
RX50 installed but not in use	10° to 40°C 50° to 104°F	10% to 90%	0 to 2.4 km 0 to 8000 ft
Storage	-40° to 66°C -40° to 151°F	10% to 95%	0 to 9.0 km 0 to 30,000 ft

1.2 FLOOR SPACE REQUIREMENTS (Figure 1-1; Table 1-2)

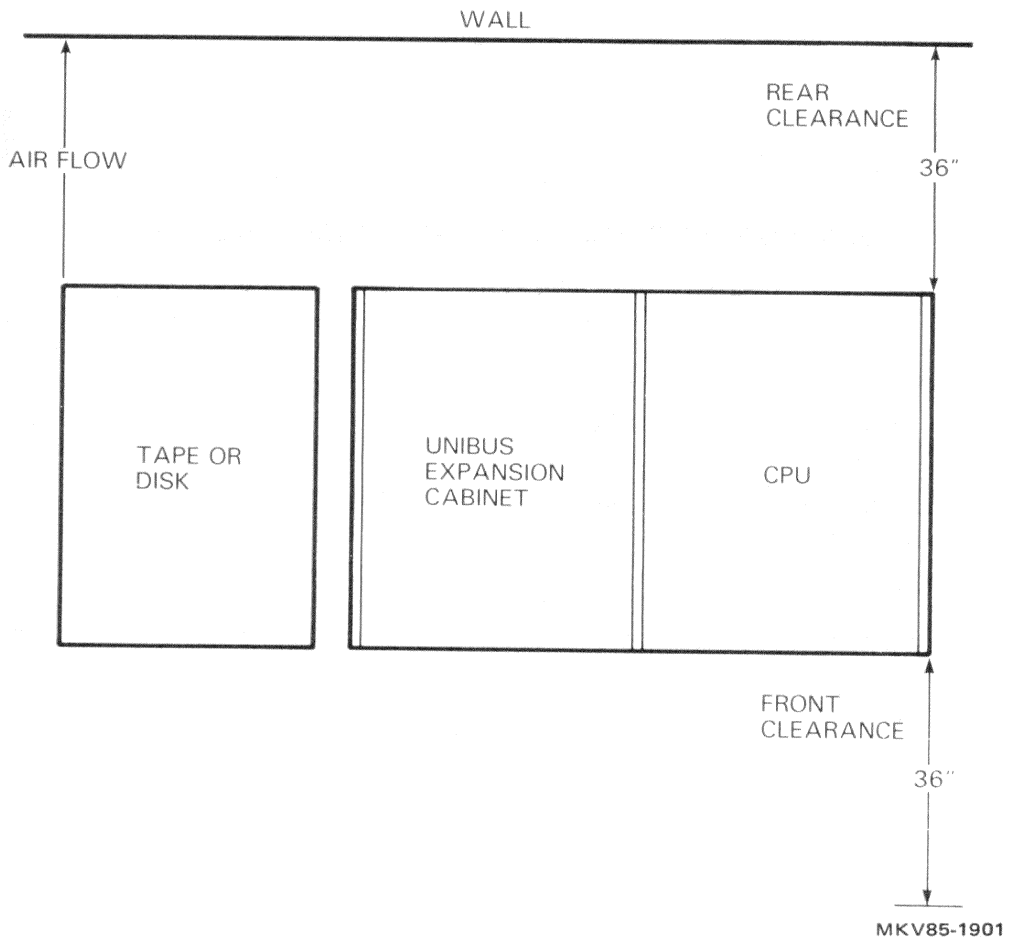


Figure 1-1 System Cabinets Typical Configuration - Top View

Table 1-2: System Cabinet Sizes

Cabinet	Height	Width	Depth	Weight
Rack-mount box	26.67 cm 10.50 in	48.26 cm 19.00 in	67.31 cm 26.50 in	34.02 to 45.36 kg 75.00 to 100.00 lbs
12-VAXBI slot processor	106.68 cm 42.00 in	55.88 cm 22.00 in	81.28 cm 32.00 in	181.44 kg 400.00 lbs
24-VAXBI slot processor	106.68 cm 42.00 in	73.66 cm 29.00 in	81.28 cm 32.00 in	226.80 kg 500.00 lbs
CIPA	105.92 cm 41.70 in	51.56 cm 20.30 in	76.20 cm 30.00 in	106.70 kg 235.00 lbs
UNIBUS expansion	106.68 cm 42.00 in	55.88 cm 22.00 in	81.28 cm 32.00 in	79.38 kg 175.00 lbs plus the weight of internally mounted options

1.3 POWER REQUIREMENTS (Tables 1-3, 1-4, 1-5, and 1-6)

NOTE

The values in Table 1-3 are for worst-case conditions.

Table 1-3: Power Requirements

Cabinet	AC Volts	Maximum AC Amps	Maximum Watts	Thermal Dissipation	
				Btu/hr	KJ/hr
Rack-mount box	120	16.0	1690	5760	6050
Rack-mount box	240	8.0	1690	5760	6050
12-VAXBI slot processor	120	16.0	1690	5760	6050
12-VAXBI slot processor	240	8.0	1690	5760	6050
24-VAXBI slot processor	120	24.0	2000	6800	7140
24-VAXBI slot processor	240	12.0	2000	6800	7140
CIPA	120	4.0	345	1242	1310
CIPA	240	2.0	345	1242	1310
UNIBUS expansion	120	9.4	900	3071	3225
UNIBUS expansion	240	4.7	900	3071	3225

Table 1-4 AC Power Requirements for the Rack-Mount Box

	Nominal	Minimum	Maximum
Vac	120	92	132
Hz	60	47	63
Amps	12	-	-
Vac	240	184	264
Hz	50	47	63
Amps	6	-	-

Table 1-5: AC Power Requirements for the 12-VAXBI Slot Processor Cabinet

	Nominal	Minimum	Maximum
Vac	120	92	132
Hz	60	47	63
Amps	16	-	-
Vac	240	184	264
Hz	50	47	63
Amps	8	-	-

Table 1-6: AC Power Requirements for the 24-VAXBI Slot Processor Cabinet

	Nominal	Minimum	Maximum
Vac	120	92	132
Hz	60	47	63
Amps	24	-	-
Vac	240	184	264
Hz	50	47	63
Amps	12	-	-

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

2.1 PREPARATION

1. Check that all system equipment has been moved to the installation site.
2. Inventory all equipment against the shipping list.
3. Check that the system cabinet, expansion cabinet, and free-standing peripherals are in their containers and that the containers are unopened.
4. Notify the customer of any opened packages or cabinets. Document this on the LARS report.
5. Notify your unit manager of any missing or incorrect items.
6. Ask the customer to contact the carrier to locate any missing items.
7. Ask your unit manager to check with the DIGITAL Traffic and Shipping Department if the carrier does not have the missing items.
8. Check all boxes for external damage.
9. Notify the customer of all damage and list it on the LARS report. (Photographs are useful for clarifying the extent of the damage.)

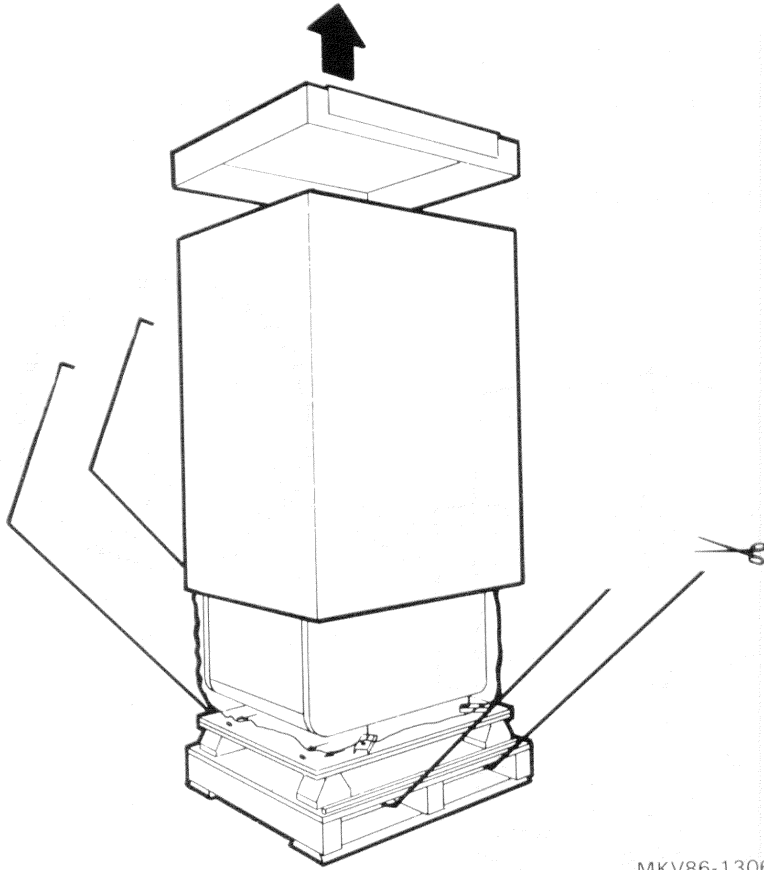
2.2 UNPACKING AND INSPECTING

WARNING

The removal of the VAX 8200/8300 processor cabinet from its skid requires at least two persons.

Wear safety shoes when removing the VAX 8200/8300 processor cabinet from its skid.

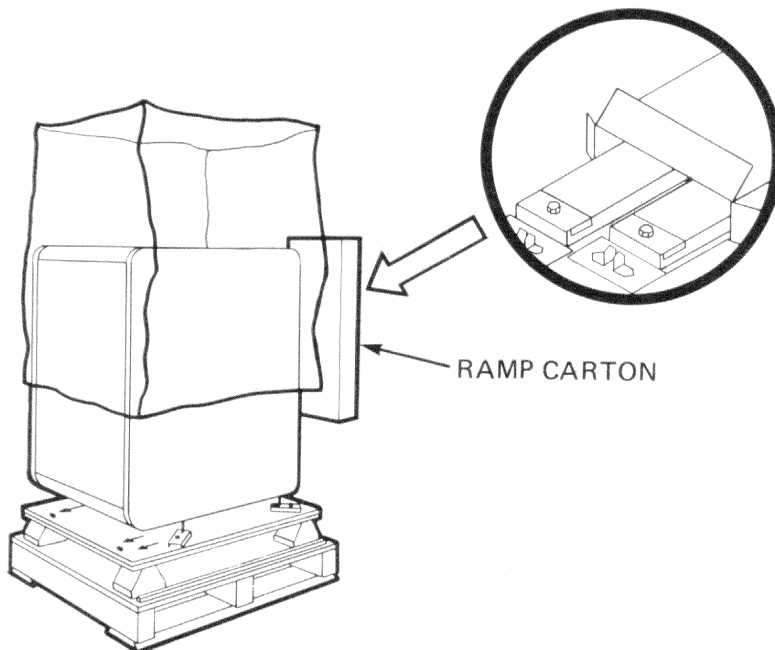
1. Unpack the processor cabinet (Figure 2-1).
 - a. Cut the banding from the processor cabinet carton.
 - b. Remove the cap from the carton.
 - c. Remove any cartons and the corrugated/foam top cushion from the top of the cabinet.
 - d. Remove the corrugated sleeve.



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Figure 2-1: Removing the Processor Cabinet from its Skid – Step 1

2. Unpack the ramps (Figure 2-2).
 - a. Remove the ramp carton from the front of the processor cabinet.
 - b. Remove the plastic bag.
 - c. Remove the ramps from the carton.



MKV86-1307

Figure 2-2: Removing the Processor Cabinet from its Skid – Step 2

3. Prepare the skid for cabinet removal (Figure 2-3).
 - a. Attach the ramps to the skid by fitting the metal prongs on the ramps into the holes on the skid. Place the ramps so that the runners are on the inside.
 - b. Remove the bolts from the four mounting brackets and remove the brackets.

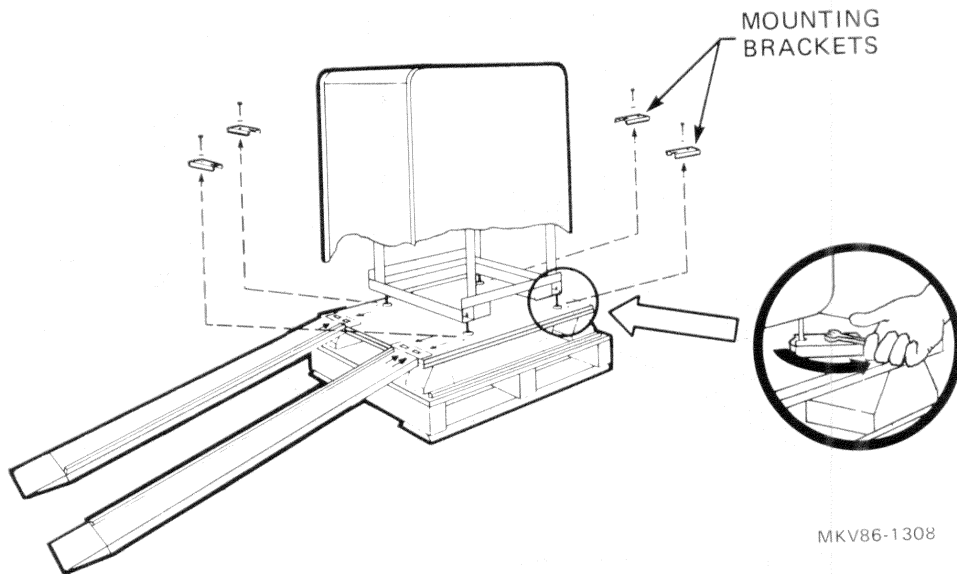
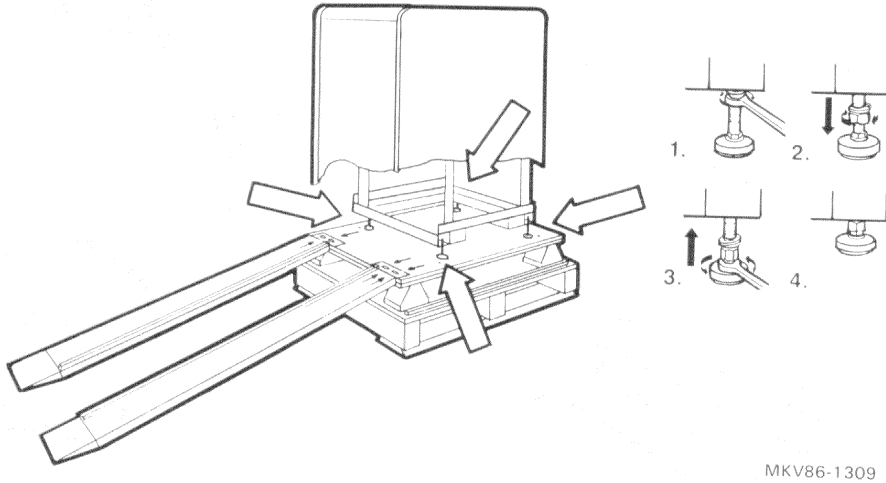


Figure 2-3: Removing the Processor Cabinet from its Skid – Step 3

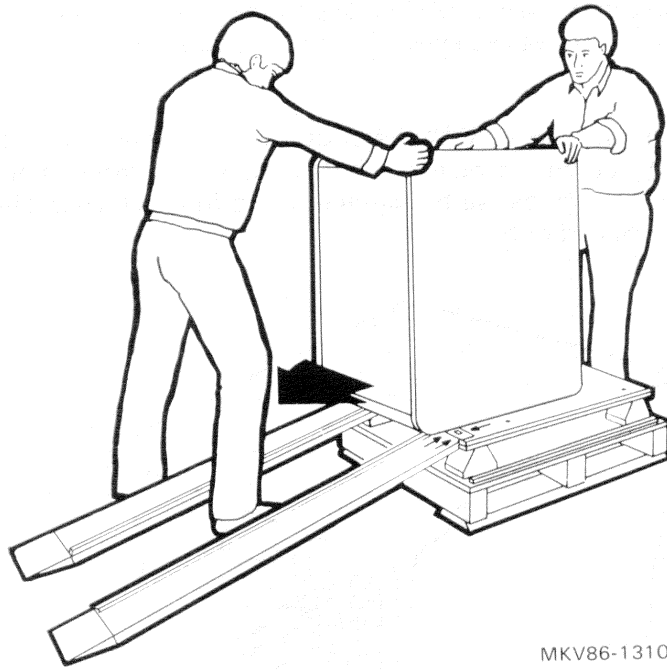
4. Prepare the cabinet for removal (Figure 2-4).
 - a. For each leveler foot, screw the top hex nut down as close to the leveler foot as possible. Then use the hex nut that is attached to the leveler foot to screw the foot up as far as possible.
 - b. If the cabinet has a stabilizer leg attached, check that it is pushed in and raised as far as possible.



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Figure 2-4: Removing the Processor Cabinet from its Skid – Step 4

5. Slowly roll the processor cabinet off the skid (Figure 2-5).



MKV86-1310

Figure 2-5: Removing the Processor Cabinet from its Skid – Step 5

6. Move the processor cabinet into place.
7. Unpack all other equipment, remove all other cabinets from their skids, and move all equipment into place.

2.3 INSTALLATION

2.3.1 12-VAXBI Slot Processor Cabinet

1. Extend the processor cabinet stabilizer leg. (If the stabilizer leg was shipped separately, attach the leg and extend it.) (See Figure 2-6.)

WARNING

When working on the 12-VAXBI slot cabinet, you must extend the stabilizer leg before pulling the BA32 box from the cabinet. Failure to do so will cause the cabinet to tip forward when the BA32 box is pulled out.

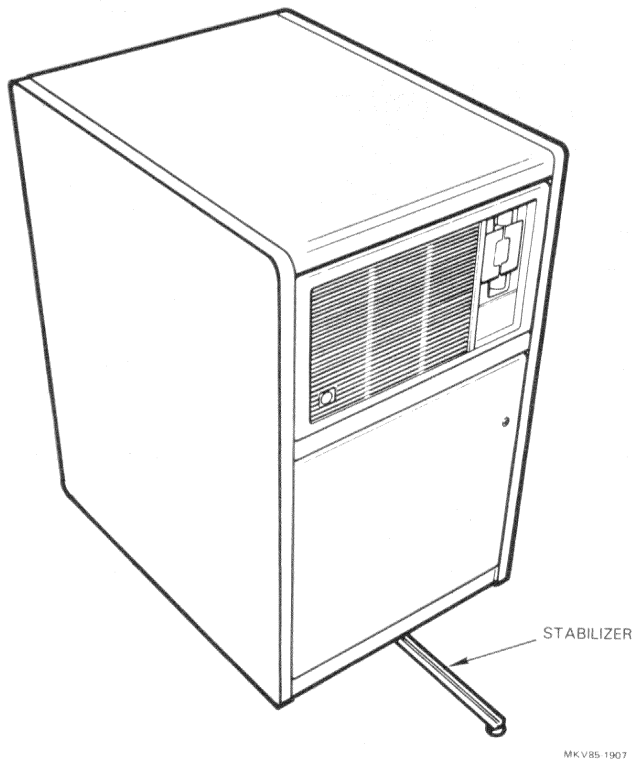
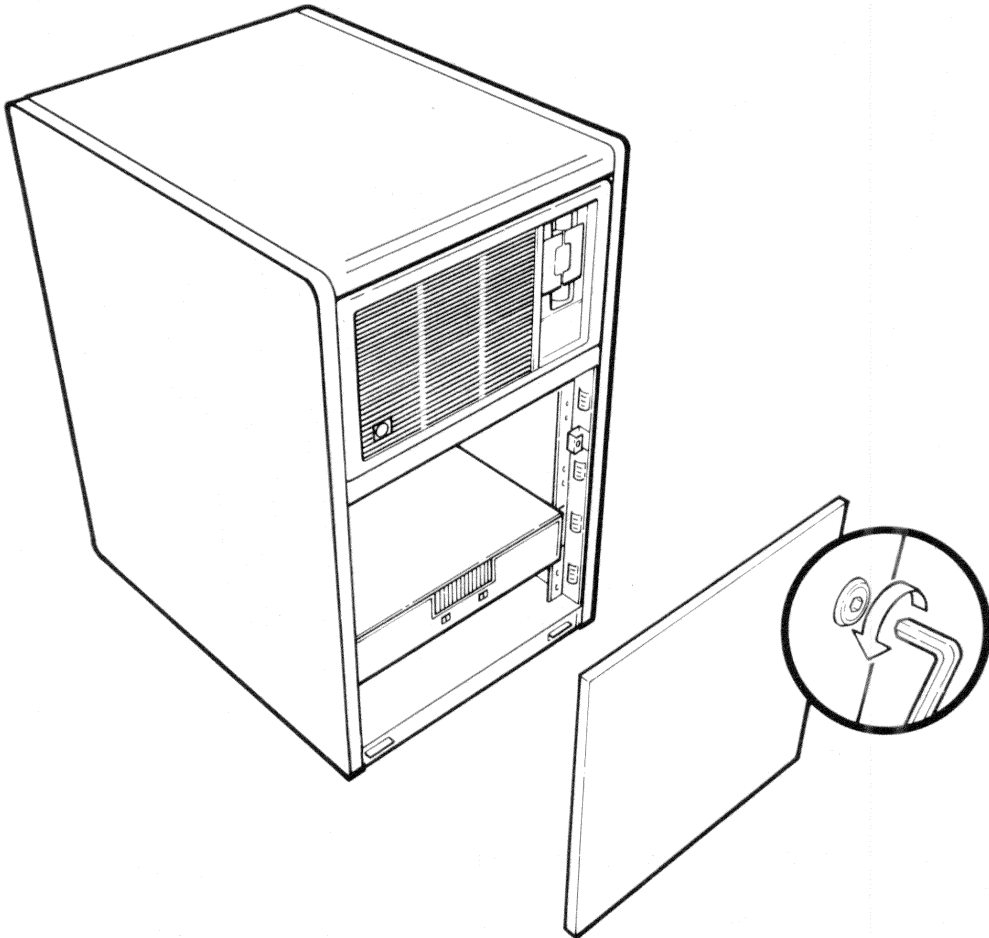


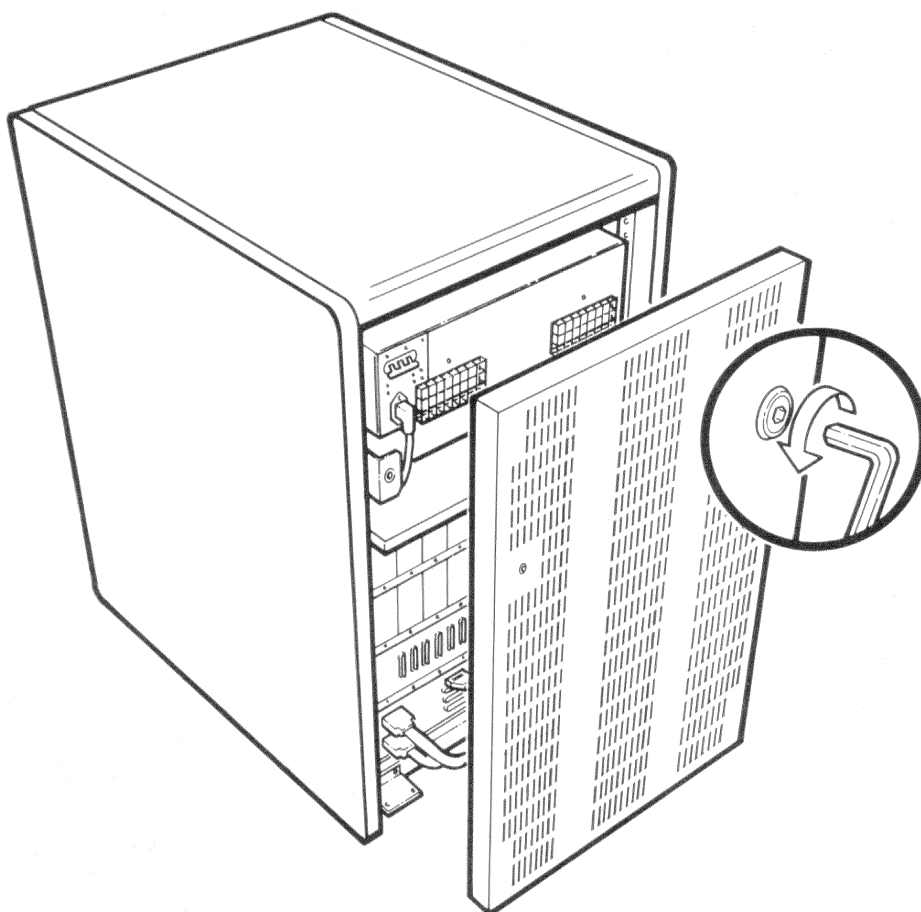
Figure 2-6: 12-VAXBI Slot Processor Cabinet Showing the Location of the Stabilizer Leg

2. Using a 5/32 inch Allen wrench, remove the front and rear doors of the processor cabinet (Figures 2-7 and 2-8).



MKV85 1908

Figure 2-7: Removing the 12-VAXBI Slot Processor Cabinet Front Door



MKV85-1909

Figure 2-8: Removing the 12-VAXBI Slot Processor Cabinet Rear Door

3. Remove the shipping brackets and restraints listed in Table 2-1. (See the appropriate installation guides or user guides for more detailed information.)

Table 2-1: Shipping Brackets and Restraints

Location	Quantity	Tools Needed	Comments
LA100 print head	1	Diagonal pliers	The restraint is a tie-wrap.
BA32 box (rear)	2	Phillips screwdriver	Leave brackets attached to cabinet. (12-VAXBI slot cabinet only)
BA11 box (UNIBUS expansion cabinet)	1	3/8 inch wrench	Two brackets in front, two in rear
RA60 – positioner assembly	1	None	Remove head lock pin from shipping bracket and locking hole; place in pin storage hole.
RA60 – rear of drive	1	Screwdriver	Loosen captive screws from retaining bracket.
RA81 – rear of box	1	Phillips screwdriver	L-shaped bracket
RA81 – inside HDA	3	5/16 inch open end wrench; 7/16 inch nut driver	None
RA81 – inside HDA	1	None	Turn white head restraint counter-clockwise to unlock.
RA81 – modules	1	1/8 inch Allen wrench	Remove foam between modules.
RA81 – motor	1	3/8 inch open end wrench	None
RX50	2	None	Remove head restraint cards.
TU80 – rear, at power supply	1	Phillips screwdriver	Remove shipping bracket, turn it to normal position, and secure it.

4. When all other cabinets have been installed, do the following:
 - a. Level the cabinets.
 - b. Attach the following cables:
 - 1) Console terminal (Figure 2-9).
 - 2) Peripherals (see the appropriate options installation manuals).
 - c. Push the processor cabinet stabilizer leg under the cabinet.
 - d. Set the Power Bus switch to Remote.
 - e. Replace the front and rear doors of the cabinets.

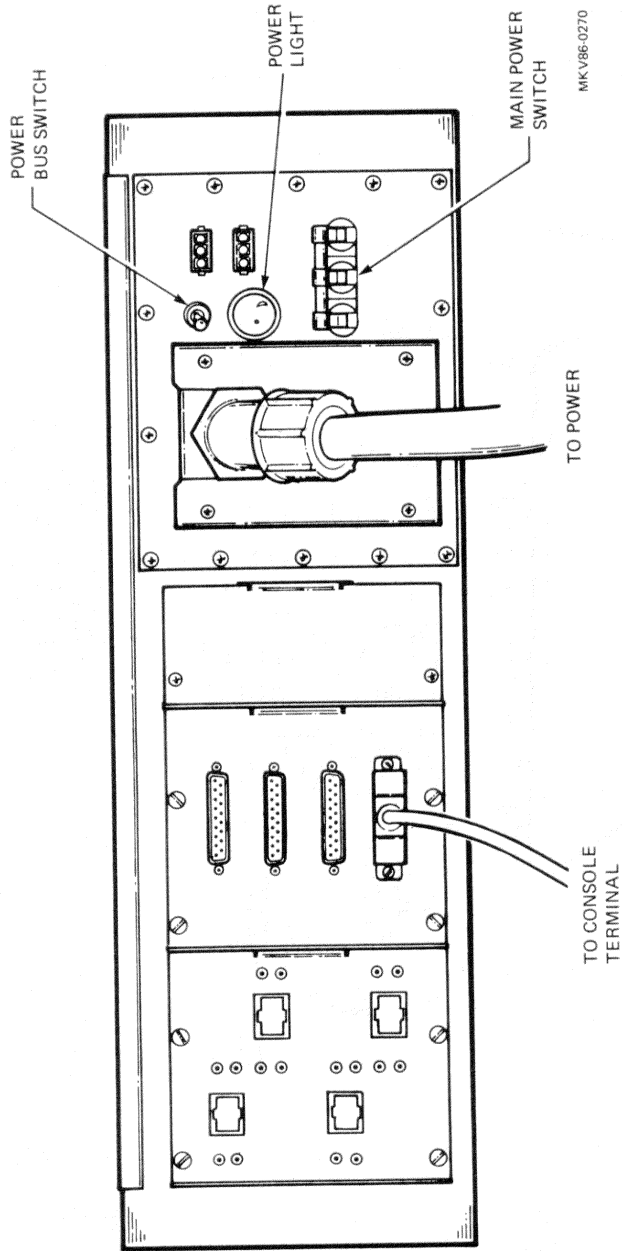
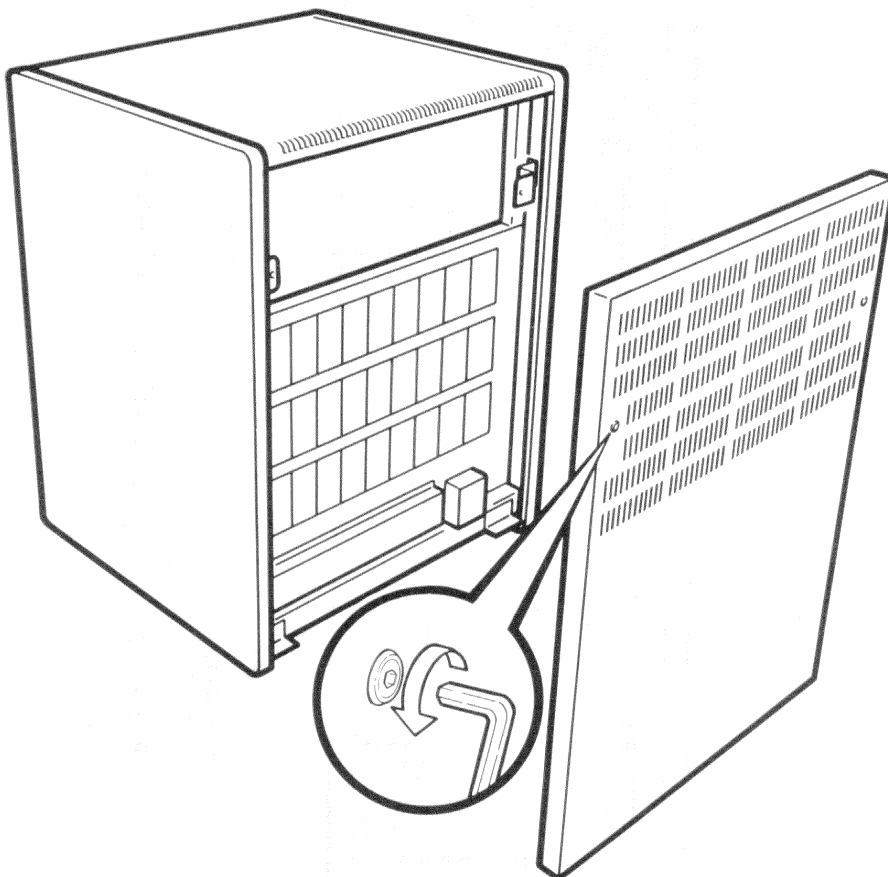


Figure 2-9: 12-VAXBI Slot Cabinet I/O Distribution Panel

2.3.2 24-VAXBI Slot Processor Cabinet

1. Using a 5/32 inch Allen wrench, remove the rear door of the processor cabinet.

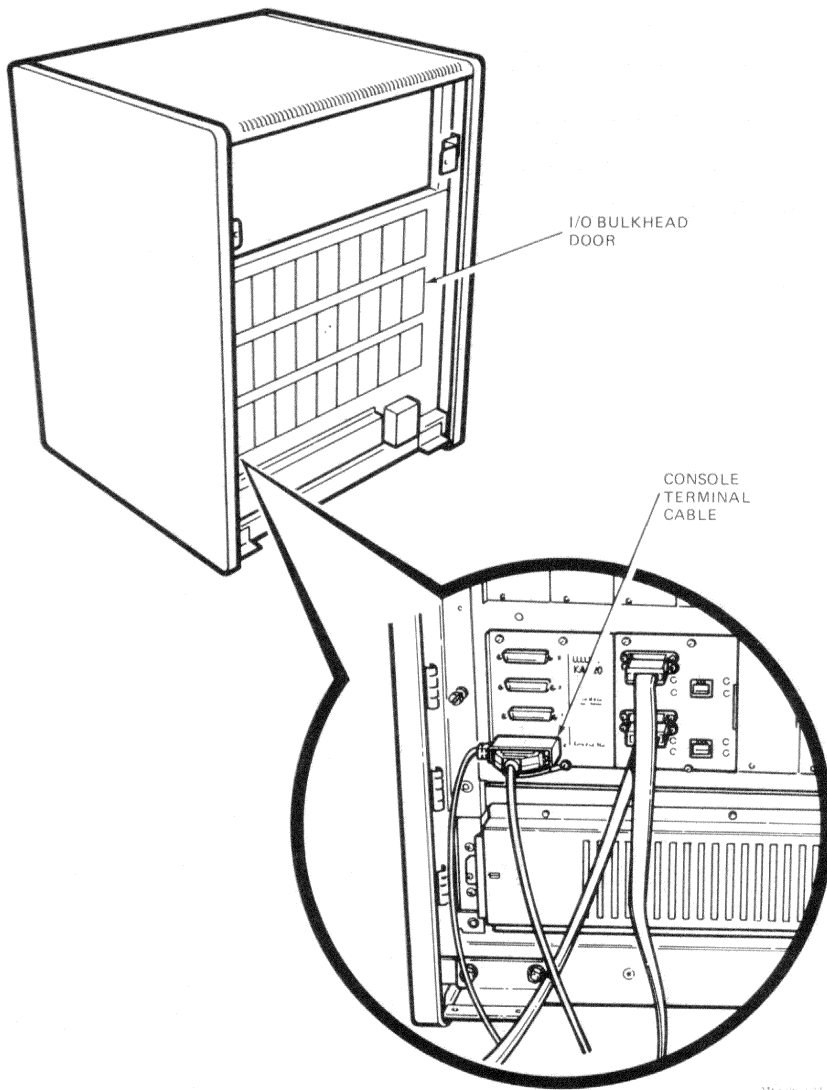


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Figure 2-10: Removing the 24-VAXBI Slot Processor Cabinet Rear Door

2. Remove the shipping brackets and restraints listed in Table 2-1. (See the appropriate installation guides or user guides for more detailed information.)

3. When all other cabinets have been installed, do the following:
 - a. Level the cabinets.
 - b. Attach the following cables:
 - 1) Console terminal (Figure 2-11).
 - 2) Peripherals (see the appropriate options installation manuals).
 - c. Set the Power Bus switch to Remote.
 - d. Replace the processor cabinet rear door. Close or replace doors of all other cabinets.



AKS 200 134

Figure 2-11: 24-VAXBI Slot Cabinet I/O Distribution Panel

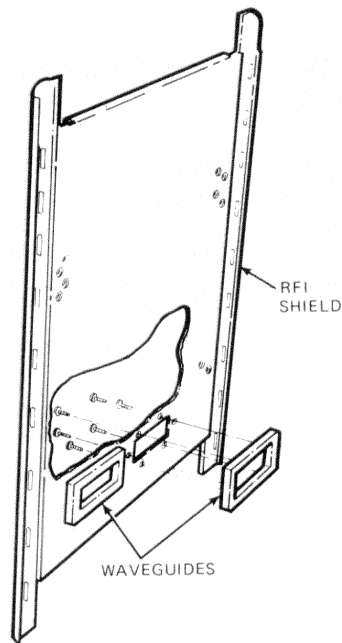
2.3.3 CIPA Cabinet

If the system includes a CIBCI, do the following:

1. Remove the shielded tape from the processor cabinet RFI shield waveguide (see note below). Attach the waveguide bracket to the outside of the processor cabinet, inserting the screws from the inside of the cabinet (Figure 2-12). Save the other set of screws.

NOTE

If cables are to be passed through only one waveguide, install a bracket only on the waveguide that will be used. Do not remove the tape from the other waveguide.



MKV85-1537

Figure 2-12: RFI Shield Waveguide Installation

2. Remove the side panel from the processor cabinet and install it on the CIPA cabinet.
3. Remove the CIPA cabinet front and back doors using a 5/32 inch Allen wrench.
4. Remove the fill panel from the side of the CIPA cabinet that will be joined to the processor cabinet.
5. Install the expansion panel between the CIPA cabinet and the processor cabinet.

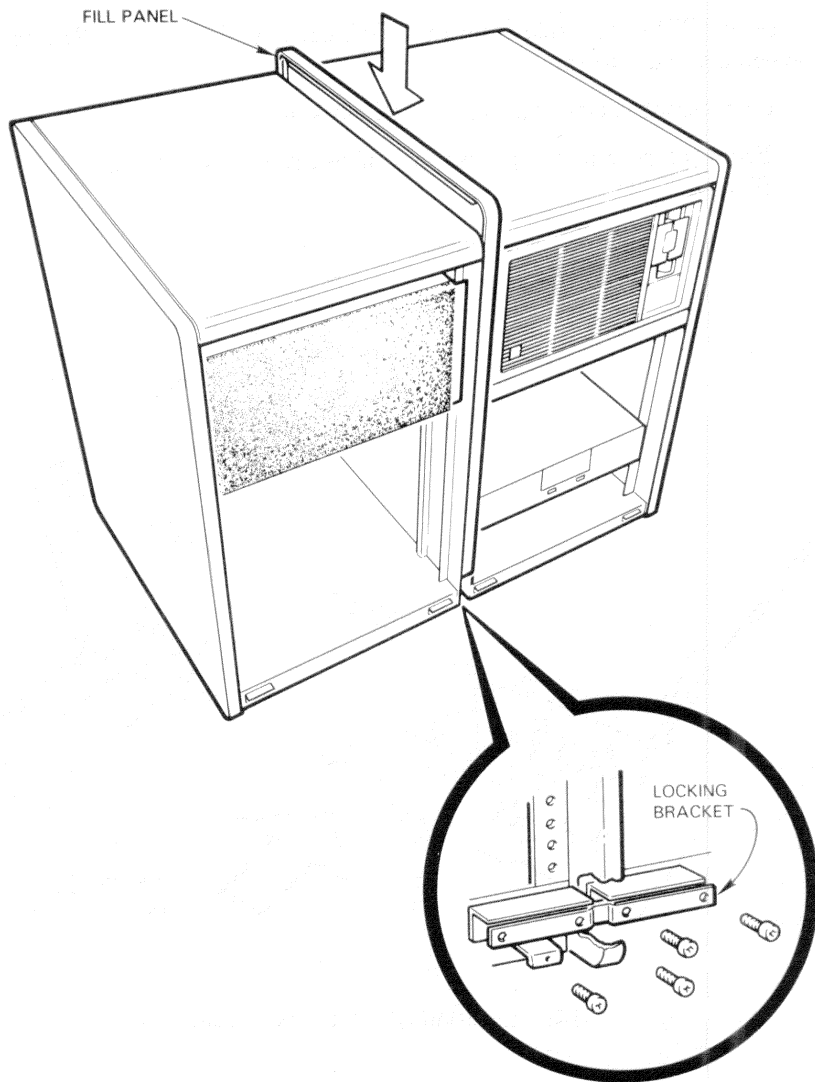
CAUTION

Use only the expansion panel shipped with the CIBCI option. This panel has a single (upper) locking bar. Do not use an expansion panel that has both upper and lower locking bars.

NOTE

Attach the side of the expansion panel with the longer set of key slots to the CIPA cabinet.

6. Attach the RFI shield waveguide screws to the bracket from inside the CIPA cabinet, bolting the two cabinets together.
7. Bolt the processor and CIPA cabinets together, front and rear, using the brackets provided (Figure 2-13).



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Figure 2-13: Attaching the Processor and CIPA Cabinets

8. Connect the power bus cable.
9. Route the CIPA bus cable from the CIPA cabinet, through the RFI shield waveguide, and into the processor cabinet.
10. If the processor cabinet has 12 VAXBI slots, do the following:
 - a. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).

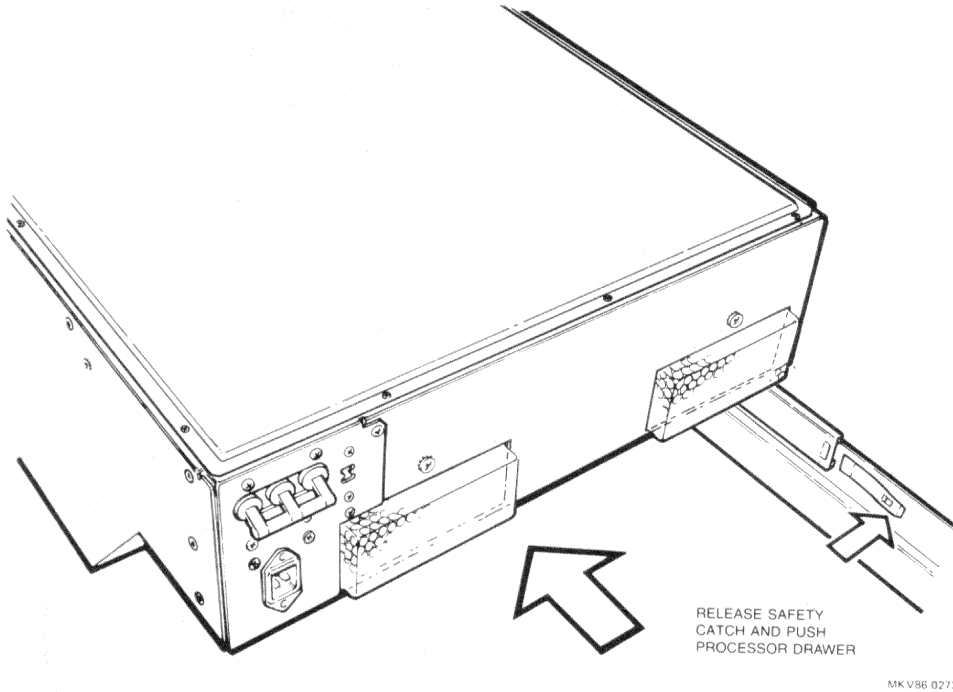


Figure 2-14: Location of BA32 Box Track Lock

- b. Slide the BA32 box out of the cabinet and rotate the box up.
 - c. From the rear of the BA32 box, open the appropriate cable restraint (see Chapter 6) and feed the transition end of the CIPA bus cable into the box. Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane.
11. Insert the T1017 and T1018 modules in adjacent slots in the same VAXBI cardcage. The T1018 module must be closer to the primary processor module, and the T1017 module must be in a slot that has a node ID plug.
 12. Attach the BCI cables to the backplane of the slots that hold the T1017 and T1018 modules (Figures 2-15 and 2-16):
 - a. Attach the shorter cables to the inside connectors of zones C and D.
 - b. Attach the longer cables to the outside connectors of zones C and D.
 13. Attach the CIPA bus cable as shown in Figures 2-15 and 2-16.

NOTE

Position the marker stripe on the cable assembly toward zone A of the VAXBI cardcage.

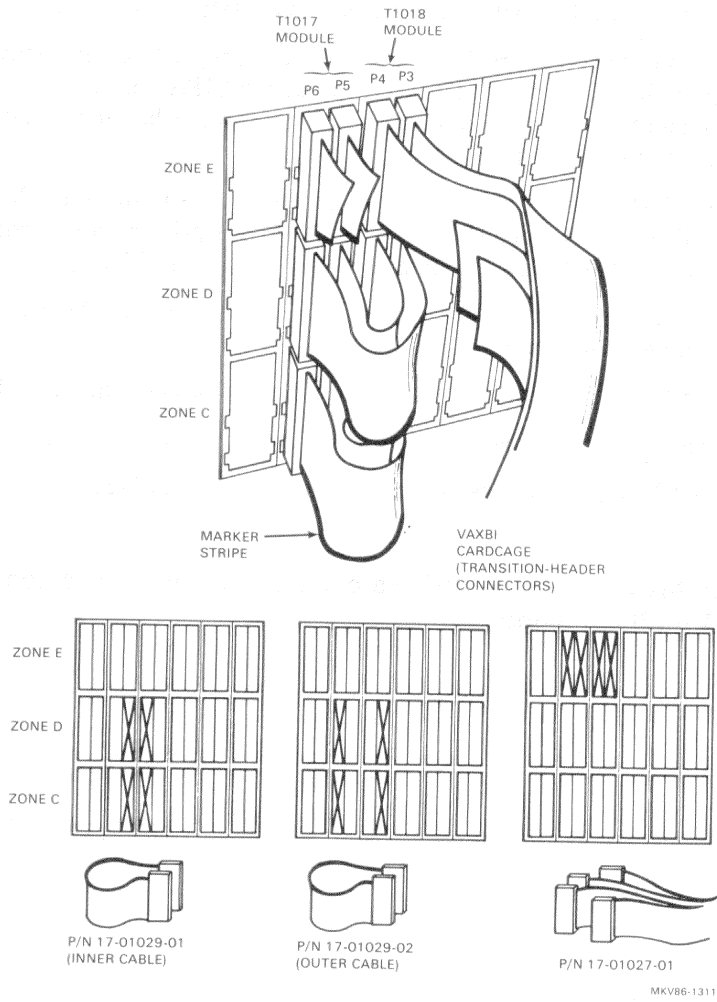


Figure 2-15: CIBCI Cable Connections – 12-VAXBI Slot Cabinet

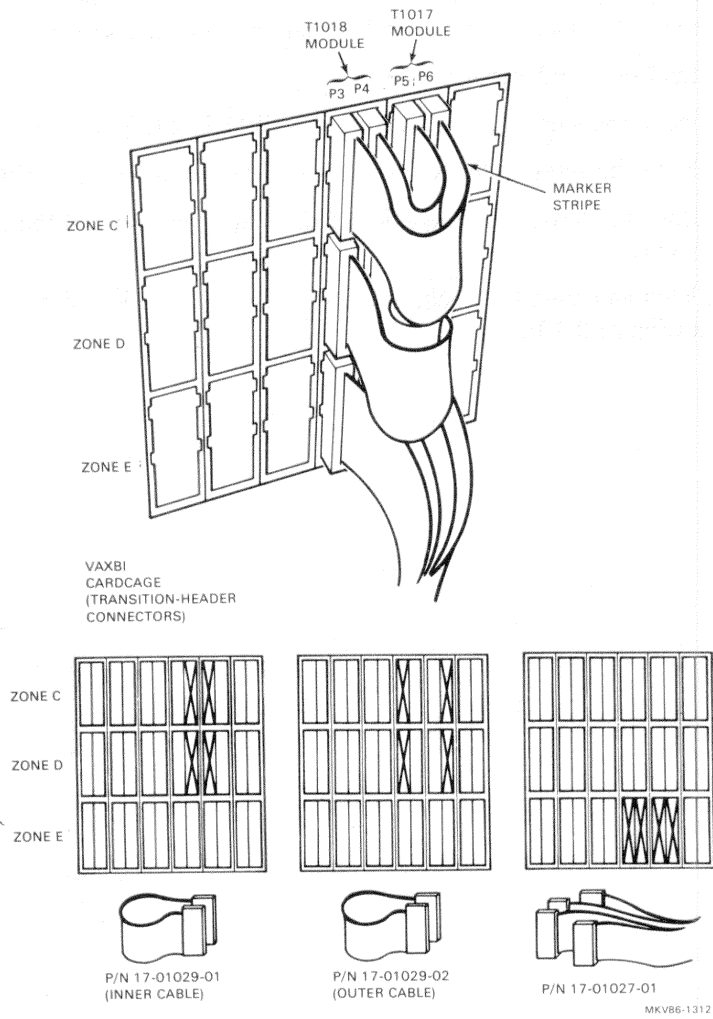
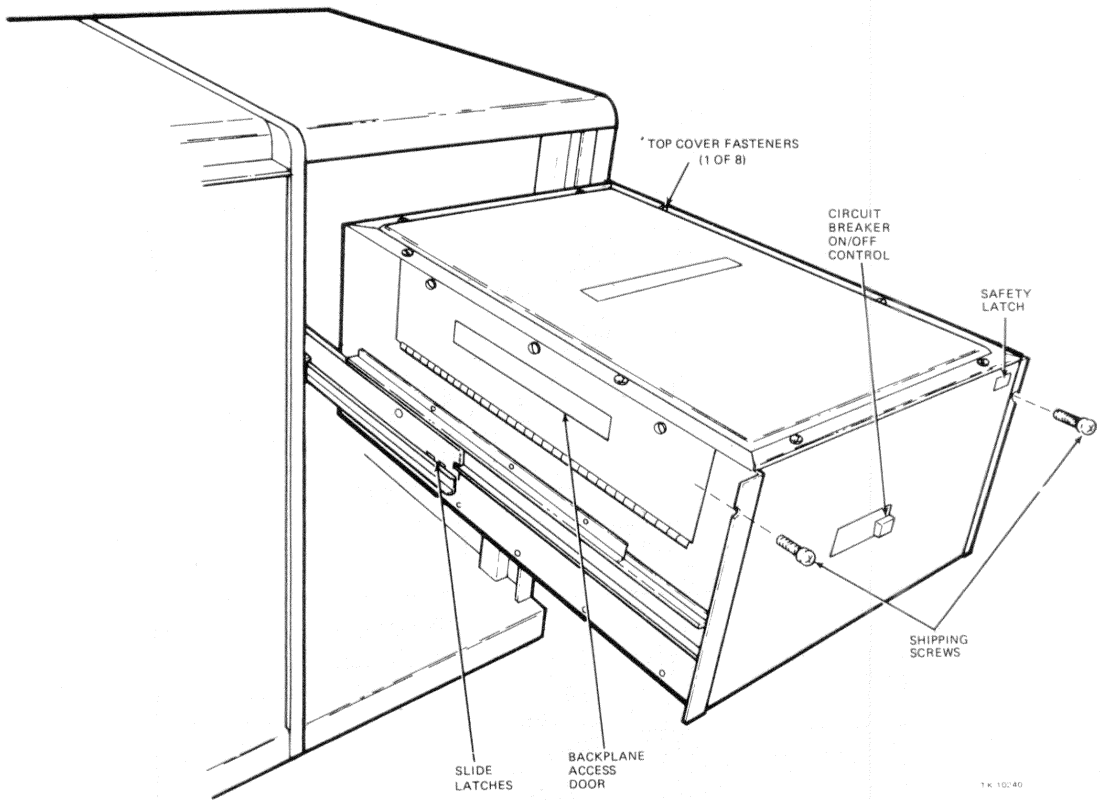


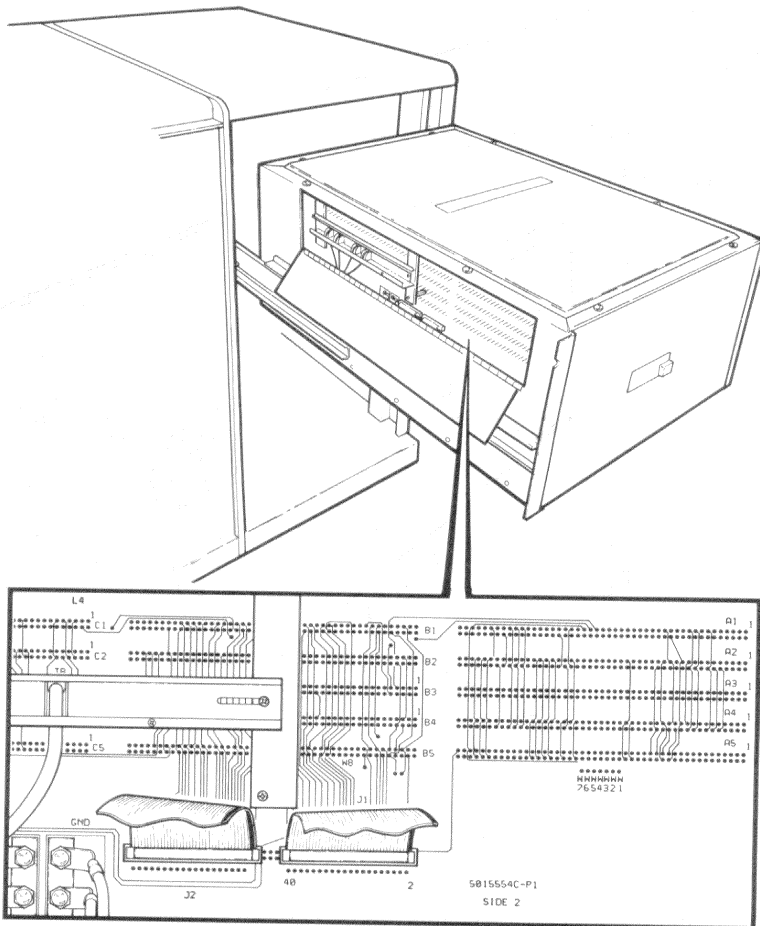
Figure 2-16: CIBC Cable Connections – 24-VAXBI Slot Cabinet

14. Check the configuration of the CIPA backplane jumpers. These jumpers are configured at the factory for normal operation (all jumpers out).
 - a. Extend the CIPA cabinet stabilizer leg.
 - b. Remove the shipping screws from the CIPA box (Figure 2-17).
 - c. Release the safety latch and slide the CIPA box out of the cabinet.
 - d. Release the latches on the sides of the slide rails and pull the box all the way out.
 - e. Unlatch and open the backplane access door on the left side of the CIPA box (Figure 2-18).



1 x 100-40

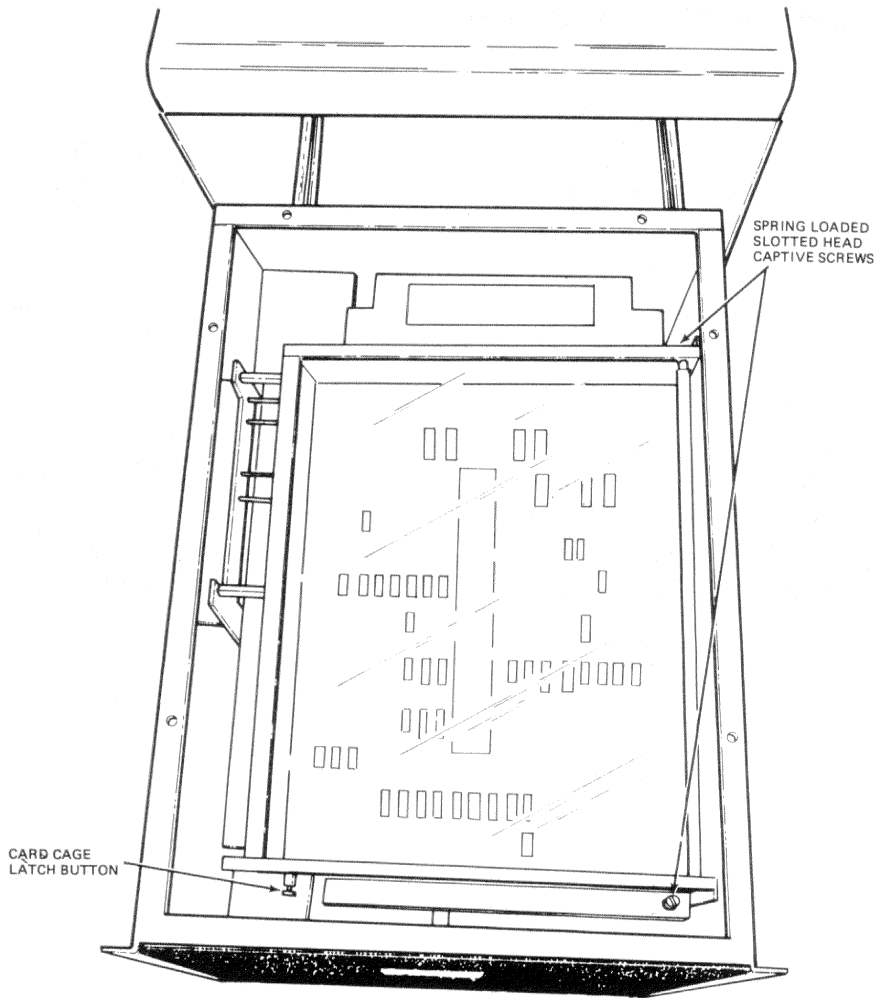
Figure 2-17: Extending the CIPA Box from the Cabinet



MKV B4-1401

Figure 2-18: Location of CIPA Backplane Jumpers

15. Configure the CIBCI node address switches.
 - a. Unlatch and remove the top cover of the CIPA box.
 - b. Raise the CIPA cardcage to its upright position.
 - 1) Unscrew the spring-loaded captive screws located at the right front corner and the right rear corner of the cardcage (Figure 2-19).
 - 2) Pull forward on the latch button at the left front corner of the cardcage and lift the right side of the cardcage.
 - 3) Release the latch button and swing the cardcage up until the latch button locks the cardcage in the upright position.
 - c. Determine the node address to be assigned.
 - d. Configure the node address switches. Set both S1 and S2 to the selected address (Figure 2-20). The on position of each switch represents a logic zero, and the off position a logic one (Table 2-2).
 - e. Lower the CIPA cardcage, reattach the spring-loaded captive screws, replace the top cover of the CIPA box, and slide the box into the CIPA cabinet.



TK 10249

Figure 2-19: CIPA Cardcage

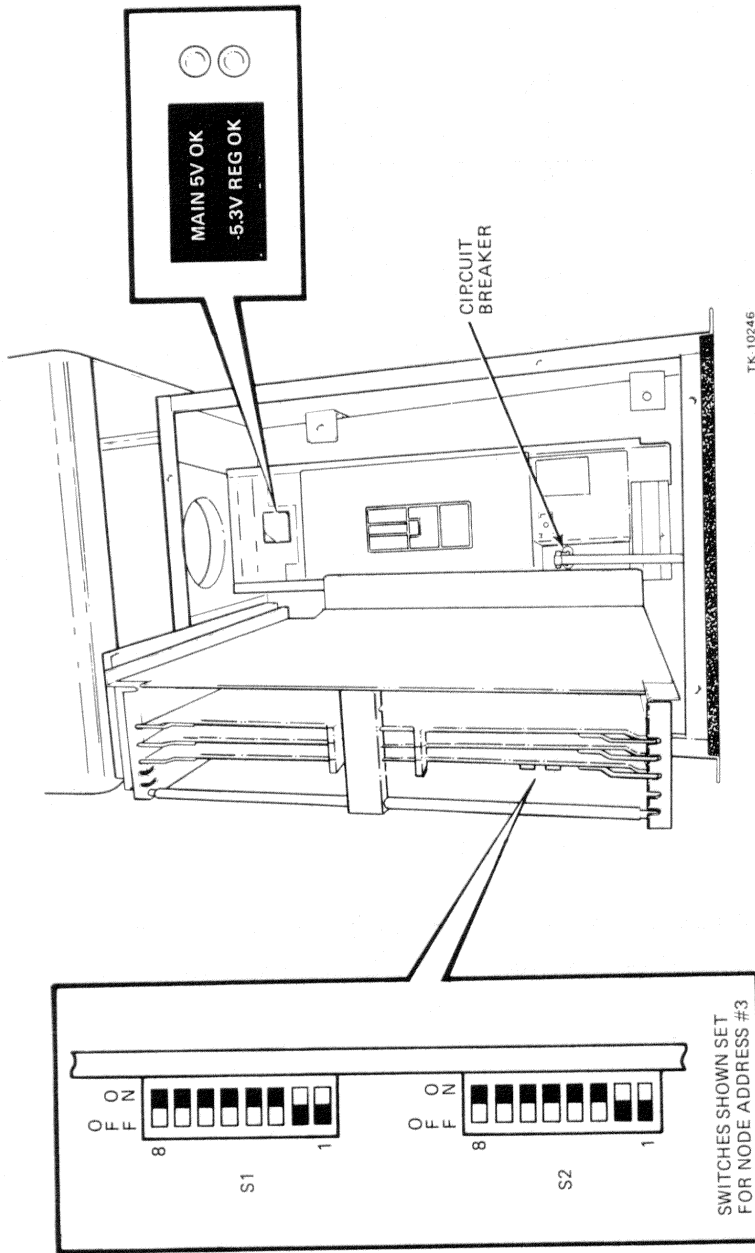


Figure 2-20: CIBCI Node Address Switches

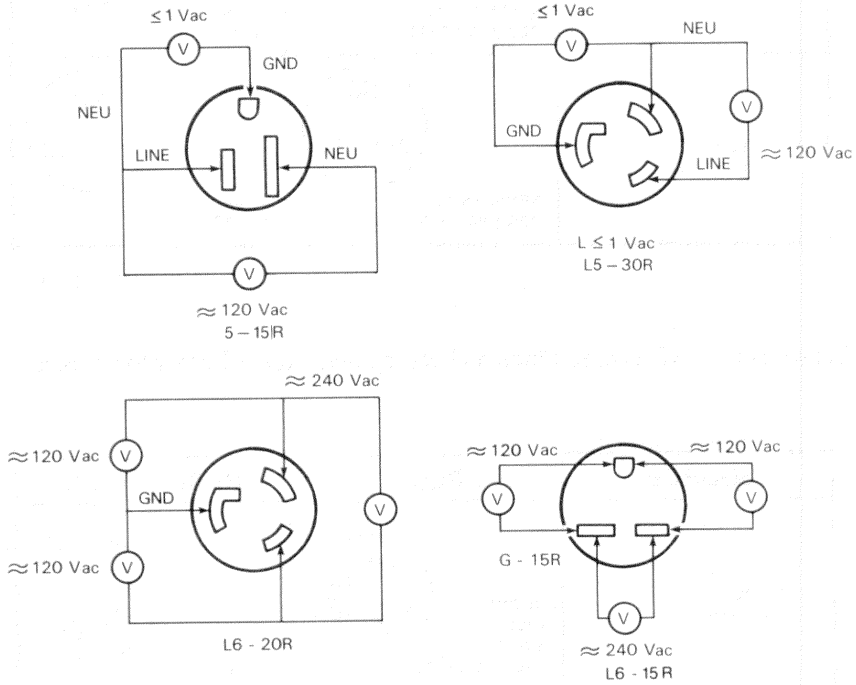
Table 2-2: CIBCI Node Address Switch Settings

Node Number	S8	S7	S6	S5	S4	S3	S2	S1
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	1	1
4	0	0	0	0	0	1	0	0
5	0	0	0	0	0	1	0	1
6	0	0	0	0	0	1	1	0
7	0	0	0	0	0	1	1	1
8	0	0	0	0	1	0	0	0
9	0	0	0	0	1	0	0	1
10	0	0	0	0	1	0	1	0
11	0	0	0	0	1	0	1	1
12	0	0	0	0	1	1	0	0
13	0	0	0	0	1	1	0	1
14	0	0	0	0	1	1	1	0
15	0	0	0	0	1	1	1	1

16. Set the CIPA cabinet power controller Local/Remote switch to Remote.
17. Route but do not connect the BNCIA-XX coaxial (CI bus) cables. See the *SC008 Star Coupler User's Guide* (EK-SC008-UG).

2.4 SYSTEM POWER


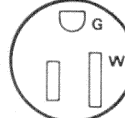
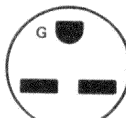
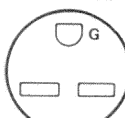
With a DVM in the proper range and setting, measure the voltage between line and neutral on the power receptacles. Also, measure the voltage between earth ground and neutral (1 volt maximum) (Figure 2-21).



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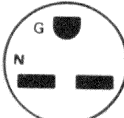
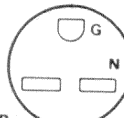
Figure 2-21: Measuring System Power

Figures 2-22 and 2-23 show the ac power plugs and receptacles that are used on a VAX 8200/8300.

SOURCE	PLUG	RECEPTACLE
120 V 15 A 1-PHASE	 HUBBEL #5286-C NEMA # 6-15P DEC # 90-08938	 #5262 5-15R 12-05351
240 V 15 A 1-PHASE	 NEMA # 6-15P DEC # 90-08853	 6-15R 12-11204

MKV85-1935

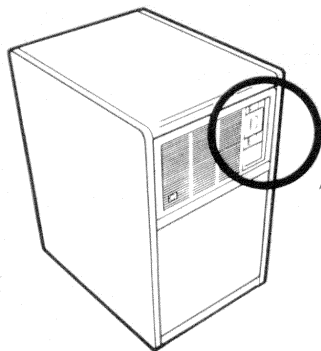
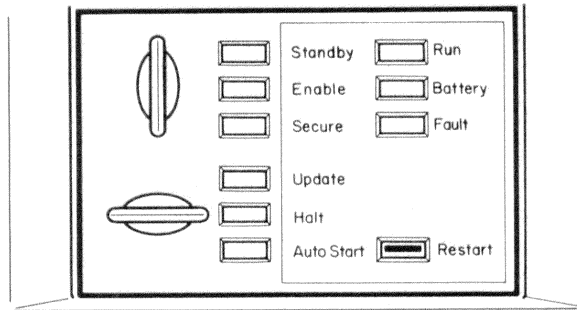
Figure 2-22: AC Power Plugs and Receptacles for a Rack-Mount Box

SOURCE	PLUG	RECEPTACLE
120 V 30 A 1-PHASE	 HUBBEL #2611 NEMA # L5-30P DEC # 12-11193	 #2610 L5-30R 12-11194
240 V 15 A 1-PHASE	 NEMA # 6-15P DEC # 90-08853	 NEMA # 6-15R DEC # 12-11204-00 (DUPLEX) DEC # 12-16095-00 (DUPLEX)

MKV85-1936

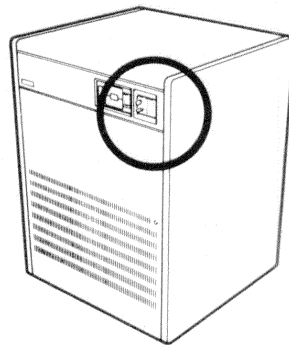
Figure 2-23: AC Power Plugs and Receptacles for the Processor, CIPA, and UNIBUS Expansion Cabinets

3.1 SWITCHES AND INDICATORS (Figure 3-1; Tables 3-1, 3-2, and 3-3)



12 VAXBI SLOT CABINET

AREA ENLARGED



24 VAXBI SLOT CABINET

AKU-99-1313

Figure 3-1: Front Panel Switches and Indicators

Table 3-1: Functions of the Top Keyswitch

Position	LED Color	System Power Status	CTRL/P and Restart Status
Fully counterclockwise	–	Off (See Note 1.)	Disabled
Standby	Red	300 V in power supply, +5 VB memory power, and +24 V blower power on; all else off.	Disabled
Enable	Yellow	All dc voltages produced by the power supply are active. See list in Note 2.	Enabled
Secure	Green	All dc voltages produced by the power supply are active. See list in Note 2.	Disabled

NOTE

1. When the top keyswitch is turned fully counterclockwise, all power is off if the system is configured properly. The configurations are listed below. In each case, the assumption is made that the ac input assembly circuit breaker is on.
 - a. The H877 power controller switch is in the REMOTE position.
 - b. The internal line cord(s) from the H877 power controller to the power supply(ies) is (are) plugged into switched outlet(s) on the power controller.
2. The dc voltages produced by the power supply are +5 V (main logic), +5 VB (memory), +12 V (VAXBI and disks), –12 V (communications options), +15 V and –15 V (UNIBUS), –5.2 V (ECL), –2 V (ECL terminator), and +24 V (blower).

Table 3-2: Functions of the Bottom Keyswitch

Position	LED Color	EEPROM Status	CPU Action on Cold Powerup or When Restart Button is Pressed
Update	Red	Write enabled	Self-test runs, halts in console mode.
Halt	Yellow	Write disabled	Self-test runs, halts in console mode.
Auto Start	Green	Write disabled	Self-test runs, system attempts to boot from default boot device.

Table 3-3 Front Panel Indicators

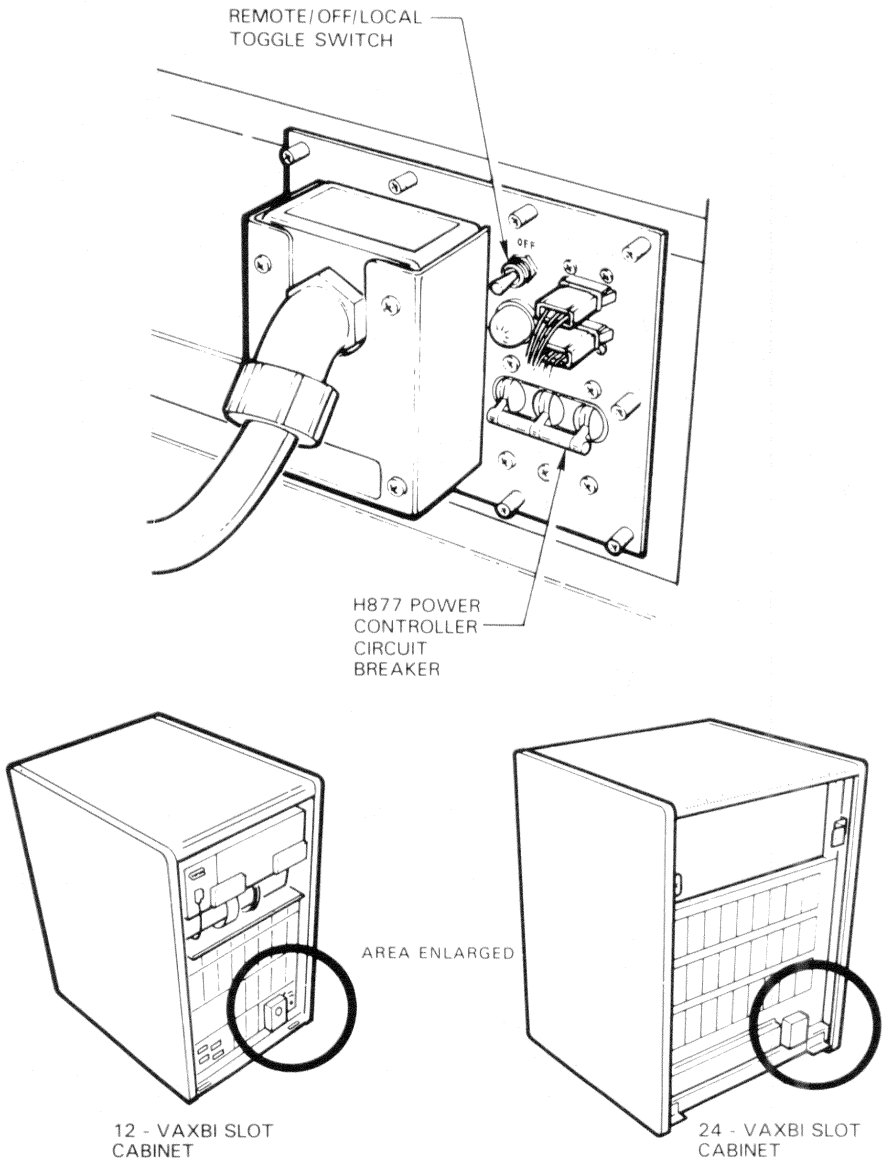
Indicator	Color	Function When On	Function When Off	Function When Flashing (1 Hz)	Function When Flickering (10 Hz)
Run	Green	Processor executing macrocode.	Processor in console I/O mode halt state.	–	–
Battery	Green	BBU❶ fully charged and connected to system.	No BBU.	BBU charging.	BBU discharging.
Fault	Red	Self-test running or VAXBI node self-test failure.	All VAXBI node self-tests passed.		

❶ Battery backup unit.

3.2 INITIAL POWER-ON PROCEDURE

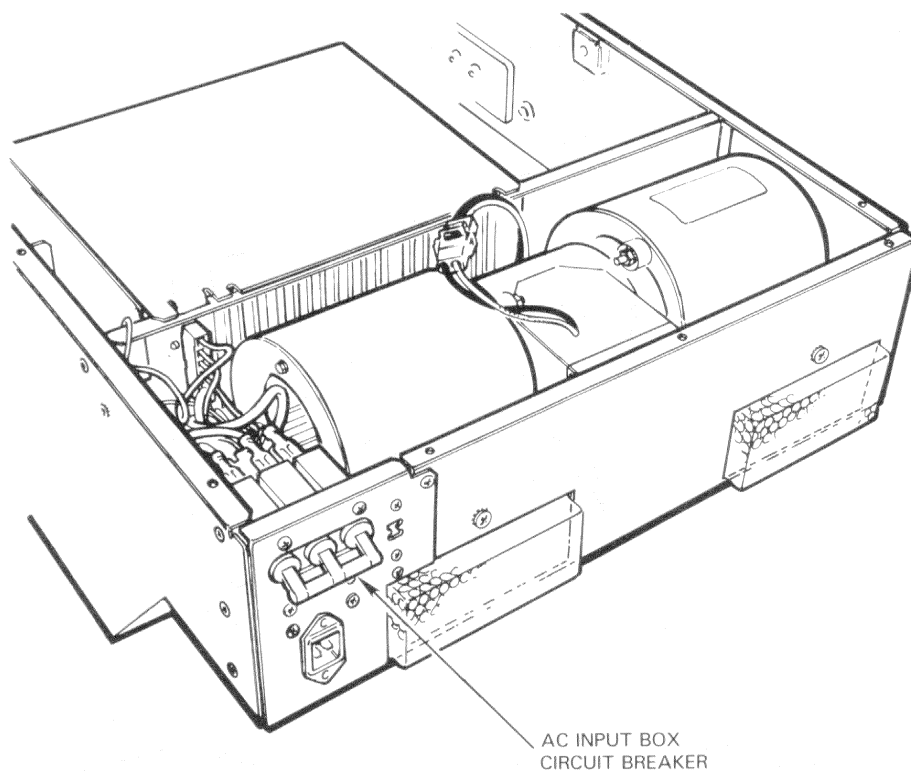
3.2.1 12-VAXBI Slot Cabinet Power On

1. Extend the processor cabinet stabilizer leg.
2. Remove processor cabinet front and rear doors.
3. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
4. Slide the BA32 box out of the cabinet.
5. Check that the following circuit breakers and switches are turned off (Figures 3-2 and 3-3):
 - a. H877 power controller circuit breaker.
 - b. BA32 ac input box circuit breaker.
 - c. BA32 front panel keyswitches (top keyswitch fully counterclockwise).



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Figure 3-2: H877 Power Controller

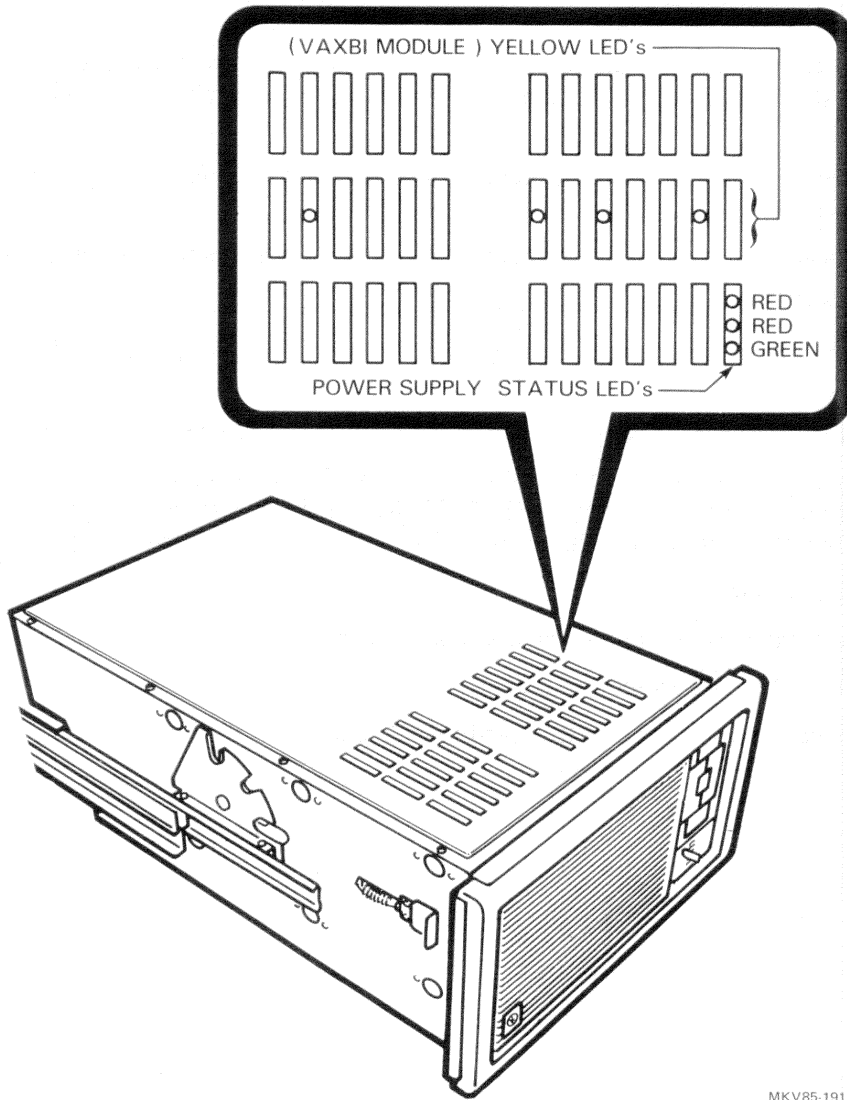


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Figure 3-3: BA32 AC Input Box Circuit Breaker

6. Check that the receptacle provided is correct for the H877 power controller.
7. Check that the power level at the receptacle is correct (Figure 2-21).
8. Plug the power cord into the receptacle.
9. Turn on the H877 power controller circuit breaker.
10. Check that the remote cable is installed between the H877 power controller and the ac input assembly. Turn the H877 power controller Remote switch to Remote.
11. Turn on the BA32 ac input box circuit breaker.
12. Set the console terminal baud rate to 1200.
13. Turn the bottom keyswitch to Halt.

14. Turn the top keyswitch to Standby. Check that the three power supply status LEDs light (Figure 3-4).



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Figure 3-4: Power Supply Status LEDs (BA32 Box)

15. Turn the top keyswitch to Enable. The following should occur:
 - a. The two red power supply status LEDs turn off; the green LED stays on.
 - b. The yellow LEDs on each VAXBI module light when each module passes its self-test (Section 3.3).
 - c. The console terminal prints the results of the self-tests for the processor and the VAXBI nodes. The message printed should be similar to Example 3-1.
16. Check the message printed at the console terminal. If it is similar to Example 3-1, skip to step 18. If it is not similar, go to step 17.
17. Do the following if the console prints a garbled string of characters or nothing.
 - a. Type CTRL/P to enter console mode.
 - b. Press Break. If the console prompt (>>>) does not appear, press Break again.
 - c. Repeat step b until the correct response appears at the operator console.
 - d. Set the default baud rate to 1200. See the *VAX 8200/8300 Owner's Manual*. Chapter 3, "The EEPROM Utility", includes instructions for setting the default baud rate of the CPU's serial line unit 0 (console port).
 - e. Press Restart.
 - f. Check the message printed at the console terminal.
18. Slide the BA32 box into the cabinet.
19. Replace the processor cabinet front and rear doors.

3.2.2 24-VAXBI Slot Cabinet Power On

1. Open the processor cabinet front door and remove the rear door.
2. Check that the following circuit breakers and switches are turned off:
 - a. H877 power controller circuit breaker (Figure 3-2).
 - b. AC input box circuit breakers (Figure 3-5).
 - c. Front panel keyswitches (top keyswitch fully counterclockwise).

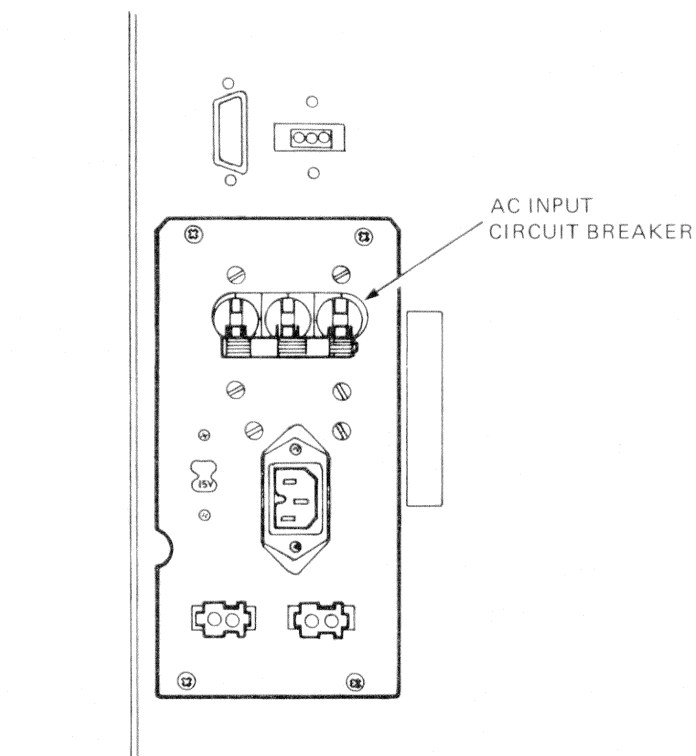


Figure 3-5: AC Input Boxes in the 24-VAXBI Slot Cabinet

3. Check that the receptacle provided is correct for the H877 power controller.
4. Check that the power level at the receptacle is correct (Figure 2-21).

5. Plug the power cord into the receptacle.
6. Turn on the H877 power controller circuit breaker.
7. Check that the remote cables are installed from the H877 power controller to the ac input assemblies. Turn the H877 power controller Remote switch to Remote.
8. Turn on the circuit breaker on each ac input box.
9. Set the console terminal baud rate to 1200.
10. Turn the bottom keyswitch to Halt.
11. Turn the top keyswitch to Standby. Check that the three power supply status LEDs for each power supply light.
12. Turn the top keyswitch to Enable. The following should occur:
 - a. For each power supply, the two red power supply status LEDs turn off; the green LED stays on.
 - b. The yellow LEDs on each VAXBI module light when each module passes its self-test (Section 3.3).
 - c. The console terminal prints the results of the self-tests for the processor and the VAXBI nodes. The message printed should be similar to Example 3-1.
13. Check the message printed at the console terminal. If it is similar to Example 3-1, skip to step 15. If it is not similar, go to step 14.
14. Do the following if the console prints a garbled string of characters or nothing.
 - a. Type CTRL/P to enter console mode.
 - b. Press Break. If the console prompt (>>>) does not appear, press Break again.
 - c. Repeat step b until the correct response appears at the operator console.
 - d. Set the default baud rate to 1200. See the *VAX 8200/8300 Owner's Manual*. Chapter 3, "The EEPROM Utility", includes instructions for setting the default baud rate of the CPU's serial line unit 0 (console port).
 - e. Press Restart.
 - f. Check the message printed at the console terminal.
15. Replace the processor cabinet rear door and close the front door.

3.3 SELF-TEST

The first step in the acceptance procedure is to run the self-test. (Self-test replaces the level 5 microdiagnostics that were used with the previous generation of VAX CPUs.) The self-test runs when the system powers up. The result of the self-test is reported at the console terminal. When the power-up procedure in Section 3.2 is followed, the console output is in the format shown in Example 3-1.

```

#ABCDEFGHIJK.MN#                ! processor self-test

0 . 2 . 4 . . . . . C D . .    ! VAXBI nodes self-test
00200000                        ! memory size (hex)
?03                              ! halt code
      PC = xxxxxxxx             ! address halted at
>>>

                                ! console prompt

```

Example 3-1: Console Output at Power Up

3.3.1 Processor Self-Test

The first line in Example 3-1 shows the results of the processor self-test. The first “#” indicates the start of the processor self-test, which consists of 14 sections. On successful completion of each section, the microcode sends to the console terminal an uppercase ASCII character (A through N) corresponding to the section of hardware tested. (If the microcode detects an error in a section, the self-test stops and the character corresponding to that section is not printed.) The second “#” indicates successful completion of the processor self-test. Table 3-4 lists the processor self-test sections and the character displayed on the console terminal by each section.

Table 3-4: Processor Self-Test Sections

Section	Self-Test Action	Hardware Tested
A	Control-store test	Control store, primary patches, MIB bus, I/E chip
B	I/E chip internals test	I/E chip
C	DAL interface test	Interface of I/E and M chips and interconnecting DAL bus
D	M chip internals test	M chip, DAL, PAL, and CAL buses
E	BTB array test; enable if enabled in EEPROM	BTB, DAL, CAL, and PAL buses
F	Cache array test; enable if enabled in EEPROM	Cache, DAL, CAL, and PAL buses
G	I/E chip and M chip interaction test	I/E chip, M chip
H	Port-controller CSR test	Port controller
I	EEPROM test	EEPROM, port controller, PCI bus
J	Packet buffer test	Packet buffer, port controller, PCI bus
K	F chip test; enable if enabled in EEPROM	F chip and interconnecting DAL bus
L	Not used	Not used
M	RCX50 controller test	RCX50 controller, interface driver circuitry, port controller, PCI bus, cable
N	BIIC test	BIIC, port controller, BCI bus

3.3.2 VAXBI Nodes Self-Test

Every VAXBI node runs its self-test when the system powers up. During system initialization, the processor polls each node to determine whether the node's self-test passed or failed. The second line of Example 3-1 shows the format in which this information is reported. A dot (.) indicates an unused VAXBI node. A hexadecimal number indicates that the VAXBI node passed its self-test. If a number is preceded by a dash (-), the indicated node failed its self-test. In Example 3-1, the system contains five VAXBI nodes (0, 2, 4, C, and D), all of which passed their self-tests.

3.4 MACRODIAGNOSTICS

1. Load and run EVKAA, VAX hardcore diagnostic.
 - a. Insert the RX50 diskette that contains EVKAA into CSA1, matching the arrow on the diskette to the orange stripe on the drive. Close the drive door.
 - b. At the console terminal, type the following:

```
>>> B CSA1<RET>
```
 - c. Run 10 passes of EVKAA. To terminate the test, type **CTRL/P**.
2. Load the VAX diagnostic supervisor (VDS).
 - a. Insert the RX50 diskette that contains EBSAA and EBUCA into CSA1 (arrow to stripe). This diskette is labeled "VAX 8200/8300 UTIL PROG FLP."
 - b. At the console terminal, type the following:

```
>>> B CSA1<RET>
```

The console responds with the prompt:

```
DS>
```
3. Run EBUCA to obtain a VAXBI node map.
 - a. Type the following:

```
DS> @EBUCA<RET>
```
 - b. Answer the questions as shown in Example 3-2.

** EBUCA STARTUP **

Do you want help Y/N {N} ? no<RET>

Source for loading EEPROM work buffer is the primary processor
Want to change this Y/N {N} ? no<RET>

EE> Are you interested in the general section Y/N {N} ? yes<RET>

Want to display VAXBI configuration matrix Y/N {N} ? yes<RET>

```
-----  
NODE      REVISION CODE    DEVICE CODE & TYPE  
-----  
00         0216             0102      DWBUA  
02         2019             0105      KA820 CPU  
06         0513             010E      KDB50  
0B         0000             0001      MS820 MEMORY  
0D         0000             0001      MS820 MEMORY  
0F         201B             0105      KA820 CPU
```

Example 3-2: Using EBUCA to Obtain a
VAXBI Node Map

4. Attach the KA820 processor. Refer to the help file for the KA820.

DS> HELP EVKAB ATTACH KA820<RET>

5. Load and run EVKAB, the VAX basic instruction exerciser. At the console terminal, type:

DS> LOAD EVKAB<RET>

DS> SET TRACE<RET>

DS> START<RET>

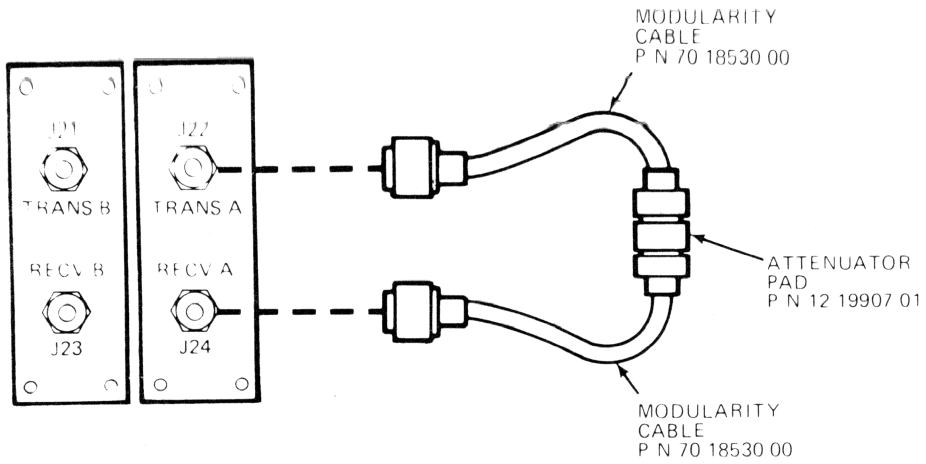
NOTE

Trace needs to be set only once during a diagnostic session.

6. Repeat step 5 for the following diagnostics:
 - a. EVKAC (VAX floating point instruction exerciser)
 - b. EVKAE (VAX privileged architecture instruction exerciser)
 - c. EBKAX (VAX 8200/8300 cluster exerciser)
 - d. Peripheral diagnostics specific to the system under test. (See the appropriate peripheral user guides for specific instructions.)
7. If the system under test is a VAX 8300, do the following:
 - a. Initialize and start the attached processor by typing the following:

```
DS> B node<RET>  ! node is the node ID number of
                  !      the attached processor
                  !      (in hexadecimal)
```
 - b. Run the following diagnostics:
 - 1) EVKAB
 - 2) EVKAC
 - 3) EVKAE
 - 4) EBKAX
 - c. Return control to the primary processor by typing the following:

```
DS> EXIT<RET>
```
 - d. Run EBKMP (VAX 8300 multiprocessor diagnostic)
8. If the system under test includes a CIBCI, do the following:
 - a. Make CI bus loopback connections on the CI bulkhead panel at the back of the CIPA cabinet. Use an attenuator pad (12-19907-01) and two modularity cables (70-18530-00) from the CIBCI CD kit (A2-W0742-10) to make each of the following connections (Figure 3-6):
 - 1) Connect TRANSMIT A (J22) to RECEIVE A (J24).
 - 2) Connect TRANSMIT B (J21) to RECEIVE B (J23).



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Figure 3-6: CIBCI Diagnostic Loopback Cable Connections

b. Attach the CIBCI:

DS> ATTACH CIBCI HUB PAA0 6 4 0<RET>

c. Select the CIBCI:

DS> SELECT PAA0<RET>

d. Run the following diagnostics:

- 1) EVCKA
- 2) EVCKB
- 3) EVCKC
- 4) EVCKD
- 5) EVCKE
- 6) EVCKF

- e. Remove the loopback connectors from the CI bulkhead panel.
- f. Connect the four CI bus coaxial cables (BNCIA-xx), one each to the following jacks:
 - 1) TRANSMIT B (J21)
 - 2) TRANSMIT A (J22)
 - 3) RECEIVE B (J23)
 - 4) RECEIVE A (J24)
- g. With the two attenuator pads, connect the cables as follows:
 - 1) TRANSMIT A to RECEIVE A
 - 2) TRANSMIT B to RECEIVE B
- h. Run five passes of the EXT-LOOP section of EVCKF to test the CI bus cables.

```
DS> RUN EVCKF/SECTION=EXTMLOOP/PASS=5<RET>
```

- i. Run five passes of EVGAA.

```
DS> LOAD EVGAA<RET>
```

```
DS> SET EVENT FLAG 1, 2<RET>      ! Load the CI  
                                   ! microcode.
```

```
DS> START/PASS=5<RET>
```

- j. Run five passes of EVGAB.

```
DS> CLEAR EVENT FLAG 1, 2<RET>
```

```
DS> RUN/PASS=5 EVGAB<RET>
```

3.5 BUILDING VAX/VMS AND RUNNING UETP

3.5.1 Building VAX/VMS

1. Load the VAX/VMS distribution media.
2. Spin up the system disk.
3. After the console prompt (>>>) is displayed at the console terminal, insert the console diskette.
4. At the console terminal, type the following:

```
>>> B/R5:800 CSA1<RET>
```
5. In response to the new prompt, type:

```
BOOT58> @CSAB00.CMD<RET>
```
6. Follow the instructions that are displayed at the console terminal. Change diskettes when prompted, and enter the date and time when required.

NOTE

If VMS V4.4 or V4.5 is running, do not change diskettes in response to the first occurrence of the following message:

Please remove the volume "SYSTEM_1" from the console device. Insert the first standalone system volume and enter "YES" when ready:

Leave the SYSTEM_1 diskette in place and respond with "YES." Do this only at the first occurrence of this message.

7. Leave the last diskette in the drive after the DCL prompt (\$) appears.
8. Restore the VMS save set REQUIRED, using the following command (Table 3-5):

```
$ BACKUP/VERIFY load_device:REQUIRED/SAVE system_device:<RET>
```

Table 3-5: VMS Load Device and System Device Names

Device Type	Device Name ❶ at Console Prompt	Device Name ❷ at DCL Prompt (load_device, system_device)
RA60	DUnu	DJcu
RA80, RA81	DUnu	DUcu
TU80, TU81	N/A	MUcu

❶ Variable n refers to the VAXBI node number; variable u to the device unit number.

❷ Variable c refers to the device controller; variable u to the device unit number.

9. Wait for the DCL prompt (\$) to be displayed on the console terminal. (The length of the wait depends on the load medium.)
10. Type **CTRL/P** to put the system in console mode.
11. Remove the standalone backup diskette from the drive.
12. Boot the system disk:
 - a. If the system disk is not on an HSC controller, type the following:

```

>>> B DUnu<RET>    ! n is the node number of the
                    !   adapter supporting the system
                    !   disk.
                    ! u is the disk unit number.

```

NOTE

If the system disk is on the UNIBUS, n is the node ID of the DWBUA. If the system disk is on the VAXBI, n is the node ID of the KDB50. For more information, see Tables 4-1 and 4-2 or run the EEPROM utility (see the *VAX 8200/8300 Owner's Manual*).

b. If the system disk is on an HSC controller, do the following:

1) Insert the console diskette.

2) Boot CSA1:

```
>>> B/R5:800 CSA1<RET>
```

3) Type these commands:

```
BOOT58> D/G 0 20<RET> ! D/G 20 deposits 20 (hex)
! into General Register 0.
! 20 is the device code
! for a device attached to
! an HSC controller.
```

```
BOOT58> D/G 1 n<RET> ! n is the VAXBI node
! number (hex) of the CI
! adapter.
```

4) If the system has one HSC controller, type the command:

```
BOOT58> D/G 2 p<RET> ! p is the CI node number
! (hex) of the HSC
! controller.
```

If the system has two HSC controllers and the system disk is connected to both, type the command:

```
BOOT58> D/G 2 0p0q<RET> ! p and q are the CI
! node numbers (hex)
! of the HSC
! controllers.
```

5) Type these commands:

```
BOOT58> D/G 3 u<RET> ! u is the unit number
! (hex) of the boot
! device connected
! to the HSC
! controller.
```

```
BOOT58> D/G 5 0<RET> ! Select VMS operating
! system.
```

```
BOOT58> D/G E 200<RET> ! 200(hex) is the
! starting address of
! VMB.
```

```
BOOT58> LOAD VMB.EXE/START:200<RET>
```

```
BOOT58> START 200<RET> ! Starts VMB and the
! booting of VMS.
```

- 6) Continue installing VMS by answering all questions. When VMS is loaded, the installation process performs a shutdown with an automatic reboot. This reboot fails if the default boot device has not been defined using the EBUCA utility. Boot the system as described in step 12a.

NOTE

See the appropriate booklet (Installing VAX/VMS on a VAX 8200/8300 from <media type>) from the VAX/VMS installation procedures package for more detailed instructions on building VAX/VMS.

3.5.2 Building the System Maintenance (SYSMAINT) Account

1. Boot VMS. See Section 3.5.1, steps 4 through 12.
2. Enter the date and time if prompted.
3. Log in:
 USERNAME: FIELD<RET>
 PASSWORD:
4. Load the VAXPAX Field Service distribution media onto the appropriate device and mount it:

```
$ MOU ddu: VAXPAX<RET>    ! dd is the device type.  
                           ! n is the controller letter.  
                           ! u is the unit number.
```

Copy the DUCT file:

```
$ COPY<RET>  
_From: ddu:[SYSMAINT]DUCT.EXE<RET>  
_To: SYS$MAINTENANCE:*<RET>
```

6. Run DUCT:

\$ RUN DUCT<RET>

- a. Select "Initialize" from the DUCT menu. Follow the directions and answer the questions.

DUCT sizes the system and reports its findings.

- b. Select "Execute." Select an entry from the Execute menu.

DUCT copies from the VAXPAX media all appropriate diagnostics and drivers, VDS, and DIAGBOOT.EXE.

NOTE

When DUCT is finished, type the following command to check that DIAGBOOT.EXE is contiguous:

\$ DIR/FULL DIAGBOOT.EXE<RET>

Look for the word "contiguous" in the "File attributes" line. If the file is not contiguous, do the following:

\$ COPY/CONTIGUOUS DIAGBOOT.EXE *.*<RET>
\$ PURGE DIAGBOOT.EXE<RET>

Appendix A contains excerpts from the DUCT help file.

7. Continue the acceptance procedure by running on-line diagnostics specific to the system under test.

8. If stand-alone diagnostics must be run, do the following:

- a. Type \$ @SYS\$SYSTEM:SHUTDOWN<RET>

- b. Answer the questions.

- c. Type CTRL/P when instructed to do so.

d. Boot the diagnostic supervisor:

- 1) If the system disk is not on an HSC controller, type the following:

```

>>> B/R5:10 DUn<RET> ! n is the VAXBI node
! number of the adapter
! supporting the system
! disk.
! u is the disk unit
! number.

```

- 2) If the system disk is on an HSC controller, do the following:

a) Insert the console diskette.

b) Type the following commands:

```

>>> B/R5:800 CSA1<RET>
BOOT58> D/G 0 20<RET>
BOOT58> D/G 1 n<RET> ! n is the VAXBI node
! number (hex) of
! the CI adapter.
BOOT58> D/G 2 {p!0p0q<RET> ! p if one HSC
! 0p0q if two
! HSCs
! p and q are
! CI node
! numbers
! (hex) of
! the HSC
! controllers.
BOOT58> D/G 3 u<RET> ! u is the unit number
! (hex) of the boot
! device connected
! to the HSC.
BOOT58> D/G 5 10<RET>
BOOT58> D/G E 200<RET>
BOOT58> LOAD VMB.EXE/START:200<RET>
BOOT58> START 200<RET>

```

e. Attach the processor.

- f. Attach the devices to be tested. Refer to the help files of the diagnostics to be run for specific information on attaching these devices, or run the VAX stand-alone autosizer, EVSBA.

3.5.3 Running VAX/VMS UETP

See the booklet *Running the UETP after Installation* from the VAX/VMS installation procedures package for instructions on running UETP.

3.6 INSTALLING ULTRIX AND RUNNING SYSTEM EXERCISERS

3.6.1 Installing ULTRIX

1. Load the ULTRIX distribution tape or disk, labeled ULTRIX V \times . \times System Software.
2. Spin up the system disk.
3. After the console prompt (>>>) is displayed at the console terminal, insert the diskette labeled "System Software Boot" in CSA1.
4. At the console terminal, type the following:

```
>>> b csa1<RET>
Boot
```

NOTE

ULTRIX is case sensitive. Anything typed in response to the ULTRIX prompt (:) must be in the case shown. Check that Caps Lock on the keyboard is not set.

5. After the ULTRIX prompt (:) is displayed at the console terminal, type the following:

```
: cs(1,0)copy<RET>
nnnnn+nnnn+nnnnnn start 0x0 ! n indicates number
```

6. Specify the source device for the copy program.
 - a. If the source device is a tape, type the following:

```
From: w(x,1)<RET> ! w is the ULTRIX tape
! device name
! (Table 3-6).
! x is calculated as
! follows:
! x = (adapter_number x
! 8) + device_unit_number
```

- b. If the source device is a disk, type the following:

```
From: ra(y,2)mini<RET>    ! y is the unit number of
                          ! the distribution disk
```

Table 3-6: ULTRIX Device Names

Device Type	Device Name	ULTRIX Name
Disk	RA60	ra
	RA80	ra
	RA81	ra
Tape	TU80	ts
	TU81	tms

7. Specify the destination device for the copy program.

```
To: ra(z,1)<RET>        ! z is the unit number of the
                          ! system disk
```

```
Copy completed: 300 records copied
```

8. Type the following:

```
From: ^P
>>> i<RET>
>>> b csa1<RET>
Boot
: ra(z,1)vmunix<RET>    ! z is the unit number of the
                          ! system disk
```

9. For the remainder of the ULTRIX installation procedure, you must answer a series of questions. Follow the instructions displayed at the console terminal.

3.6.2 Running ULTRIX System Exercisers

1. Sign on the system as superuser.
2. Change the directory to /usr/field by typing the following:

```
# cd /usr/field<RET>
```
3. Use the following command to type the Readmefirst file, which contains instructions for running the system exercisers:

```
# cat Readmefirst<RET>
```
4. Follow the instructions in the Readmefirst file.

3.7 POWER-OFF PROCEDURE

1. Shut down the operating system.
 - a. If the operating system is VMS, type:

```
$ @SYS$SYSTEM:SHUTDOWN<RET>
```

Answer all questions.
 - b. If the operating system is ULTRIX, sign on as superuser and type:

```
: shutdown -h +xx<RET>      ! xx is the number of  
                             !   minutes until  
                             !   shutdown.
```
2. Turn the top keyswitch to Enable.
3. Type **CTRL/P** at the console terminal to halt the system when indicated by the operating system.
4. Turn the top keyswitch counterclockwise until it stops.

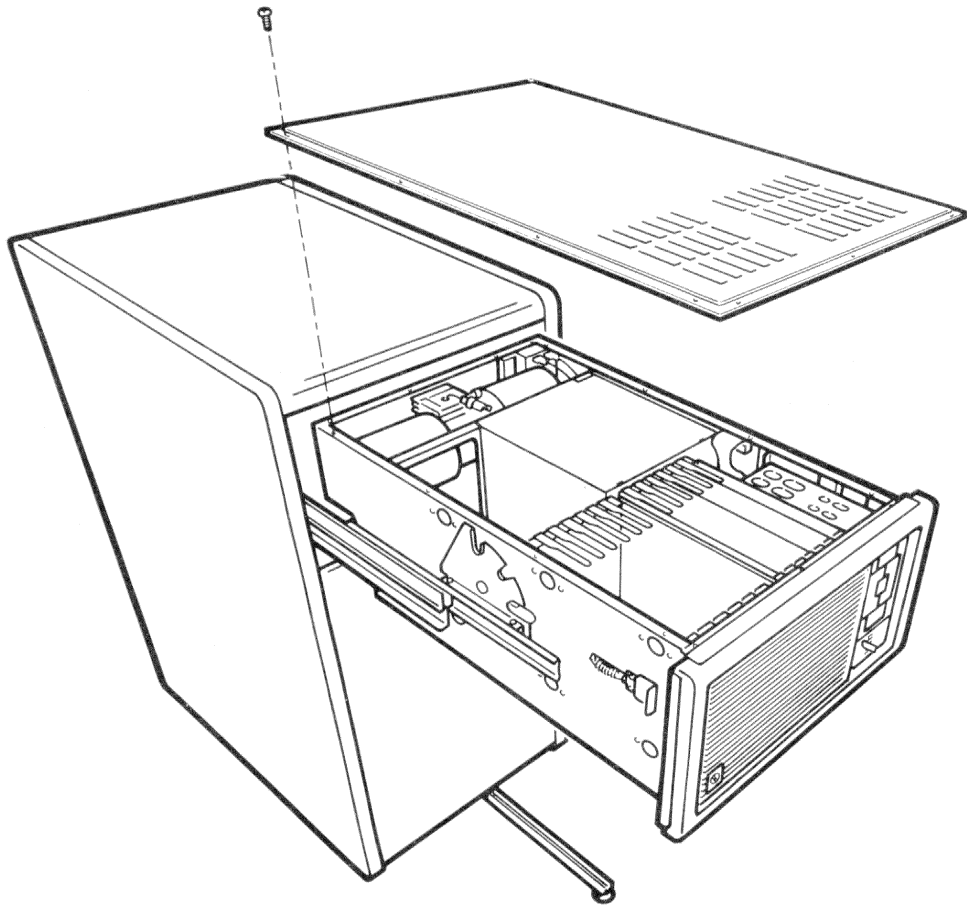
Section II
12-VAXBI Slot Cabinet

Options Installation in a 12-VAXBI Slot Cabinet **4**

WARNING

Shut off system power and disconnect the main system power cord before performing any procedure in this chapter.

The processor cabinet stabilizer leg must be extended whenever the BA32 box is pulled out (Figure 4-1). If you have trouble extending the stabilizer leg, adjust the leveler foot on the stabilizer leg.



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Figure 4-1: Processor Cabinet with BA32 Box and Stabilizer Leg Extended

4.1 VAXBI MODULES OVERVIEW

4.1.1 Electrostatic Discharge Precautions

CAUTION

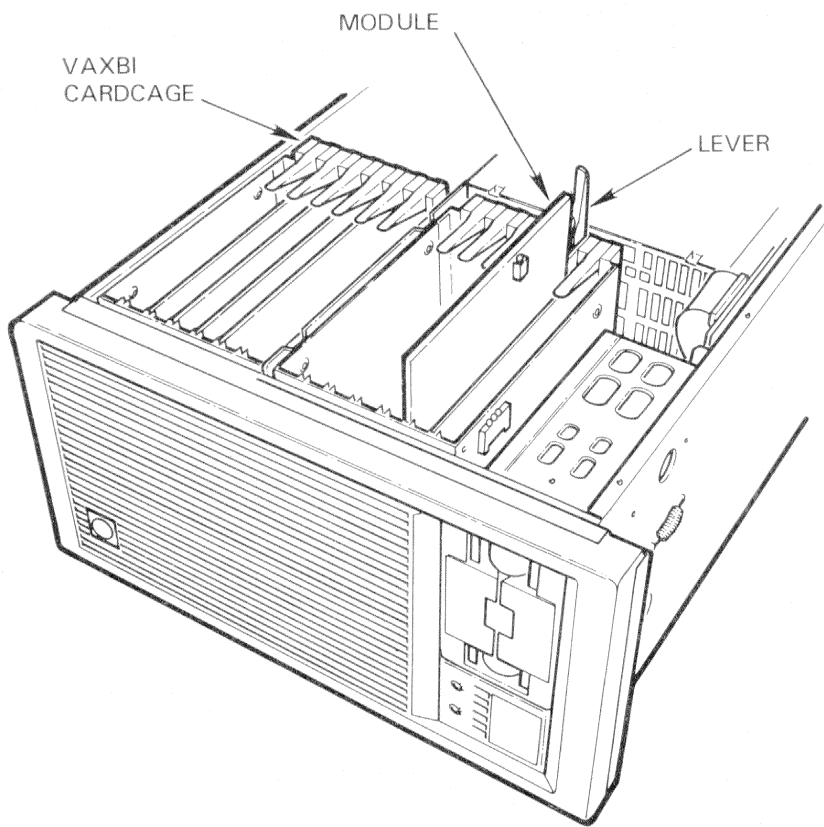
You must wear an anti-static wrist strap connected to the processor cabinet whenever you work on the VAX 8200/8300.

4.1.1.1 Anti-Static Wrist Strap – The anti-static wrist strap is located behind the processor cabinet front panel. Using a 5/32 inch Allen wrench, unlatch the locks that hold the panel in place. The wrist strap is located inside the cabinet and it is connected to ground. Slip this wrist strap on your wrist before performing any of the following procedures.

4.1.1.2 Conductive Module Containers – Whenever you remove a VAXBI module from the cardcage, place it in a conductive container.

4.1.2 Module Installation (No Cable Set)

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Lift the lever of the VAXBI cardcage slot into which the module will be placed (Figure 4-2).
6. Open the conductive container that houses the module.
7. If a module is being replaced, remove the module presently in the slot and place it in the empty half of the conductive container.
8. Remove the module to be installed from the conductive container and insert it into the VAXBI cardcage slot (Figure 4-2).
9. Return the lever of the VAXBI cardcage slot to the locked position.
10. Replace the BA32 box top cover.
11. Slide the BA32 box into the cabinet.
12. Replace the processor cabinet front and rear doors.



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Figure 4-2: VAXBI Module Installation

4.1.3.2 Module Placement Rules -

1. The maximum number of VAXBI modules is 12.
2. The primary CPU module (KA820) must be installed in K1J1. Slot K1J1 must have VAXBI node ID 2.
3. The DWBUA module must be installed in slot K1J2. Slot K1J2 must have node ID 0. A system may have no more than one DWBUA.
4. With the exception of the CIBCI, all multi-module options are installed so that the module with the BIIC is placed to the right of the other modules in the option module set. (That is, the module with the BIIC must be closer to the primary processor module than is the other module in the option set.) The node ID plug must be installed on the backplane of the slot holding the module with the BIIC. (In the CIBCI option module set, the module with the BIIC is installed to the left of the other module.)
5. All modules of a multi-module option must be installed in adjacent slots within the same cardcage.
6. No other type of module may be installed to the left of an MS820-BA. All that may be immediately to the left of an MS820-BA is the side wall of the VAXBI cardcage, an empty slot, or another MS820-BA.
7. All DEBNT modules must have higher node IDs than any KLESI-B. If any DEBNT has a node ID lower than any KLESI-B, a fatal bug check will result when running VAX/VMS V4.4.
8. The power available to VAXBI options is limited. Check power totals against the values in the *VAXBI Options Handbook*.
9. The I/O panel space available for VAXBI options is limited. See Table 4-1.
10. The maximum number of various options allowed in the 12-VAXBI slot cabinet is listed in Table 4-2.

Table 4-1: I/O Panel Space Usage

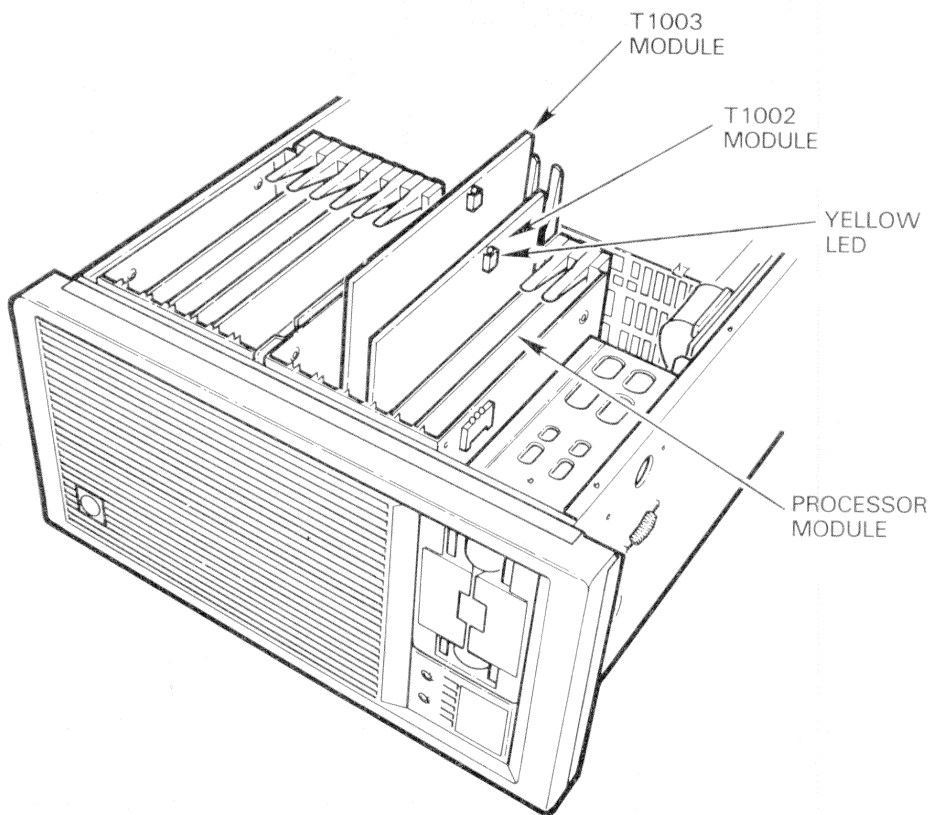
Option	Number of Modules	Number of I/O Panel Units	Notes
KA820	1	2	Primary processor uses 2 I/O panel units; attached processor uses none
DWBUA	1	0	Cables to the UNIBUS expansion cabinet through the cabinet sidewalls
CIBCI	2	0	Cables to the CIPA cabinet through the cabinet sidewalls
KDB50	2	2	One to four RA** disks
MS820-A	1	0	2M byte memory module
MS820-B	1	0	4M byte memory module
DRB32-M	1	0	Cables directly to user's I/O
DRB32-E	2	2	
DRB32-W	2	0	Cables directly to user's I/O
DMB32	1	4	10 lines: 8 asynchronous, 1 synchronous, and 1 printer
KLESI-B	1	1	TU81E only
DEBNT	1	2	Uses 2 I/O panel units if only the Ethernet (NI) is used; optionally, uses 4 I/O panel units if the cabinet kit for TK50 is added

Table 4-2: Option Limits in 12-VAXBI Slot Cabinet

Option	Maximum in 12-VAXBI Slot Cabinet
KA820	2
MS820-AA	8
MS820-BA	6
MS820-AA and MS820-BA combined	6
Storage options (KDB50 and CIBCI combined)	2
KLESI-B	1
DMB32	2
DRB32-M, DRB32-W, and DRB32-E combined	2
DEBNT	1

4.2 KDB50 INSTALLATION

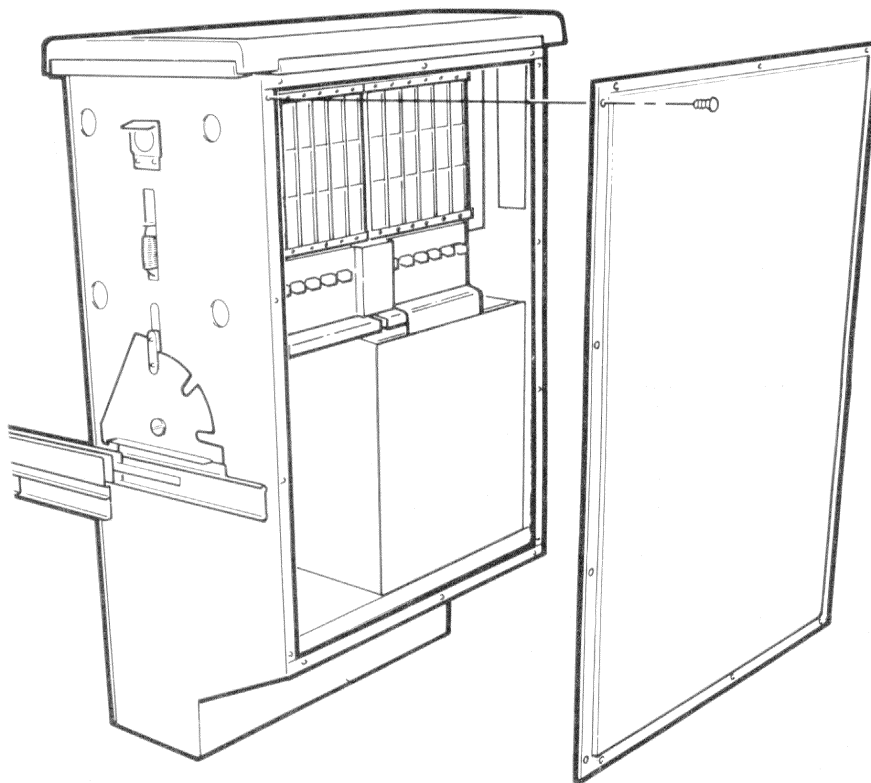
1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1002 and T1003 modules in the VAXBI cardcage (Figure 4-4). Place T1002 nearer to the processor module and T1003 adjacent to T1002.



MKV85-1920

Figure 4-4: Inserting KDB50 Modules

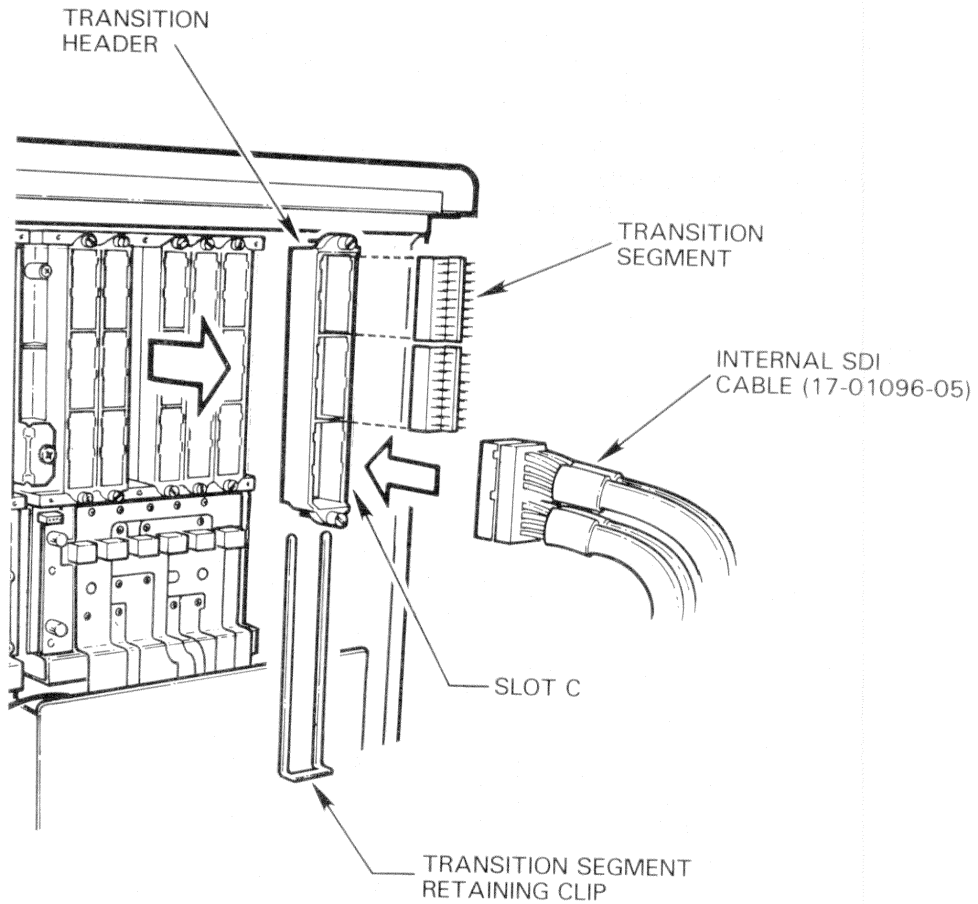
6. Attach the KDB50 backplane I/O assembly to the backplane of the VAXBI cardcage using the following procedure (Figure 4-5):
 - a. Rotate the BA32 box up and remove the bottom cover (Figure 4-5).



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Figure 4-5: BA32 Box Bottom Cover Removal

- b. Remove the protective shipping material from the transition end of the internal SDI cable assembly.
- c. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition end of the internal SDI cable into the box. Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1003 module.

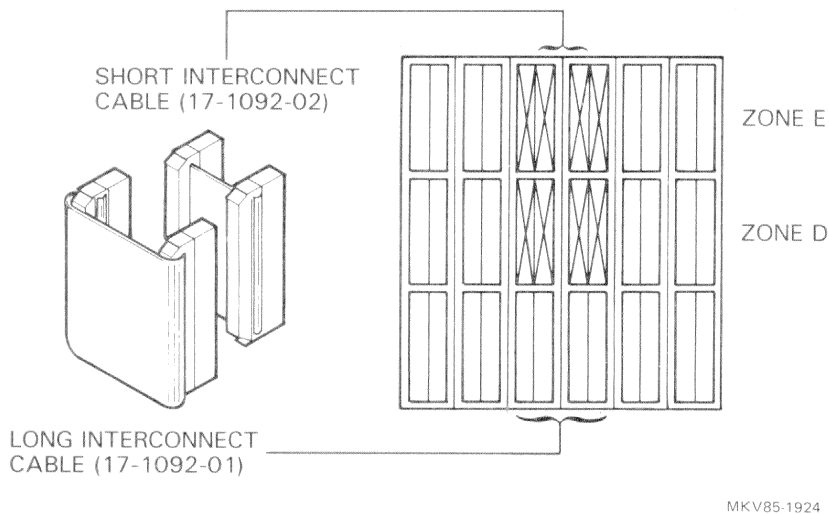


MKV85-1923

Figure 4-6: KDB50 Transition Header Assembly

- d. Remove the transition segment retaining clip from one of the transition headers in the option kit.
- e. Remove the slot C transition segment. Insert the transition end of the internal SDI cable [17-01096-05 (8 ft) or 17-01096-06 (12 ft)] into slot C of the transition header housing.

- f. Replace the retaining clip. Check that the two remaining transition segments and the transition end of the SDI cable are secure within the transition header assembly.
- g. Attach this transition header assembly to the VAXBI backplane of the slot holding the T1003 module. Tighten the screws in stages; do not tighten one completely before tightening the other. Torque both screws to 5 ± 1 inch-pounds using the torque screwdriver (29-27381-00) from the field service kit.
- h. Attach the other transition header to the backplane of the slot holding the T1002 module.
- i. Connect the T1002 and T1003 transition headers as follows (Figure 4-7):



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Figure 4-7: Connecting KDB50 Transition Headers

- 1) Insert the short interconnect cables (17-01092-02) on the inside rows of pins on zone D and zone E. The cable ground plane should face out, away from the backplane.
- 2) Insert the long interconnect cables (17-01092-01) on the outside rows of pins on zone D and zone E. The cable ground plane should be out, away from the backplane.

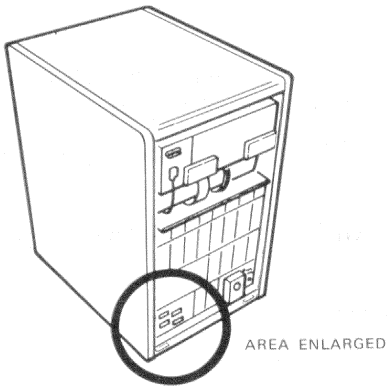
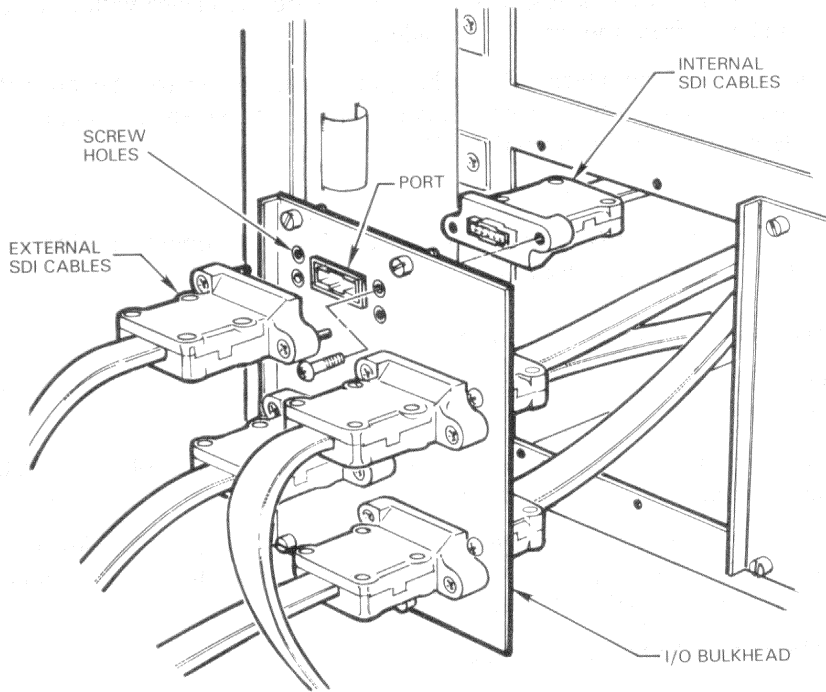
7. Dress the internal SDI cables, fan-fold style. Secure the cables with a tie-lock, 25.4 cm (10 in) from the transition header.
8. Continue to dress the internal SDI cables, being careful not to interfere with other cables or the bottom cover (when it is attached). When finished, close the cable restraint at the rear of the BA32 box.

NOTE

Route the internal SDI cables separately from the power cables inside the processor cabinet.

9. Replace the BA32 box bottom cover.
10. Attach the I/O bulkhead on the processor cabinet using the following procedure (Figure 4-8):
 - a. Bring the internal SDI cables through the opening of one of the available option bulkhead panels at the back of the cabinet.
 - b. Screw the internal SDI cables (J1 through J4) into the small holes on either side of each port on the I/O bulkhead (Figure 4-8). Turn two of the keyed internal SDI cables one-half turn.
 - c. Mount the I/O bulkhead on the option bulkhead panel.
11. Attach the keyed external SDI cables to the processor cabinet I/O bulkhead (Figure 4-8).
12. Replace the BA32 box top cover.
13. Power up the system. The KDB50 self-test runs upon power up. Check that the yellow LEDs on the T1002 and T1003 modules light (Figure 4-4).

If the yellow LEDs do not light, refer to the *KDB50 Disk Controller User Guide* (EK-KDB50-UG).
14. Refer to the *KDB50 Disk Controller User Guide* for the complete acceptance procedure.
15. Slide the BA32 box into the processor cabinet.
16. Replace the processor cabinet front and rear doors.



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Figure 4-8: SDI Cable Installation in an I/O Bulkhead

4.3 DWBUA INSTALLATION

NOTE

Multiple DWBUAs are not supported in a VAX 8200/8300 system.

4.3.1 DWBUA Installation with the UNIBUS Backplane in the UNIBUS Expansion Cabinet

1. Remove the shielded tape from the processor cabinet RFI shield waveguide (see note below) and attach the waveguide bracket to the outside of the processor cabinet, inserting the screws from inside the cabinet. Save the other set of screws.

NOTE

If cables are to be passed through only one waveguide, install a bracket only on the waveguide that will be used. Do not remove the tape from the other waveguide.

2. Remove the side panel from the processor cabinet and install it on the UNIBUS expansion cabinet.
3. Place the fill panel between the cabinets (Figure 4-9).
4. Line up the keys on the processor and UNIBUS expansion cabinets.
5. Attach the RFI shield waveguide screws to the bracket from inside the UNIBUS expansion cabinet, bolting the two cabinets together (Figure 4-10).
6. Bolt the processor and UNIBUS expansion cabinets together, front and rear, using the brackets provided (Figure 4-11).
7. Connect the UNIBUS cables.
8. Connect the power bus cable (Figure 4-12).

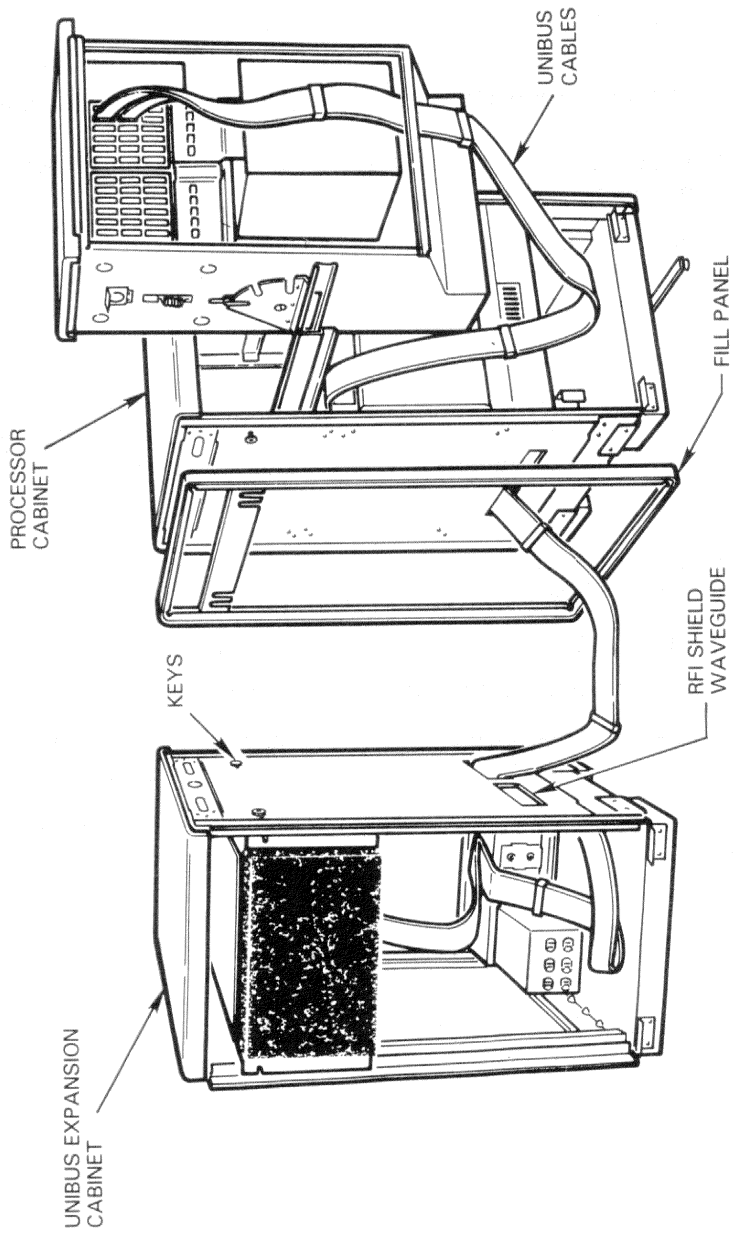
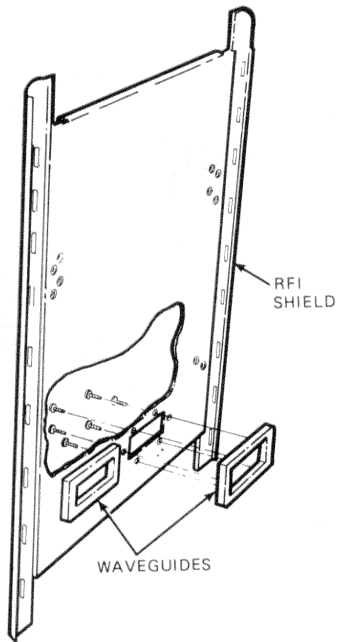


Figure 4-9: Joining the Processor and the UNIBUS Expansion Cabinets



MKV85-1537

Figure 4-10: RFI Shield Waveguide Installation

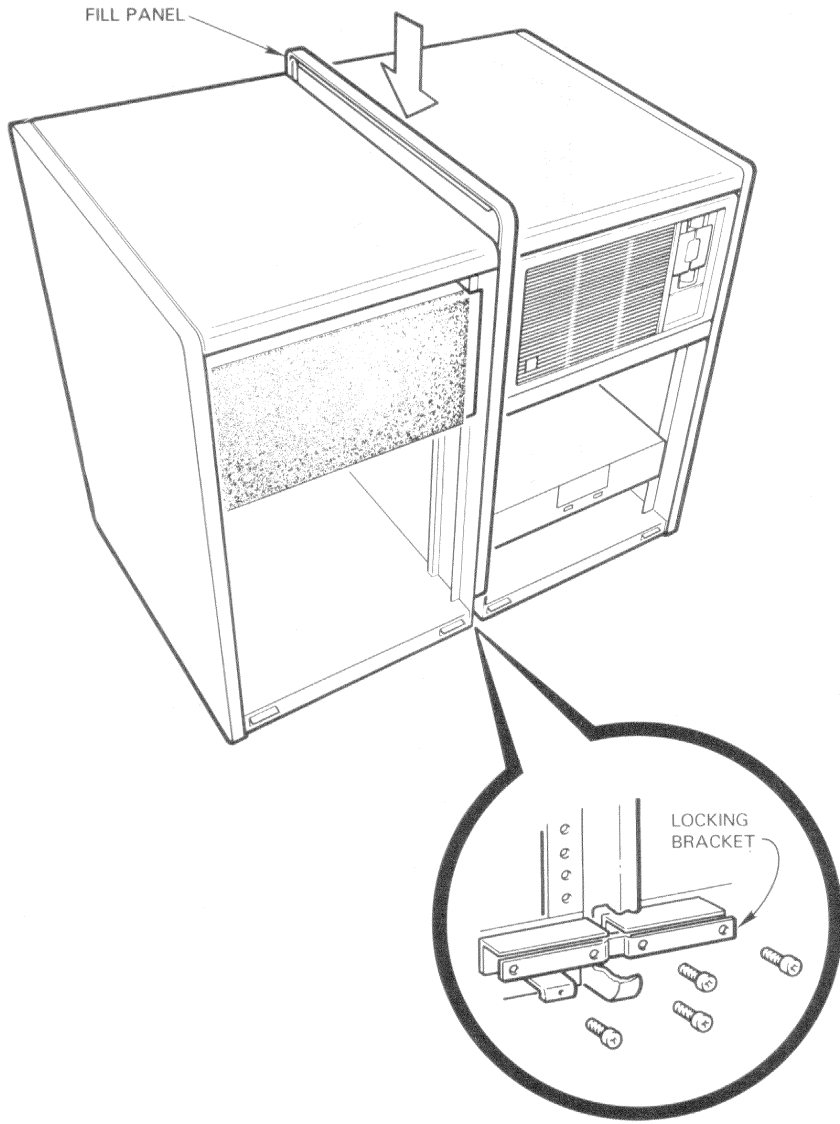
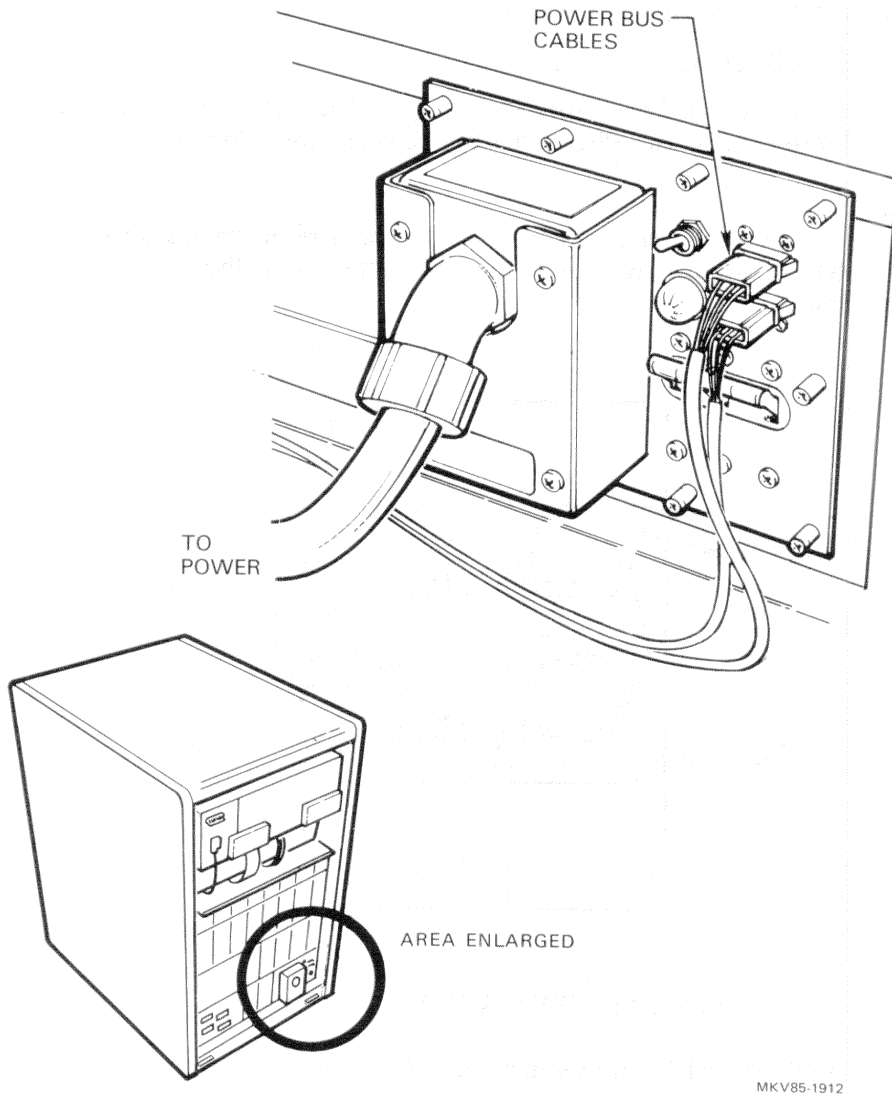


Figure 4-11: Attaching Processor and UNIBUS Cabinets



MKV85-1912

Figure 4-12: Connecting the Power Bus Cable

9. Slide the BA11 box out of the cabinet.
10. Remove the BA11 box top cover.
11. Label each end of the four UNIBUS cables (J1 through J4). Attach the cables to the M7166 paddle card (Figure 4-13). The connector is keyed.

NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector in the receptacle.

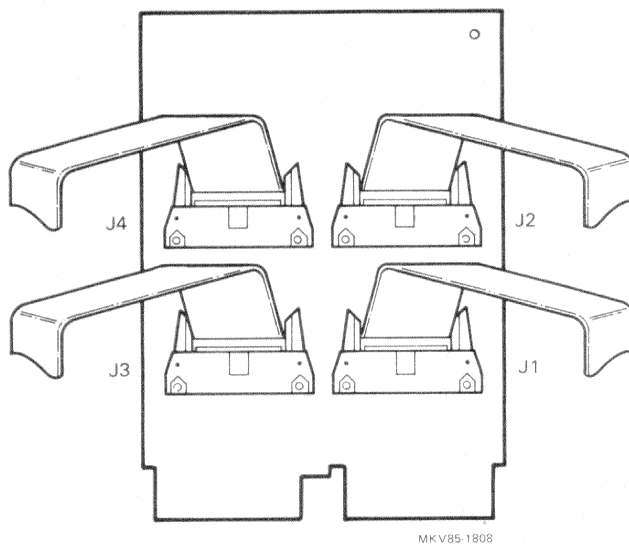


Figure 4-13: DWBUA M7166 Paddle Card

12. Pass the M7166 paddle card through the RFI shield waveguide.
13. Remove the cable hold-down bar in the bottom of the UNIBUS expansion cabinet. Lay the cables on the guide and replace the bar.
14. From the rear of the cabinet, remove the cable hold-down bar below the BA11 box. Lay the cables on the guide and replace the bar. Leave enough slack to enable the BA11 box to be pulled out and rotated up.

15. Insert the M7166 paddle card into slot 1, segments A and B, of the UNIBUS backplane (Figure 4-14).
16. Insert the M9313 UET module into the last slot, segments A and B, of the UNIBUS backplane (Figure 4-14).

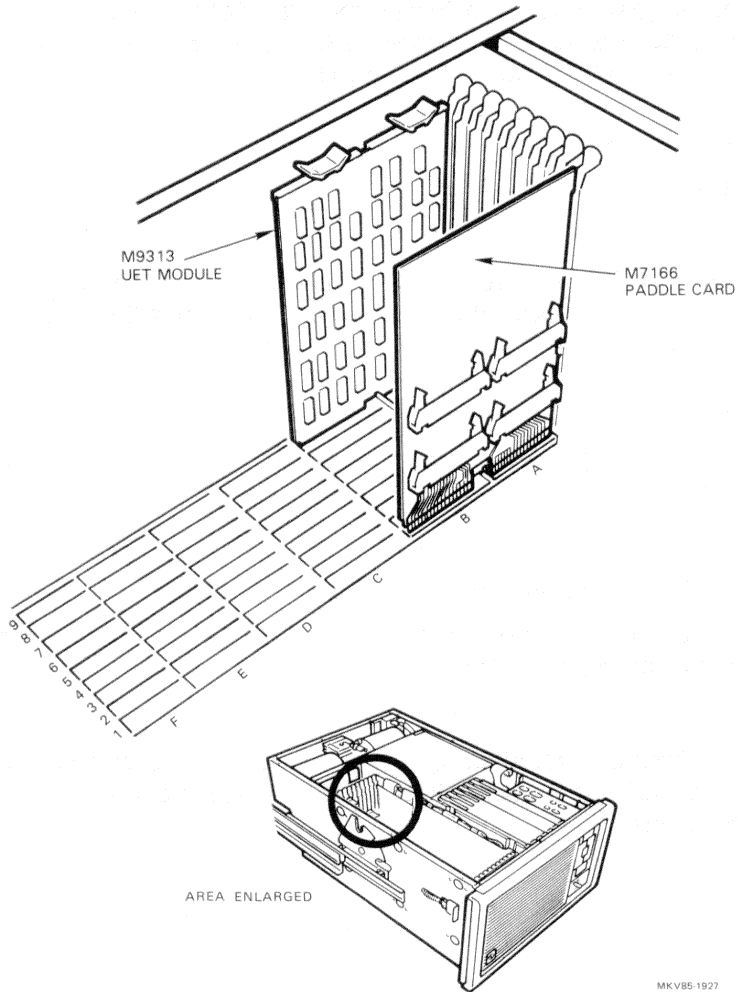


Figure 4-14: UNIBUS Backplane Showing the M7166 and M9313 Installed

17. Insert grant continuity cards in segment D of all unused UNIBUS slots.

NOTE

The BA11-AY/AZ UNIBUS box requires a load of at least 750 mA on -15 V to operate. Some BA11s may have a preload in the H7204, in place of the power cable to the third DD11 backplane. If a third DD11 is being added and a preload is needed, install an M9049 preload module in the leftmost slot of the third DD11. Place the M9313 module in segments A and B, and the M9049 module in segments C and D of this slot.

18. Replace the BA11 box top cover.
19. Slide the BA11 box into the cabinet.

NOTE

When sliding the BA11 box into the cabinet, take care not to pinch the cables between the bottom of the box and the upper cable restraint bracket.

20. Remove processor cabinet front and rear doors.
21. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
22. Slide the BA32 box out of the cabinet.
23. Rotate the BA32 box up and remove the bottom cover.
24. Install the transition header on the backplane of K1J2 in the slot that will hold the T1010 module (Figure 4-15).

NOTE

When installing the transition header, use only the torque screwdriver (29-17381-00) provided in the field service kit. Torque to 5±1 inch-pounds.

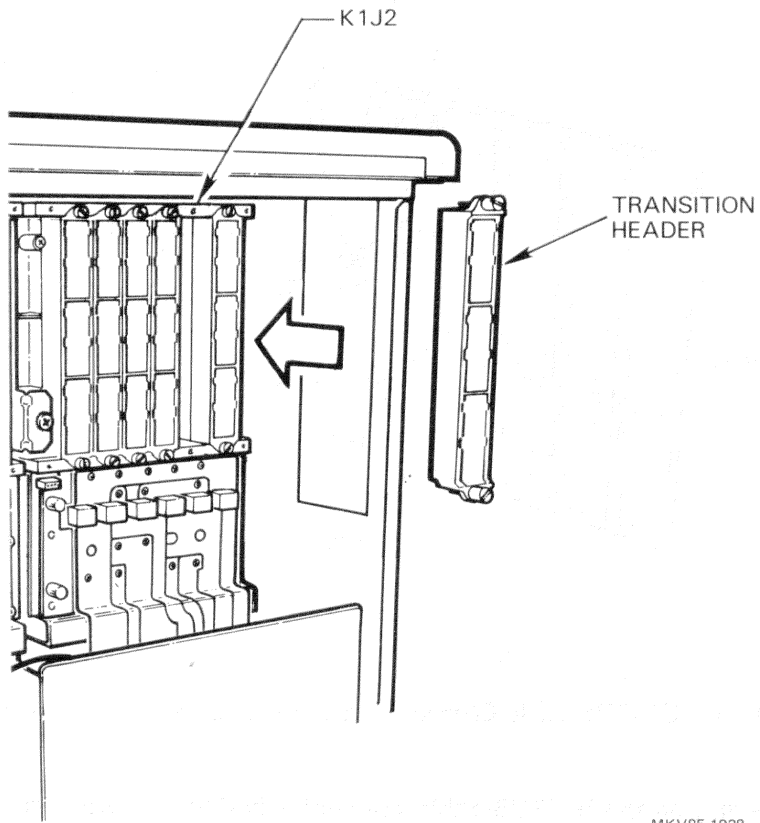
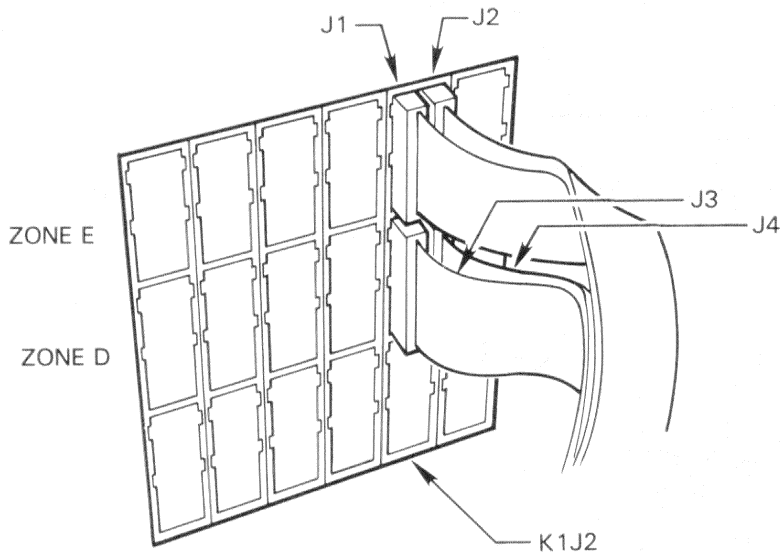


Figure 4-15: VAXBI Transition Header Installation on J2

25. Refer to Figure 4-16 and connect the four UNIBUS cables to the transition header assembly. The connector is keyed.



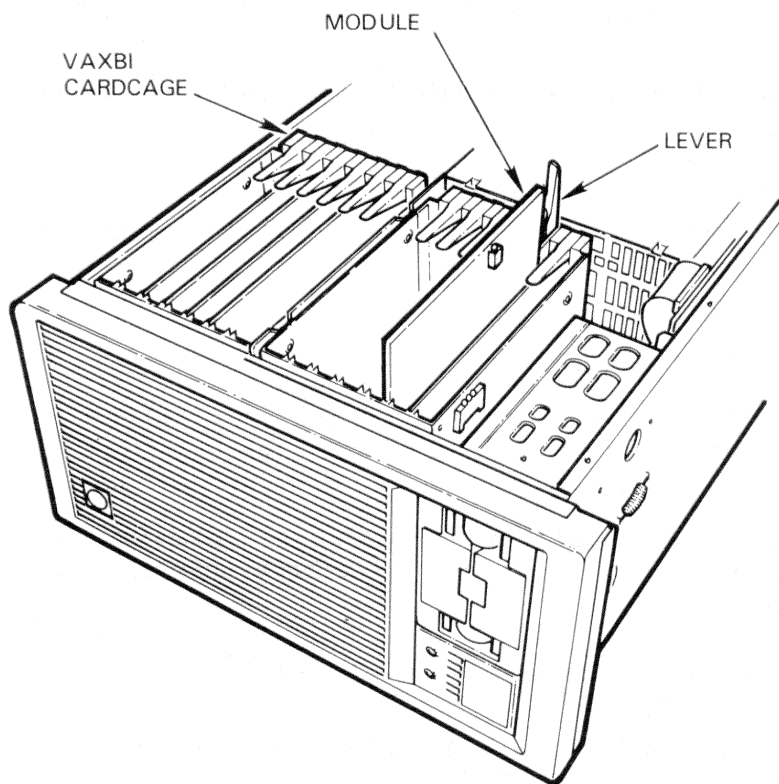
MKV85-1929

Figure 4-16: UNIBUS Cable Connections (UNIBUS in Expansion Cabinet)

NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector in the receptacle.

26. Check that the node ID 0 plug is installed.
27. Replace the BA32 box bottom cover.
28. Rotate the BA32 box down and remove the top cover.
29. Insert the T1010 module into slot K1J2 of the VAXBI cardcage (Figure 4-17).
30. Install the power bus cable from the processor cabinet to the UNIBUS expansion cabinet.
31. Replace the BA32 box top cover.



MKV85-1919

Figure 4-17: Inserting the DWBUA Module (UNIBUS in the UNIBUS Expansion Cabinet)

32. Power up the system. The DWBUA self-test runs upon power up. Check that the yellow LED on the T1010 module lights.
If the yellow LED does not light, see Section 2.5 of the *DWBUA UNIBUS Adapter Technical Manual* (EK-DWBUA-TM).
33. Run two full passes of EVCBB, the DWBUA macrodiagnostic program. For the complete acceptance procedure, see the *DWBUA UNIBUS Adapter Technical Manual*.
34. Slide the BA32 box into the cabinet.
35. Replace the processor cabinet front and rear doors.

4.3.2 DWBUA Installation with the UNIBUS Backplane in the BA32 Box

NOTE

Installation of the DWBUA in the BA32 box is typically performed at the factory.

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Attach the four UNIBUS cables to the M7166 paddle card (Figure 4-13). The connector is keyed.

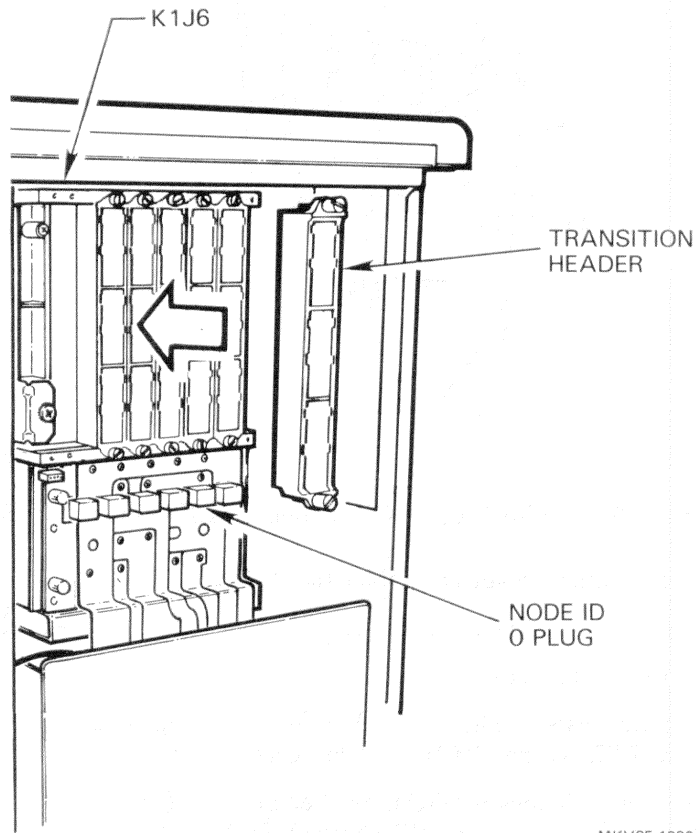
NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector into the receptacle.

6. Insert the M7166 paddle card into slot 1, zones A and B, of the UNIBUS backplane (Figure 4-14).
7. Insert the M9313 UET module into the last slot, zones A and B, of the UNIBUS backplane (Figure 4-14).
8. Insert grant continuity cards into all unused UNIBUS slots.
9. Rotate the BA32 box up and remove the bottom cover.
10. Install the transition header on the VAXBI backplane of slot K1J6 (the slot that will hold the T1010 module). (See Figure 4-18.)

NOTE

When installing the transition header, use only the torque screwdriver (29-17381-00) provided in the field service kit. Torque to 5±1 inch-pounds.



MKV85-1930

Figure 4-18: VAXBI Transition Header Installation on J6

11. Refer to Figure 4-19 and connect the four UNIBUS cables to the transition header assembly. The connector is keyed.

NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector into the receptacle.

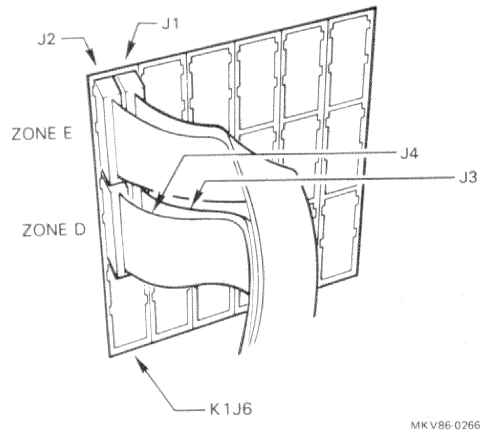
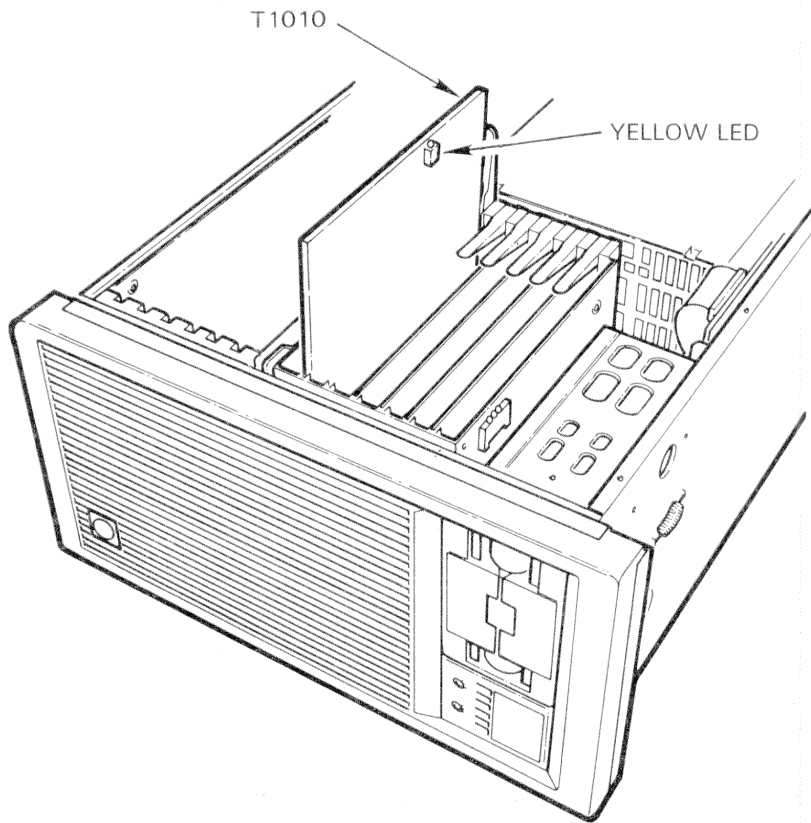


Figure 4-19: UNIBUS Cable Connections (UNIBUS in the BA32 Box)

12. Replace the bottom cover and rotate the BA32 box down.
13. Insert the T1010 module into slot K1J6 of the VAXBI cardcage (Figure 4-20).
14. Replace the BA32 box top cover.
15. Power up the system. The DWBUA self-test runs upon power up. Check that the yellow LED on the T1010 module lights.

If the yellow LED does not light, see Section 2.5 of the *DWBUA UNIBUS Adapter Technical Manual* (EK-DWBUA-TM).



MKV85-1932

Figure 4-20: Inserting the DWBUA Module (UNIBUS in the BA32 Box)

16. Run two full passes of EVCBB, the DWBUA macrodiagnostic program. For the complete acceptance procedure, see the *DWBUA UNIBUS Adapter Technical Manual*.
17. Slide the BA32 box into the cabinet.
18. Replace the processor cabinet front and rear doors.

4.4 ATTACHED PROCESSOR INSTALLATION (VAX 8300 UPGRADE)

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the attached processor module (T1001) in the appropriate VAXBI slot. Install it as any other module without a cable set (Section 4.1.2).
6. Replace the BA32 box top cover.
7. Power up the system. The self-test runs upon power up. Check that the yellow LED on the T1001 module lights.
8. Refer to Section 3.4, step 7, for the acceptance procedure.
9. Slide the BA32 box into the processor cabinet.
10. Replace the processor cabinet front and rear doors.
11. Pop the VAX 8200 medallion out from the inside and replace it with the VAX 8300 medallion.
12. Boot VMS.
13. Insert the diskette labeled VAX/VMS 8300 MP KEY BIN RX50 in CSA1.
14. Type the following command. The response should look like the one in Example 4-1.

```
Ⓢ @SYS$UPDATE:VMSINSTAL VMSMPS CSA1<RET>
```

```
$ @SYS$UPDATE:VMSINSTAL VMSMPS CSA1
```

```
VAX/VMS Software Product Installation Procedure X4.5
```

```
It is 15-JUL-1986 at 15:33.
```

```
Enter a question mark (?) at any time for help.
```

```
* Are you satisfied with the backup of your system disk [YES]? yes
```

```
The following products will be processed:
```

```
VMSMPS V4.4
```

```
Beginning installation of VMSMPS V4.4 at 15:34
```

```
%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target  
directories...
```

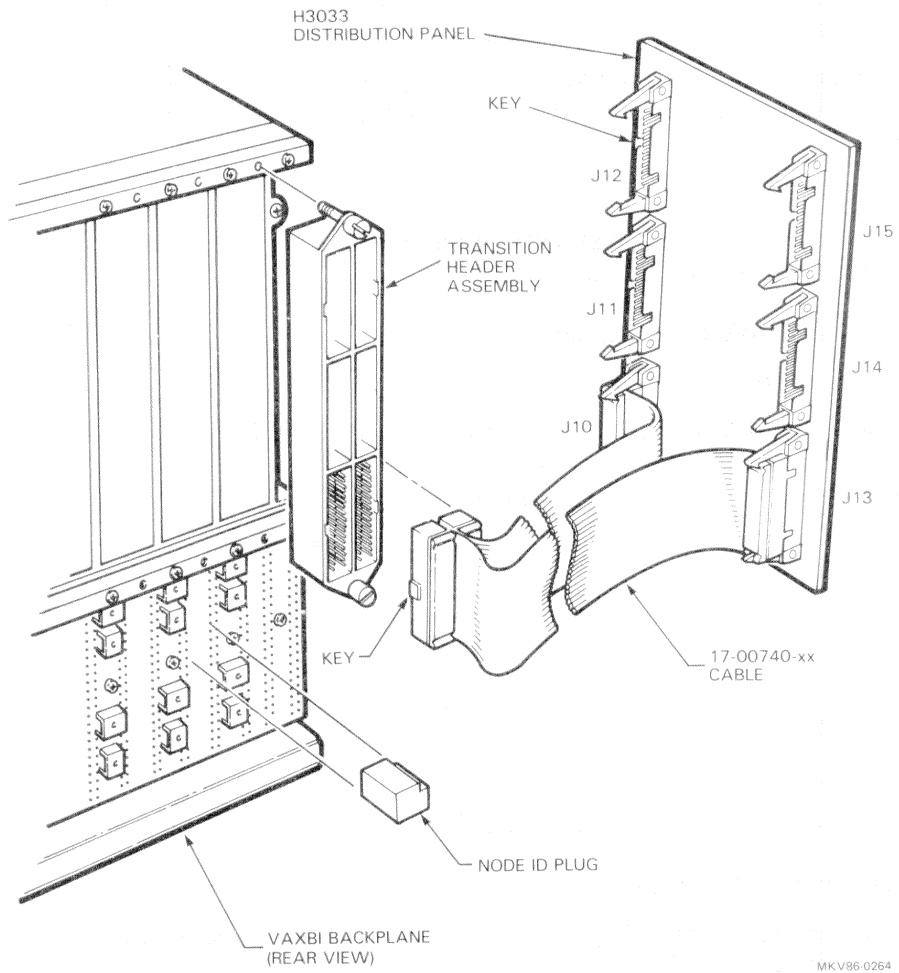
```
Installation of VMSMPS V4.4 completed at 15:34
```

```
VMSINSTAL procedure done at 15:34
```

Example 4-1: Enabling VAX/VMS Multi-Processing on
a VAX 8300

4.5 DMB32 INSTALLATION

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1012 module in the VAXBI cardcage.
6. Rotate the BA32 box up and remove the bottom cover.
7. Install the transition header on the backplane of the slot holding the T1012 module.
8. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition end of the DMB32 cables into the box. Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1012 module.
9. Connect the six DMB32 ribbon cables (17-00740-XX) to the transition header on the backplane of the slot that holds the T1012 module. Both the cable connectors and the sockets on the transition header are keyed to prevent incorrect installation (Figure 4-21).



MKV86-0264

Figure 4-21: DMB32 Installation

10. Dress the DMB32 cables, fan-fold style. Secure the cables with a tie-lock, 25.4 cm (10 in) from the transition header.
11. Continue to dress the DMB32 cables, being careful not to interfere with other cables or the bottom cover (when it is attached). When finished, close the cable restraint at the rear of the BA32 box.

NOTE

Route the DMB32 cables separately from the power cables inside the processor cabinet.

12. Replace the BA32 box bottom cover.
13. Rotate the BA32 box down.
14. Connect the DMB32 cables to the distribution panel (Table 4-3).

Table 4-3: DMB32 Cable Connections

Transition Header Connector	H3033 Distribution Panel Socket
C-1	J10
C-2	J13
D-1	J11
D-2	J14
E-1	J12
E-2	J15

15. Replace the BA32 box top cover.
16. Power up the system. The DMB32 self-test runs upon power up. Check that the yellow LED on the T1012 module lights.
If the yellow LED does not light, refer to the *DMB32 User Guide*.
17. Refer to the *DMB32 User Guide* for the complete acceptance procedure.
18. Slide the BA32 box into the processor cabinet.
19. Replace the processor cabinet front and rear doors.

4.6 KLESI-B INSTALLATION

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Rotate the BA32 box up and remove the bottom cover.
6. Install the transition header on the backplane of the slot that will hold the T1014 module.
7. Feed the double-connector end of the KLESI-B cable through the cable slot at the bottom of the BA32 box. Be sure that the cable does not scrape against the sheet metal edges of the slot.
8. Pull the cable far enough to allow the dual cable connectors to reach the top of the VAXBI backplane assembly with adequate slack.
9. Insert the two cable connectors into zone E of the backplane of the slot that will hold the T1014 module. Check that the connectors are correctly oriented and seated (Figure 4-22).

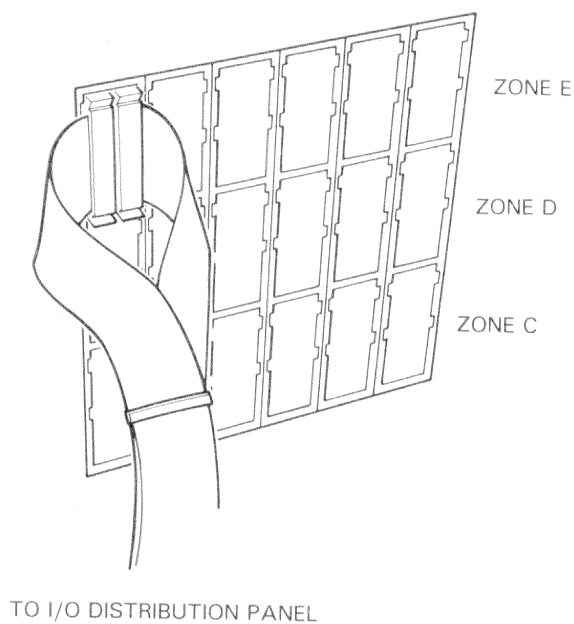


Figure 4-22: KLESI-B Cables

10. Dress the cables.
11. Replace the BA32 box bottom cover.
12. Route the free end of the KLESI-B cable through the cabinet to the I/O distribution panel at the rear of the cabinet.
13. Locate the KLESI-B connector position on the distribution panel.
14. Remove the blank insert for the KLESI-B cable connector.
15. Route the cable through the opening in the panel.
16. Attach the I/O bulkhead panel to the 50-contact connector end of the KLESI-B cable. Use the hex standoffs from the KLESI-B kit. Tighten the hex standoffs.

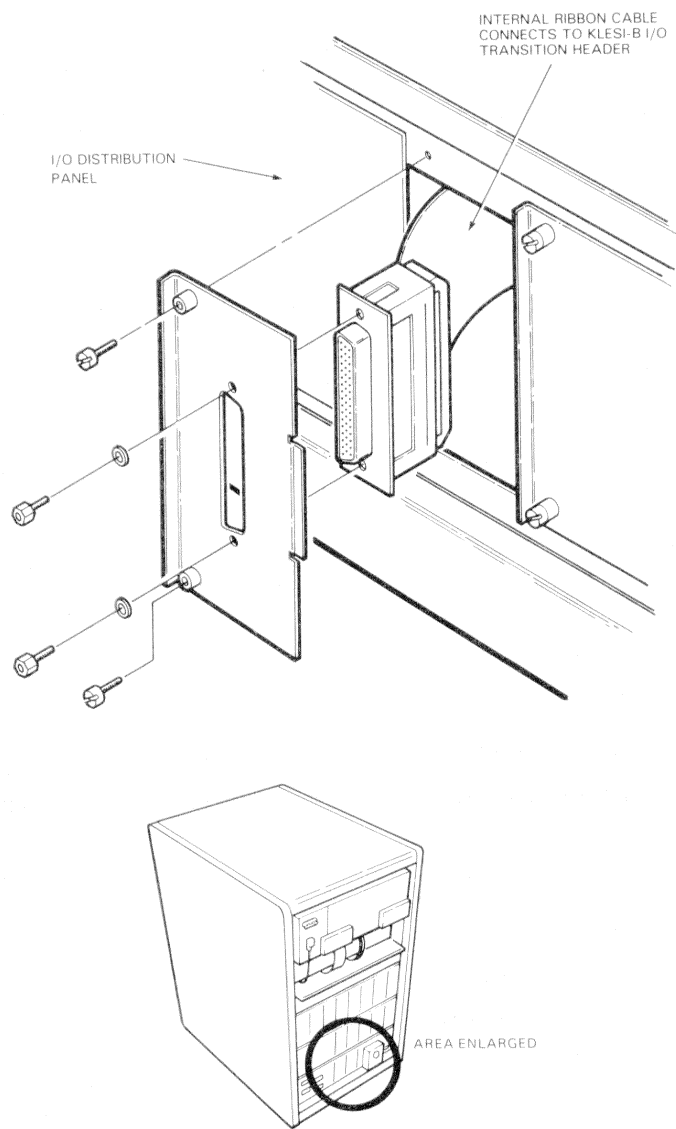


Figure 4-23: KLESI-B I/O Connector

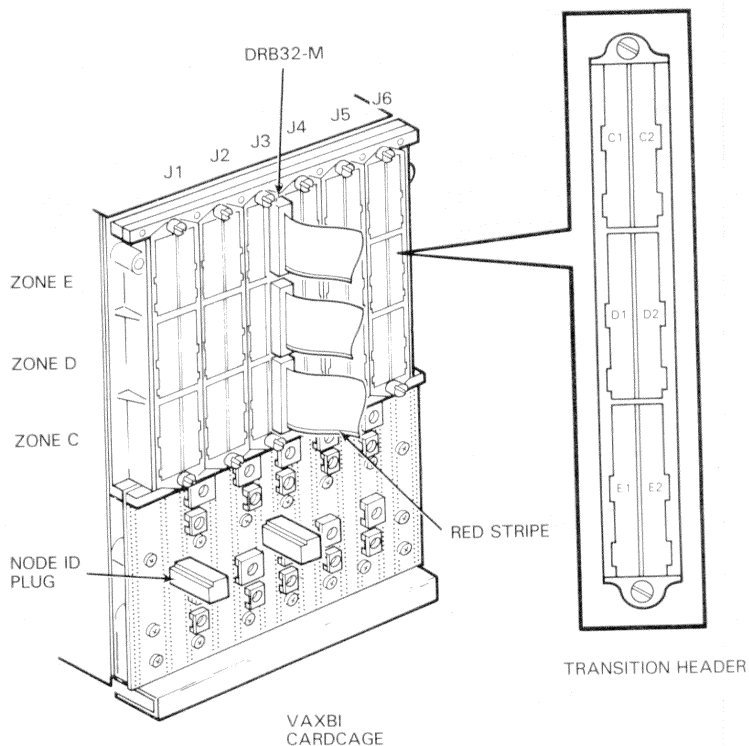
17. Place a helical lockwasher on each of the captive slotted screws supplied in the KLESI-B kit. Thread the screws into the hex standoffs.
18. Install the adapter panel on the I/O distribution panel and tighten the screws.
19. Rotate the BA32 box down.
20. Insert the T1014 module in the VAXBI cardcage.
21. Replace the BA32 box top cover.
22. Power up the system. The KLESI-B self-test runs upon power up. Check that the yellow LED on the T1014 module lights.
If the yellow LED does not light, refer to the *KLESI-B User and Installation Guide*.
23. Refer to *KLESI-B User and Installation Guide* for the complete acceptance procedure.
24. Slide the BA32 box into the processor cabinet.
25. Replace the processor cabinet front and rear doors.

4.7 DRB32 INSTALLATION

4.7.1 DRB32-M Installation

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1022 module in the VAXBI cardcage.
6. Rotate the BA32 box up and remove the bottom cover.
7. Install the transition header on the backplane of the slot holding the T1022 module.
8. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module.

9. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition-header end of the DRB32 cables into the box. (The transition-header end has the key and white arrow on the same side of the connector.) Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1022 module.
10. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1022 module. Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the left side of zones C, D, and E, with the colored stripe up (away from the power cubes).



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Figure 4-24: DRB32-M Cables

11. Route the cables to the location designated by the customer.
12. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock, 25.4 cm (10 in) from the transition header.
13. Continue to dress the DRB32 cables, being careful not to interfere with other cables or the bottom cover (when it is attached). When finished, close the cable restraint at the rear of the BA32 box.

NOTE

Route the DRB32 cables separately from the power cables inside the processor cabinet.

14. Replace the BA32 box bottom cover.
15. Rotate the BA32 box down.
16. Connect the DRB32 cables to the customer's device.
17. Replace the BA32 box top cover.
18. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.

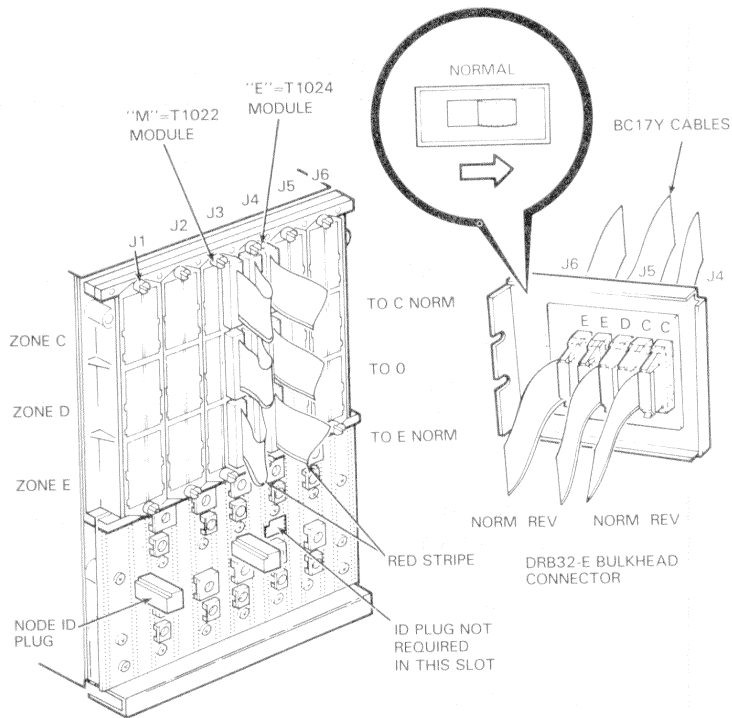
If the yellow LED does not light, refer to the *DRB32 Installation Guide*.

19. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
20. Slide the BA32 box into the processor cabinet.
21. Replace the processor cabinet front and rear doors.

4.7.2 DRB32-E Installation

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1022 and T1024 modules in the VAXBI cardcage. These modules must be installed in two adjacent slots in the same cardcage, and T1022 must be closer to the primary processor module.
6. Rotate the BA32 box up and remove the bottom cover.

7. Install the transition headers on the backplane of the slots holding the T1022 and T1024 modules.
8. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module. The backplane of the slot that holds the T1024 module should have no VAXBI node ID plug.
9. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition-header end of the DRB32 cables into the box. (The transition-header end has the key and white arrow on the same side of the connector.) Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1024 module.
10. Install the interconnect cables (17-01092-02) as shown in Figure 4-25. The colored stripe is up (away from the power cubes).



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Figure 4-25: DRB32-E Cables

11. Install the I/O panel and bulkhead connector on the I/O bulkhead panel.
12. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1024 module. Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the left side of zones C, D, and E, with the colored stripe away from the power cubes. The cable connections are detailed in Table 4-4.

Table 4-4: DRB32-E I/O Cable Connections

Cable End	Identifier	Zone E Connections	Zone D Connections	Zone C Connections
Transition Header	Key and white arrow on same side of connector	Left side of T1024 slot (E2)	Left side of T1024 slot (D2)	Left side of T1024 slot (C2)
IOCP	Key and white arrow on opposite sides of connector	E NORM of I/O panel	D NORM of I/O panel	C NORM of I/O panel

13. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock, 25.4 cm (10 in) from the transition header.
14. Continue to dress the DRB32 cables, being careful not to interfere with other cables or the bottom cover (when it is attached). When finished, close the cable restraint at the rear of the BA32 box.

NOTE

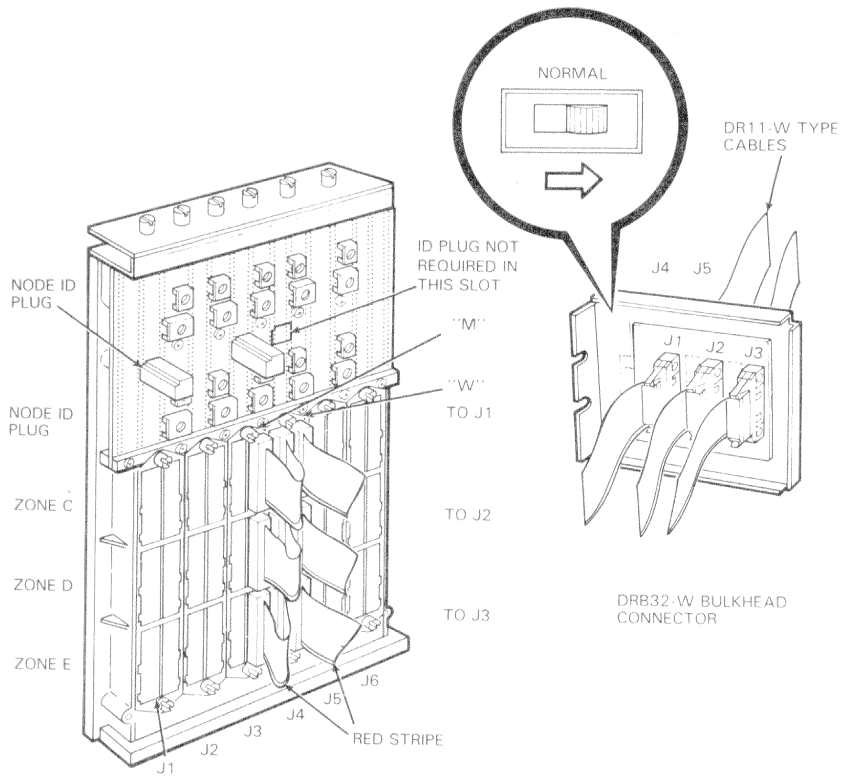
Route the DRB32 cables separately from the power cables inside the processor cabinet.

15. Replace the BA32 box bottom cover.
16. Rotate the BA32 box down.
17. Install the I/O panel and bulkhead connector to the I/O section at the back of the system.
18. Connect the DRB32 cables to the distribution panel, as listed in Table 4-4.

19. Install cables BS17Y-20 or BS17Y-40 to the bulkhead assembly on the outside of the I/O distribution panel. Route them to the location designated by the customer.
20. Replace the BA32 box top cover.
21. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.
If the yellow LED does not light, refer to the *DRB32 Installation Guide*.
22. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
23. Slide the BA32 box into the processor cabinet.
24. Replace the processor cabinet front and rear doors.

4.7.3 DRB32-W Installation

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1022 and T1023 modules in the VAXBI cardcage. These modules must be installed in two adjacent slots in the same cardcage, and T1022 must be closer to the primary processor module.
6. Rotate the BA32 box up and remove the bottom cover.
7. Install the transition headers on the backplane of the slots holding the T1022 and T1023 modules.
8. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module. The backplane of the slot that holds the T1023 module should have no VAXBI node ID plug.
9. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition-header end of the DRB32 cables into the box. (The transition-header end has the key and white arrow on the same side of the connector.) Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1023 module.
10. Install the interconnect cables (17-01092-02) as shown in Figure 4-26. The colored stripe is up (away from the power cubes).



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Figure 4-26: DRB32-W Cables

11. Install the DRB/DR11 cable adapter. If the DR11-W device is in the system cabinet, attach the cable adapter to the system frame. If the DR11-W device is outside of the system cabinet, attach the cable adapter to the system I/O bulkhead.
12. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1023 module. Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the left side of zones C, D, and E, with the colored stripe away from the power cubes. The cable connections are detailed in Table 4-5.

Table 4-5: DRB32-W I/O Cable Connections

Cable End	Identifier	Zone E Connections	Zone D Connections	Zone C Connections
Transition Header	Key and white arrow on same side of connector	Left side of T1023 slot	Left side of T1023 slot	Left side of T1023 slot
IOCP	Key and white arrow on opposite sides of connector	J3 of I/O panel	J2 of I/O panel	J1 of I/O panel

13. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock, 25.4 cm (10 in) from the transition header.
14. Continue to dress the DRB32 cables, being careful not to interfere with other cables or the bottom cover (when it is attached). When finished, close the cable restraint at the rear of the BA32 box.

NOTE

Route the DRB32 cables separately from the power cables inside the processor cabinet.

15. Replace the BA32 box bottom cover.
16. Rotate the BA32 box down.
17. Connect the DRB32 cables to the distribution panel, as listed in Table 4-5.
18. Connect the DR11 cables from the customer's device to the DRB/DR11 adapter.
19. Replace the BA32 box top cover.
20. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.

If the yellow LED does not light, refer to the *DRB32 Installation Guide*.

21. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
22. Slide the BA32 box into the processor cabinet.
23. Replace the processor cabinet front and rear doors.

4.8 DEBNT INSTALLATION

1. Remove processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-14).
3. Slide the BA32 box out of the cabinet.
4. Remove the BA32 box top cover.
5. Insert the T1034 module in the VAXBI cardcage.
6. Rotate the BA32 box up and remove the bottom cover.
7. Install the transition header on the backplane of the slot holding the T1034 module.
8. From the rear of the BA32 box, open the appropriate cable restraint and feed the transition end of the DEBNT cable into the box. Pull enough of the cable into the box to feed the cable under and through the rear brace and up to the backplane of the slot that holds the T1034 module.
9. Connect the DEBNT cable to zone E (left) of the transition header on the backplane of the slot that holds the T1034 module.
10. Connect the 12 V power cable from the power supply distribution board to the pigtail connector on the DEBNT cable.
11. Close the cable restraint at the rear of the BA32 box.

NOTE

Route the DEBNT cables separately from the power cables inside the processor cabinet.

12. Replace the BA32 box bottom cover.

13. Rotate the BA32 box down.
14. Connect the DEBNT cables to the distribution panel.
15. Replace the BA32 box top cover.
16. Power up the system. The DEBNT self-test runs upon power up. Check that the yellow LED on the T1034 module lights.

If the yellow LED does not light, refer to the *DEBNT Ethernet Tape Controller Technical Manual*.

17. Refer to the *DEBNT Ethernet Tape Controller Technical Manual* for the complete acceptance procedure.
18. Slide the BA32 box into the processor cabinet.
19. Replace the processor cabinet front and rear doors.

Hardware Removal and Replacement **5** in a 12-VAXBI Slot Cabinet

WARNING

Shut off system power and disconnect the main system power cord before performing any procedure in this chapter.

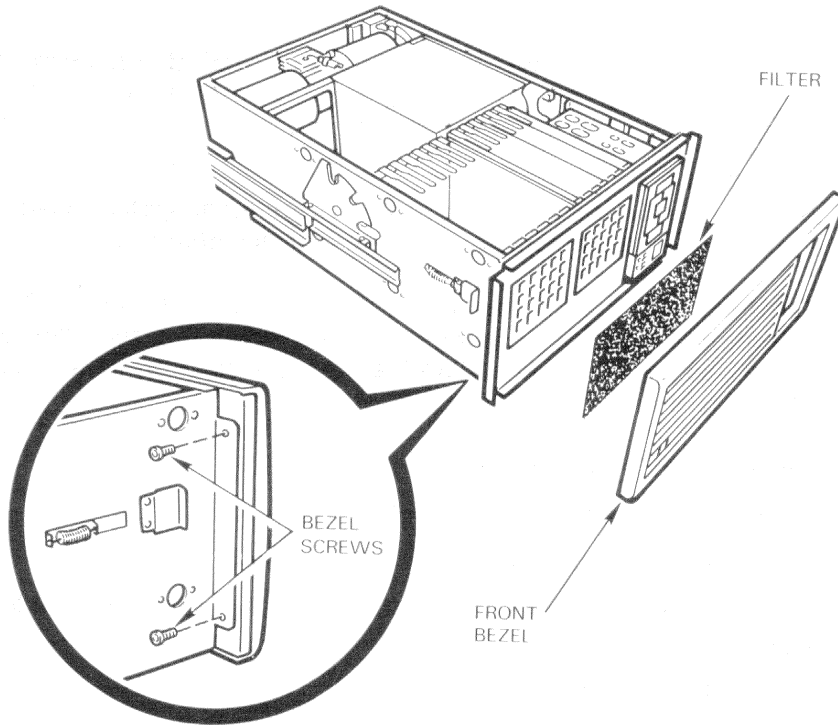
The front stabilizer leg must be pulled out whenever the BA32 box is pulled out. See Figure 4-1 for the location of the stabilizer leg. If you have trouble pulling the stabilizer leg out, adjust the leveler foot on the stabilizer leg.

5.1 FRONT BEZEL AND FILTER

5.1.1 Front Bezel and Filter Removal

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.

4. Remove and save the four screws behind the bezel (two on each side) (Figure 5-1).



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Figure 5-1: Front Bezel Removal/Replacement

5. Remove the bezel.
6. Carefully pull the filter off the fastener strips (Figure 5-1).

5.1.2 Front Bezel and Filter Replacement

To replace the front bezel and the filter, reverse steps 1 through 6 in Section 5.1.1.

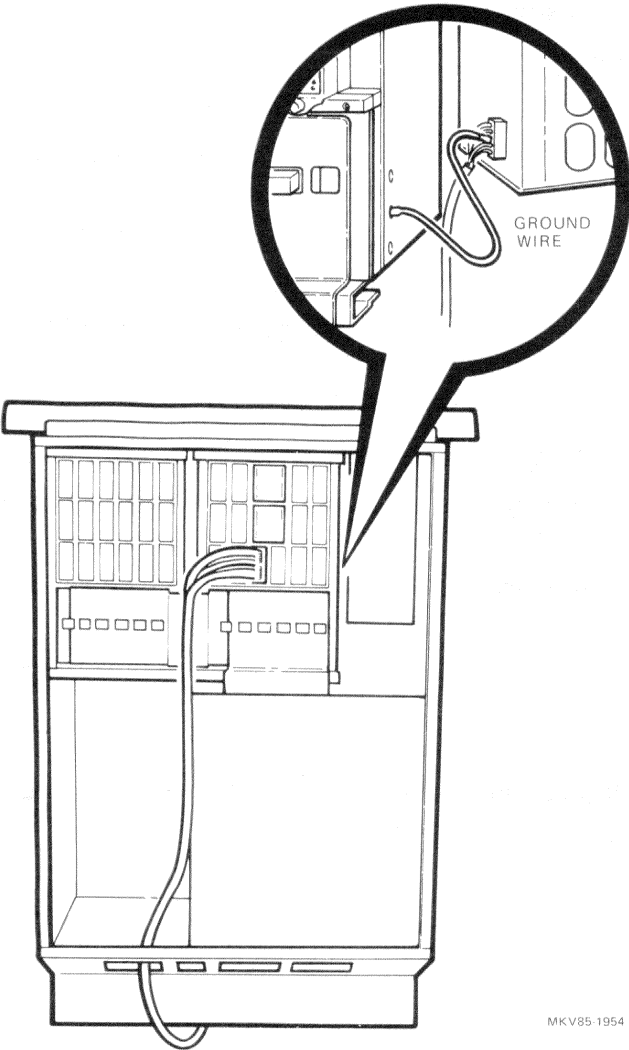
5.2 RX50 DISK DRIVE

5.2.1 RX50 Removal

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out the cabinet and remove the front bezel (Section 5.1.1).
4. Rotate the BA32 box up and remove the bottom cover.
5. Remove the ground wire connected to the side of the VAXBI cardcage by pulling the tab (Figure 5-2).
6. Rotate the BA32 box down.
7. Remove the BA32 box top cover.
8. Remove the four screws that secure the RX50. These screws are located on the right side of the BA32 box.
9. Disconnect the RX50-to-RCX50 cable (17-01039-01) from the RCX50 controller card.
10. Slide the drive out of the BA32 box. Angle the drive as necessary (Figure 5-3).

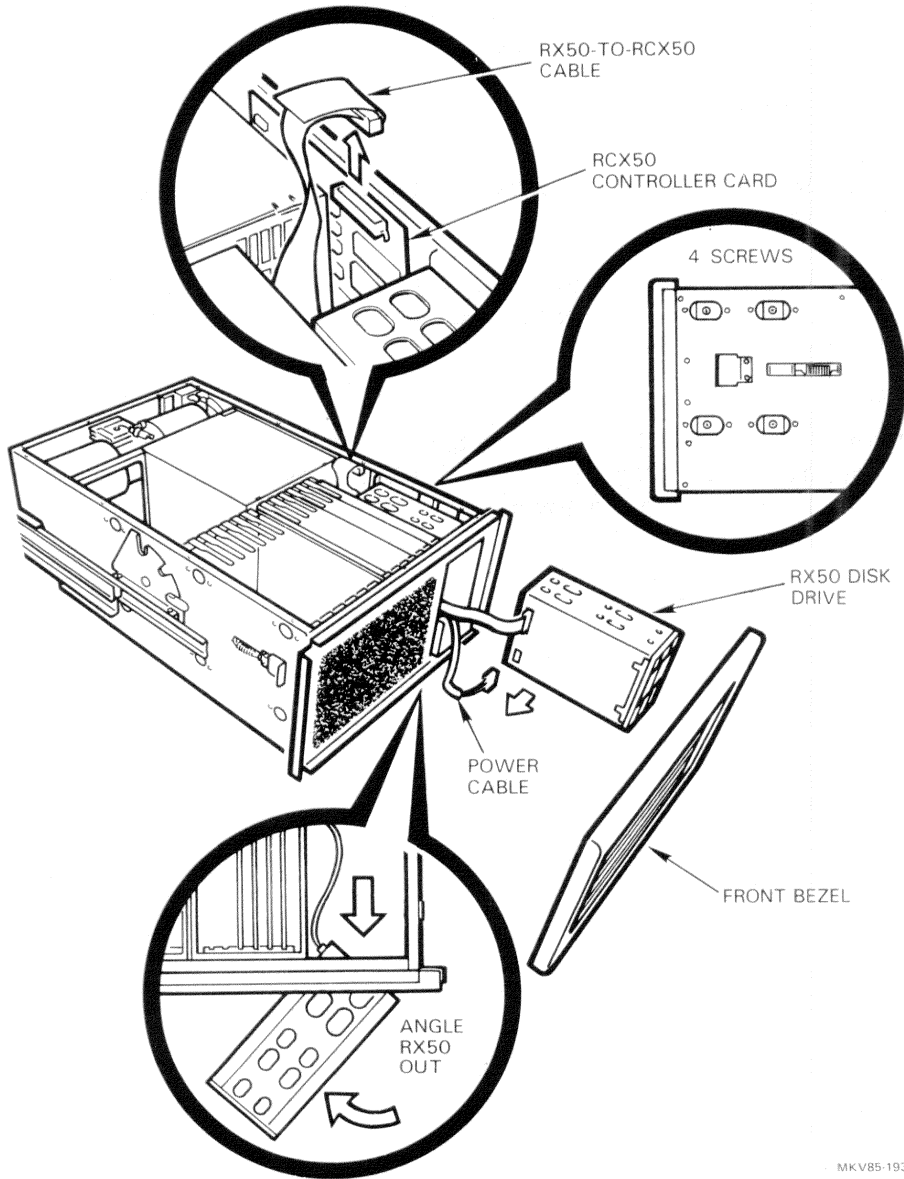
CAUTION

The ferrite bead on the RX50-to-RCX50 cable is fragile. Handle it carefully.



MKV85-1954

Figure 5-2: RX50 Ground Wire



MKV85-1934

Figure 5-3: RX50 Removal/Replacement

11. Disconnect the power cable (17-00687-01) from the RX50.
12. Replace the four screws in the drive.

5.2.2 RX50 Replacement

NOTE

When placing the RX50 drive into the BA32 box, angle the drive into the front of the box.

To replace the RX50, reverse Steps 1 through 12 in Section 5.2.1. (The RX50-to-RCX50 cable used in the replacement procedure is the same cable that was removed in Section 5.2.1, step 9.)

NOTE

When attaching the RX50 drive to the BA32 box, the screws are going into plastic. Cross-threading is a potential problem. Do not force the screws into the holes.

5.3 RCX50 DISK CONTROLLER

5.3.1 RCX50 Removal

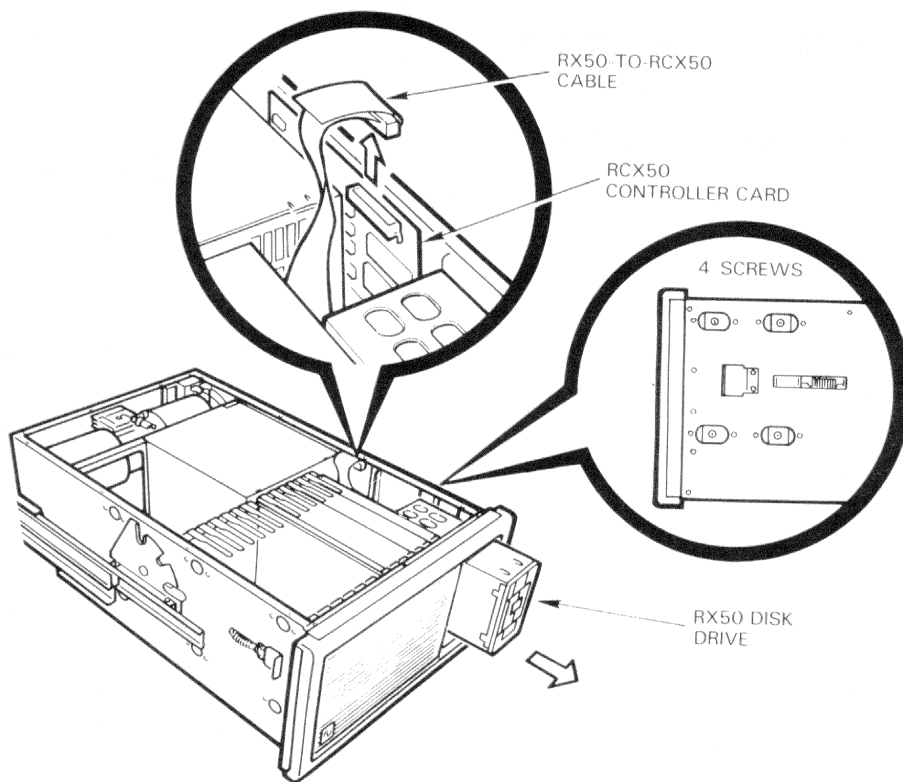
1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.
5. Disconnect the RX50-to-RCX50 cable (17-01039-01) from the controller module (Figure 5-4).
6. Remove the four screws that attach the RX50 drive to the right side of the BA32 box.
7. Slide the RX50 drive forward.
8. Disconnect the RCX50-to-KK810 cable (17-00763-01) from the KK810.
9. From the top of the BA32 box, slide the RCX50 controller module straight out of its slot.
10. Separate the RCX50 module from its mounting plate. (Use a small screwdriver or small needlenose pliers to release the lock on the clips.) Save the mounting plate.
11. Pull the lever out from the ZIF connector and turn it away from you. Save the cable card.

CAUTION

The ferrite bead on the RX50-to-RCX50 cable is fragile. Handle it carefully.

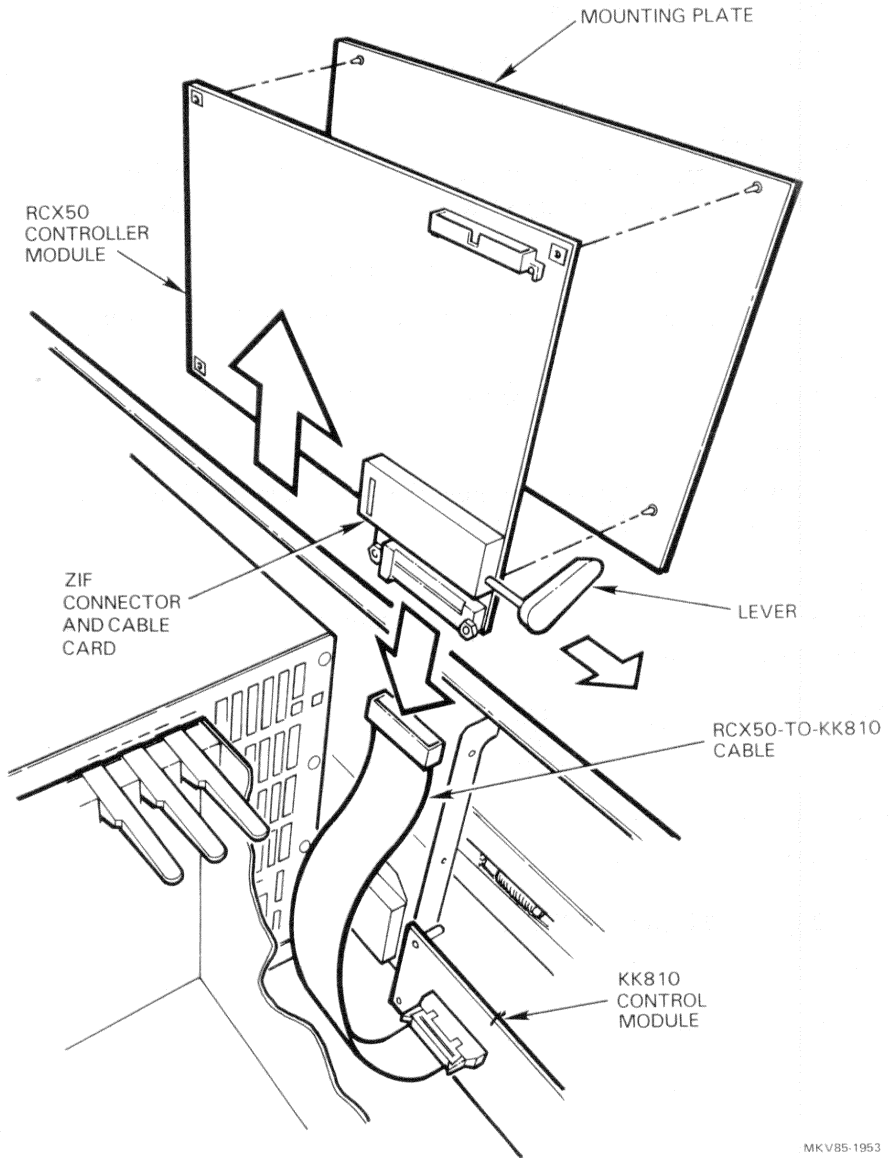
5.3.2 RCX50 Replacement

To replace the RCX50 disk controller, reverse steps 1 through 11 in Section 5.3.1.



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Figure 5-4: RCX50 Removal/Replacement (Sheet 1 of 2)



MKV85-1953

Figure 5-4: RCX50 Removal/Replacement (Sheet 2 of 2)

5.4 POWER SUPPLY MODULES

5.4.1 H7250, H7251, and H7253 Removal

WARNING

After turning off system power and disconnecting the main system power cord, wait two minutes for the capacitors to discharge before touching any of the power supply modules.

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.
5. Disconnect the ac input connector from the H7250 module through the rear of the power supply box (Figure 5-5).

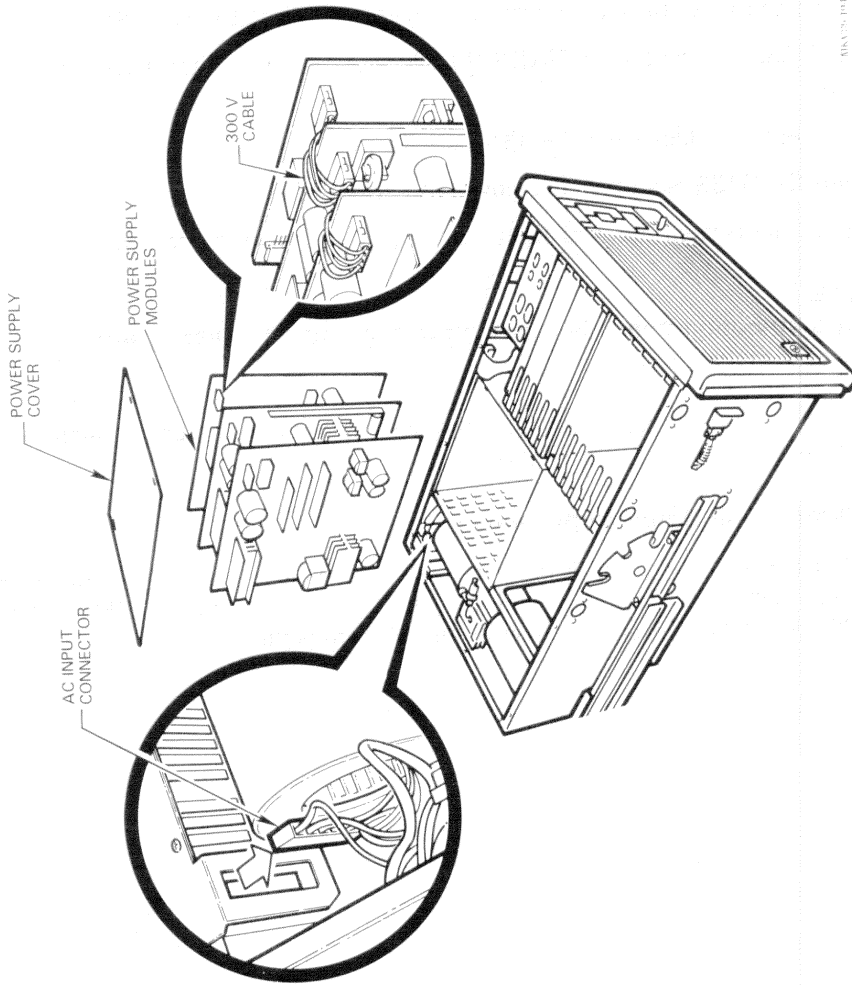
NOTE

The ac input connector must be disconnected before the power supply cover can be removed.

6. Remove and save the screws from the power supply cover.
7. Lift the cover and remove it from the front hinge slots.
8. Remove the 300 V cable (17-00718-01).
9. Remove the desired power supply module(s).

5.4.2 H7250, H7251, and H7253 Replacement

To replace the H7250, H7251, and H7253 modules, reverse steps 1 through 9 in Section 5.4.1.



80A7253-000

Figure 5-5: H7250, H7251, and H7253 Removal/Replacement

5.4.3 Distribution Board Removal (Figures 5-6 through 5-8)

1. Remove the three power supply modules (Section 5.4.1).
2. Remove and save the screws from the power flex circuit (17-00681-01).
3. If the BA32 box contains a UNIBUS backplane, disconnect the UNIBUS cables.
4. Disconnect all cables from the distribution board.
5. Rotate the BA32 box up and remove the bottom cover.
6. Remove the bottom cover of the power supply and save the screws.

NOTE

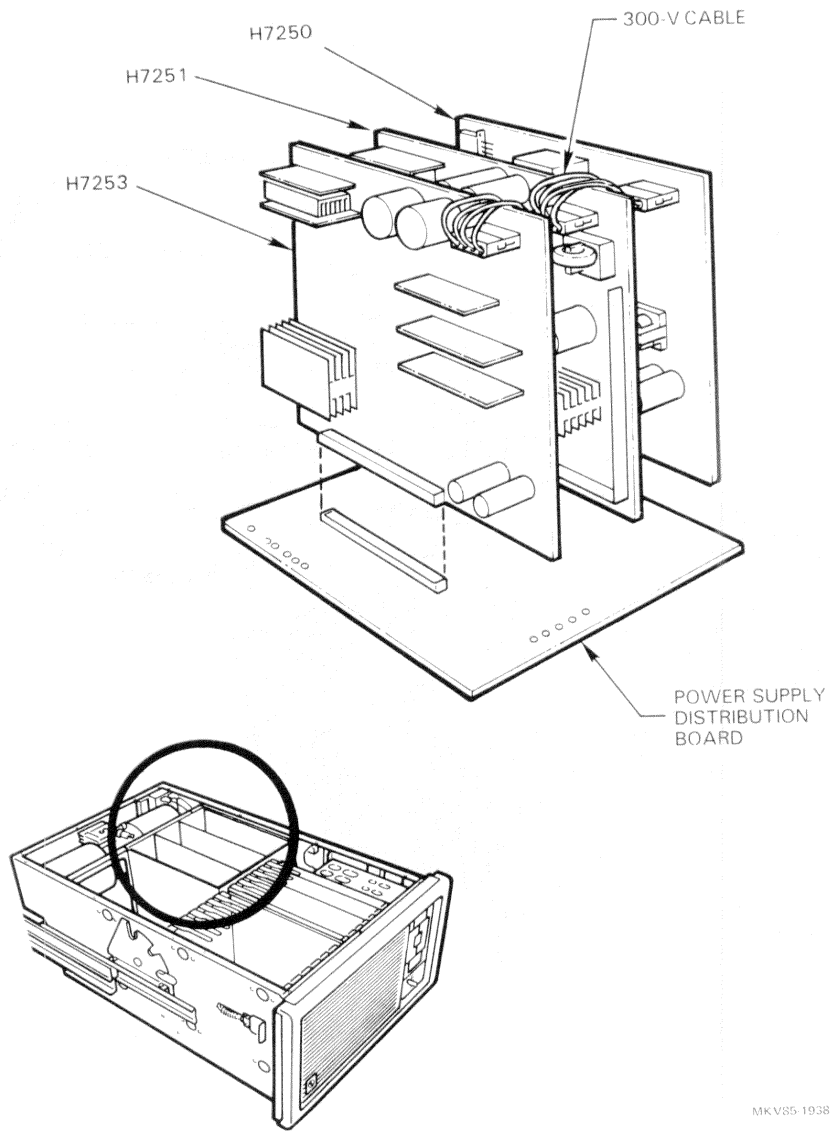
The distribution board is attached to the bottom cover of the power supply.

7. Remove the distribution board from the bottom cover of the power supply. Save the screws.

5.4.4 Distribution Board Replacement

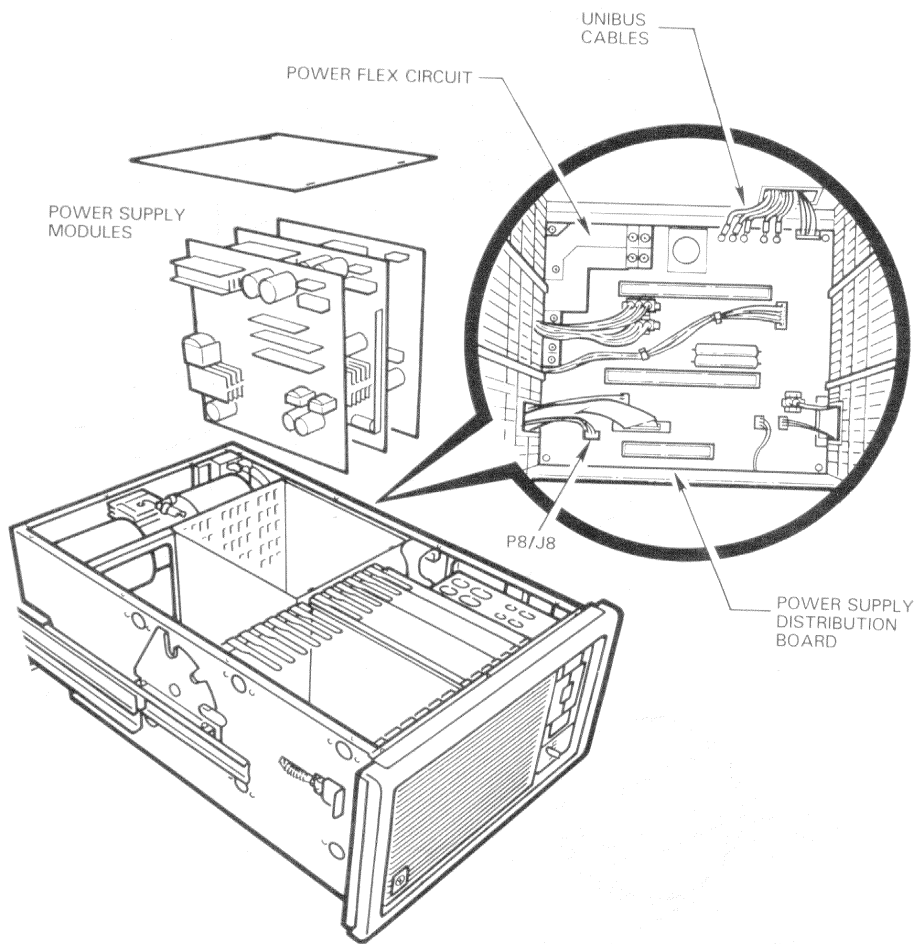
To replace the distribution board, reverse steps 1 through 7 in Section 5.4.3. When attaching the power flex circuit, use the torque screwdriver (29-27381-00) supplied in the field service kit. Torque the screws to 6 ± 1 inch-pounds.

Hardware Removal and Replacement in a 12-VAXBI Slot Cabinet



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Figure 5-6: Power Supply Distribution Board Location



MKV35-1939

Figure 5-7: Power Supply Distribution Board Components

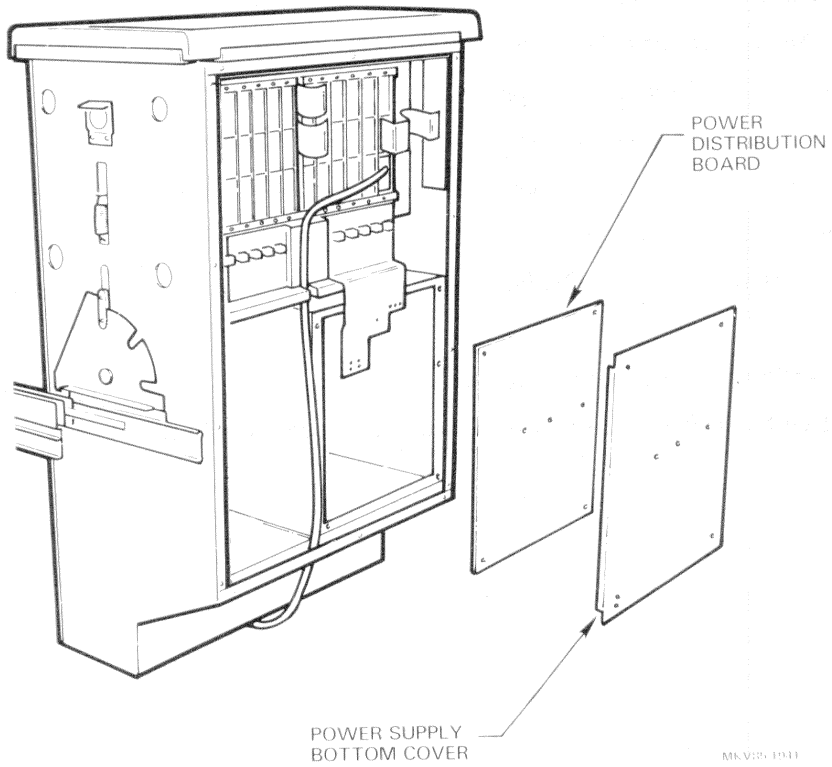


Figure 5-8: Power Supply Distribution Board Removal/Replacement

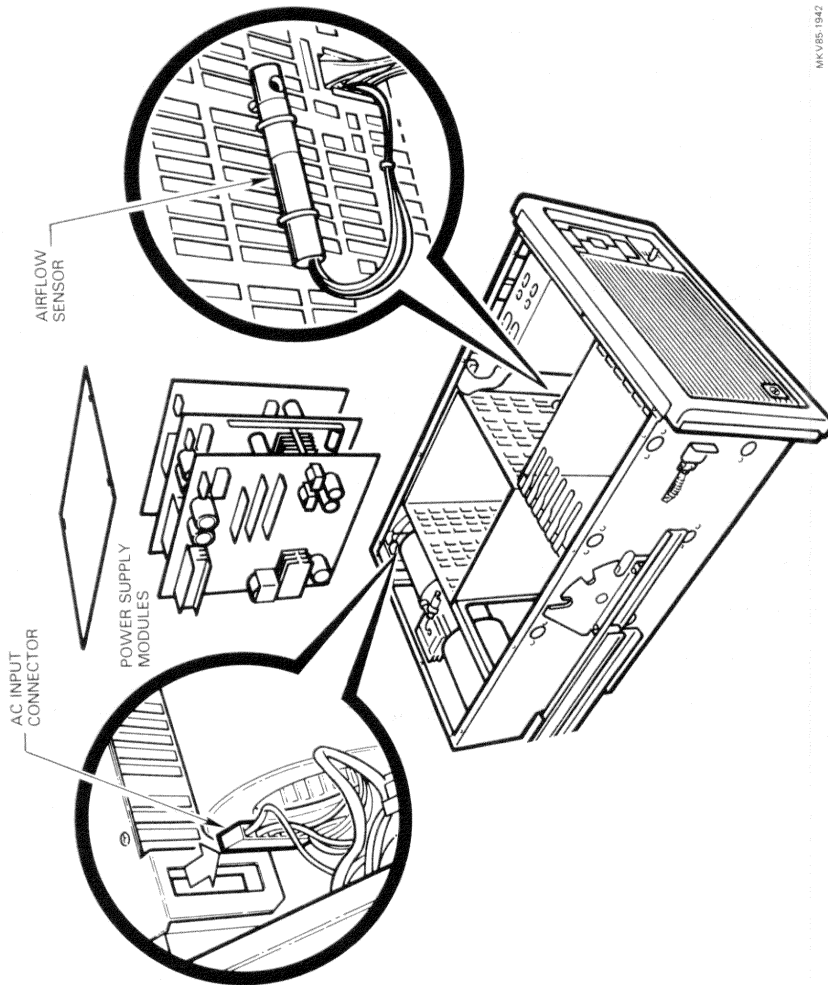
5.5 AIRFLOW SENSOR

5.5.1 Airflow Sensor Removal (Figure 5-9)

1. Remove the three power supply modules (Section 5.4.1).
2. Disconnect the cable from J8 on the distribution board (Figure 5-7).
3. Attach a piece of wire the length of the airflow sensor cable to P8.
4. Remove the airflow sensor.
5. Remove the wire from P8, but leave the end of the wire in the power supply box.

5.5.2 Airflow Sensor Replacement

To replace the airflow sensor, reverse steps 1 through 5 in Section 5.5.1.



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Figure 5-9: Airflow Sensor Removal/Replacement

5.6 VAXBI CARDCAGE

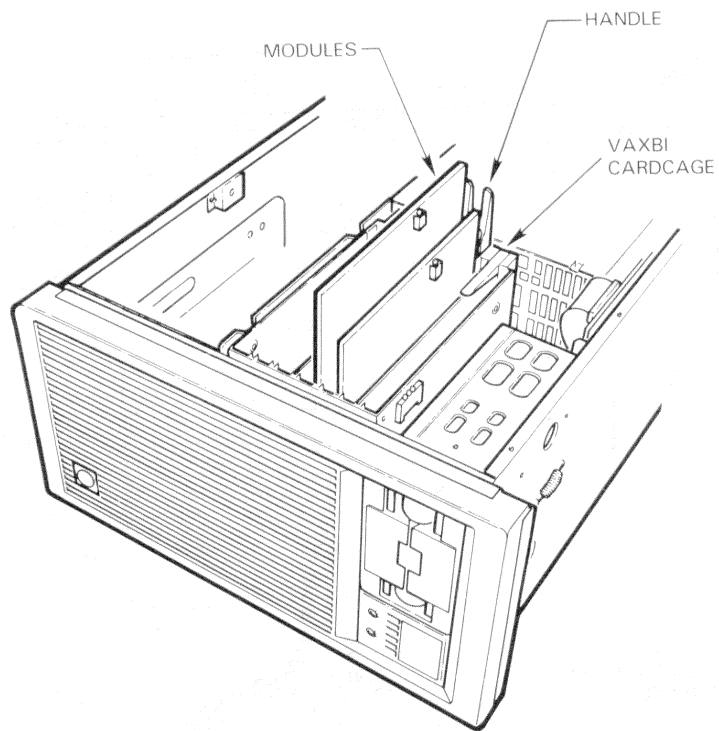
5.6.1 VAXBI Cardcage Removal (One VAXBI Cardcage in the BA32 Box)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet when you handle VAXBI modules.

5. Remove the modules from the VAXBI cardcage (Figure 5-10):
 - a. Raise the handles.
 - b. Note the slots in which the modules are located, then lift the modules out of the cardcage.
 - c. Place the modules in anti-static bags.
6. Rotate the BA32 box up.
7. Remove the bottom cover.
8. Remove the transition headers, with the cables attached, from the VAXBI cardcage (Figure 5-11).



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Figure 5-10: Removing Modules from a Single VAXBI Cardcage

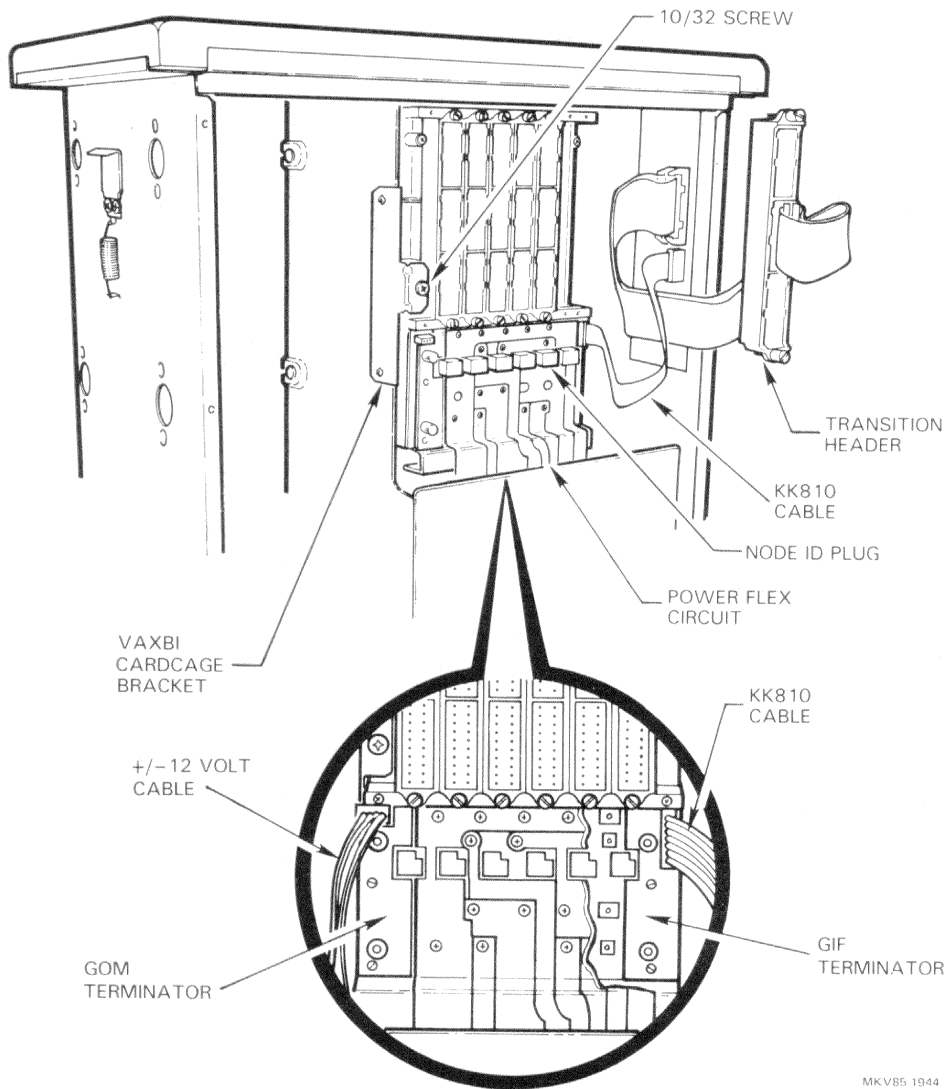


Figure 5-11: VAXBI Cardcage - Single Cardcage

9. Note the location of each node ID plug, then remove the plugs.
10. Disconnect the ± 12 V cable and the KK810 cable located to the left and the right of the power flex circuit (Figure 5-11).

11. Remove and save the screws from the power flex circuit (Figure 5-11).
12. Remove the 10/32 inch screw (Figure 5-11).
13. Rotate the BA32 box down.
14. Unscrew the power supply status LEDs and set them aside (Figure 5-12).

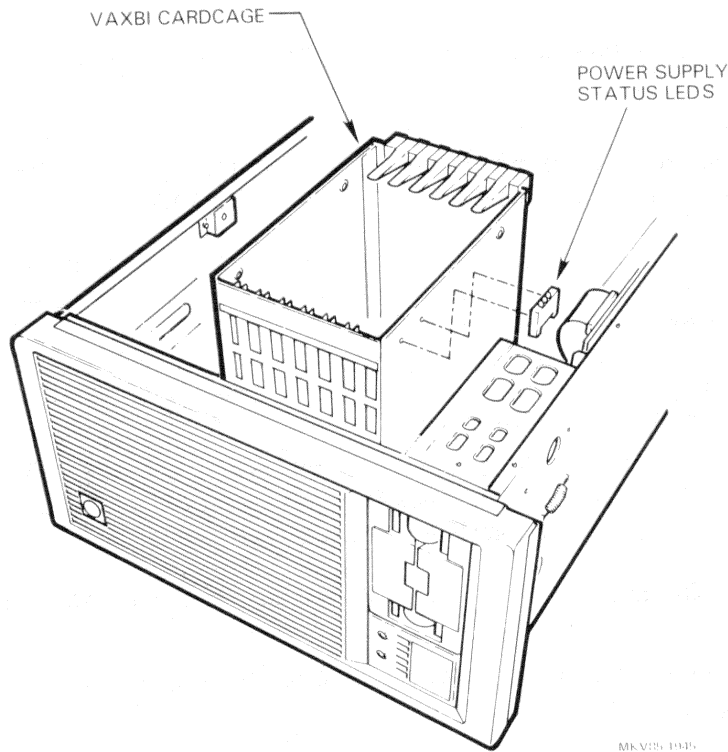


Figure 5-12: Single VAXBI Cardcage Removal/Replacement

15. Carefully pull the cardcage away from the air gasket and straight up.

CAUTION

The airflow sensor behind the cardcage and the air gasket in front of the cardcage can be damaged when the cardcage is pulled out. Use caution when removing the cardcage.

16. Remove and save the following from the VAXBI cardcage:
 - a. The bracket on the left side of the cardcage. Remove and save the two screws and two nuts (Figure 5-11).
 - b. Terminators: GOM (goes in moveable) and GIF (goes in fixed) on the left and right sides of the cardcage, respectively (Figure 5-11).
 - c. Retaining nuts and button bushings.

5.6.2 VAXBI Cardcage Replacement (One VAXBI Cardcage in the BA32 Box)

CAUTION

When you handle the VAXBI modules, you must wear an anti-static wrist strap connected to the processor cabinet.

To replace the VAXBI cardcage when there is one VAXBI cardcage in the BA32 box, reverse steps 1 through 16 in Section 5.6.1. When attaching the power flex circuit, use the torque screwdriver (29-27381-00) from the field service kit. Torque the screws to 6±1 inch-pounds. When attaching the transition headers, tighten the screws in stages. Do not tighten one completely before tightening the other. Torque these screws to 5±1 inch-pounds.

When the replacement procedure is complete, apply system power and check that all nodes pass self-test. Also, run EBKAX and other exercisers for the specific nodes. Refer to Chapter 3 for complete acceptance instructions.

5.6.3 VAXBI Cardcage Removal (Two VAXBI Cardcages in the BA32 Box)

NOTE

Except where noted, the following instructions apply to both cardcages (K1 and K2).

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet when you handle VAXBI modules.

5. Remove the modules from the VAXBI cardcage (Figure 5-13).
6. Rotate the BA32 box up.
7. Remove the bottom cover.
8. With the cables attached, remove the transition headers that have cables from both VAXBI cardcages (Figure 5-14).

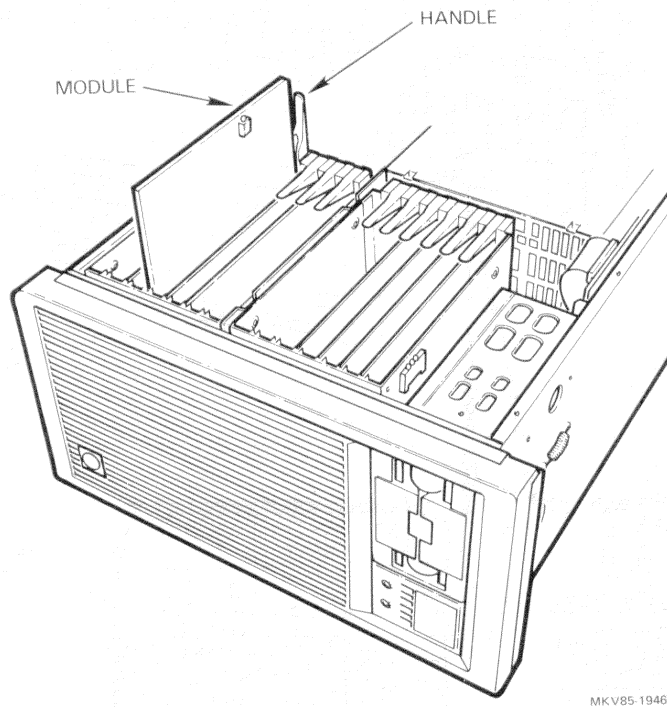
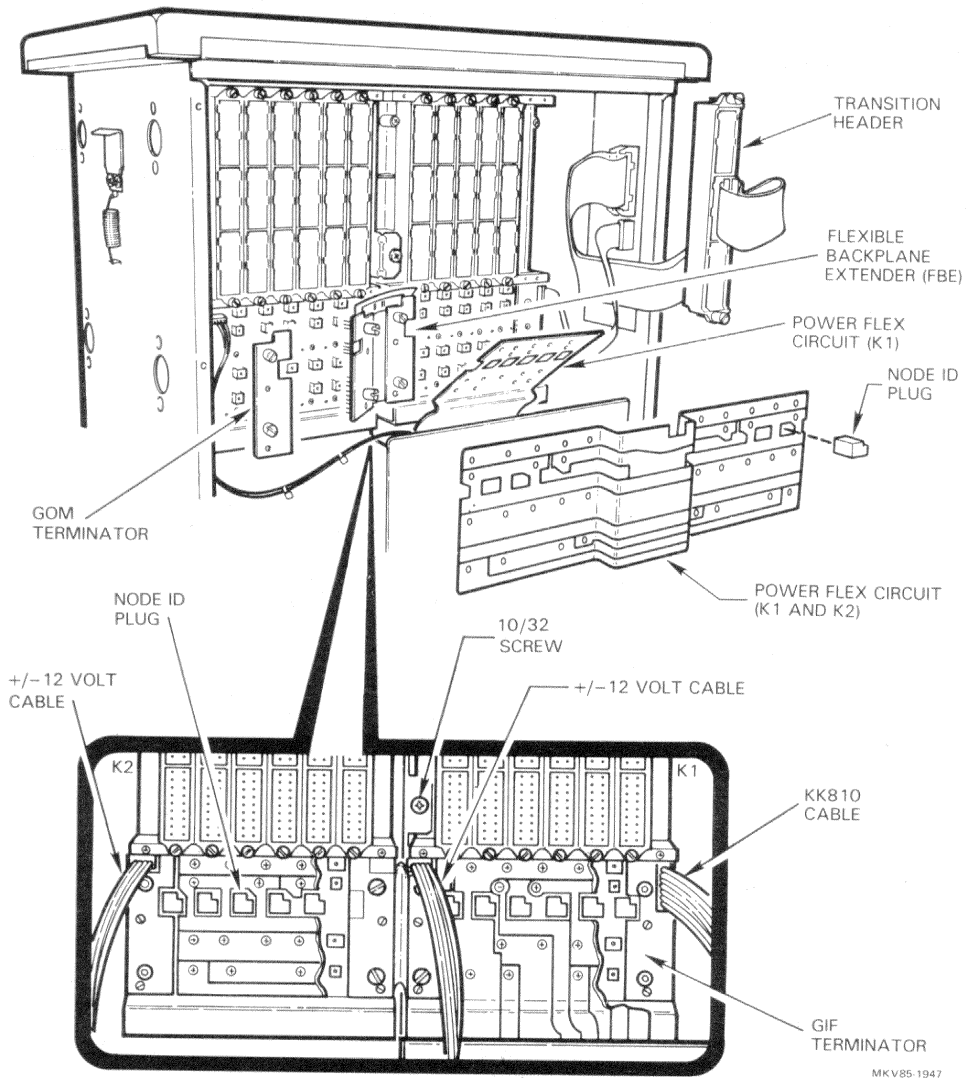


Figure 5-13: Removing Modules from a Dual VAXBI Cardcage



MKV85-1947

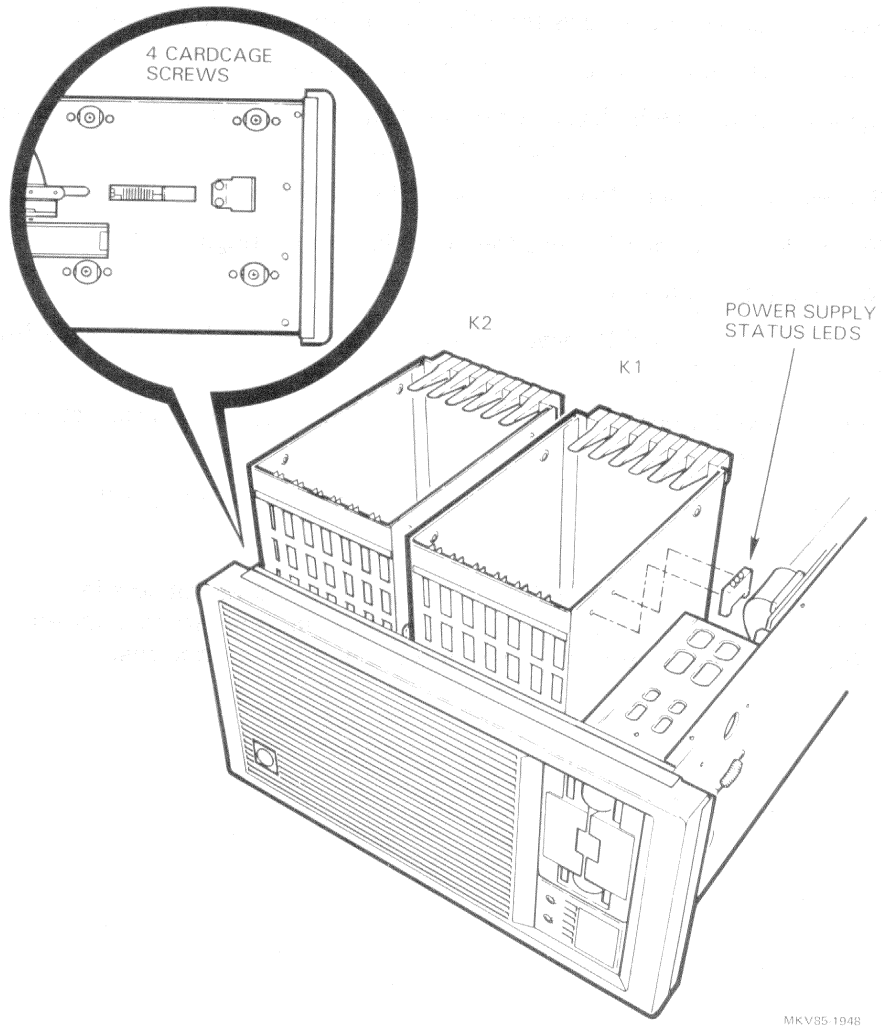
Figure 5-14: VAXBI Cardcage - Dual Cardcage

9. Disconnect the ± 12 V cable from each cardcage (Figure 5-14).
10. For cardcage K1 only: Remove the KK810 cable (Figure 5-14).
11. Note the location of each node ID plug, then remove the plugs.

12. Remove and save the screws from the power flex circuit (Figure 5-14).
13. Remove the power flex circuit that attaches to both cardcages.
14. Remove the flexible backplane extender (FBE) from the cardcage that is being removed. Leave the FBE attached to the other cardcage (Figure 5-14).
15. For cardcage K2 only: Remove and save the GOM terminator (Figure 5-14).
16. For cardcage K1 only: Remove the 10/32 inch screw (Figure 5-14).
17. Rotate the BA32 box down.
18. For cardcage K2 only: Remove the four screws from the left side of the BA32 box (Figure 5-15).
19. For cardcage K1 only: Unscrew the power supply status LEDs and set them aside (Figure 5-15).
20. Carefully pull the cardcage away from the air gasket and straight up.

CAUTION

The airflow sensor behind cardcage K1 and the air gasket in front of both cardcages can be damaged when these cardcages are pulled out. Use caution when removing the cardcages.



MKV85-1948

Figure 5-15: Dual VAXBI Cardcage Removal/Replacement

5.6.4 VAXBI Cardcage Replacement (Two VAXBI Cardcages in the BA32 Box)

5.6.4.1 K1 Replacement -

1. Lower the VAXBI cardcage into the BA32 box.
2. Attach the power supply status LEDs.
3. Rotate the BA32 box up.
4. Attach the 10/32 inch screw.
5. Install the right side of the FBE as explained in the following steps (Figure 5-16).

CAUTION

The FBE pins can easily be broken. Exercise caution when installing the FBE.

- a. Check the FBE pins and straighten if necessary.
- b. Fold the flexible cable between the two cardcages.
- c. Position the right side of the FBE over the locating studs on K1. Ease the pins into the holes. Turn the two knurled jack screws one-half to one turn each.
- d. Check the pins to ensure that they are properly aligned. (A good light is helpful.)

CAUTION

The FBE pins must all be properly aligned at this point. A mis-aligned pin will buckle when the jack screws are tightened.

- e. Torque the jack screws in stages to 6 ± 1 inch-pounds using the torque screwdriver (29-27381-00) from the field service kit.

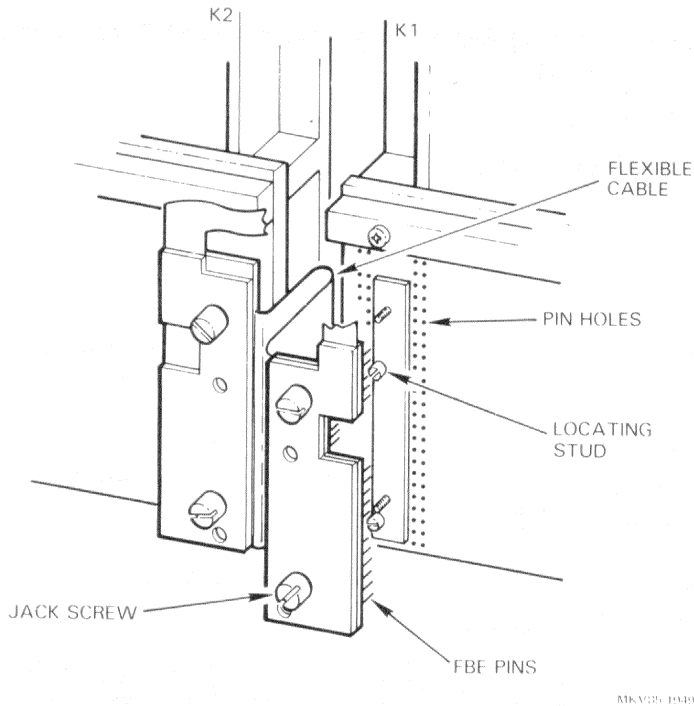


Figure 5-16: FBE Installation on K1

6. Attach the power flex circuit, using the torque screwdriver. Torque to 6 ± 1 inch-pounds (Figure 5-14).

CAUTION

The torque screwdriver must be used when attaching the power flex circuit.

7. Attach the ± 12 V and KK810 cables to the left and right sides of the power flex circuit (Figure 5-14).
8. Install the node ID plugs, taking care not to bend their pins.
9. Attach the transition headers, with the cables attached, to the VAXBI card-cage. Tighten the screws in stages; do not tighten one completely before tightening the other. Torque both screws to 5 ± 1 inch-pounds, using the torque screwdriver (Figure 5-14).

10. Reattach the bottom cover on the BA32 box.
11. Rotate the box down.

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet when you handle VAXBI modules.

12. Insert the modules into the VAXBI cardcage.
13. Reattach the top cover on the BA32 box.
14. Slide the BA32 box into the cabinet.
15. Apply system power and check that all nodes pass self-test.
16. Run EBKAX and other exercisers for the specific nodes.

NOTE

See Chapter 3 for complete acceptance instructions.

17. Replace the processor cabinet front and rear doors.

5.6.4.2 K2 Replacement –

1. If this VAXBI cardcage is replacing a UNIBUS backplane, do the following (Figure 5-17):
 - a. Rotate the BA32 box up.
 - b. Remove the DWBUA cables from the backplane of K1J2.
 - c. Remove the T1010 module from K1J2
 - d. Insert the T1010 module into K1J6
 - e. Remove the serial line unit cables from K1J1.
 - f. Remove the ± 12 V cable from K1.
 - g. Remove all VAXBI node ID plugs.
 - h. Remove the GOM terminator from K1.
 - i. Remove all screws from the power flex circuit.
 - j. Pull the power flex circuit away from the K1 power cubes.
 - k. Rotate the BA32 box down.
 - l. Remove the UNIBUS backplane (Section 5.10.1).
2. Lower VAXBI cardcage K2 in place, being careful not to damage the air gasket.

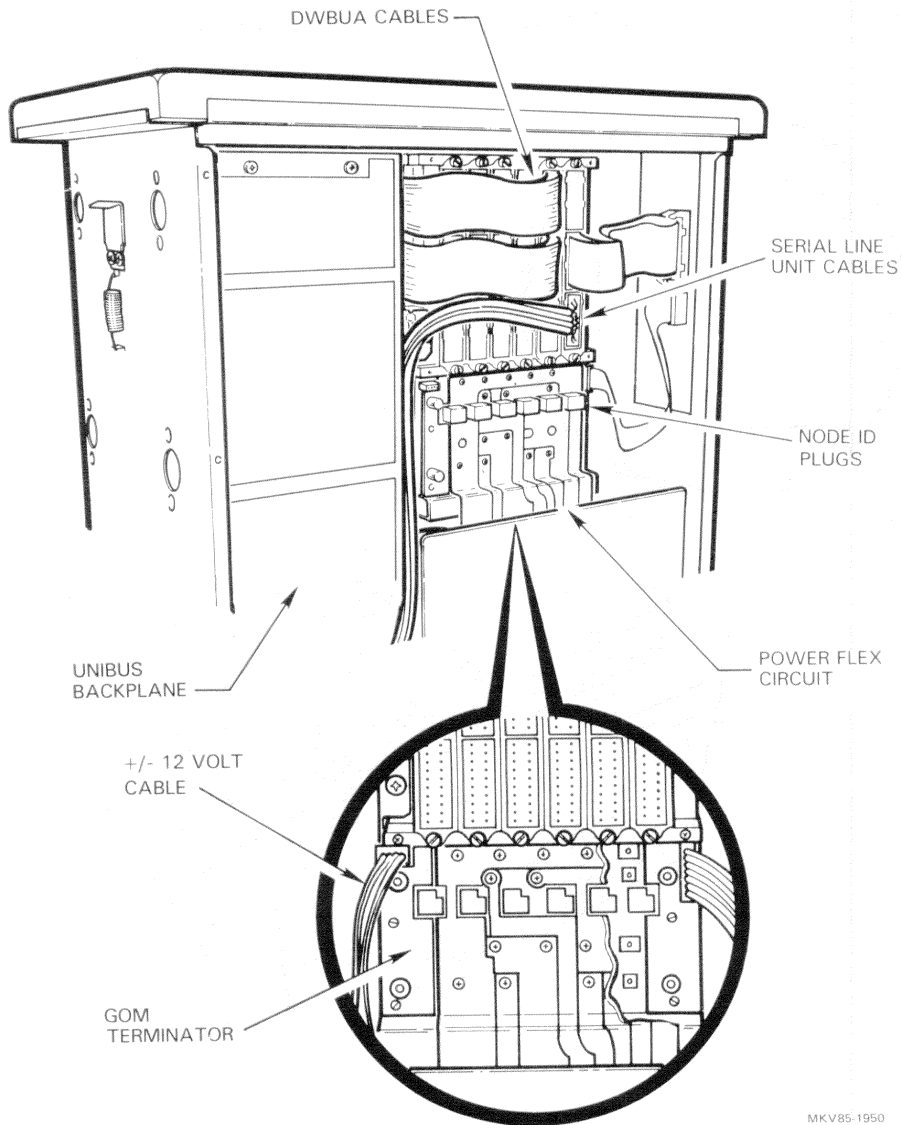


Figure 5-17: Replacement of a UNIBUS Backplane with a VAXBI Cardcage

3. Attach the cardcage to the left side of the BA32 box (Figure 5-18).

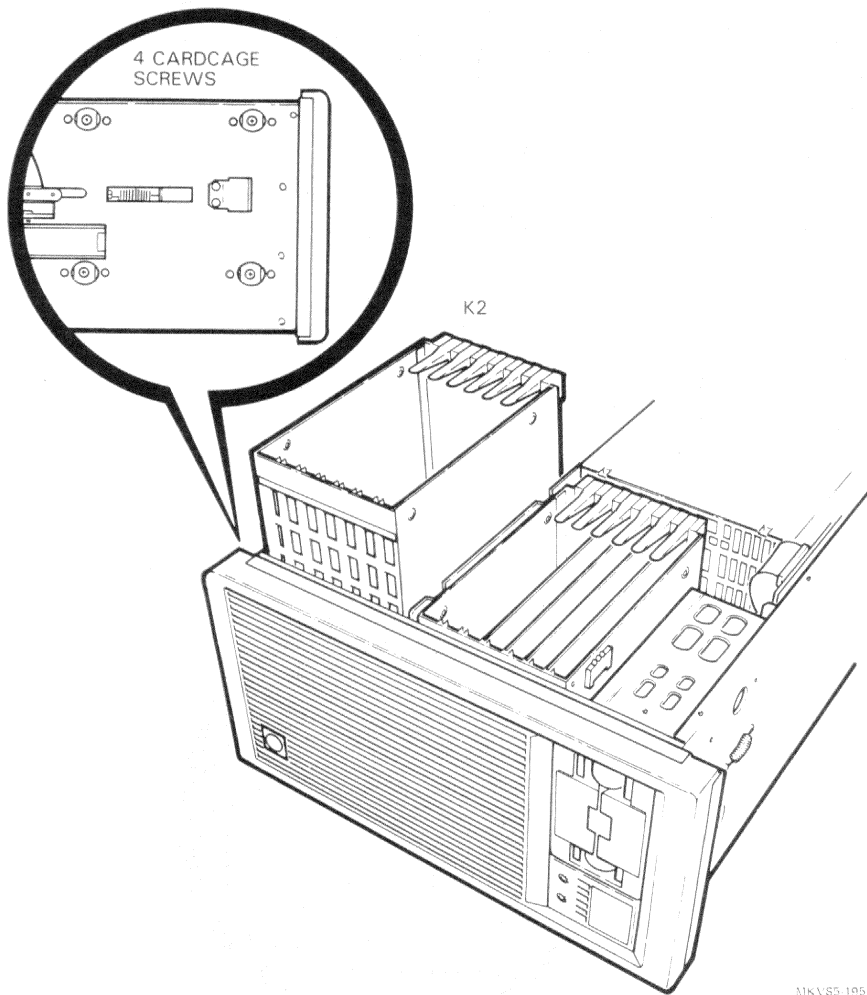


Figure 5-18: Installing the VAXBI Cardcage on K2

4. Rotate the BA32 box up.
5. Remove the transition header from K1J6.

6. Install the GOM terminator on the far (left) end of K2. Tighten the nuts equally, finger-tight only (Figure 5-17).
7. Install the FBE as explained in the following steps (Figure 5-19).

CAUTION

The FBE pins can easily be broken. Exercise caution when installing the FBE.

- a. Using the pin-straightening tool provided, straighten the FBE pins.
- b. Check the pins on the left side of the FBE, and straighten them if necessary.
- c. Fold the flexible cable between the two cardcages (Figure 5-19).

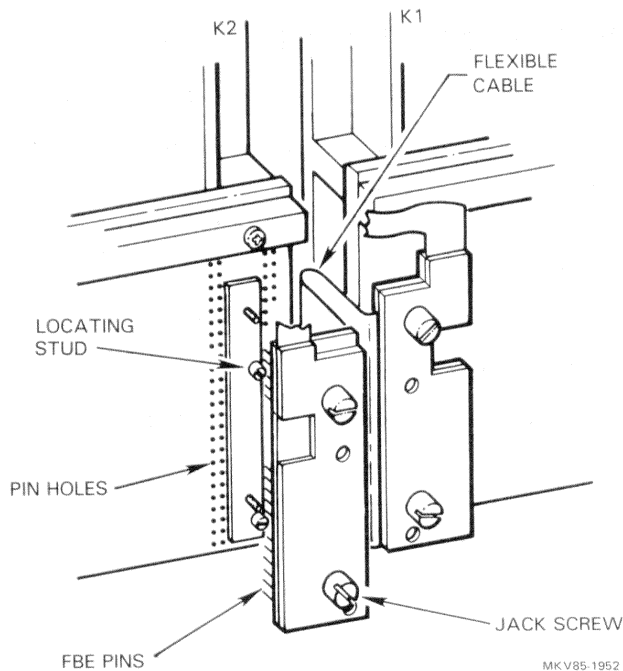


Figure 5-19: FBE Installation on K2

- d. Position the left side of the FBE over the locating studs on K2. Ease the pins into the holes. Turn the two knurled jack screws one-half to one turn each.
- e. Check the pins to ensure that they are properly aligned.

CAUTION

The FBE pins must all be properly aligned at this point. A mis-aligned pin will buckle when the jack screws are tightened later in this procedure.

- f. Torque the jack screws in stages to 6 ± 1 inch-pounds, using the torque screwdriver (29-27381-00) from the field service kit.
8. Install the transition header on K1J6. Torque the screws to 5 ± 1 inch-pounds.

NOTE

Check all transition headers for proper torque (5 ± 1 inch-pounds).

9. Install the power flex circuit as explained in the following steps (Figure 5-20).
 - a. Position the circuit on K1 under the existing power flex circuit.
 - b. Replace the existing power flex circuit.
 - c. Insert a few screws (do not tighten) for alignment in the K1 and K2 sides of the circuit.
 - d. Attach the ground strap to K1.
 - e. Loosely install the remainder of the screws.
 - f. Tighten and torque all screws to 6 ± 1 inch-pounds.

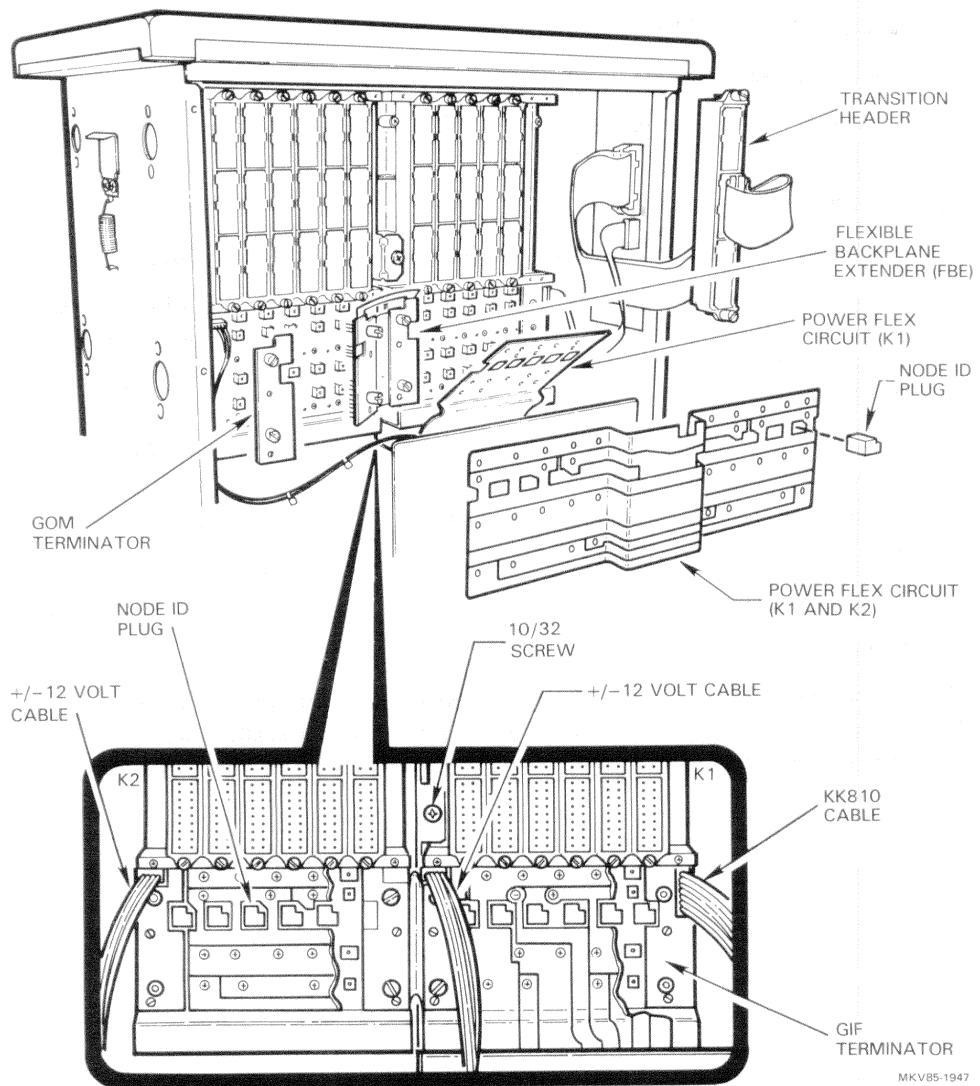


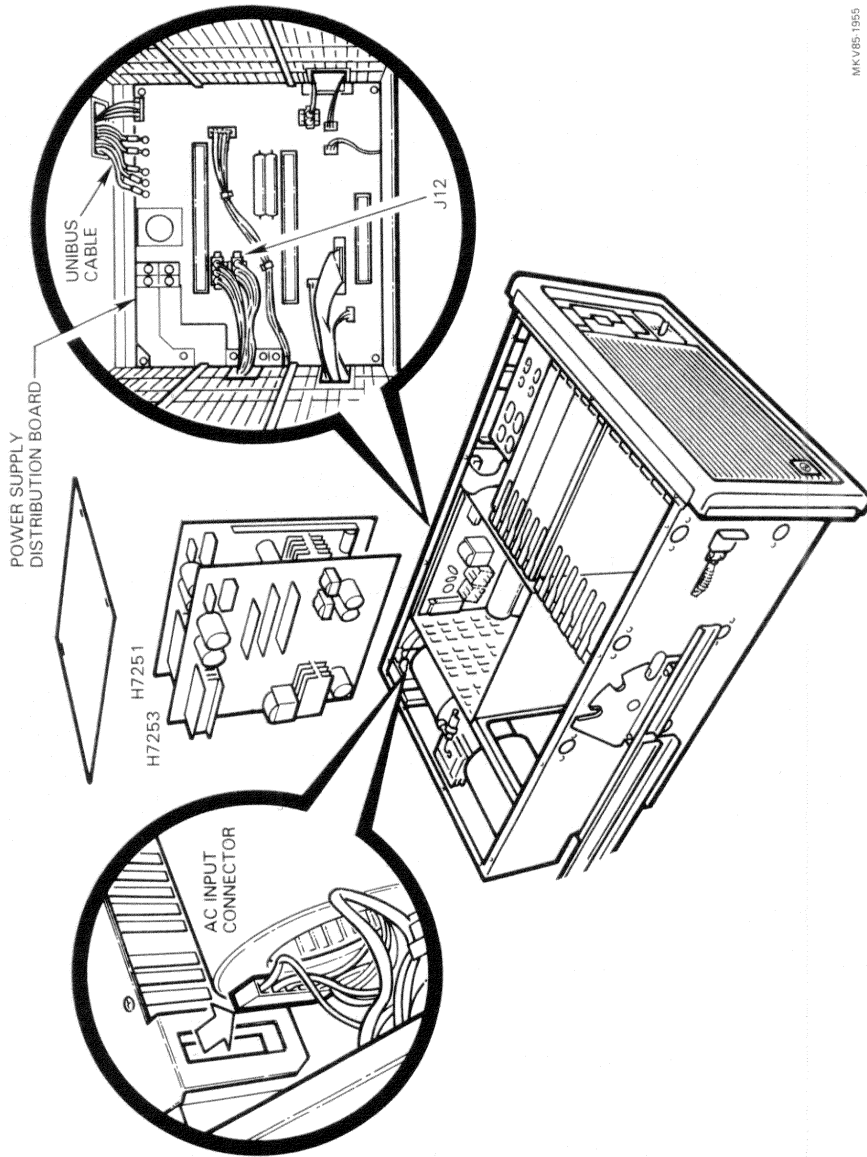
Figure 5-20: VAXBI Backplane – Dual Cardcage

10. Replace the VAXBI node ID plugs.
11. Replace the ± 12 V cable on K1.
12. Replace the serial line unit cables on K1J1.

13. Attach the DWBUA cables to the backplane of K1J6
14. Replace any other cables that were removed.
15. If this VAXBI cardcage is replacing a UNIBUS backplane, do the following (Figure 5-21):
 - a. Rotate the BA32 box down.
 - b. Remove H7253 and H7251 from the power supply (Section 5.4.1).
 - c. Thread the Berg ❶ connector end of the ± 12 V cable through the hole in the power supply housing. Reach under the BA32 box and pull the cable through. Attach the Mate-n-Lok ❷ connector to J12 on the power supply distribution board.
 - d. Remove the UNIBUS cable from the power supply distribution board. Discard the cable.
 - e. On H7253, remove the jumpers from plug carriers J6, J7, and J8, and attach them to plug carriers J3, J4, and J5.
 - f. Rotate the BA32 box up.
 - g. Install the ± 12 V cable on K2.
16. Before applying power, check from ground to each power run on the power flex circuit with an ohmmeter. Check that no dead shorts exist. (The meter should read greater than zero.)

❶ Berg is a trademark of Berg Electronics, Inc.

❷ Mate-n-Lok is a trademark of AMP, Inc.



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Figure 5-21: Power Supply Modification when Replacing the UNIBUS Backplane with a VAXBI Cardage (Sheet 1 of 2)

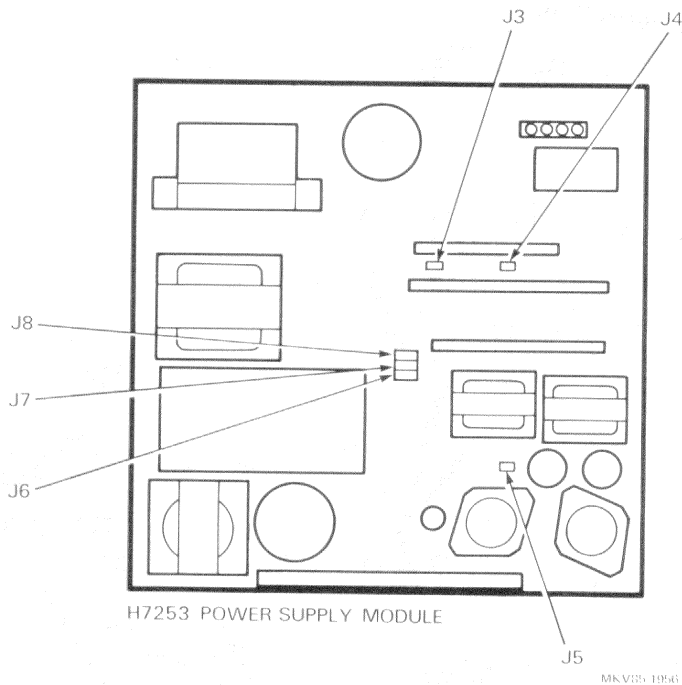


Figure 5-21 Power Supply Modification when Replacing the UNIBUS Backplane with a VAXBI Cardcage (Sheet 2 of 2)

17. Attach the BA32 box bottom cover.
18. Rotate the BA32 box down.
19. Attach the top cover.
20. Slide the BA32 box into the cabinet.
21. Apply system power and check that all nodes pass self-test.
22. Run EBKAX and other exercisers for the specific nodes.

NOTE

See Chapter 3 for complete acceptance instructions.

23. Replace the processor cabinet front and rear doors.

5.7 BLOWER ASSEMBLY

5.7.1 Blower Assembly Removal (Figure 5-22)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Remove and save the four screws from the rear of the BA32 box.
4. Slide the BA32 box out of the cabinet.
5. Remove the top cover.
6. Unplug the blower power cable.
7. Roll the blower assembly downward and out of the BA32 box.

5.7.2 Blower Assembly Replacement

To replace the blower assembly, reverse steps 1 through 7 in Section 5.7.1. When replacing the blower assembly, hold the assembly with the discharge facing the bottom of the BA32 box and the power cable facing down.

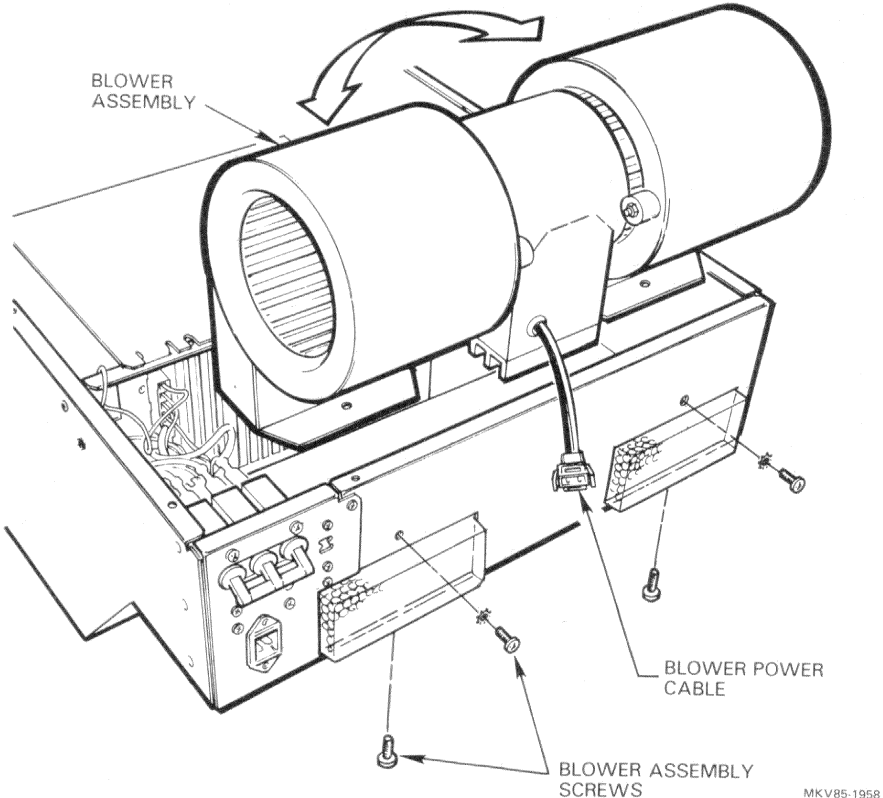


Figure 5-22 Blower Assembly Removal/Replacement

MKV85-1958

5.8 POWER CONTROLLER

5.8.1 Power Controller Removal (Figures 5-23 and 5-24)

1. Open the processor cabinet rear door.
2. Remove the strain relief clamp. Save the screw and clamp.
3. Loosen the 10 captive screws on the power controller.
4. Disconnect the power control bus cables.
5. Using a 5/32 inch Allen wrench, unlatch the locks on the processor cabinet front door, and remove the door.
6. Note the power controller outlet to which each cable is connected, then disconnect the cables.
7. Disconnect the power control bus cables (Figure 5-24).
8. Slide the power controller out from the rear.

5.8.2 Power Controller Replacement

To replace the power controller, reverse steps 1 through 8 in Section 5.8.1.

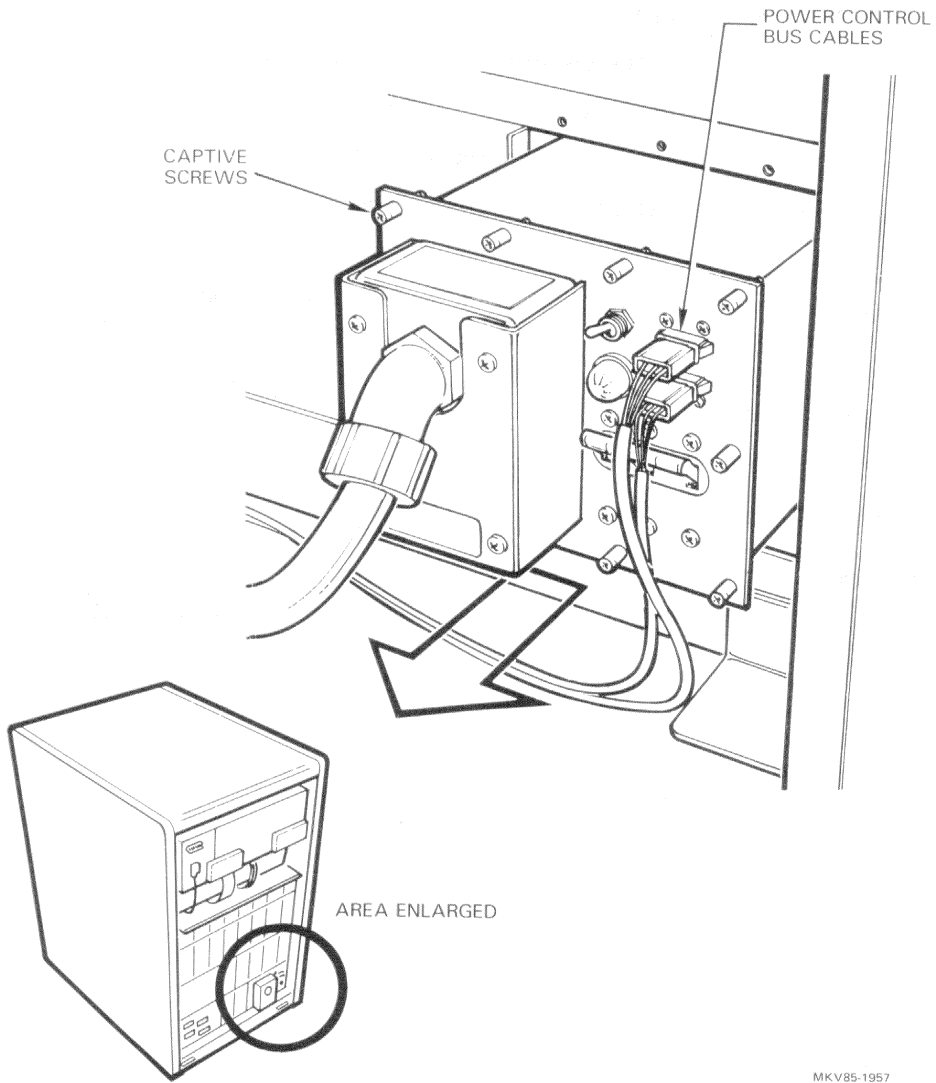


Figure 5-23: Rear View of the Power Controller

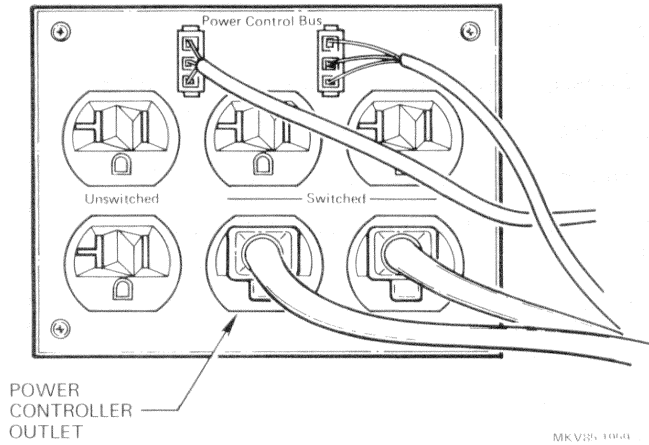


Figure 5-24: Front View of the Power Controller

5.9 H7231 BATTERY BACKUP UNIT

5.9.1 Battery Backup Unit Removal (Figures 5-25 and 5-26)

1. Open the processor cabinet rear door.
2. Unplug the power cable from the power controller.
3. Remove the following cables, in the order listed, from the rear of the battery backup unit:
 - a. Power cable
 - b. 15-pin signal cable
 - c. Power bus cable
 - d. 300 V supply cable
4. Remove the ground wire on the 300 V supply cable from the ground stud.
5. Using a 5/32 inch Allen wrench, unlatch the locks on the processor cabinet front door, and remove the door.
6. Using a 3/8 inch nut driver, remove and save one nut on each side of the battery backup unit.
7. Slide the battery backup unit out from the front of the cabinet.

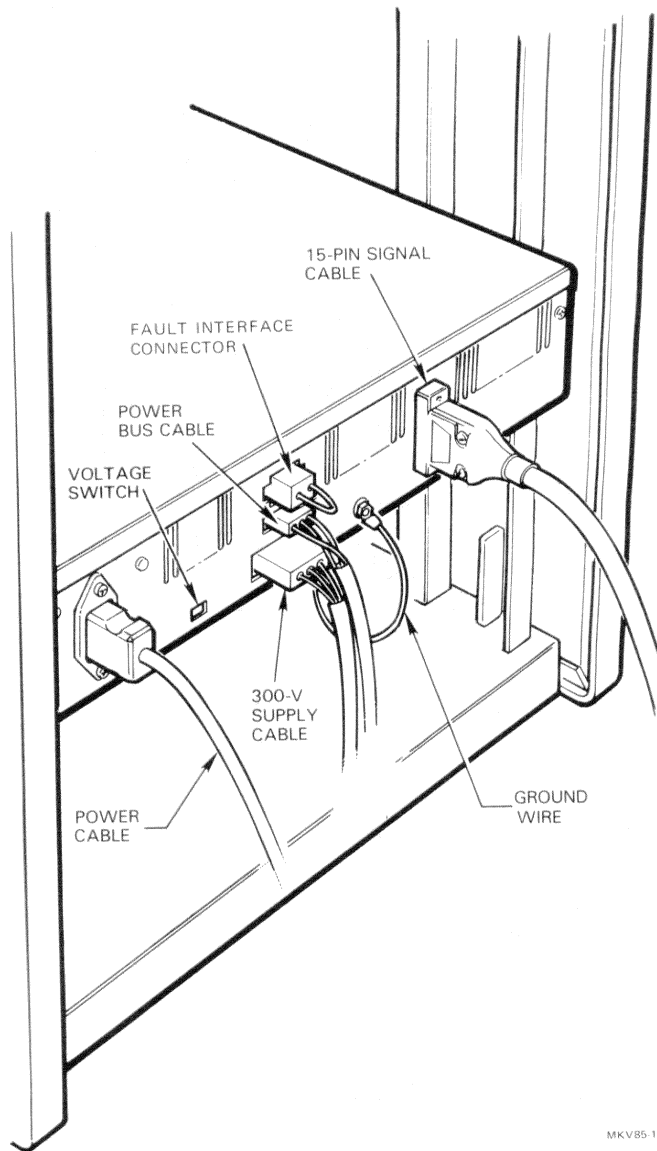


Figure 5-25: Rear View of the Battery Backup Unit

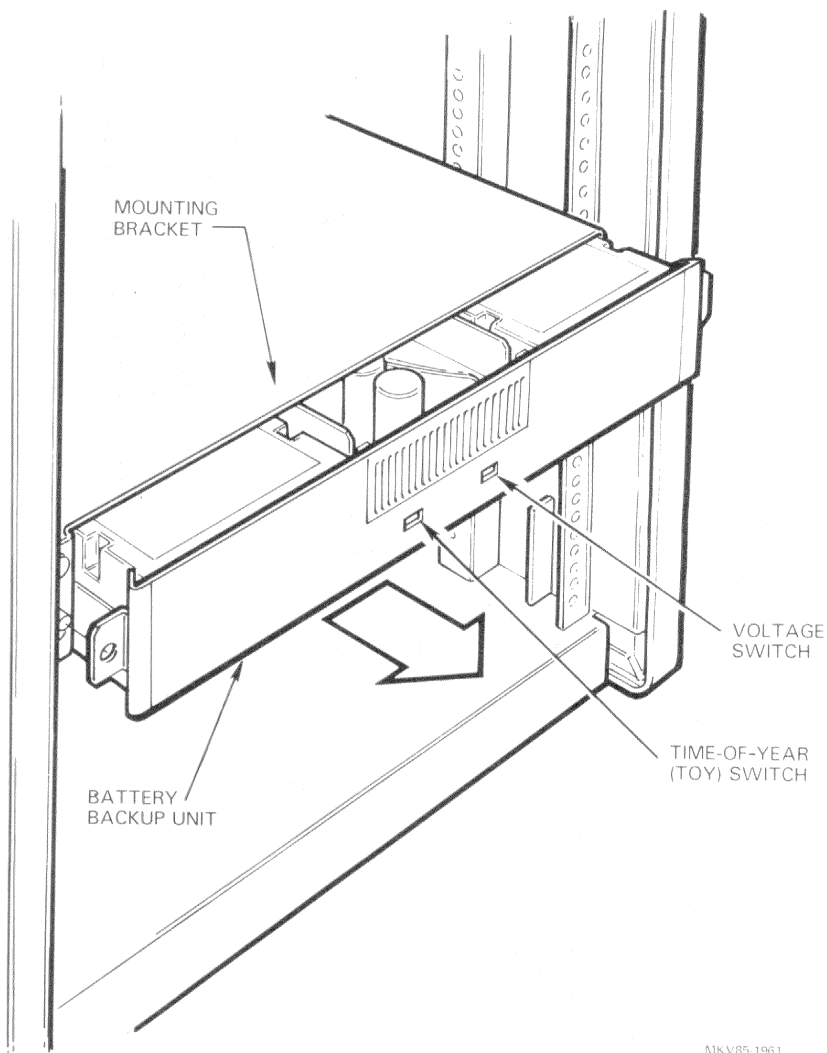


Figure 5-26: Battery Backup Unit Removal/Replacement

5.9.2 Battery Backup Unit Replacement

1. Slide the mounting bracket off the replacement battery backup unit.
2. If this an installation of a replacement battery backup unit, discard the mounting bracket.

If this is an initial battery backup unit installation, install the mounting bracket in holes 11 and 14, counting from the bottom.
3. Set the voltage switches on the front and rear of the battery backup unit to the desired voltage.
4. Set the time-of-year (TOY) switch to off.
5. Reverse steps 1 through 7 in Section 5.9.1. (See Table 5-1 for cable connections.)

Table 5-1: Battery Backup Unit Cables

Cable	Connects To	See Figure
Power cable	Power controller unswitched outlet	5-24
Power bus cable	Power controller front	5-24
300 V supply cable	AC input assembly	5-30
15-pin signal cable	AC input assembly	5-30

5.10 UNIBUS BACKPLANE

5.10.1 UNIBUS Backplane Removal

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet when you handle UNIBUS modules.

5. Remove the M7166 paddle card with the cables attached (Figure 5-27).
6. Disconnect the cables from all modules in the UNIBUS backplane.
7. Remove all modules from the UNIBUS backplane and place them in anti-static bags.
8. Rotate the BA32 box up.
9. Remove the BA32 box bottom cover.

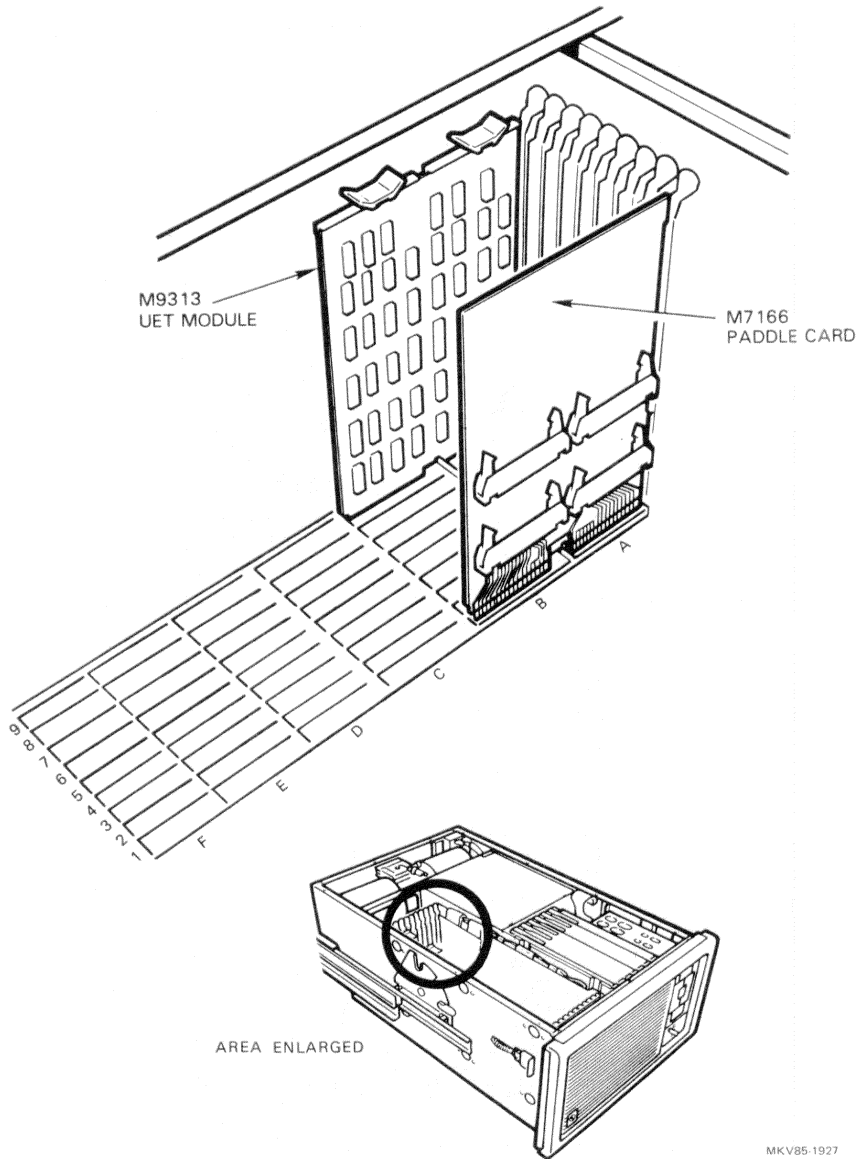


Figure 5-27: UNIBUS Backplane Showing the M7166 Paddle Card

10. Disconnect the three power connectors from the rear of the UNIBUS backplane (Figure 5-28).

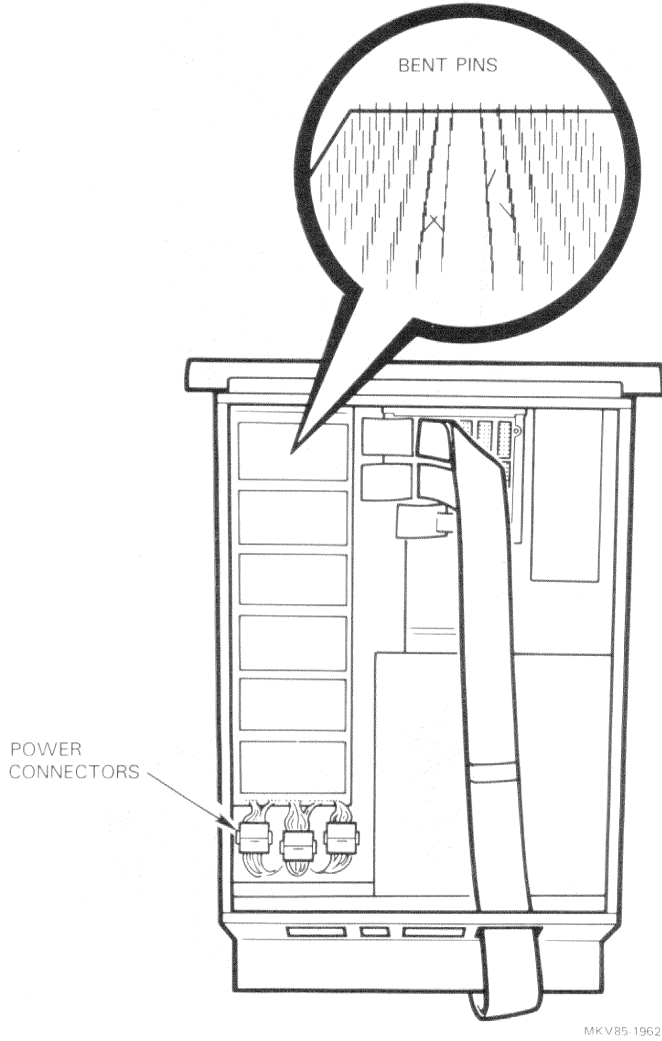
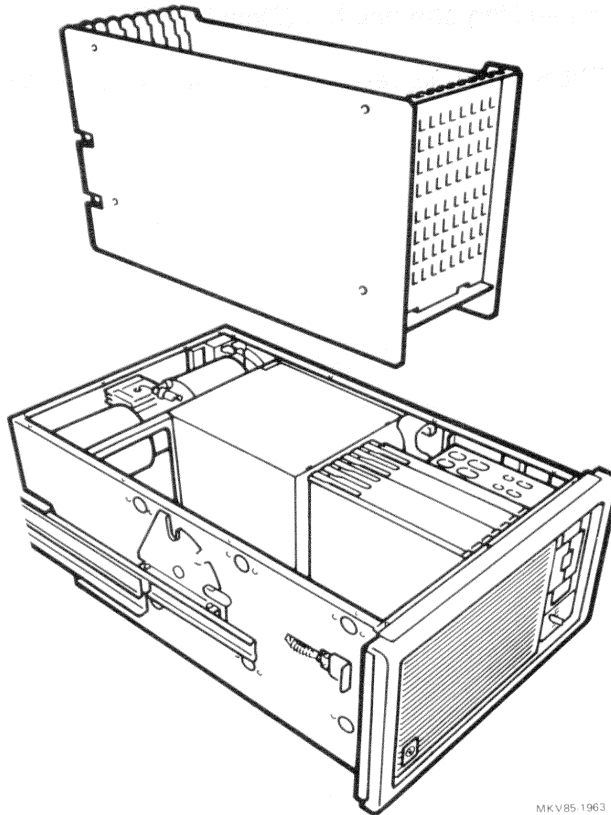


Figure 5-28: UNIBUS Backplane Power Connectors

11. Rotate the BA32 box down.
12. Remove and save the four screws from the left side of the BA32 box. Support the backplane while removing these screws (Figure 5-29).



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Figure 5-29: UNIBUS Backplane Removal/Replacement

13. Being careful not to damage the air gasket, pull the UNIBUS backplane straight up and out of the BA32 box.

5.10.2 UNIBUS Backplane Replacement

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet when you handle UNIBUS modules.

NOTE

Inspect the pins on the replacement UNIBUS backplane. Check for bent pins touching one another (Figure 5-28).

To replace the UNIBUS backplane, reverse steps 1 through 13 in Section 5.10.1.

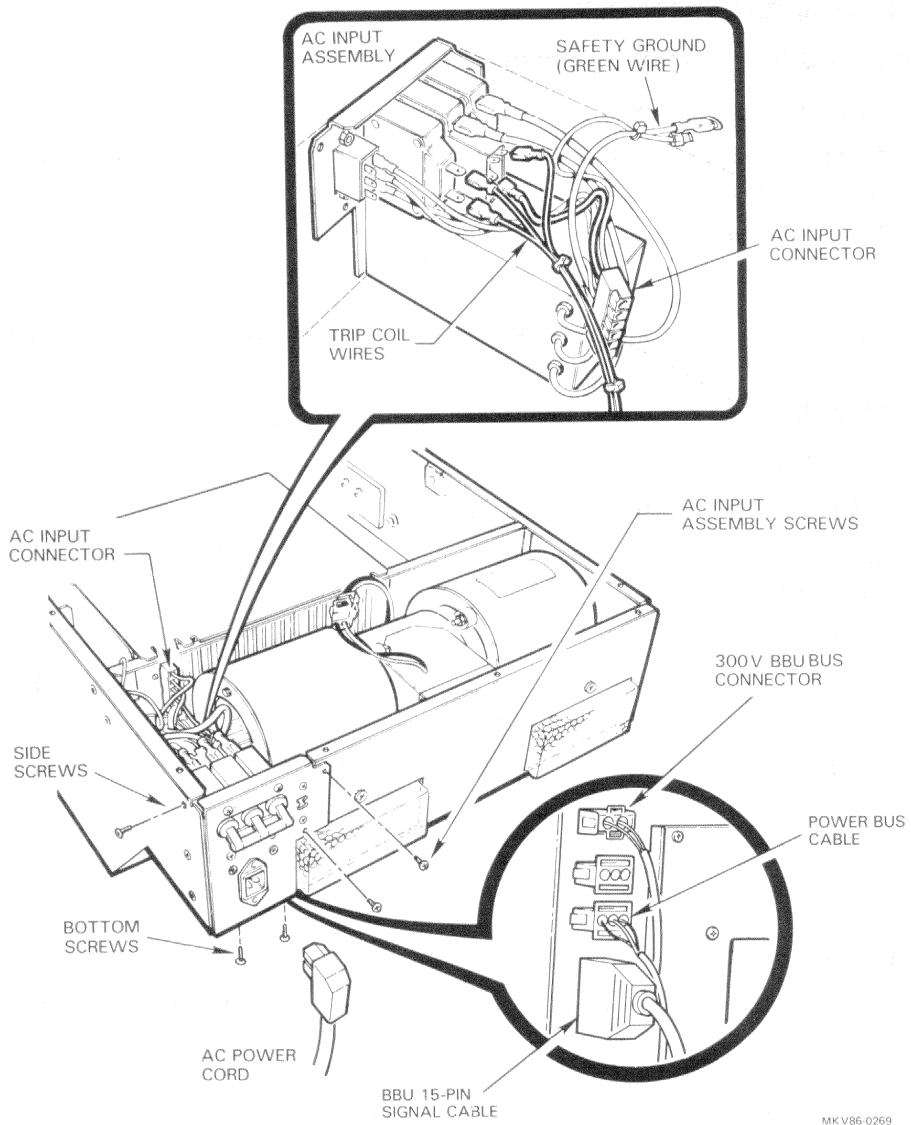
5.11 AC INPUT ASSEMBLY

5.11.1 AC Input Assembly Removal (Figure 5-30)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Disconnect the ac power cord.
4. Remove the three ac input assembly screws.
5. Remove two screws from the bottom rear of the chassis (immediately below the ac input box).
6. Slide the BA32 box out of the cabinet.
7. Remove the top cover.
8. Remove the three screws at the right side rear of the BA32 box.
9. Disconnect the ac input connector from the H7250 module through the rear of the power supply box.
10. Remove the safety ground (green wire with yellow stripes).
11. Note the location of the four trip coil wires (two red and two black) on the circuit breaker, and remove the wires.
12. Slide the ac input assembly back to enable access to the 300 V BBU bus connectors.
13. Disconnect the two 300 V BBU bus connectors.
14. Reach under the BA32 box and slide the ac input assembly out.

5.11.2 AC Input Assembly Replacement

To replace the ac input assembly, reverse steps 1 through 14 in Section 5.11.1.



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Figure 5-30: AC Input Assembly Removal/Replacement

5.12 KK810 CONTROL ASSEMBLY

5.12.1 Battery Removal (Figure 5-31)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Rotate the BA32 box up and remove the bottom cover.
5. Disconnect the two-wire cable from the control module.
6. Remove the two screws on the right side of the BA32 box.
7. Remove the battery holddown bracket.

5.12.2 Battery Replacement

To replace the battery, reverse steps 1 through 7 in Section 5.12.1.

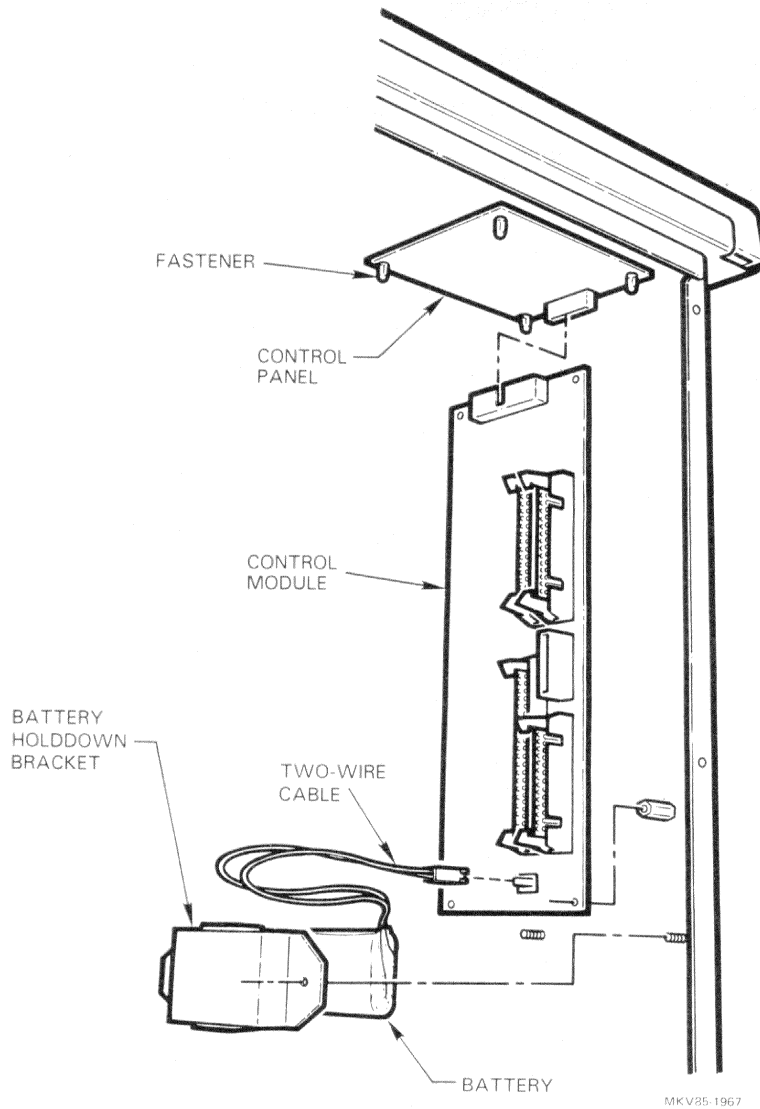


Figure 5-31: KK810 Battery and Control Module Removal/Replacement

5.12.3 Control Module Removal

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Rotate the BA32 box up and remove the bottom cover.
5. Disconnect all cables from the control module.
6. Using an offset Phillips head screwdriver, remove the two screws at the bottom of the control module.

CAUTION

As the screws are being removed from the control module, they can easily be dropped into the power supply. Take care when removing them. If a screw should fall into the power supply, remove it immediately.

7. Unplug the control module from the control panel.

5.12.4 Control Module Replacement

To replace the control module, reverse steps 1 through 7 in Section 5.12.3.

5.12.5 Control Panel Removal (Figure 5-32)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Rotate the BA32 box up and remove the bottom cover.
5. Remove the control module (Section 5.12.3).
6. Remove the keys from the front panel keyswitches.
7. Remove the front bezel. See Section 5.1.1. (The filter can stay in place.)
8. Remove and save the screw on each side of the front panel.

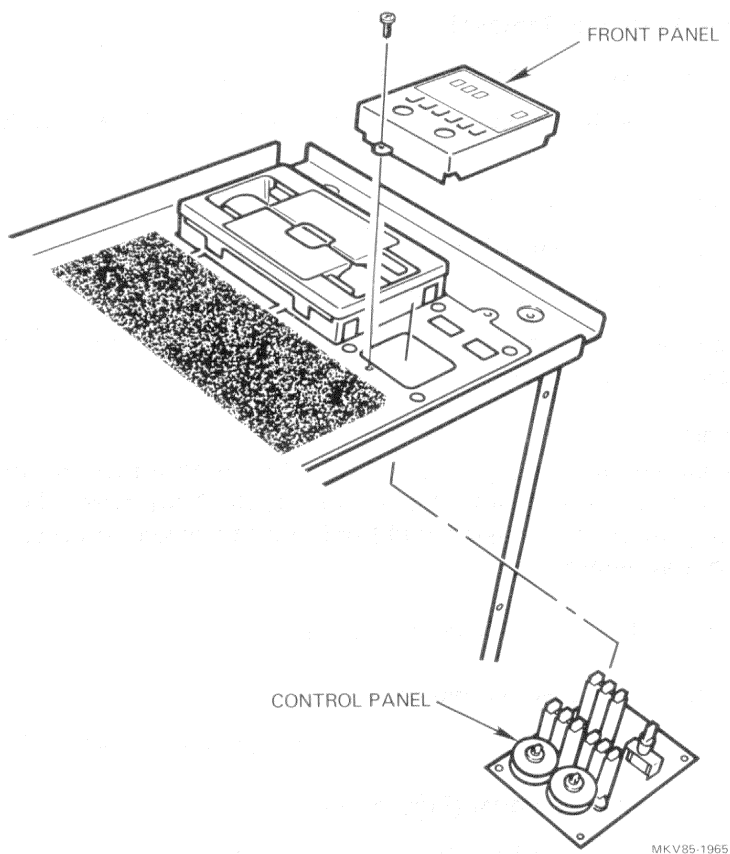


Figure 5-32: KK810 Control Panel Removal/Replacement

9. Using a screwdriver or needlenose pliers, release the fasteners and pull the control panel straight down.

5.12.6 Control Panel Replacement

To replace the control panel, reverse steps 1 through 9 in Section 5.12.5. When replacing, line up the switches on the replacement control panel to match the keyswitch positions on the front panel. Check that the control panel does not make contact with the FCC gasket clip next to the RX50.

5.13 BA32 BOX

WARNING

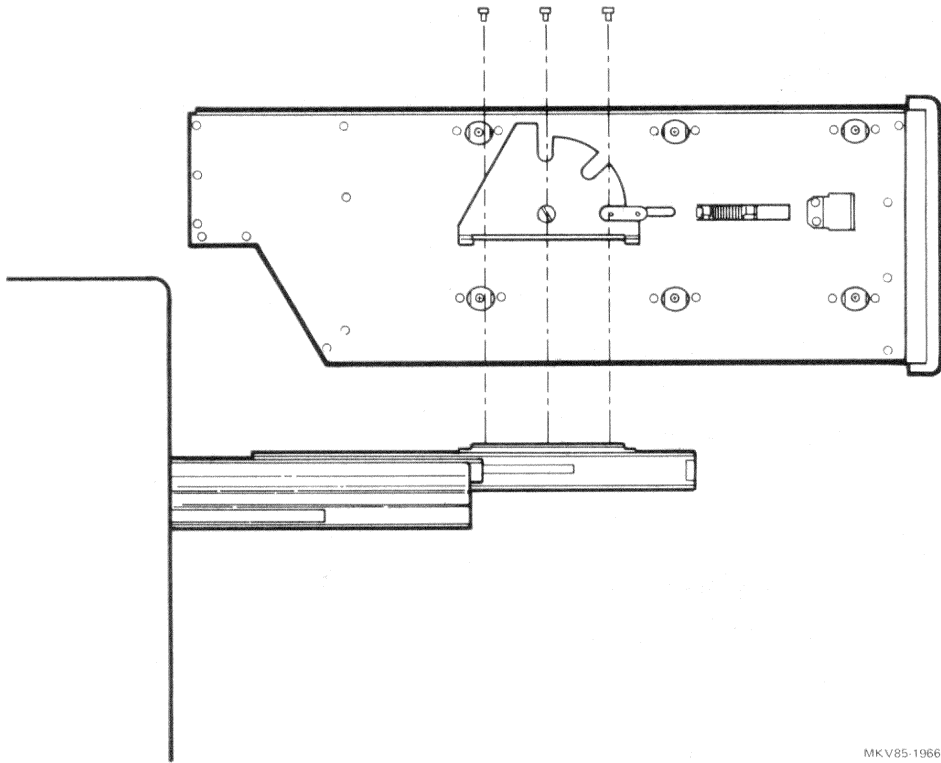
Do not attempt to lift the BA32 box by yourself. You will need the help of at least one other person.

5.13.1 BA32 Box Removal (Figure 5-33)

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Disconnect all cables.
5. Remove the three screws from the rotating mechanism on both slides.
6. Lift the BA32 box off the slides.

5.13.2 BA32 Box Replacement

To replace the BA32 box, reverse steps 1 through 6 in Section 5.13.1.



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Figure 5-33: BA32 Box Removal/Replacement

5.14 PROCESSOR MODULE

5.14.1 Processor Module Removal

1. Remove the processor cabinet front and rear doors.
2. From the rear of the processor cabinet, release the BA32 box track lock (Figure 2-21).
3. Slide the BA32 box out of the cabinet.
4. Remove the top cover.

CAUTION

Observe electrostatic discharge precautions when handling the processor module. See Section 4.1.1 of this manual.

5. Remove the appropriate processor module.

5.14.2 Processor Module Replacement

1. Insert the replacement processor module in the appropriate slot.
2. Replace the BA32 box top cover.
3. Slide the BA32 box into the cabinet.
4. Apply system power.
5. If the replaced module is the attached processor and if it fails self-test, check the polarity of the RCX50 self-test enable bit and change it if necessary.

- a. Logically connect the console to the attached processor:

```
>>>Z n<RET>          ! n is the node ID of the
                        ! attached processor
```

- b. Examine the RCX50 self-test enable bit:

```
>>>E/E 3<RET>
      P    20098176    08  ! 08 indicates bit is
                        !   enabled
                        ! 18 indicates bit is
                        !   disabled
```

- c. If the RCX50 self-test enable bit is enabled (08), disable it:

```
>>>D/E 3 18<RET>
```

- d. Break the logical connection:

>>> CTRL/P

NOTE

For more information on the RCX50 self-test enable bit, see the *VAX 8200/8300 Owner's Manual*.

6. Check the contents of the processor's EEPROM. (See the *VAX 8200/8300 Owner's Manual* for instructions.) Check the parameters listed in Table 5-2.

Table 5-2: EEPROM Parameters to Check When Replacing the Processor Module

EEPROM Parameter	Contents in Primary Processor	Contents in Attached Processor
Serial number	Belongs to module; do not change.	Belongs to module; do not change.
Logical console node number.	Don't care	Node ID of primary processor (must be 2). ❶

❶ If the logical console node number in the attached processor is anything other than the node ID of the primary processor, the attached processor must be moved into the slot dedicated to the primary processor before the node number can be changed. See the *VAX 8200/8300 Owner's Manual* for details.

7. Check the following parameters:
- Default boot device
 - Latest patches
 - Console baud rate
8. Replace the processor cabinet front and rear doors.

BA32 Box Cable Management **6**

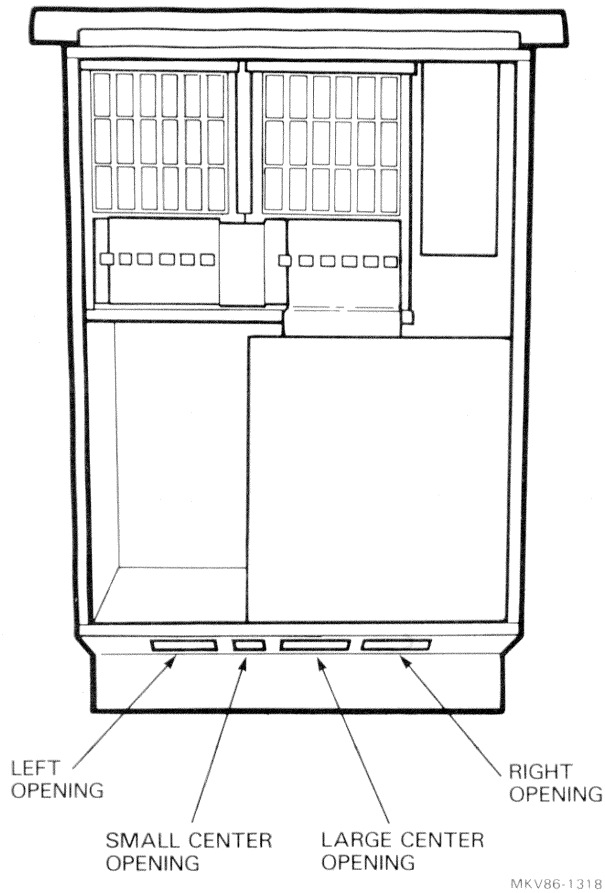


Figure 6-1: BA32 Box Cable Openings

Table 6-1: BA32 Box Cable Routing

Option	Left Opening	Small Center Opening	Large Center Opening	Right Opening
CIBCI			X	
DEBNT ❶		X		
DMB32 ❷	X			
DRB32 ❷	X			
DWBUA				X
KDB50 ❸	Second		First	
RS-232 ❹		X		
TU81			X	

Note

Route the option cable through the opening marked by an X.

- ❶ DEBNT NI cable only. Placement of the DEBNT TK50 cable is left to the judgement of the person installing the option.
- ❷ The total of DMB32s and DRB32s cannot exceed two. This is limited by the cable thickness.
- ❸ If the system contains one KDB50 and one CIBCI, the KDB50 cable is routed through the left opening.
- ❹ KA820 console lines.

Section III
24-VAXBI Slot Cabinet

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

WARNING

Shut off system power at the main system circuit breaker (on the H877 power controller) before performing any procedure in this chapter. **DO NOT RELY UPON THE FRONT PANEL KEY-SWITCH TO SHUT OFF SYSTEM POWER.** The main circuit breaker is the only reliable means of disconnecting ac power from the cabinet.

7.1 VAXBI MODULES OVERVIEW

7.1.1 Electrostatic Discharge Precautions

CAUTION

You must wear an anti-static wrist strap connected to the processor cabinet whenever you work on the VAX 8200/8300.

7.1.1.1 Anti-Static Wrist Strap – The anti-static wrist strap is located in its storage pouch inside the processor cabinet front door. It is connected to ground. Slip this strap on your wrist before performing any of the following procedures.

7.1.1.2 Conductive Module Container and Mat – Whenever you remove a VAXBI module from the cardcage, place it in a conductive container or on a grounded Velostat^❶ mat.

❶ Velostat is a trademark of the Minnesota Mining and Manufacturing Co.

7.1.2 Module Installation (No Cable Set)

1. Open the processor cabinet front door.
2. Remove the anti-static wrist strap from its storage pouch and slip it onto your wrist. Connect the other ESD lead to a Velostat mat or, if the new module is packaged in one, the conductive container.
3. Remove the clear plastic panel that covers the VAXBI cardcages. This panel is attached with four slotted, quarter-turn fasteners.
4. Lift the lever of the VAXBI cardcage slot into which the module will be placed (Figure 7-1).
5. Open the conductive container which houses the module.
6. If a module is being replaced, remove the module presently in the slot and place it on the Velostat mat or in the empty half of the conductive container.
7. Remove the module to be installed from the conductive container and insert it into the VAXBI cardcage slot (Figure 7-1).
8. Return the lever of the VAXBI cardcage slot to the locked (closed) position. If the lever will not return to the fully closed position, reopen it and reseat the module.
9. Replace the clear plastic panel over the VAXBI cardcages.
10. Mark the module number and location on the module map.
11. Close the processor cabinet front door.

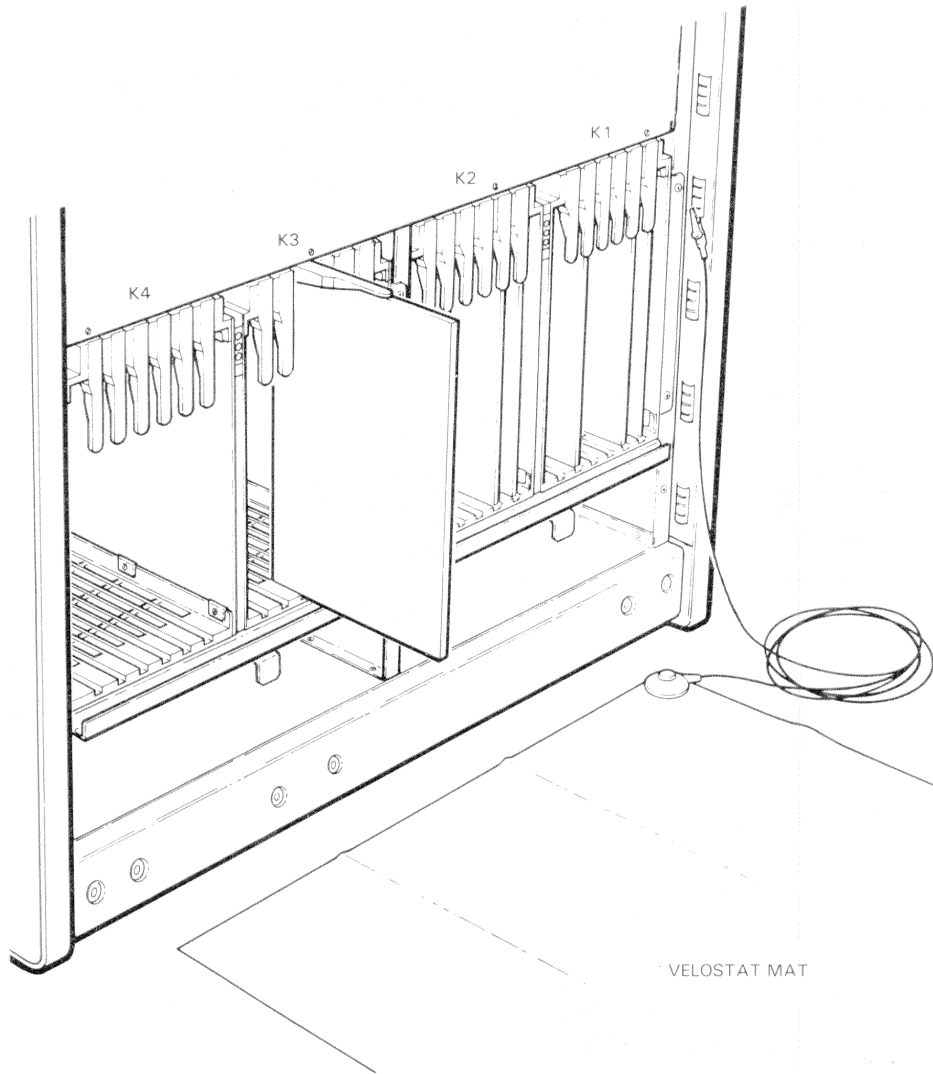


Figure 7-1: VAXBI Module Installation

7.1.3 VAX 8200/8300 VAXBI Node ID Guidelines

7.1.3.1 Node ID Assignments – The VAXBI node ID assignment shown in Figure 7-2 is the typical configuration shipped from the factory. This configuration can be changed, but the rules listed in Section 7.1.3.2 must be followed.

Figure 7-2 shows the VAXBI cardcages as viewed from the front of the cabinet.

7.1.3.2 Module Placement Rules –

1. The maximum number of VAXBI options is 16.
2. The maximum number of VAXBI modules is 24.
3. The primary CPU module (KA820) must be installed in K1J1. Slot K1J1 must have VAXBI node ID 2.
4. The DWBUA module must be installed in slot K1J2. Slot K1J2 must have node ID 0. A system may have no more than one DWBUA.
5. With the exception of the CIBCI, all multi-module options are installed so that the module with the BIIC is placed to the right of the other modules in the option module set. (That is, the module with the BIIC must be closer to the primary processor module than is the other module in the option set.) The node ID plug must be installed on the backplane of the slot holding the module with the BIIC. (In the CIBCI option module set, the module with the BIIC is installed to the left of the other module.)
6. All modules of a multi-module option must be installed in adjacent slots within the same cardcage.
7. No other type of module may be installed to the left of an MS820-BA. All that may be immediately to the left of an MS820-BA is the side wall of the VAXBI cardcage, an empty slot, or another MS820-BA.
8. All DEBNT modules must have higher node IDs than any KLESI-B. If any DEBNT has a node ID lower than any KLESI-B, a fatal bug check will result when running VAX/VMS V4.4.

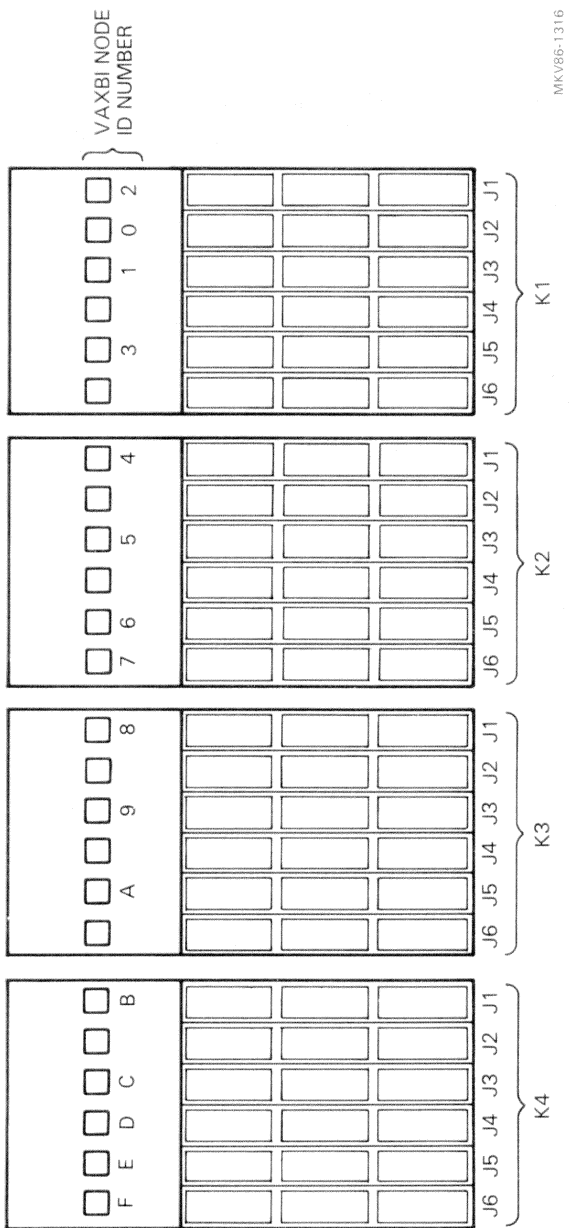


Figure 7-2: Typical VAXBI Node ID Configuration for a 24-VAXBI Slot Cabinet

9. At least one storage option (CIBCI or KDB50) must be installed in cardcage K3 or K4.
10. If the system contains an H7231 battery backup unit, the maximum memory is six MS820s. These memory modules must be installed in cardcages K3 and K4.

If the system does not contain an H7231 battery backup unit, the maximum memory is 12 MS820s. Each power supply can accommodate a maximum of six MS820 modules.

11. A memory module must be assigned to node ID F.
12. The power available to VAXBI options is limited. Check power totals against the values in the *VAXBI Options Handbook*.
13. The I/O panel space available for VAXBI options is limited. (See Table 7-1.)
14. The maximum number of various options allowed in the 24-VAXBI slot cabinet is listed in Table 7-2.

Table 7-1: I/O Panel Space Usage

Option	Number of Modules	Number of I/O Panel Units	Notes
KA820	1	2	Primary processor uses 2 I/O panel units; attached processor uses none
DWBUA	1	0	Cables to the UNIBUS expansion cabinet through the cabinet sidewalls
CIBCI	2	0	Cables to the CIPA cabinet through the cabinet sidewalls
KDB50	2	2	One to four RA** disks
MS820-A	1	0	2M byte memory module
MS820-B	1	0	4M byte memory module
DRB32-M	1	0	Cables directly to user's I/O
DRB32-E	2	2	
DRB32-W	2	0	Cables directly to user's I/O
DMB32	1	4	10 lines: 8 asynchronous, 1 synchronous, and 1 printer
KLESI-B	1	1	TU81E only
DEBNT	1	2	Uses 2 I/O panel units if only the Ethernet (NI) is used; optionally, uses 4 I/O panel units if the cabinet kit for TK50 is added

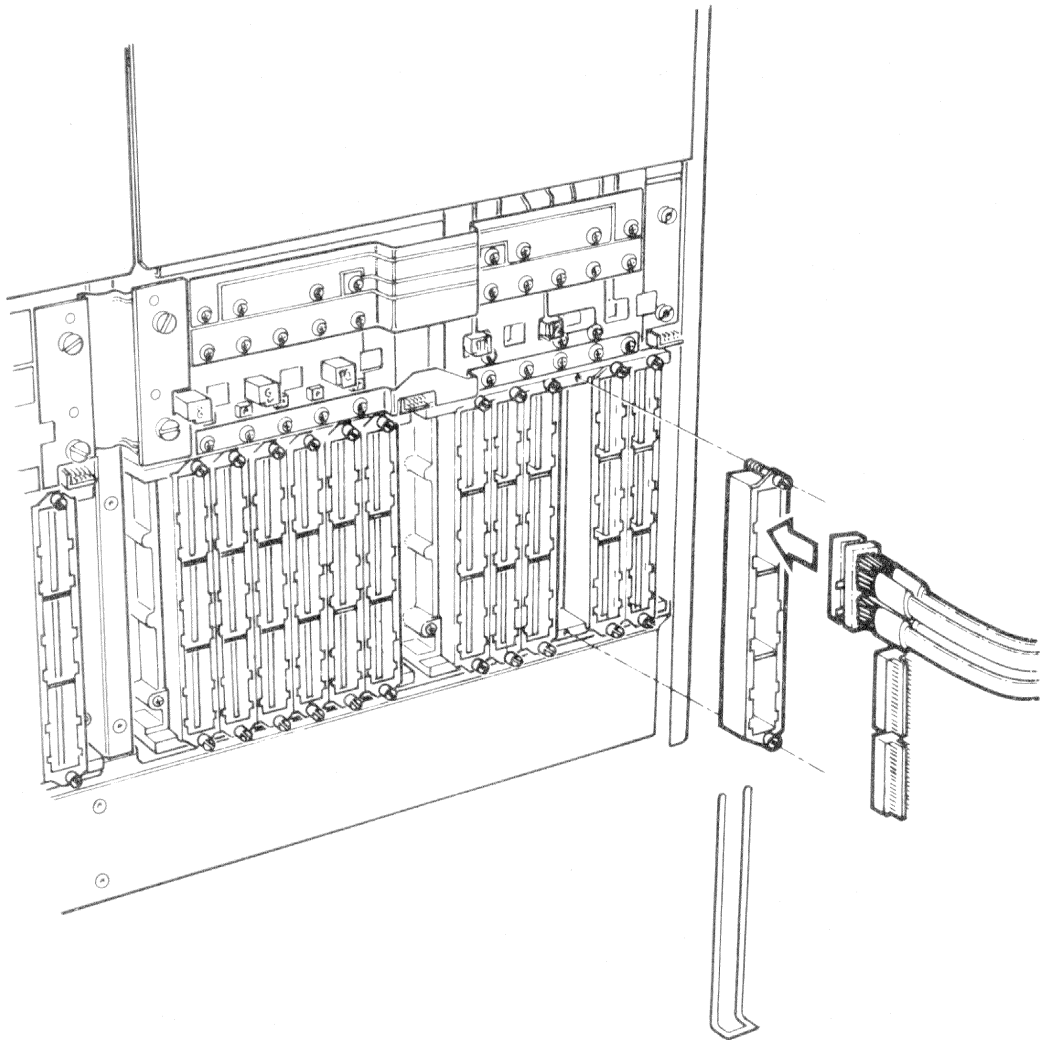
Table 7-2: Option Limits in a 24-VAXBI Slot Cabinet

Option	Maximum in 24-VAXBI Slot Cabinet	Notes
KA820	2	
MS820-BA	6 or 12	6 if BBU in system, 12 if no BBU
MS820-AA and MS820-BA combined	6 or 12	6 if BBU in system, 12 if no BBU
Storage options (KDB50 and CIBCI combined)	4	
KLESI-B	3	
DMB32	6	
DRB32-M	8	
DRB32-W and DRB32-E combined	4	
DRB32-M, DRB32-W, and DRB32-E combined	8	
DEBNT	2	One per power supply

7.2 KDB50 INSTALLATION

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1002 and T1003 modules in the VAXBI cardcage. The two modules must be in adjacent slots of the same VAXBI cardcage. Place T1002 nearer to the processor module and T1003 adjacent to T1002. Check for a node ID plug on the backplane of the slot in which T1002 is placed.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Attach the KDB50 backplane I/O assembly to the backplane of the VAXBI cardcage using the following procedure (Figure 7-3):
 - a. Remove the protective shipping material from the transition end of the internal SDI cable assembly.
 - b. Remove the transition header from the backplane of the slot that holds the T1003 module.
 - c. Remove the transition segment retaining clip from one of the transition headers in the option kit.
 - d. Remove the slot C transition segment. Insert the transition end of the internal SDI cable [17-01096-05 (8 ft) or 17-01096-06 (12 ft)] into slot C of the transition header housing (Figure 7-4).
 - e. Replace the retaining clip. Check that the two remaining transition segments and the transition end of the SDI cable are secure within the transition header assembly.
 - f. Attach the transition header assembly to the VAXBI backplane of the slot that holds the T1003 module.

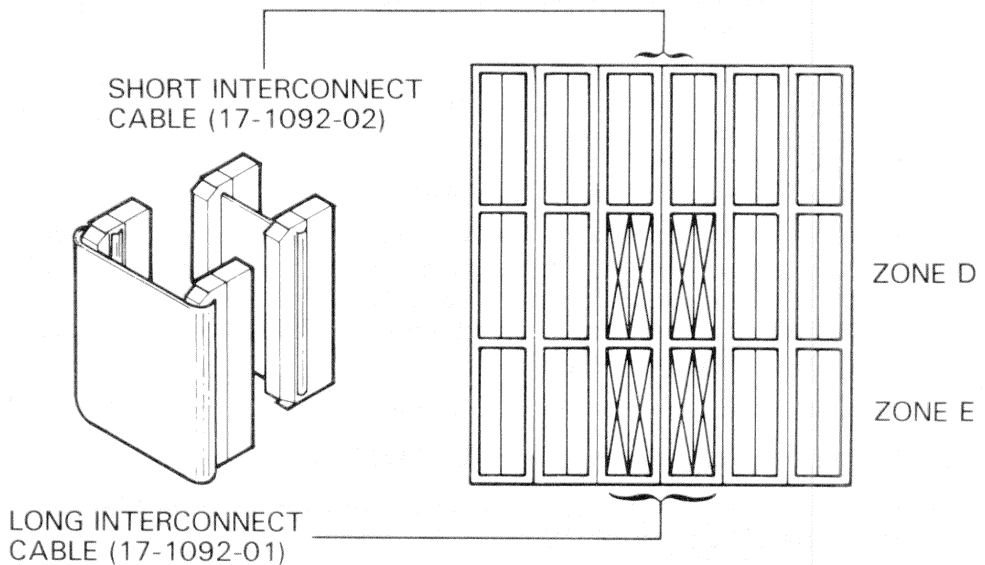
Tighten the screws in stages; do not tighten one completely before tightening the other. Torque both screws to 5 ± 1 inch-pounds using the torque screwdriver (29-27381-00) from the field service kit.
 - g. Install the other transition header to the backplane of the slot that holds the T1002 module.



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Figure 7-3: KDB50 Transition Header Assembly

- h. Connect the T1002 and T1003 transition headers as follows (Figure 7-4):



MKV86-1315

Figure 7-4: Connecting KDB50 Transition Headers

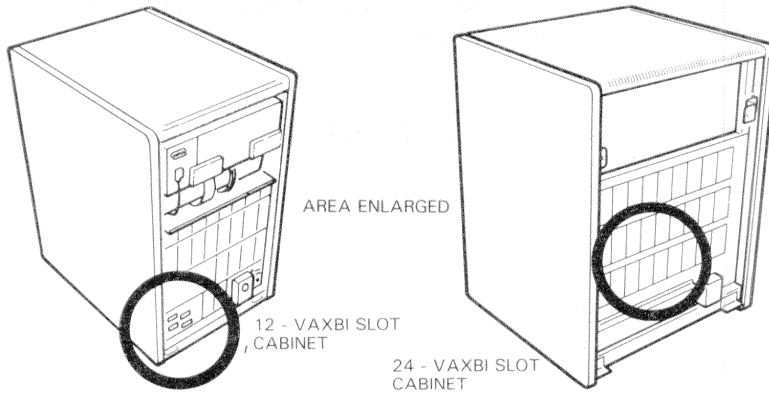
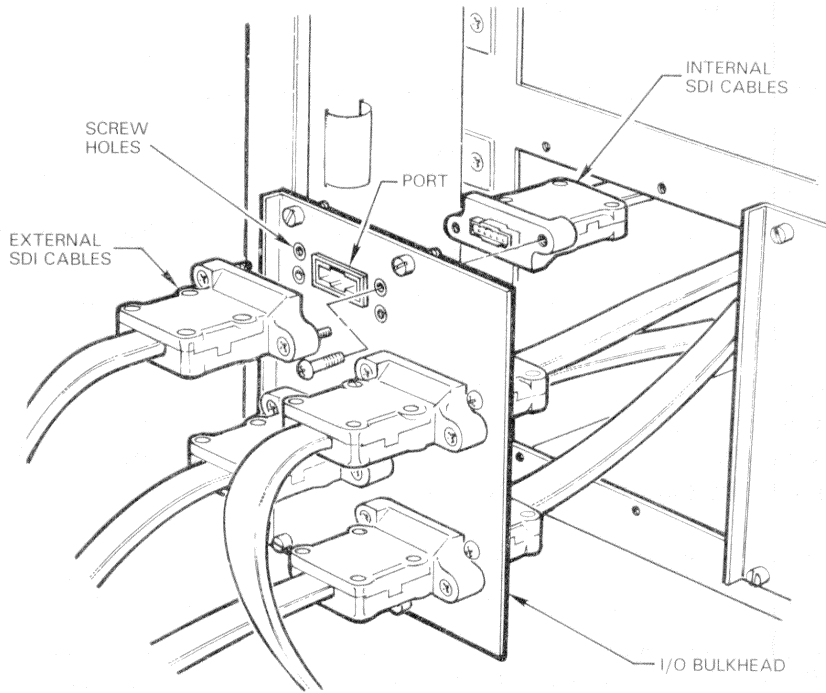
- 1) Insert the short interconnect cables (17-01092-02) on the inside rows of pins on zone D and zone E. The cable ground plane should face out, away from the backplane. (The cable ground plane is the flat side of the cable.)
 - 2) Insert the long interconnect cables (17-01092-01) on the outside rows of pins on zone D and zone E. The cable ground plane should face out, away from the backplane.
7. Dress the internal SDI cables, fan-fold style. Secure the cables with a tie-lock in the cable management tray.
 8. Continue to dress the internal SDI cables, being careful not to interfere with other cables in the cable management tray.

NOTE

Route the internal SDI cables separately from the power cables inside the processor cabinet.

9. Attach the I/O bulkhead on the processor cabinet using the following procedure (Figure 7-5):
 - a. Bring the internal SDI cables through the opening of one of the available option bulkhead panels on the I/O bulkhead door.
 - b. Screw the internal SDI cables (J1 through J4) into the small holes on either side of each port on the I/O bulkhead. Turn two of the keyed internal SDI cables one-half turn.
 - c. Mount the I/O bulkhead on the bulkhead door.
 - d. Dress off any excess cable length in the horizontal section of the cable management tray. Using the tie wraps provided, anchor the internal SDI cables at the holes along the inside of the I/O bulkhead door. Leave enough slack in the cables to enable the door to open and close without crimping or pulling the cables.
10. Attach the keyed external SDI cables to the processor cabinet I/O bulkhead.
11. Replace the clear plastic panel over the VAXBI cardcages.
12. Power up the system. The KDB50 self-test runs upon power up. Check that the yellow LEDs on the T1002 and T1003 modules light.

If the yellow LEDs do not light, refer to the *KDB50 Disk Controller User Guide* (EK-KDB50-UG).
13. Refer to the *KDB50 Disk Controller User Guide* for the complete acceptance procedure.
14. Update the module map with the module numbers and location of the KDB50 modules.
15. Replace the processor cabinet rear door and close the front door.



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Figure 7-5: SDI Cable Installation in an I/O Bulkhead

7.3 DWBUA INSTALLATION

NOTE

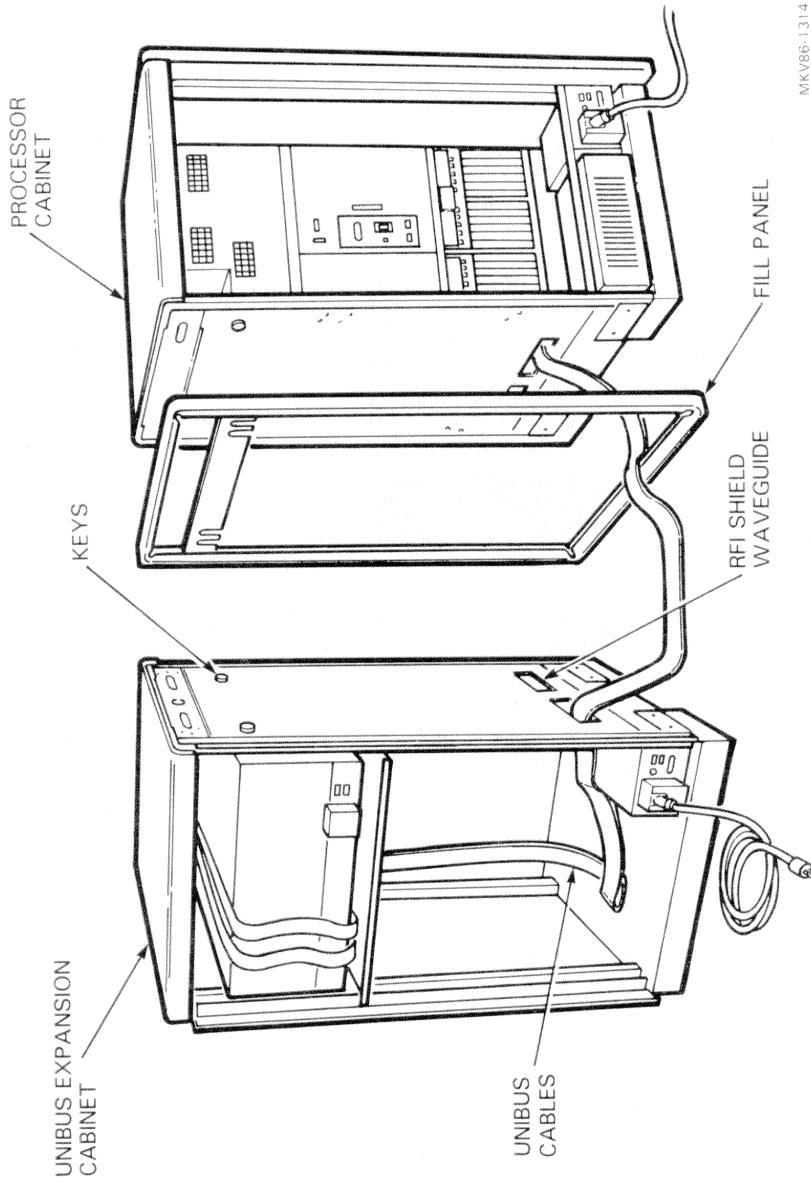
Multiple DWBUAs are not supported in a VAX 8200/8300 system.

1. Remove the side panel from the processor cabinet and install it on the UNIBUS expansion cabinet.
2. Remove the shielded tape from the processor cabinet RFI shield waveguide (see note below) and attach the waveguide bracket to the outside of the processor cabinet, inserting the screws from the inside of the cabinet. Save the other set of screws.

NOTE

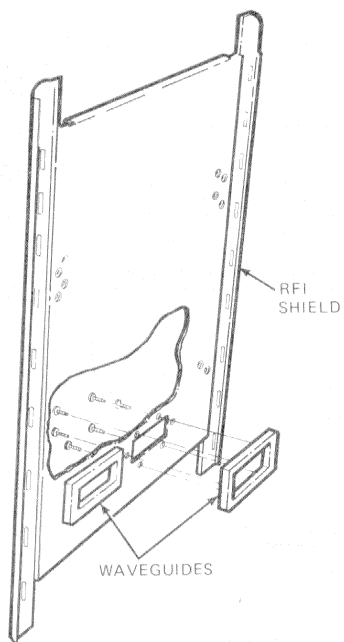
If the cables are to be passed through only one waveguide, install a bracket only on the waveguide that will be used. Do not remove the tape from the other waveguide.

3. Place the fill panel between the cabinets (Figure 7-6).
4. Line up the keys on the processor and UNIBUS expansion cabinets.
5. Attach the RFI shield waveguide screws to the bracket from inside the UNIBUS expansion cabinet, bolting the two cabinets together (Figure 7-7).
6. Bolt the processor and UNIBUS expansion cabinets together, front and rear, using the brackets provided (Figure 7-8).
7. Connect the UNIBUS cables.
8. Connect the power bus cable (Figure 7-9).



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Figure 7-6: Joining the Processor and the UNIBUS Expansion Cabinets



MKV85-1537

Figure 7-7: RFI Shield Waveguide Installation

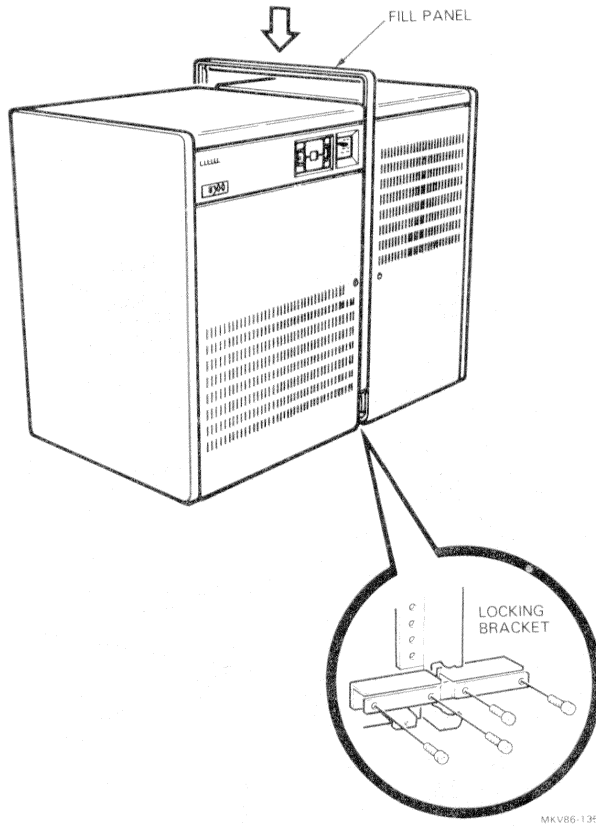


Figure 7-8: Attaching the Processor and UNIBUS Cabinets

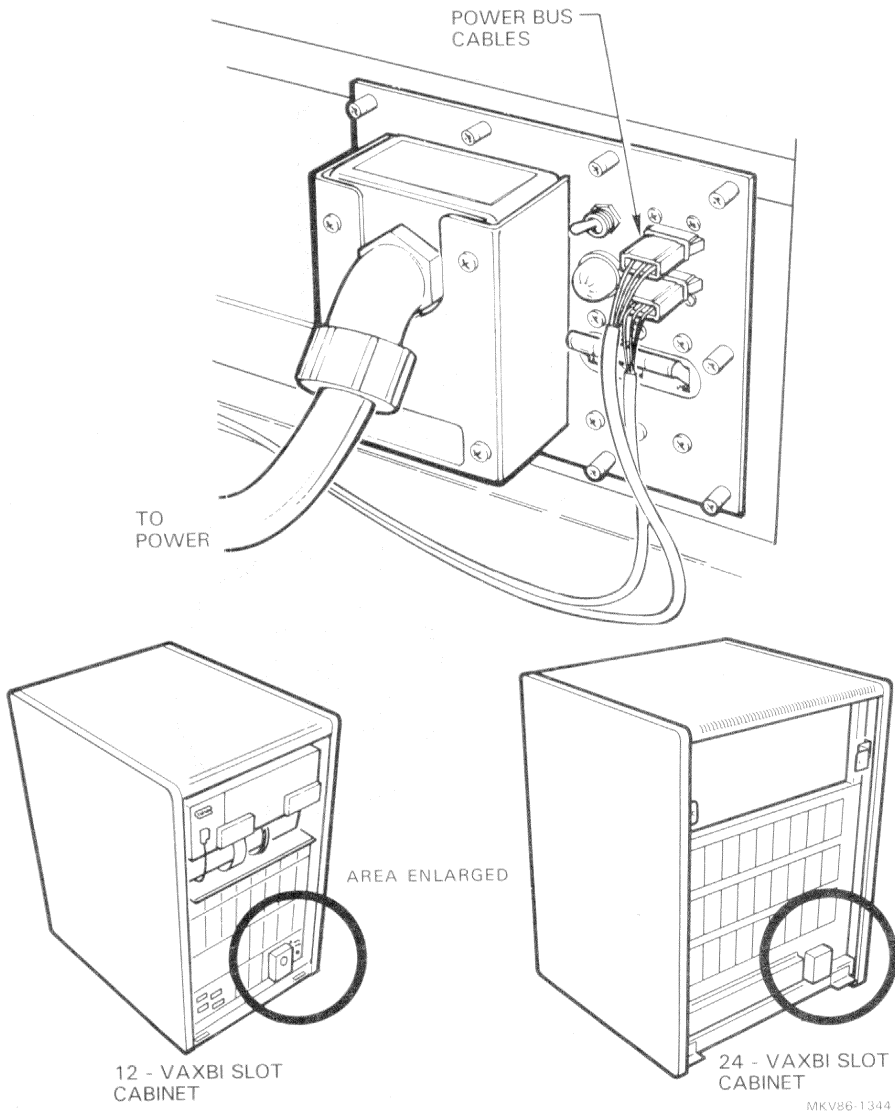


Figure 7-9: Connecting the Power Bus Cable

9. Remove the UNIBUS expansion cabinet front and rear doors. Pull out the stabilizer leg.

10. Slide the BA11 box out of the cabinet.
11. Remove the BA11 box top cover.
12. Attach the four UNIBUS cables to the M7166 paddle card (Figure 7-10). The two ends of the UNIBUS cables have the connectors oriented differently. On one end the connectors face the same direction, and on the other end they face opposite directions. The end of the cable that attaches to the M7166 card is the end that has the connectors facing the same way. The connectors are keyed.

NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector in the receptacle.

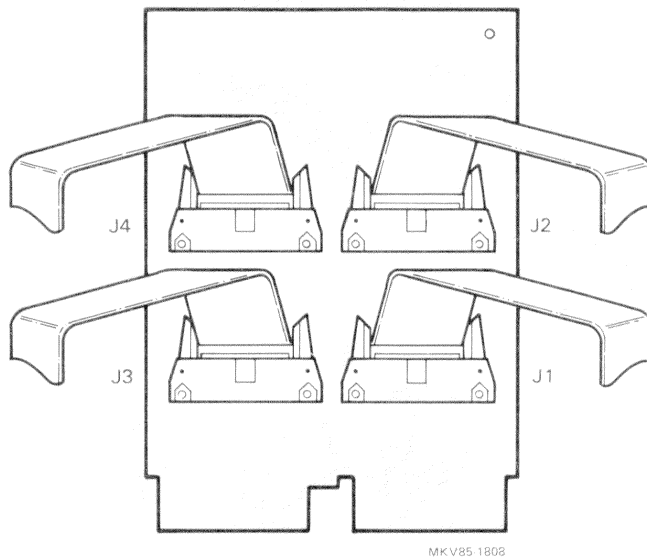


Figure 7-10: DWBUA M7166 Paddle Card

13. Mark the cables (J1 through J4) using the blank labels (36-16073-03) in the envelope inside the rear of the processor cabinet.
14. Insert the M7166 paddle card into slot 1, segments A and B, of the UNIBUS backplane (Figure 7-11).

15. Insert the M9313 UET module into the last slot, segments A and B, of the UNIBUS backplane (Figure 7-11).

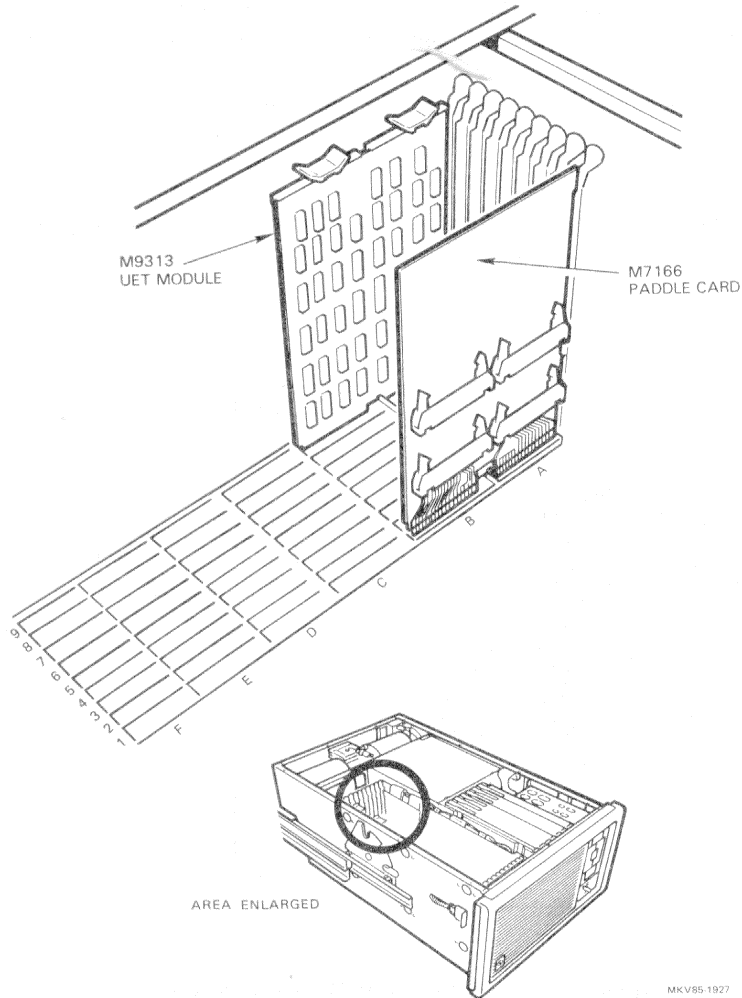


Figure 7-11: UNIBUS Backplane Showing the M7166 and M9313 Installed

16. Remove the cable hold-down bar at the rear of the BA11 box. Fold the cables, lay them on the guide, and replace the bar.

17. From the rear of the cabinet, remove the cable hold-down bar below the BA11 box. Lay the cables on the guide and replace the bar. Leave enough slack to enable the BA11 box to be pulled out and rotated up.
18. Pass the cables through the waveguide into the processor cabinet.
19. Insert grant continuity cards in segment D of all unused UNIBUS slots.

NOTE

The BA11-AY/AZ UNIBUS box requires a load of at least 750 mA on -15 V to operate. Some BA11s may have a preload in the H7204, in place of the power cable to the third DD11 backplane. If a third DD11 is being added and a preload is needed, install an M9049 preload module in the leftmost slot of the third DD11. Place the M9313 module in segments A and B, and the M9049 module in segments C and D of this slot.

20. Replace the BA11 box top cover.
21. Slide the BA11 box into the cabinet. Check behind the cabinet to ensure that no cables are crimped.
22. Open the processor cabinet front door and remove the rear door.
23. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
24. Remove the clear plastic panel that covers the VAXBI cardcages.
25. Install the transition header on the backplane of the slot that will hold the T1010 module.
26. Refer to Figure 7-12 and connect the four UNIBUS cables to the transition header assembly. The connectors are keyed.

NOTE

The keying on the UNIBUS cable connector is delicate. Be sure to match the keys before inserting the connector in the receptacle.

34. Update the module map with the module number and location of the DWBUA module.
35. Replace the processor cabinet rear door and close the front door.

7.4 ATTACHED PROCESSOR INSTALLATION (VAX 8300 UPGRADE)

1. Open the processor cabinet front door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the attached processor module (T1001) in the appropriate VAXBI slot. Install it as any other module without a cable set (Section 7.1.2).
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Power up the system. The self-test runs upon power up. Check that the yellow LED on the T1001 module lights.
7. Refer to Section 3.4, step 7, for the acceptance procedure.
8. Update the module map with the module number and location of the attached processor module.
9. Close the processor cabinet front door.
10. Pop the VAX 8200 medallion out from the inside and replace it with the VAX 8300 medallion.
11. Boot VMS.
12. Insert the diskette labeled VAX/VMS 8300 MP KEY BIN RX50 in CSA1.
13. Type the following command. The response should look like that in Example 7-1.

```
$ @SYS$UPDATE:VMSINSTAL VMSMPS CSA1<RET>
```

```
$ @SYS$UPDATE:VMSINSTAL VMSMPS CSA1
```

```
VAX/VMS Software Product Installation Procedure X4.5
```

```
It is 15-JUL-1986 at 15:33.
```

```
Enter a question mark (?) at any time for help.
```

```
* Are you satisfied with the backup of your system disk [YES]? yes
```

```
The following products will be processed:
```

```
VMSMPS V4.4
```

```
Beginning installation of VMSMPS V4.4 at 15:34
```

```
%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
```

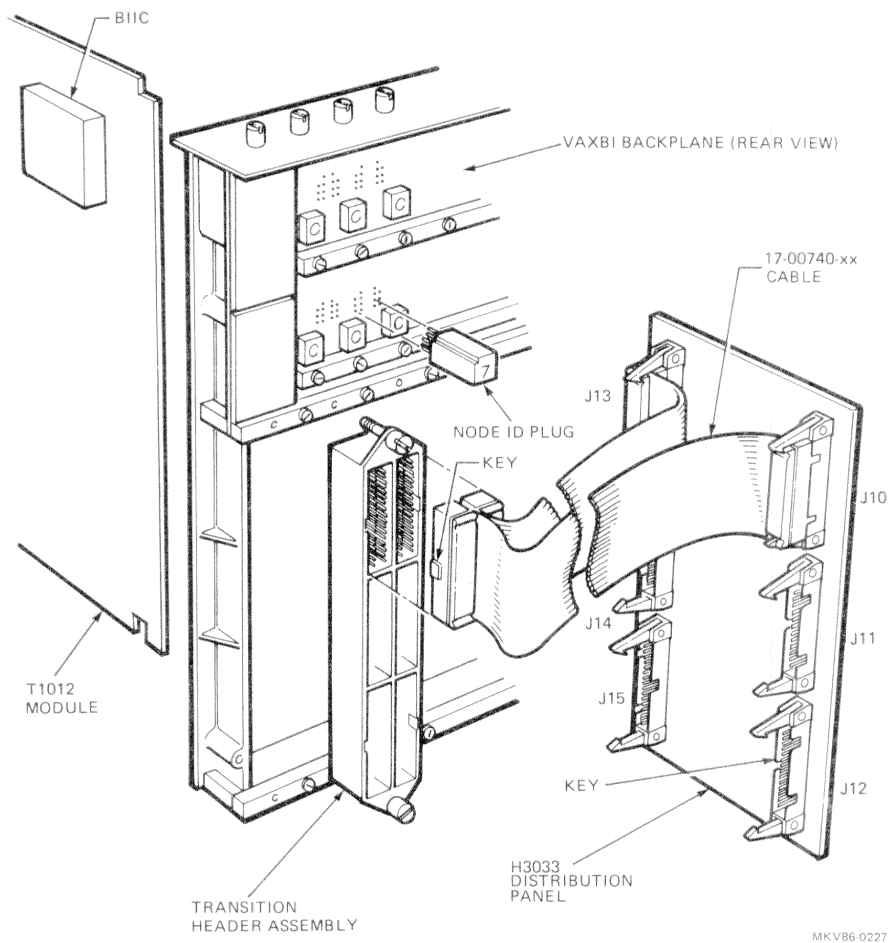
```
Installation of VMSMPS V4.4 completed at 15:34
```

```
VMSINSTAL procedure done at 15:34
```

Example 7-1: Enabling VAX/VMS Multi-Processing on
a VAX 8300

7.5 DMB32 INSTALLATION

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1012 module in the VAXBI cardcage.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Install the transition header on the backplane of the slot that holds the T1012 module.
7. Connect the six DMB32 ribbon cables (17-00740-XX) to the transition header on the backplane of the slot that holds the T1012 module. Both the cable connectors and the sockets on the transition header are keyed to prevent incorrect installation (Figure 7-13).



MKV86-0227

Figure 7-13: DMB32 Installation

8. Dress the DMB32 cables, fan-fold style. Secure the cables with a tie-lock in the cable management tray.
9. Continue to dress the DMB32 cables, being careful not to interfere with other cables.

NOTE

Route the DMB32 cables separately from the power cables inside the processor cabinet.

10. Connect the DMB32 cables to the I/O bulkhead door (Table 7-3).

Table 7-3: DMB32 Cable Connections

Transition Header Connector	H3033 Distribution Panel Socket
C-1	J10
C-2	J13
D-1	J11
D-2	J14
E-1	J12
E-2	J15

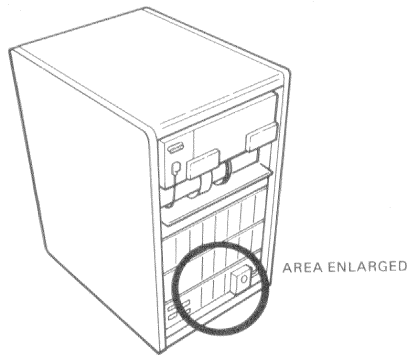
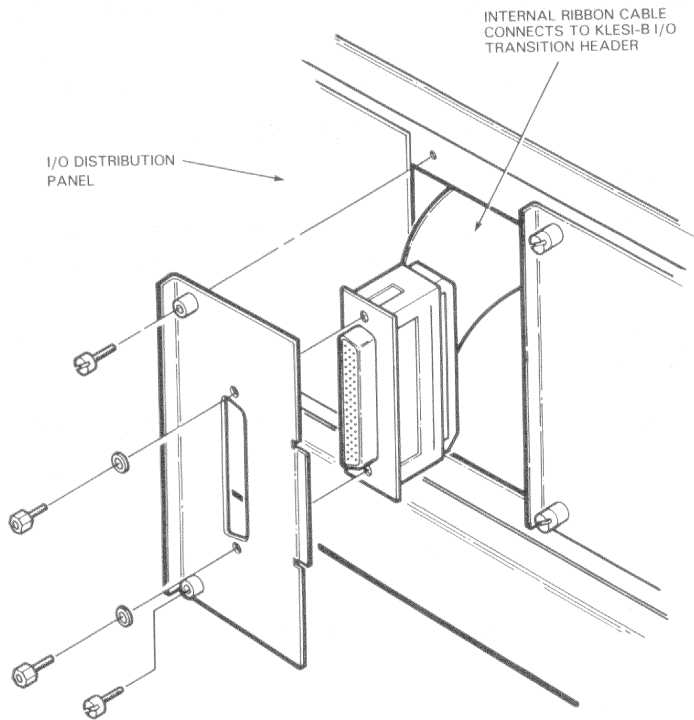
11. Power up the system. The DMB32 self-test runs upon power up. Check that the yellow LED on the T1012 module lights.
If the yellow LED does not light, refer to the *DMB32 User Guide*.
12. Refer to the *DMB32 User Guide* for the complete acceptance procedure.
13. Update the module map with the module number and location of the DMB32 module.
14. Replace the processor cabinet rear door and close the front door.

7.6 KLESI-B INSTALLATION

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1014 module in the VAXBI cardcage.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Install the transition header on the backplane of the slot that holds the T1014 module.
7. Insert the two cable connectors into zone E of the backplane of the slot that will hold the T1014 module. Check that the connectors are correctly oriented and seated.
8. Dress the cables.

9. Route the free end of the KLESI-B cable through the cabinet to the I/O bulkhead door.
10. Locate the KLESI-B connector position on the I/O bulkhead door.
11. Remove the blank insert for the KLESI-B cable connector.
12. Route the cable through the opening in the panel.
13. Attach the I/O bulkhead panel to the 50-contact connector end of the KLESI-B cable. Use the hex standoffs from the KLESI-B kit. Tighten the hex standoffs (Figure 7-14).
14. Place a helical lockwasher on each of the captive slotted screws supplied in the KLESI-B kit. Thread the screws into the hex standoffs.
15. Install the adapter panel on the I/O bulkhead door and tighten the screws.
16. Power up the system. The KLESI-B self-test runs upon power up. Check that the yellow LED on the T1014 module lights.

If the yellow LED does not light, refer to the *KLESI-B User and Installation Guide*.
17. Refer to *KLESI-B User and Installation Guide* for the complete acceptance procedure.
18. Update the module map with the module number and location of the KLESI-B module.
19. Close the processor cabinet front door and replace the rear door.



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Figure 7-14: KLESI-B I/O Connector

7.7 DRB32 INSTALLATION

7.7.1 DRB32-M Installation

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1022 module in the VAXBI cardcage.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Install the transition header on the backplane of the slot that holds the T1022 module.
7. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module.
8. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1022 module (Figure 7-15). Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the right side of zones C, D, and E, with the colored stripe down (away from the power cubes).
9. Route the cables to the location designated by the customer.
10. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock in the cable management tray.
11. Continue to dress the DRB32 cables, being careful not to interfere with other cables.

NOTE

Route the DRB32 cables separately from the power cables inside the processor cabinet.

12. Connect the DRB32 cables to the customer's device.

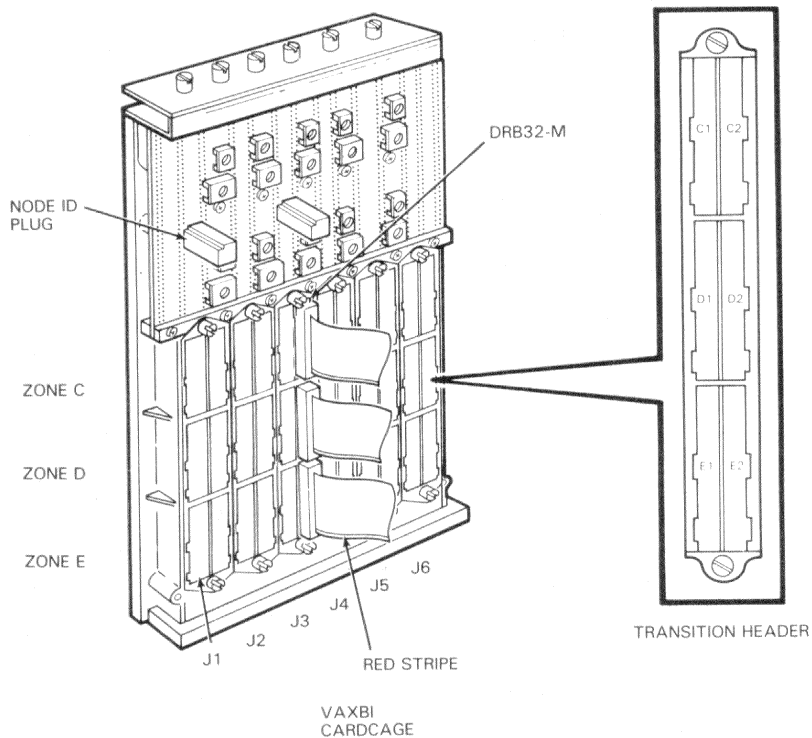
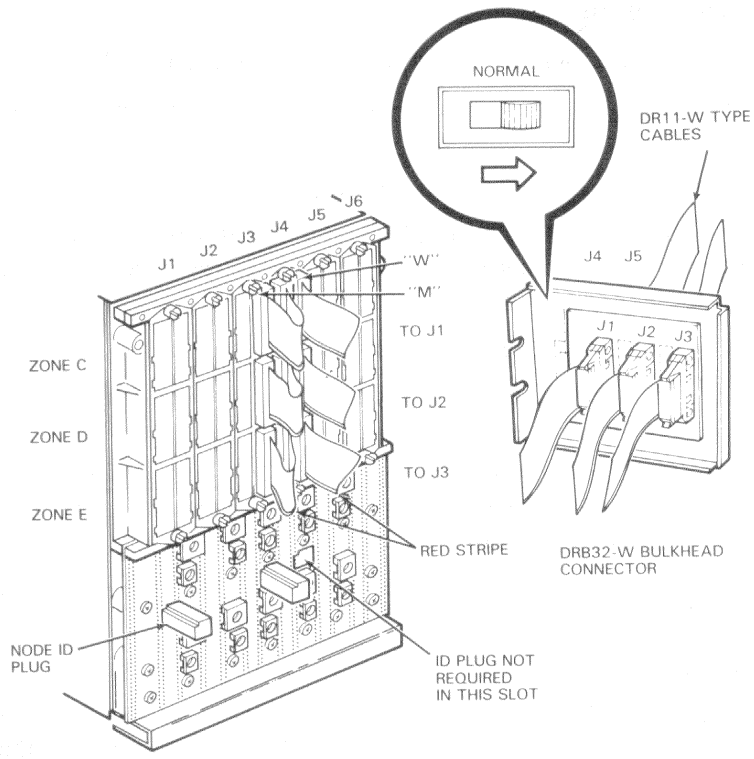


Figure 7-15: DRB32-M Cables

13. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.
If the yellow LED does not light, refer to the *DRB32 Installation Guide*.
14. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
15. Update the module map with the module number and location of the DRB32 module.
16. Close the processor cabinet front door and replace the rear door.

7.7.2 DRB32-E Installation

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1022 and T1024 modules in the VAXBI cardcage. These modules must be installed in two adjacent slots in the same cardcage, and T1022 must be closer to the primary processor module.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Install the transition headers on the backplane of the slots that hold the T1022 and T1024 modules.
7. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module. The backplane of the slot that holds the T1024 module should have no VAXBI node ID plug.
8. Install the interconnect cables (17-01092-02) as shown in Figure 7-16. The colored stripe is down (away from the power cubes).
9. Install the I/O panel and bulkhead connector on the I/O bulkhead door.
10. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1024 module. Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the right side of zones C, D, and E, with the colored stripe away from the power cubes. The cable connections are detailed in Table 7-4.



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Figure 7-16: DRB32-E Cables

Table 7-4: DRB32-E I/O Cable Connections

Cable End	Identifier	Zone E Connections	Zone D Connections	Zone C Connections
Transition header	Key and white arrow on same side of connector	Right side of T1024 slot (E2)	Right side of T1024 slot (D2)	Right side of T1024 slot (C2)
IOCP	Key and white arrow on opposite sides of connector	E NORM of I/O panel	D NORM of I/O panel	C NORM of I/O panel

11. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock in the cable management tray.
12. Continue to dress the DRB32 cables, being careful not to interfere with other cables.

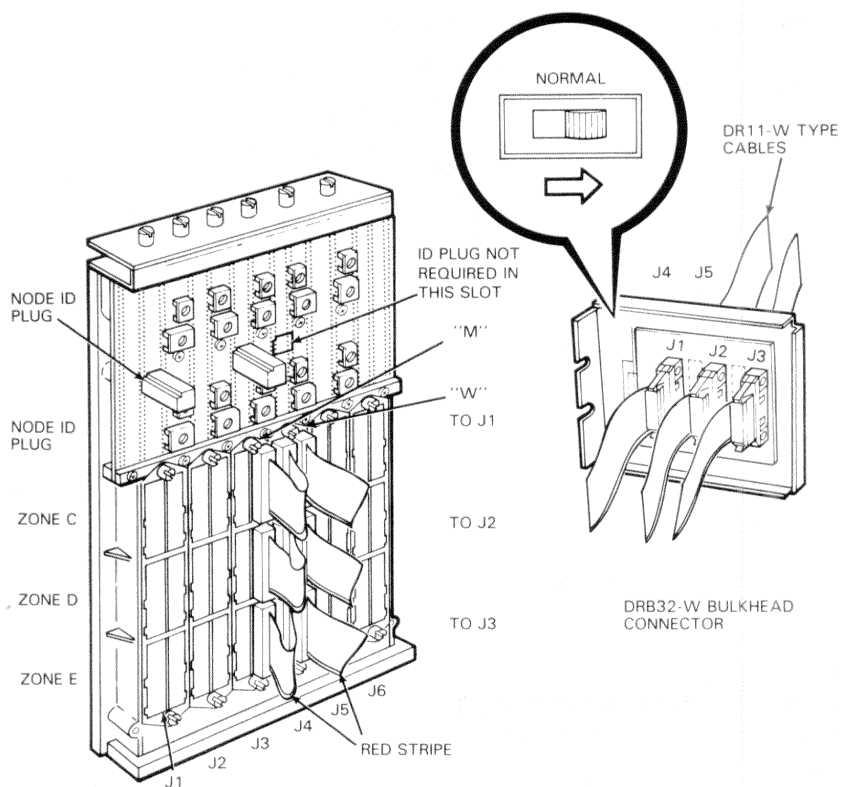
NOTE

Route the DRB32 cables separately from the power cables inside the processor cabinet.

13. Install the I/O panel and bulkhead connector to the I/O section at the back of the system.
14. Connect the DRB32 cables to the distribution panel, as listed in Table 7-4.
15. Install cables BS17Y-20 or BS17Y-40 to the bulkhead assembly on the outside of the I/O distribution panel. Route them to the location designated by the customer.
16. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.
If the yellow LED does not light, refer to the *DRB32 Installation Guide*.
17. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
18. Update the module map with the module numbers and location of the DRB32 modules.
19. Close the processor cabinet front door and replace the rear door.

7.7.3 DRB32-W Installation

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1022 and T1023 modules in the VAXBI cardcage. These modules must be installed in two adjacent slots in the same cardcage, and T1022 must be closer to the primary processor module.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Install the transition headers on the backplane of the slots that hold the T1022 and T1023 modules.
7. Check for a unique VAXBI node ID plug on the backplane of the slot that holds the T1022 module. The backplane of the slot that holds the T1023 module should have no VAXBI node ID plug.
8. Install the interconnect cables (17-01092-02) as shown in Figure 7-17. The colored stripe is down (away from the power cubes).
9. Install the DRB/DR11 cable adapter. If the DR11-W device is in the system cabinet, attach the cable adapter to the system frame. If the DR11-W device is outside of the system cabinet, attach the cable adapter to the system I/O bulkhead.
10. Connect the DRB32 ribbon cables (CK-DRB32-L*) to the transition header on the backplane of the slot that holds the T1023 module. Connect to the backplane the end of each cable that has the key and white arrow on the same side of the connector. Connect one cable each to the right side of zones C, D, and E, with the colored stripe away from the power cubes. The cable connections are detailed in Table 7-5.



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Figure 7-17: DRB32-W Cables

Table 7-5: DRB32-W I/O Cable Connections

Cable End	Identifier	Zone E Connections	Zone D Connections	Zone C Connections
Transition header	Key and white arrow on same side of connector	Right side of T1023 slot (E2)	Right side of T1023 slot (D2)	Right side of T1023 slot (C2)
IOCP	Key and white arrow on opposite sides of connector	J3 of I/O panel	J2 of I/O panel	J1 of I/O panel

11. Dress the DRB32 cables, fan-fold style. Secure the cables with a tie-lock in the cable management tray.
12. Continue to dress the DRB32 cables, being careful not to interfere with other cables.

NOTE

Route the DRB32 cables separately from the power cables inside the processor cabinet.

13. Connect the DRB32 cables to the distribution panel, as listed in Table 7-5.
14. Connect the DR11 cables from the customer's device to the DRB/DR11 adapter.
15. Power up the system. The DRB32 self-test runs upon power up. Check that the yellow LED on the T1022 module lights.
If the yellow LED does not light, refer to the *DRB32 Installation Guide*.
16. Refer to the *DRB32 Installation Guide* for the complete acceptance procedure.
17. Update the module map with the module numbers and location of the DRB32 modules.
18. Close the processor cabinet front door and replace the rear door.

7.8 DEBNT INSTALLATION

1. Open the processor cabinet front door and remove the rear door.
2. Attach the anti-static wrist strap and Velostat mat or conductive container (Section 7.1.1).
3. Remove the clear plastic panel that covers the VAXBI cardcages.
4. Insert the T1034 module in the VAXBI cardcage.
5. Replace the clear plastic cover over the VAXBI cardcages.
6. Connect the DEBNT cable to zone E (right) of the transition header on the backplane of the slot that holds the T1034 module.
7. Connect the 12 V power cable from the power supply distribution board to the pigtail connector on the DEBNT cable.
8. Secure the cable with a tie-lock in the cable management tray.

NOTE

Route the DEBNT cable separately from the power cables inside the processor cabinet.

9. Connect the DEBNT cable to the I/O bulkhead door.
10. Power up the system. The DEBNT self-test runs upon power up. Check that the yellow LED on the T1034 module lights.

If the yellow LED does not light, refer to the *DEBNT Ethernet Tape Controller Technical Manual*.

11. Refer to the *DEBNT Ethernet Tape Controller Technical Manual* for the complete acceptance procedure.
12. Update the module map with the module number and location of the DEBNT module.
13. Close the processor cabinet front door and replace the rear door.

Hardware Removal and Replacement in a 24-VAXBI Slot Cabinet **8**

WARNING

Shut off system power at the main system circuit breaker before performing any procedure in this chapter. DO NOT RELY UPON THE FRONT PANEL KEYSWITCH TO SHUT OFF SYSTEM POWER. The main circuit breaker is the only reliable means of disconnecting ac power from the cabinet.

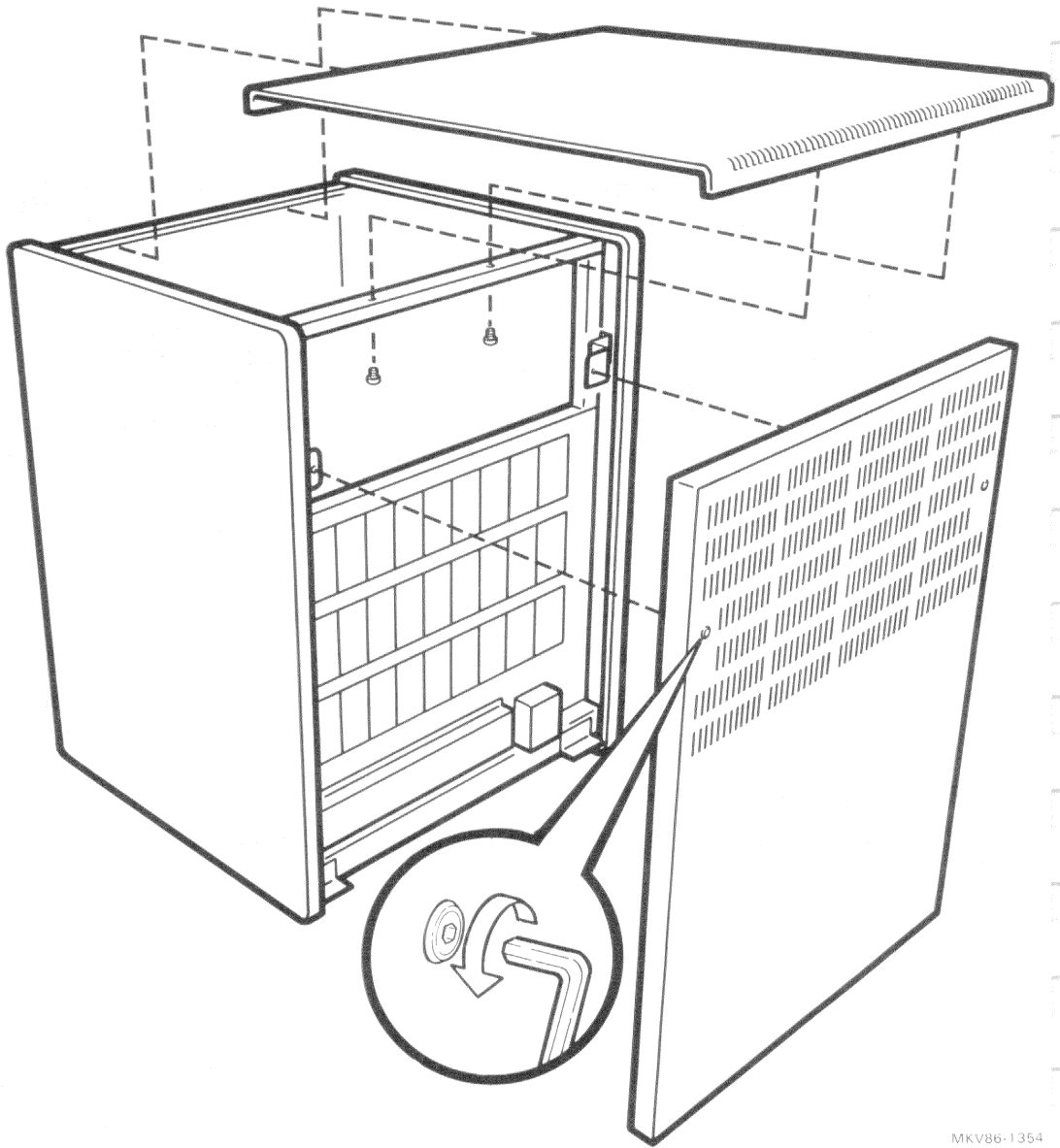
8.1 TOP PANEL

8.1.1 Top Panel Removal (Figure 8-1)

1. Remove the processor cabinet rear door.
2. Remove the two screws at the rear of the top panel.
3. Slide the top panel toward the rear of the cabinet and lift it free of the front clips.

8.1.2 Top Panel Replacement

To replace the top panel, reverse steps 1 through 3 in Section 8.1.1.



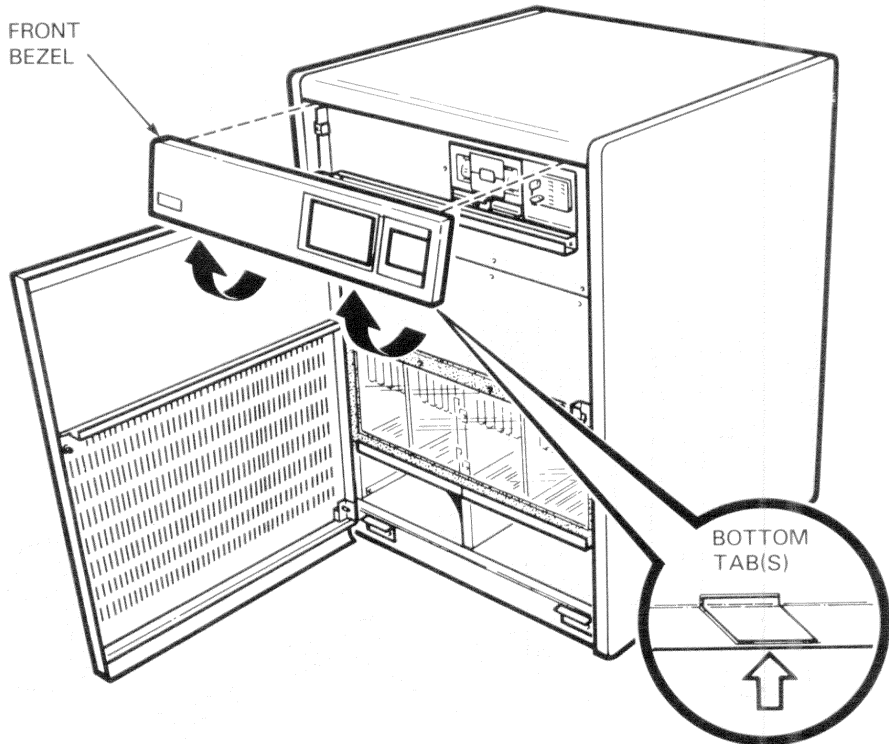
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Figure 8-1: Top Panel Removal/Replacement

8.2 FRONT BEZEL

8.2.1 Front Bezel Removal (Figure 8-2)

1. Open the processor cabinet front door.
2. Push in the bottom tabs, lift the bottom of the bezel out, and rotate it up.



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Figure 8-2: Front Bezel Removal/Replacement

8.2.2 Front Bezel Replacement

To replace the front bezel, reverse the steps in Section 8.2.1. Note the locator keys shown in Figure 8-2.

8.3 AIR FILTERS

8.3.1 Air Filter Removal (Figure 8-3)

1. Open the processor cabinet front door.
2. Rotate the latch out and remove the filter tray.
3. Remove the filter from the filter tray.

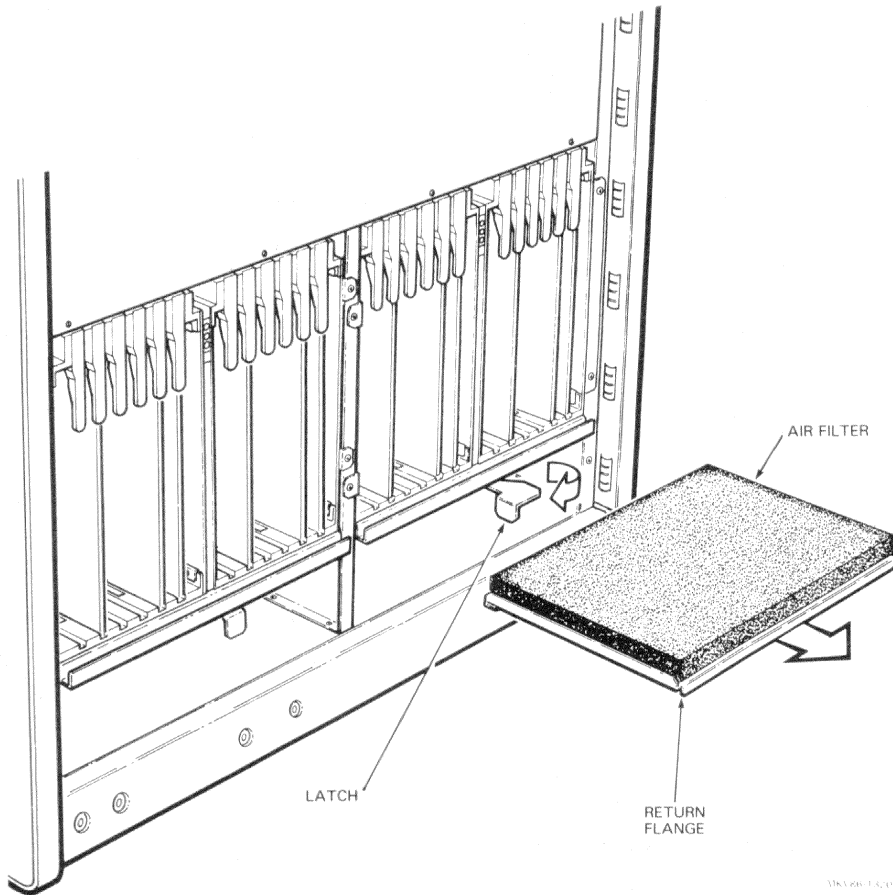


Figure 8-3: Air Filter Removal/Replacement

8.3.2 Air Filter Replacement

To replace the air filter, reverse steps 1 through 3 in Section 8.3.1. When replacing the tray, be sure that the return flange is toward the front of the cabinet.

8.4 RX50 DISK DRIVE

8.4.1 RX50 Removal (Figure 8-4)

1. Remove the processor cabinet rear door and top panel.
2. Remove the front bezel.
3. Disconnect the power cable (17-00687-01) from the RX50.
4. Disconnect the RX50-to-RCX50 cable (17-01039-01) from the rear of the RX50 drive.

CAUTION

The ferrite bead on the RX50-to-RCX50 cable is fragile. Handle it carefully.

5. Push down on the release latch located under the front of the RX50 drive, and slide the drive out of the cabinet.

8.4.2 RX50 Replacement

To replace the RX50 disk drive, reverse steps 1 through 5 in Section 8.4.1. The RX50-to-RCX50 cable connector is not keyed. Insert the connector so that the colored stripe is toward the center of the drive housing. The ferrite bead on the RX50-to-RCX50 cable is fragile. Handle it carefully. Check that the ground connection on the power cable is attached to the spade lug on the blower compartment wall.

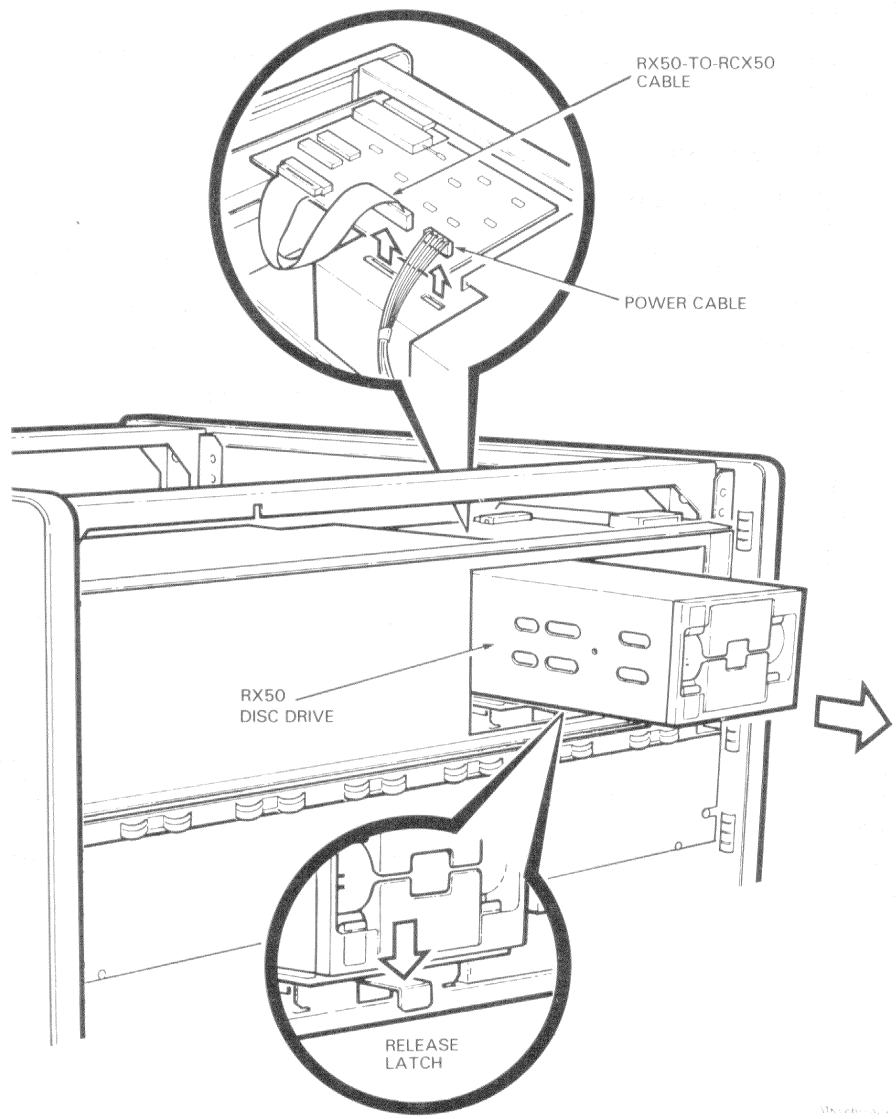


Figure 8-4: RX50 Disk Drive Removal/Replacement

8.5 RCX50 DISK CONTROLLER

8.5.1 RCX50 Removal (Figure 8-5)

1. Remove the processor cabinet rear door and top panel.
2. Disconnect the RX50-to-RCX50 cable (17-01039-01) from the RCX50 controller module.

CAUTION

The ferrite bead on the RX50-to-RCX50 cable is fragile. Handle it carefully.

3. Disconnect the RCX50-to-KK810 cable (17-00763-01) from the KK810 control module.
4. Remove the RCX50 module by sliding it toward the rear of the cabinet.
5. Pull the lever out from the ZIF connector and turn it away from you. Save the paddle card.

8.5.2 RCX50 Replacement

To replace the RCX50 disk controller, reverse steps 1 through 5 in Section 8.5.1.

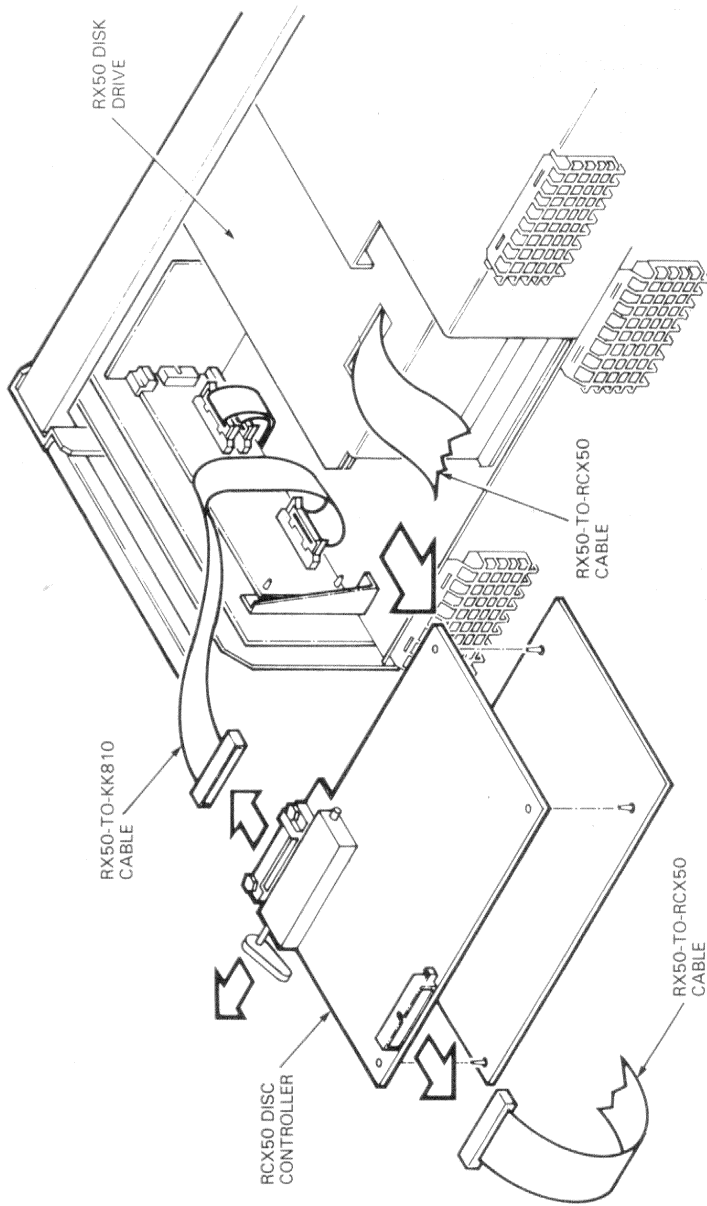


Figure 8-5: RCX50 Disk Controller Removal/Replacement

8.6 POWER SUPPLY MODULES

8.6.1 H7250, H7251, and H7253 Removal

WARNING

Shut off system power at the main system circuit breaker before removing the power supply cover. After turning off system power and disconnecting the main system power cord, wait two minutes for the capacitors to discharge before touching any of the power supply modules.

1. Disconnect the green/yellow bonding wire at the bottom of the processor cabinet front door and remove the door. Remove the front door latch bracket by removing the two mounting screws (Figure 8-6).
2. Remove the clear plastic panel from the front of the VAXBI cardcages.
3. Remove the front door latch.
4. Remove the power supply cover by loosening the quarter-turn fasteners.

WARNING

Each power supply module has a 300 V run along its front edge. Allow at least two minutes for the capacitors to discharge to safe levels before removing the power supply cover.

5. Remove the 300 V cable (17-00718-01).
6. If the H7250 module is to be removed, disconnect the ac input connector. Do not pull this connector straight up. Instead, rock it from end to end while lifting until it pulls free from the module.
7. Remove the desired power supply module(s) (Figure 8-7).

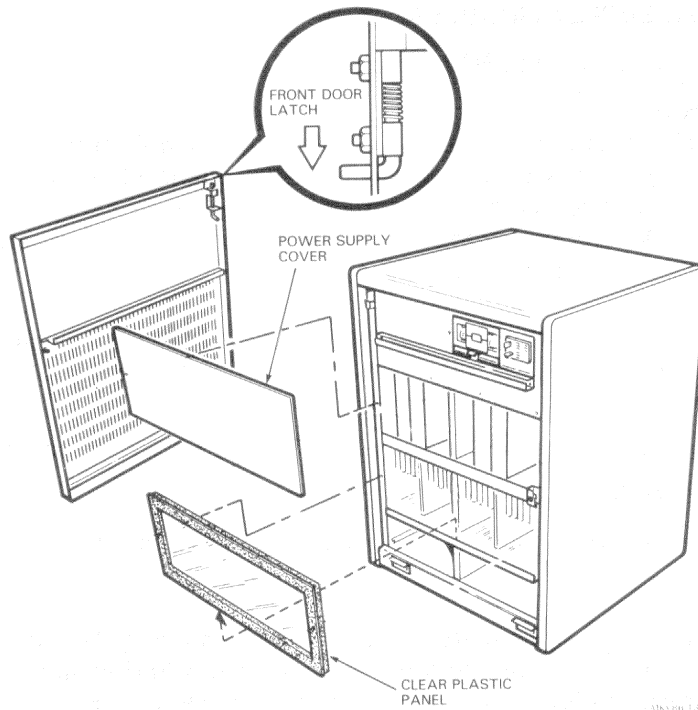


Figure 8-6: Accessing Power Supply Modules

CAUTION

When removing a power supply module, do not use the components as handles. Instead, grasp the side of the module with your fingertips. Pulling on a component can damage the module. If the module has a plastic ring pull, use it to remove the module.

Some heat sinks on the power supply modules may be tilted. Do not try to straighten them, since straightening will damage components mounted to the heat sinks.

8.6.2 H7250, H7251, and H7253 Replacement

To replace the H7250, H7251, and H7253 modules, reverse steps 1 through 6 in Section 8.6.1.

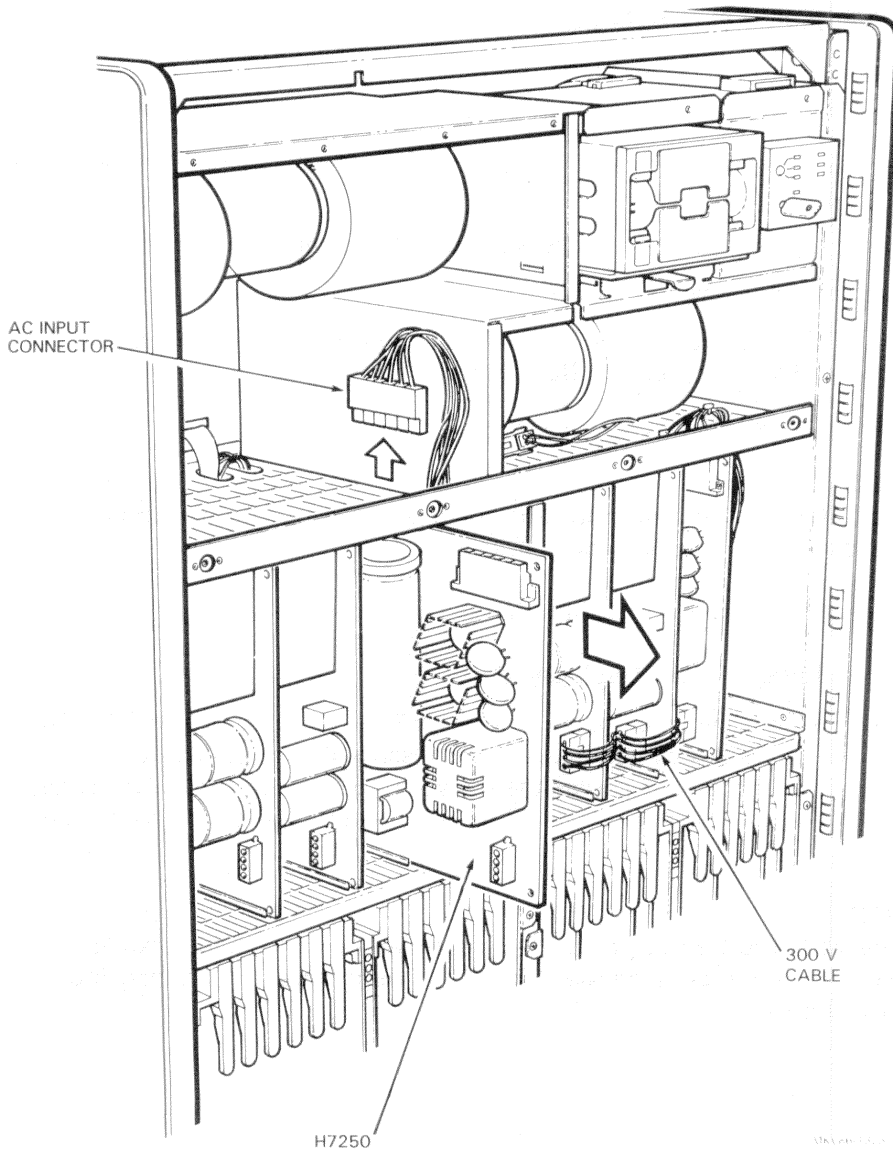


Figure 8-7: H7250, H7251, and H7253 Removal/Replacement

8.6.3 Distribution Board Removal

1. Remove the three power supply modules (Section 8.6.1).
2. Disconnect all cables from the distribution board (Figure 8-8).
3. Remove and save the screws that attach the power flex circuit (17-00681-01) to the distribution board.
4. Open the processor cabinet rear door and the I/O bulkhead door.
5. Disconnect the power bus cable.
6. If the PS2 distribution board is being removed and a battery backup unit is installed, disconnect the two BBU cables.
7. Remove the power supply rear panel.

NOTE

Keep the screws from the rear cover and the power flex circuit separate. The washers are different.

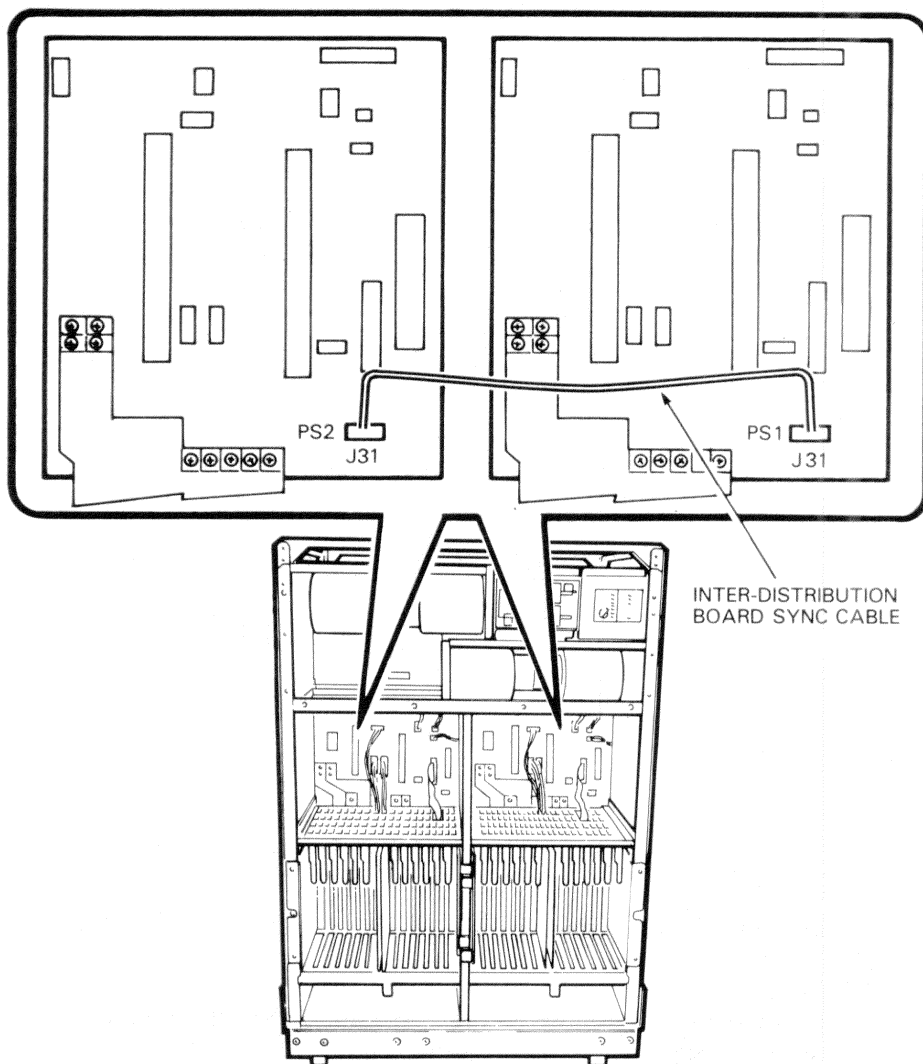
8. Remove the distribution board from the rear panel (Figure 8-9).

8.6.4 Distribution Board Replacement

To replace the distribution board, reverse steps 1 through 8 in Section 8.6.3. When attaching the power flex circuit, use the torque screw driver (29-27381-00) supplied in the field service kit. Torque the screws to 6 ± 1 inch-pounds. When replacing the power supply synchronization cable, be careful to orient it correctly. (See Figure 8-8.)

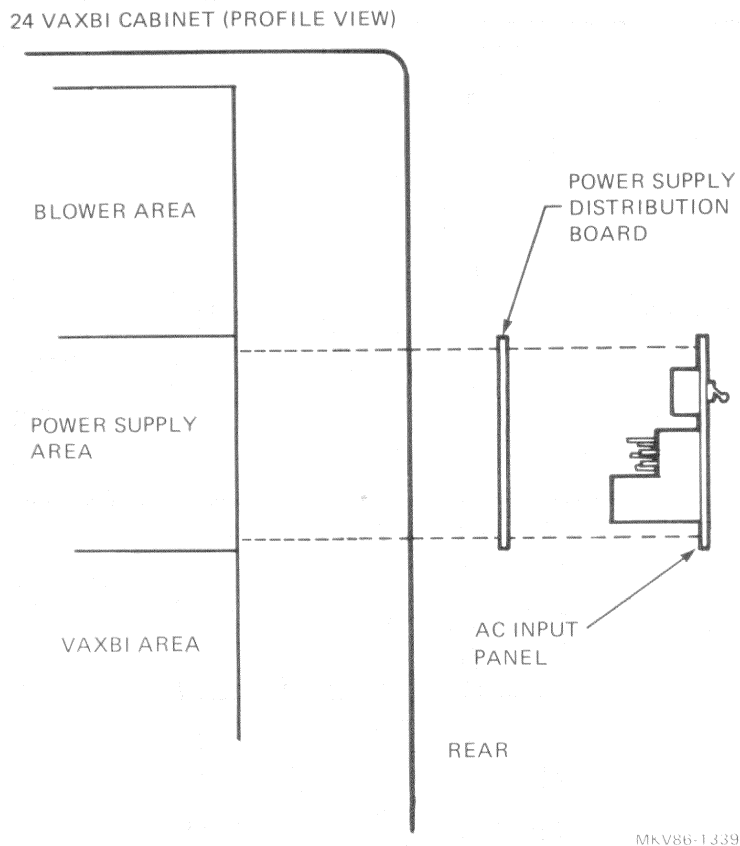
NOTE

The washers for the power flex circuit are cupped. When replacing the circuit, be sure that the cup of each washer is facing the power cube.



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Figure 8-8: Power Supply Distribution Board Location



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Figure 8-9: Power Supply Distribution Board Removal/Replacement

CAUTION

When replacing the screws in the distribution board, be sure they go in straight. If a screw strips, the board must be replaced.

When replacing the power supply synchronization cable, be sure to connect the cable correctly. If this cable is reversed (that is, if the PS1 connector is connected to the PS2 distribution board), noise will be induced.

8.7 AIRFLOW SENSORS

8.7.1 Airflow Sensor Removal (Figure 8-10)

1. Remove the three power supply modules (Section 8.6.1).
2. Loosen the screw and remove the airflow sensor bracket.
3. Disconnect the cable from J8 on the power supply distribution board.
4. Remove the airflow sensor.

8.7.2 Airflow Sensor Replacement

To replace the airflow sensor, reverse steps 1 through 4 in Section 8.7.1. The cable must be routed through the holes in the housing. If it is not routed, the wires will be pinched when the power supply modules are replaced. The connector on this cable is not keyed. Be sure to plug it onto all four pins on the power supply distribution board.

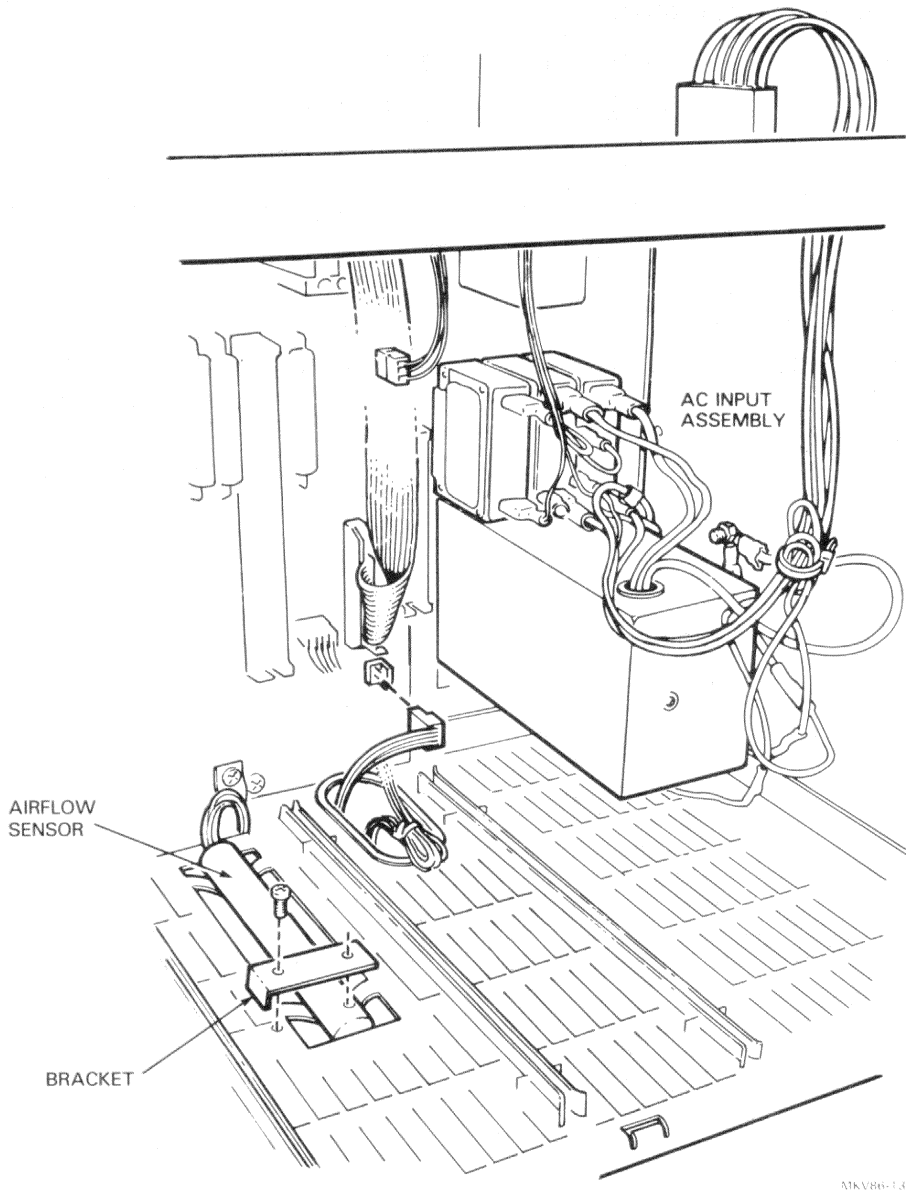


Figure 8-10: Airflow Sensor Removal/Replacement

8.8 VAXBI CARDCAGES

8.8.1 VAXBI Cardcage Removal

1. Remove the processor cabinet front and rear doors.
2. Remove the clear plastic panel from the front of the VAXBI cardcages (Figure 8-11).
3. Lay out the Velostat mat and connect it to the processor cabinet.
4. Remove the modules from the VAXBI cardcage assembly and place them on the Velostat mat.
5. Remove the mounting screws from the sides of the cardcage.
6. Remove the power status LEDs from the spacer between the cardcages.
7. From the rear of the processor cabinet, open the I/O bulkhead door (Figure 8-12).
8. Disconnect the following from the cardcage assembly that will be removed:
 - Transition headers that have cables attached
 - Any other cables
 - Braided ground strap
 - ± 12 volt cables
 - Node ID plugs
9. Remove all screws from the K2 or K4 side of the power flex circuit.
10. Remove the appropriate side of the FBE that attaches the two cardcage assemblies.
11. Slide the cardcage assembly out from the front (Figure 8-13).

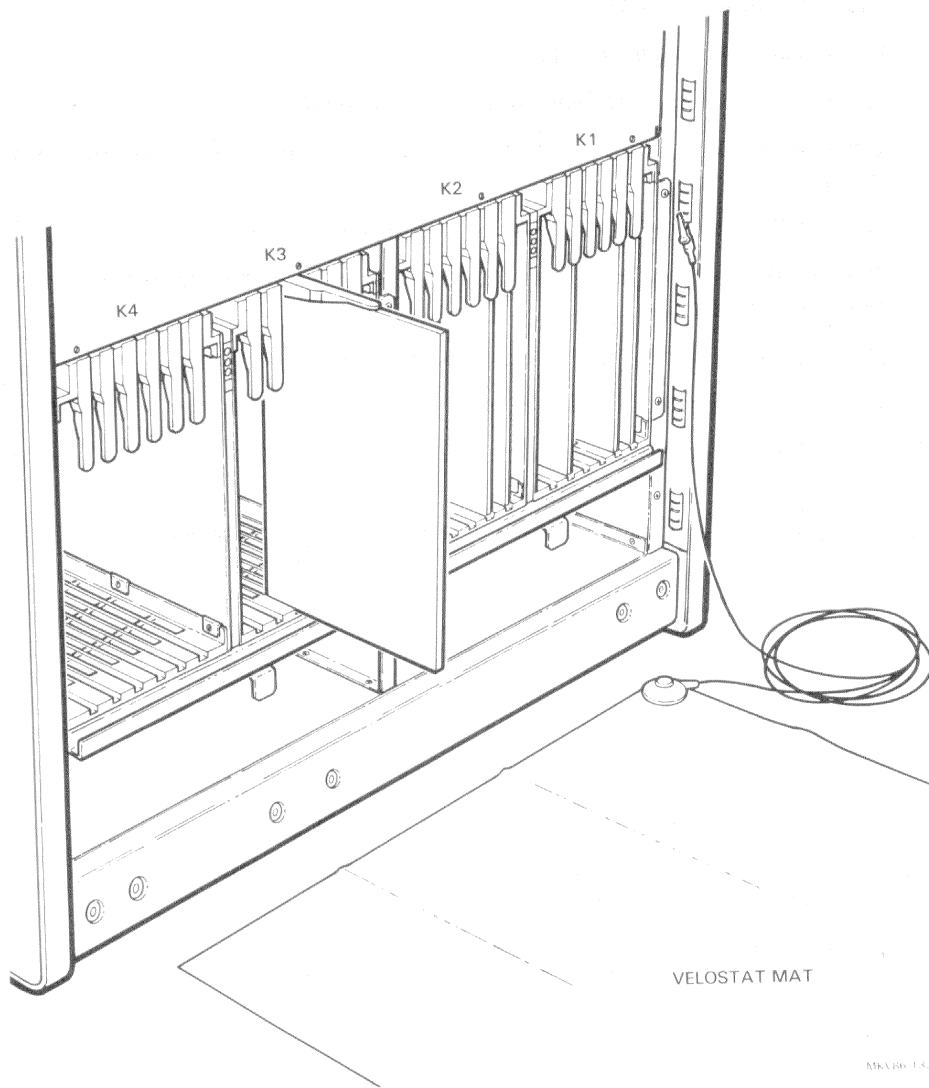
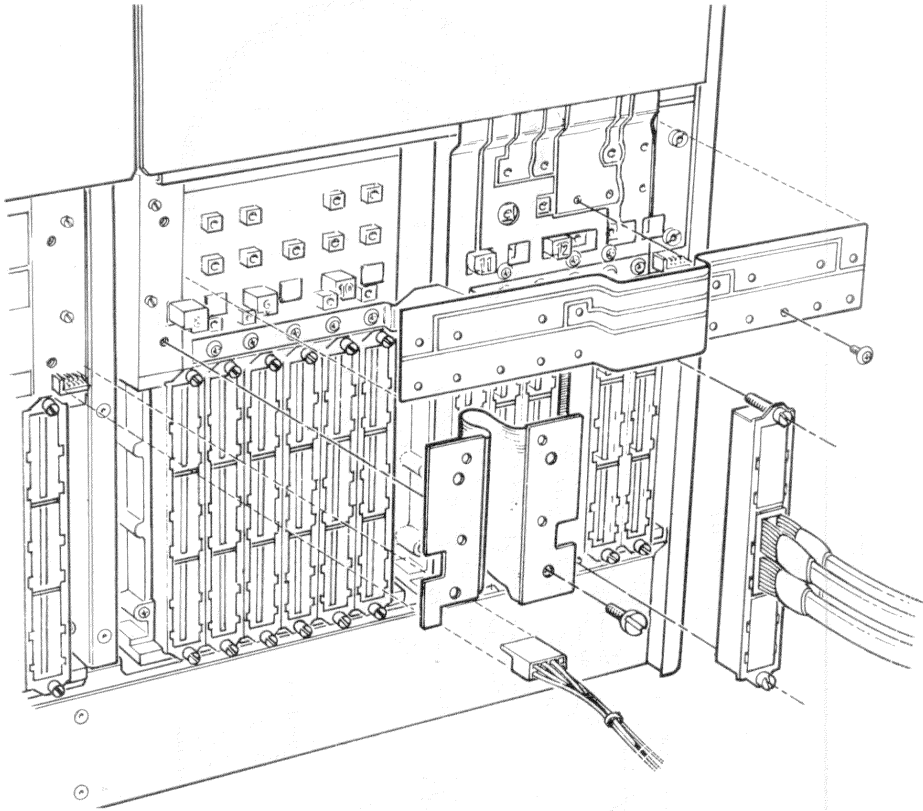


Figure 8-11: VAXBI Cardcages – Front View



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Figure 8-12: VAXBI Cardcages – Rear View

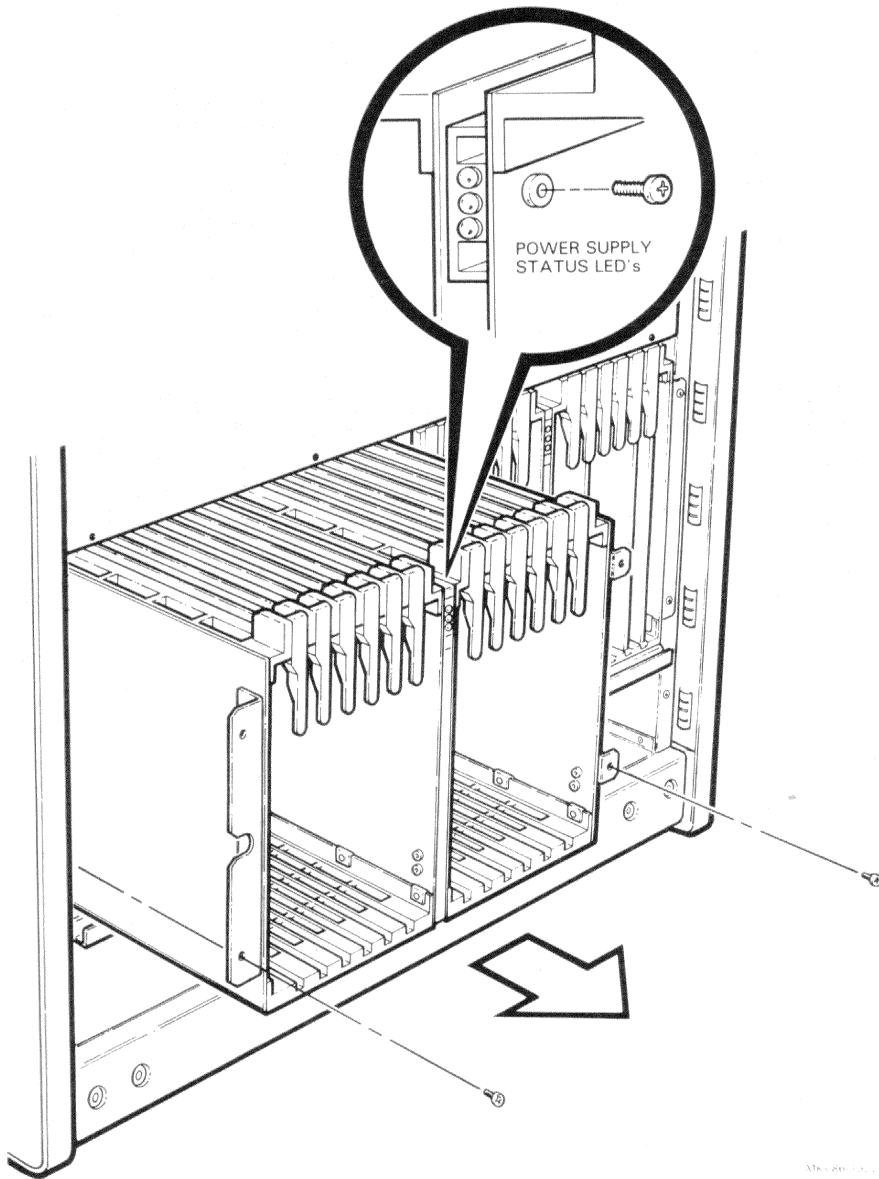
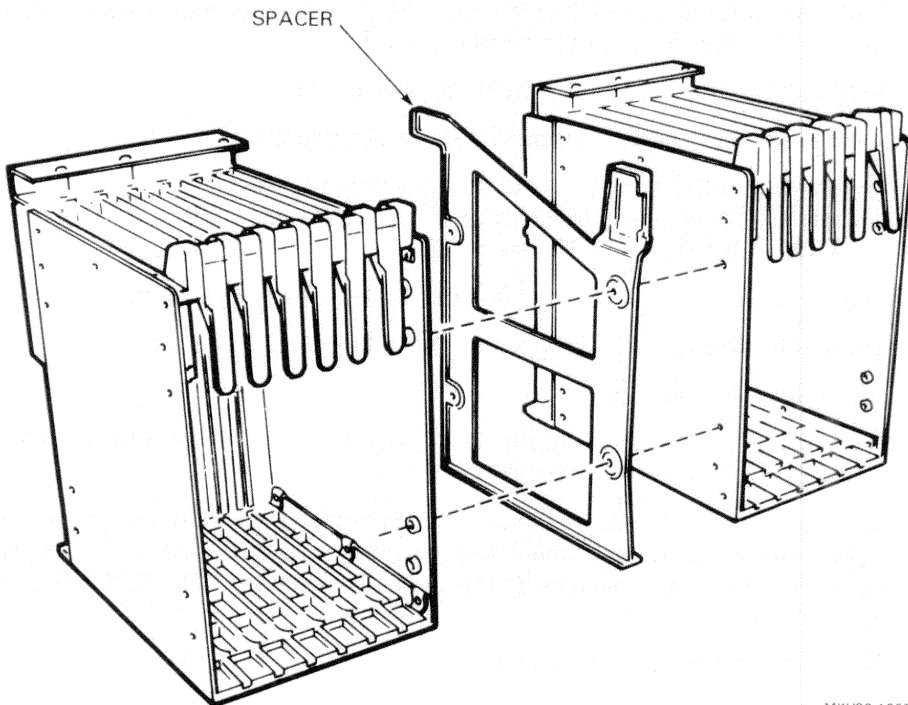


Figure 8-13: VAXBI Cardcage Removal/Replacement

12. Place the cardcage assembly on a workbench and do the following (Figure 8-14):
 - a. Remove the remaining screws from the power flex circuit.
 - b. Remove the FBE that attaches the two cardcages.
 - c. If cardcage K1 or K4 is being replaced, remove the terminator.
 - d. Using a stubby screwdriver, remove the screws that hold the two cardcages together.



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Figure 8-14: Separating VAXBI Cardcages

8.8.2 VAXBI Cardcage Replacement

CAUTION

When you handle the VAXBI modules, you must wear an anti-static wrist strap connected to the processor cabinet.

1. Clean the slots of the replacement cardcage with the cleaning kit provided.
2. Attach the two cardcages.
3. Insert the node ID plugs on the backplane of the replacement cardcage.
4. Attach the two cardcages with the FBE. Torque the jack screws in stages to 6 ± 1 inch-pounds, using the torque screwdriver (29-27381-00) from the field service kit.
5. Attach the power flex circuit that connects the cardcages. Replace all screws, but do not tighten those on the K2 (or K4) side.
6. Slide the cardcage assembly in from the front of the processor cabinet. Take care not to damage the power supply status LEDs.
7. Replace the power flex circuit from the power supply.
8. Replace the front mounting screws, but do not tighten them.
9. Replace the FBE that connects the two cardcage assemblies. Torque the jack screws in stages to 6 ± 1 inch-pounds, using the torque screwdriver (29-27381-00) from the field service kit.
10. Replace all screws in the power flex circuit, but do not tighten them.
11. Torque the screws in the power flex circuit to 6 ± 1 inch-pounds.
12. Attach the ± 12 volt connectors.
13. If the K1/K2 assembly is being replaced, attach the KK810-to-KA820 cable and the KK810-to-H9400 connector.
14. Attach any transition headers that had been removed. Tighten the screws in stages; do not tighten one completely before tightening the other. Torque both screws to 5 ± 1 inch-pounds, using the torque screwdriver (29-27381-00) from the field service kit.
15. Tighten the front mounting screws.
16. Replace the foam airflow strip if it had been removed.
17. Replace the braided ground strap.
18. Replace the modules in the cardcage.
19. Replace the processor cabinet top panel and rear door, and close the front door.

8.9 BLOWER ASSEMBLY

8.9.1 Upper Blower Removal

CAUTION

Cables are routed through the blower assembly housing. Take care not to damage them when removing or replacing the blower assembly.

1. Remove the processor cabinet front and rear doors.
2. Remove the clear plastic panel from the front of the VAXBI cardcages.
3. Allow time for the power supply capacitors to discharge, then remove the power supply cover.
4. Remove the front bezel (Section 8.2.1) and the blower cover (Figure 8-15).
5. From the rear of the cabinet, remove the screws from the bottom of the blower screens (Figure 8-16).
6. From the front of the cabinet, hold the blower in place and remove the top blower screws from the top of the housing (Figure 8-17).
7. Slide the blower assembly out.
8. Disconnect the power connector from the blower assembly.

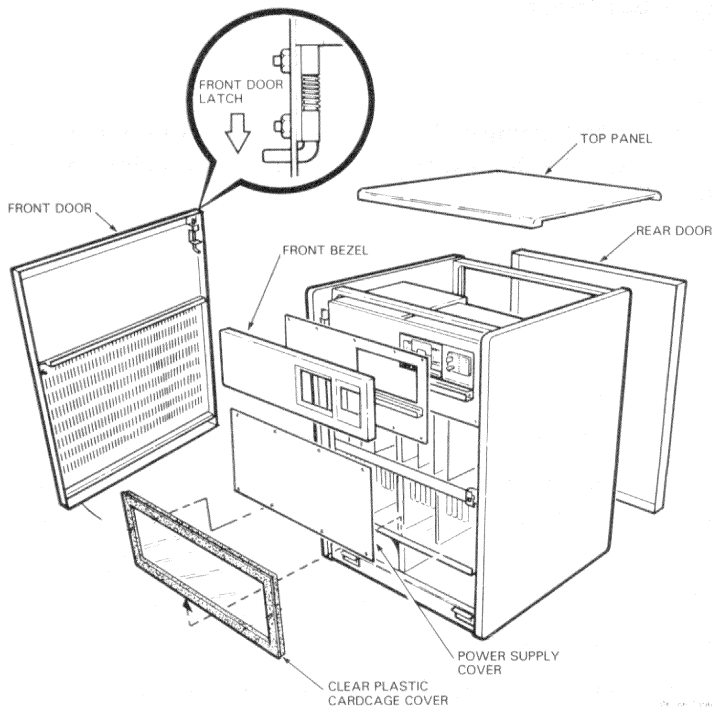


Figure 8-15: Accessing Blowers

8.9.2 Upper Blower Replacement

To replace the upper blower assembly, reverse steps 1 through 8 in Section 8.9.1. Do not tighten the screws until all are in place.

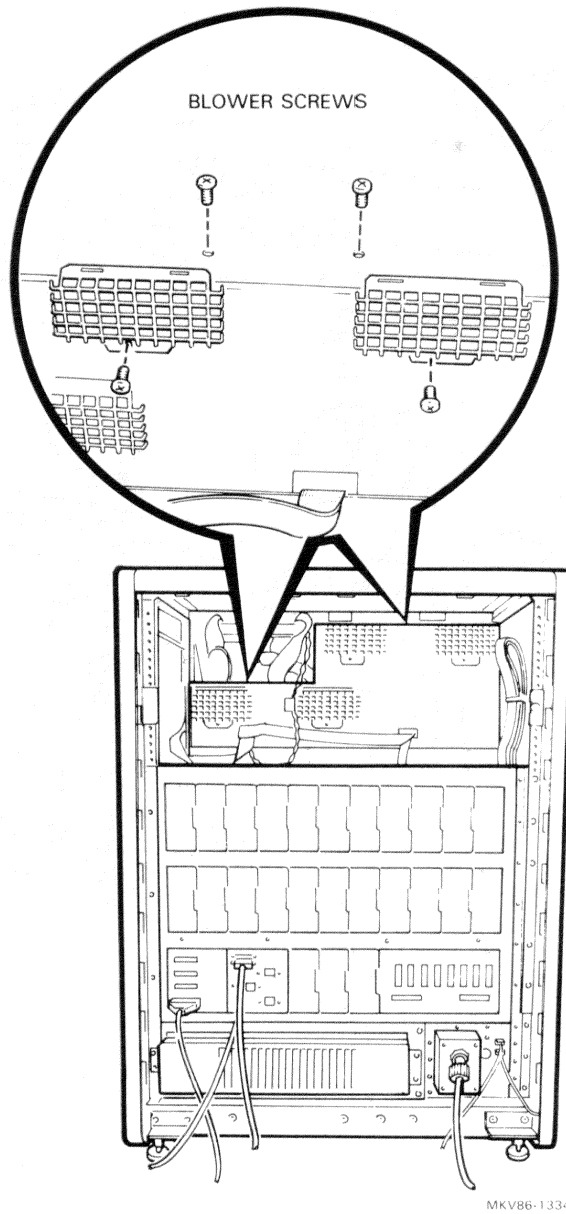


Figure 8-16: Blower Assembly Mounting Screws

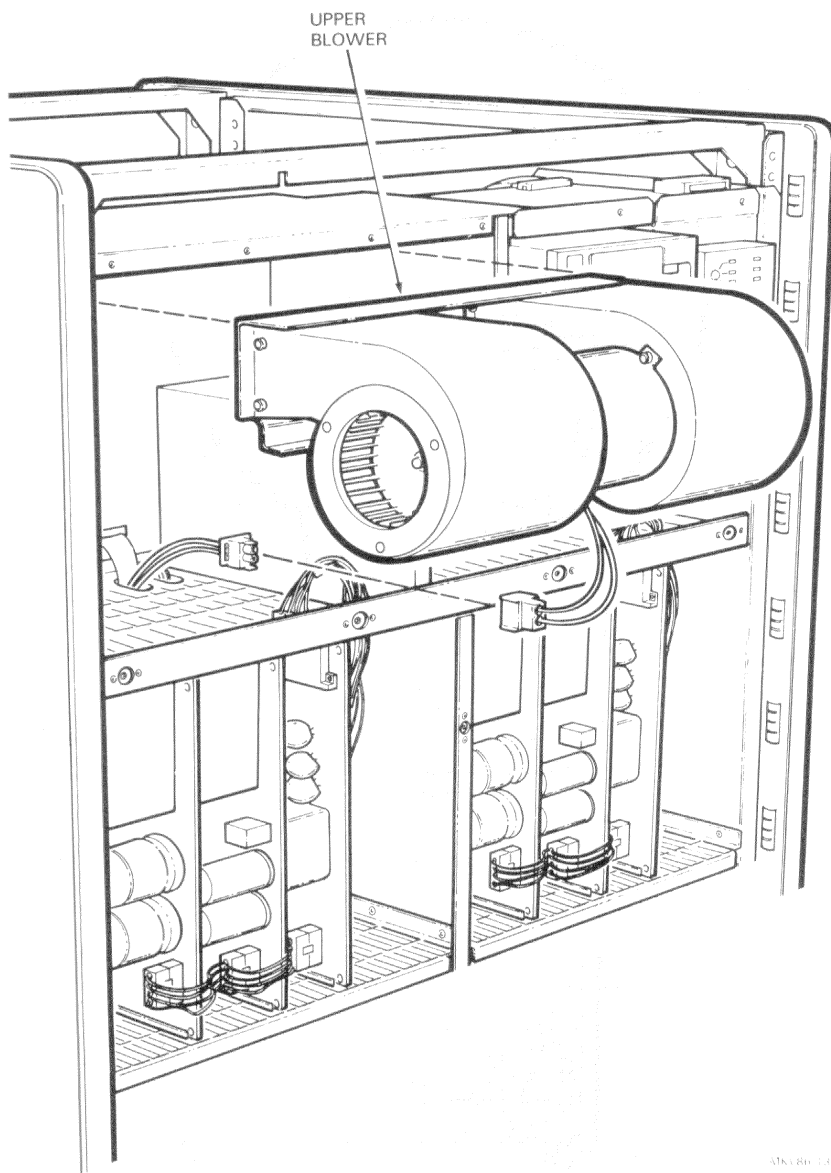


Figure 8-17: Upper Blower Removal/Replacement

8.9.3 Lower Blower Removal

CAUTION

Cables are routed through the blower assembly housing. Take care not to damage them when removing or replacing the blower assembly.

1. Open the processor cabinet front door and remove the rear door.
2. Remove the clear plastic panel from the front of the VAXBI cardcages.
3. Remove the power supply cover.
4. Remove the front bezel (Section 8.2.1) and the blower cover.
5. Remove the upper blower (Section 8.9.1) and the center baffle (Figure 8-18).
6. From the rear of the cabinet, remove the screws from the bottom of the blower screens.
7. Remove the screws from the top rear of the RX50 disk drive housing.
8. Slide the blower assembly to the left, taking care not to damage the cables behind the blower assembly (Figure 8-19).
9. Tilt the blower up and disconnect the power connector.
10. Slide the blower assembly out.

8.9.4 Lower Blower Replacement

To replace the lower blower assembly, reverse steps 1 through 10 in Section 8.9.3. Do not tighten the screws until all are in place.

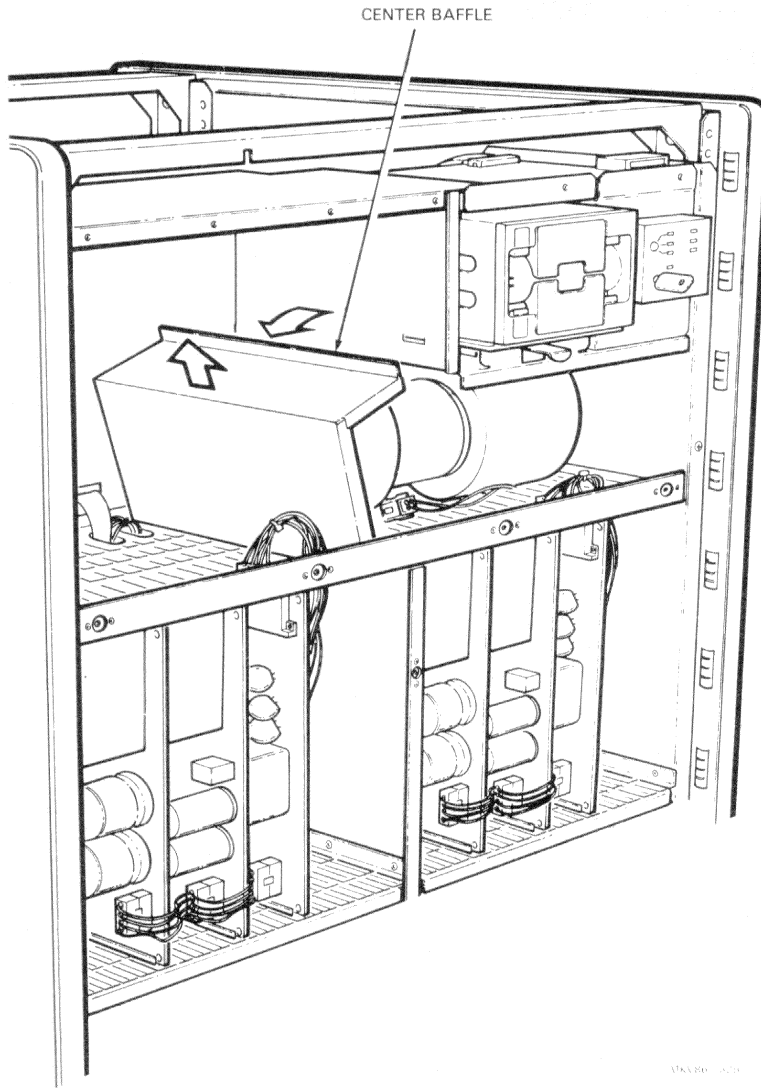
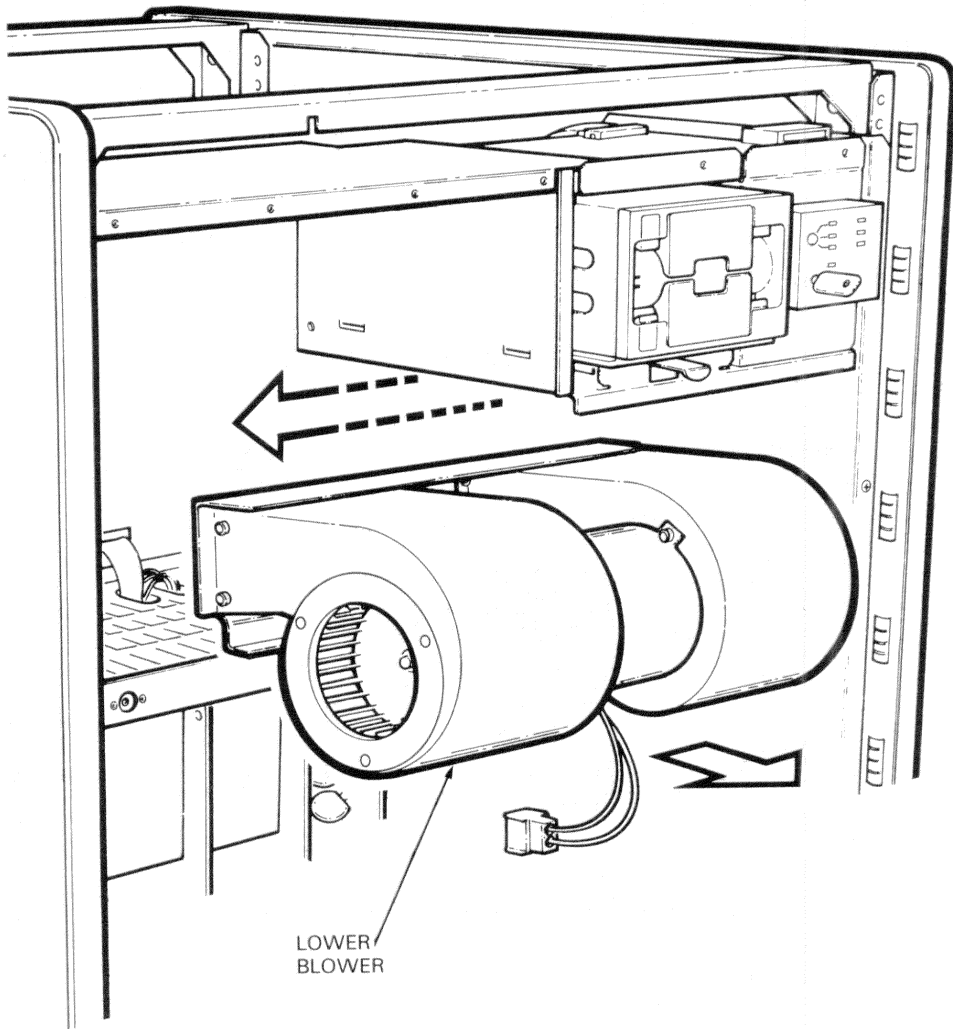


Figure 8-18: Center Baffle Removal



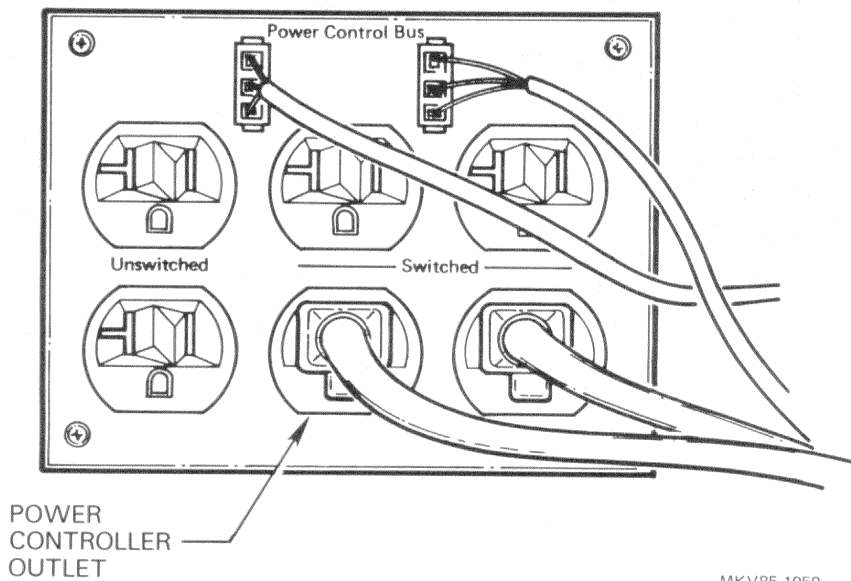
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Figure 8-19: Lower Blower Removal/Replacement

8.10 POWER CONTROLLER

8.10.1 Power Controller Removal (Figures 8-20 and 8-21)

1. Remove the processor cabinet rear door.
2. Turn off the main circuit breaker and disconnect the power cord from the wall outlet.
3. Loosen all captive screws from the faceplate.
4. Remove all cables and power cords from the front and rear of the power controller.
5. Slide the power controller out from the rear of the cabinet.



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Figure 8-20: Power Controller Front View

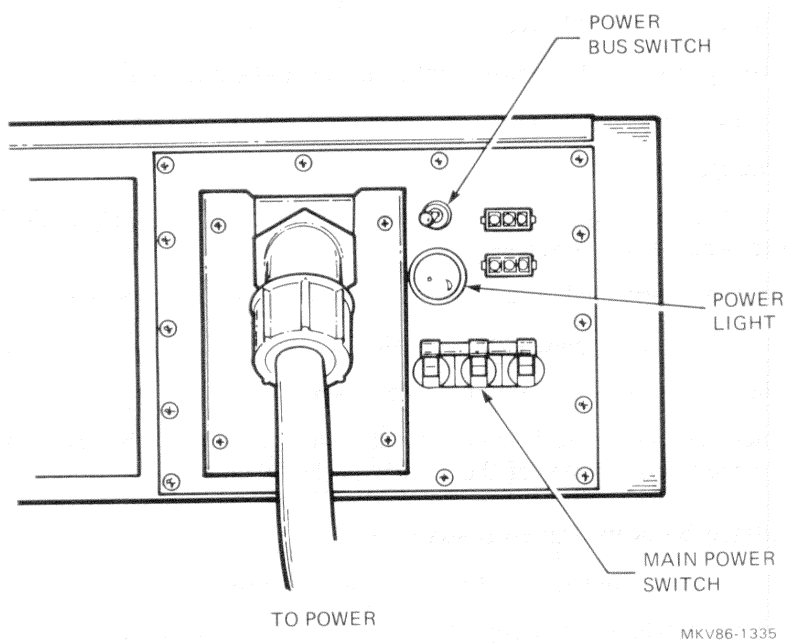


Figure 8-21: Power Controller Rear View

8.10.2 Power Controller Replacement

To replace the power controller, reverse steps 1 through 5 in Section 8.10.1. When replacing the power supply power cords, do not plug both into the same duplex outlet.

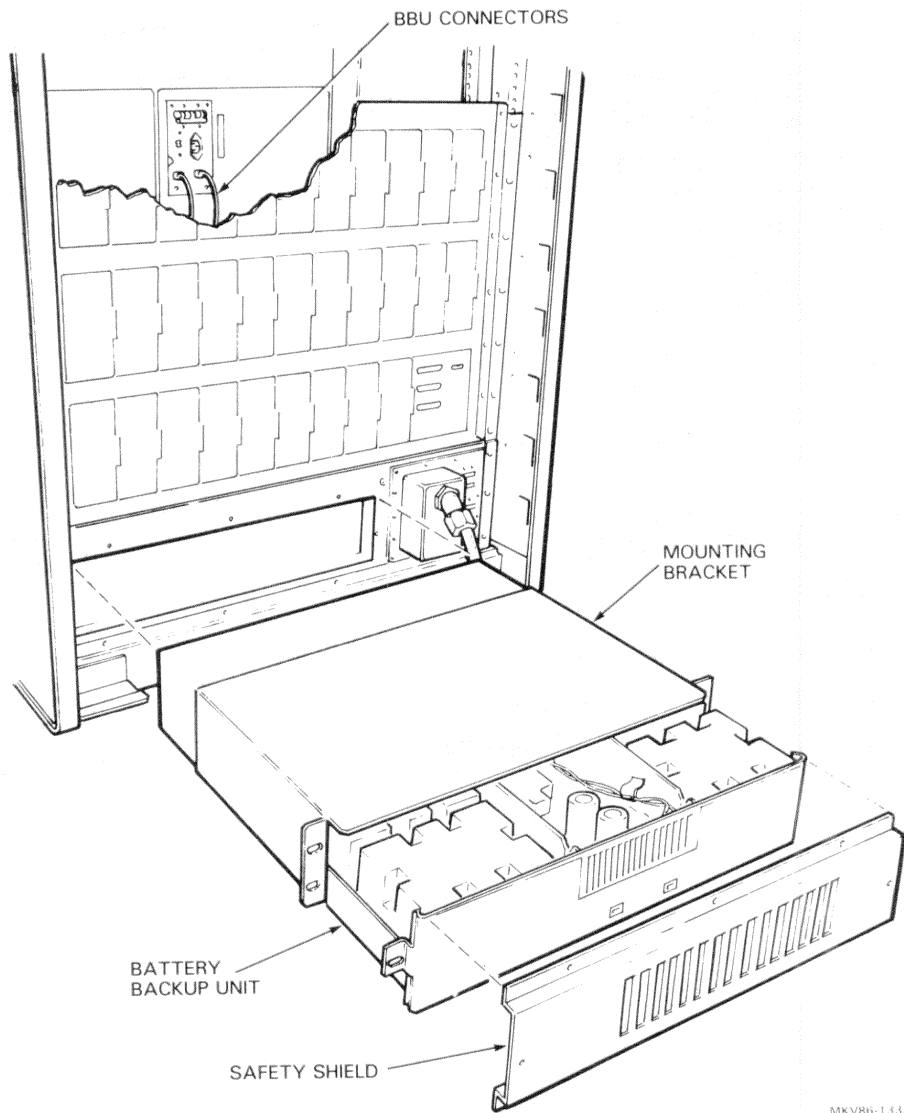
8.11 H7231 BATTERY BACKUP UNIT

8.11.1 Battery Backup Unit Removal (Figures 8-22 and 8-23)

1. Remove the processor cabinet rear door.
2. Open the I/O bulkhead door.
3. Disconnect the battery backup signal cable and the 300 V supply cable from the rear panel of power supply 2.
4. Remove the safety shield from the front of the battery backup unit.
5. Remove the mounting nuts (one on each side).
6. Slide the battery backup unit out of the cabinet.
7. Disconnect the power cord, 15-pin signal cable, power bus cable, and 300 V supply cable from the rear of the battery backup unit.

8.11.2 Battery Backup Unit Replacement

1. Slide the mounting bracket off the replacement battery backup unit.
2. If this is an installation of a replacement battery backup unit, discard the mounting bracket.
If this is an initial battery backup unit installation, install the mounting bracket.
3. Set the voltage switches on the front and rear of the battery backup unit to the desired voltage.
4. Set the time-of-year (TOY) switch to off.
5. Reverse steps 1 through 7 in Section 8.11.1. (See Table 8-1 for cable connections.)



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Figure 8-22: Battery Backup Unit Removal/Replacement

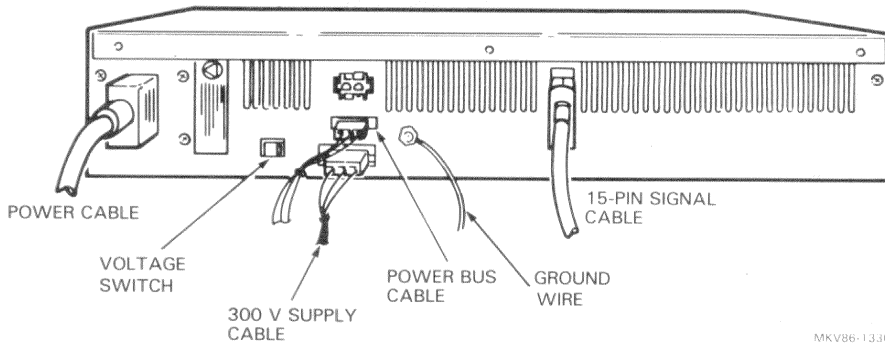


Figure 8-23: Battery Backup Unit Cables

Table 8-1: Battery Backup Unit Cables

Cable	Connects to	See Figure
Power cable	Power controller unswitched outlet	8-20
Power bus cable	Power controller front	8-20
300 V supply cable	AC input assembly	8-24
15-pin signal cable	AC input assembly	8-24

8.12 AC INPUT ASSEMBLY

8.12.1 AC Input Assembly Removal

1. Remove the processor cabinet front and rear doors.
2. Disconnect the ac power cord.
3. From the rear of the processor cabinet, turn off the circuit breakers on the ac input assembly and the power controller.
4. Remove the clear plastic panel from the front of the VAXBI cardcages.
5. Remove the power supply cover by loosening the quarter-turn fasteners.
6. Disconnect the ac input connector from the H7250 module of the appropriate power supply, and remove the module (Figure 8-24).
7. Disconnect the circuit breaker trip cable from J9 on the power supply distribution board.
8. Disconnect the safety ground (green/yellow bonding wire) from the stud on the wall of the power supply housing.

CAUTION

Hazardous voltages are present at the BBU terminals at the rear of the ac input assembly. Wait at least five minutes for the capacitors to discharge before removing the cables from these terminals.

9. If applicable, remove the battery backup cables from the BBU terminals at the rear of the ac input assembly (Figure 8-25).
10. Remove the corner screws from the ac input assembly panel and remove the assembly.

8.12.2 AC Input Assembly Replacement

To replace the ac input assembly, reverse steps 1 through 10 in Section 8.12.1. Set the line voltage select switch to the appropriate position.

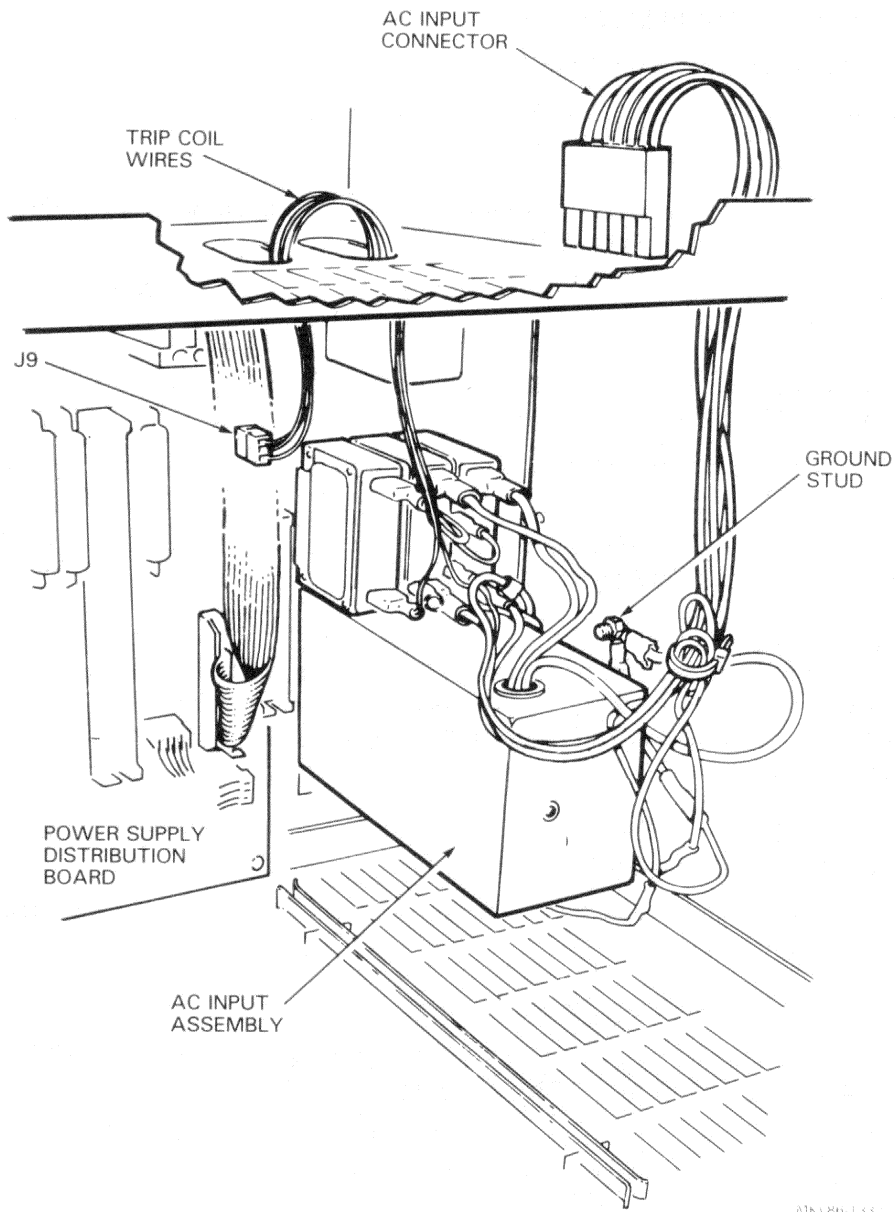
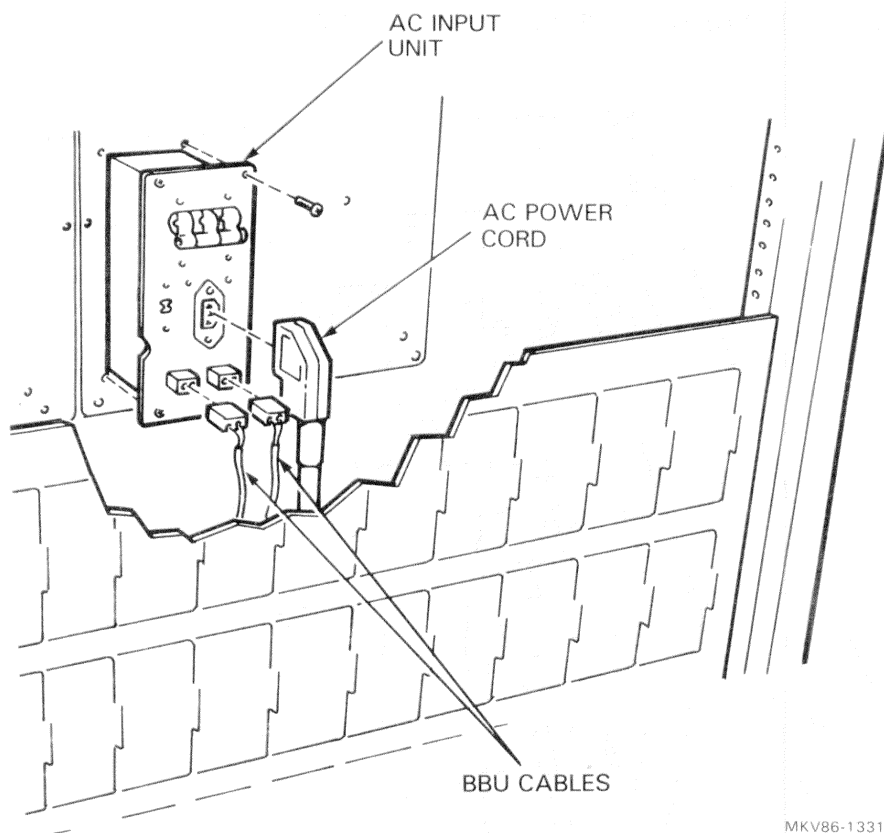


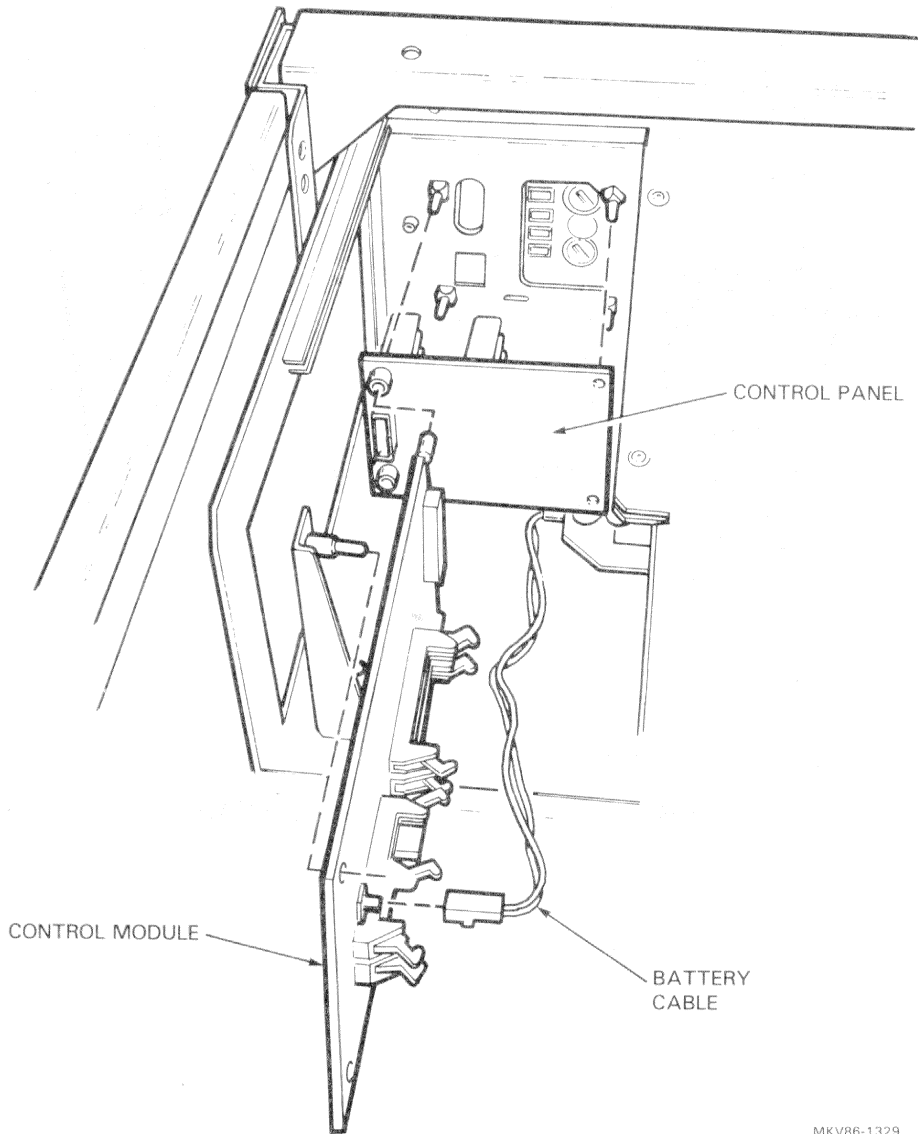
Figure 8-24: AC Input Assembly Removal/Replacement



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Figure 8-25: AC Input Assembly Rear View

8.13 KK810 CONTROL ASSEMBLY (Figure 8-26)



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Figure 8-26: KK810 Control Assembly Removal/Replacement

8.13.1 Control Module Removal

1. Open the processor cabinet front door, and remove the rear door and top panel.
2. Disconnect the control module from the snap-in standoffs on the mounting bracket.
3. Slide the control module straight back from the control panel.
4. Disconnect all cables.

NOTE

Cables P1 and P2 are identical. Be sure to note which is which.

8.13.2 Control Module Replacement

To replace the control module, reverse steps 1 through 4 in Section 8.13.1. Align the plastic sleeves on the control module with the standoffs on the control panel before snapping the control module into the connector.

8.13.3 Battery Removal

1. Open the processor cabinet front door, and remove the rear door and top panel.
2. Remove the control module (Section 8.13.1).
3. Snap the battery out of the battery clip.

8.13.4 Battery Replacement

To replace the battery, reverse steps 1 through 3 in Section 8.13.3.

8.13.5 Control Panel Removal

1. Open the processor cabinet front door, and remove the rear door and top panel.
2. Remove the control module (Section 8.13.1).
3. Using pliers, pinch the standoffs in the corners of the control panel closed, one at a time. While closing the standoff, pull the corner of the control panel free.

8.13.6 Control Panel Replacement

To replace the control panel, reverse steps 1 through 3 in Section 8.13.5. When replacing, line up the switches on the replacement control panel to match the keyswitch positions on the front panel.

NOTE

The plunger for the RESTART switch is not mounted in the front panel. Be sure the plunger is in place before replacing the control panel.

8.14 PROCESSOR MODULE

8.14.1 Processor Module Removal

1. Open the processor cabinet front door.
2. Remove the clear plastic panel from the front of the VAXBI cardcages.

CAUTION

Observe electro-static discharge precautions when handling the processor module. See Section 7.1.1 of this manual.

3. Remove the appropriate processor module.

8.14.2 Processor Module Replacement

1. Insert the replacement processor module in the appropriate slot.
2. Replace the clear plastic panel over the VAXBI cardcages.
3. Apply system power.

4. If the replaced module is the attached processor and if it fails self-test, check the polarity of the RCX50 self-test enable bit and change it if necessary.

- a. Logically connect the console to the attached processor:

```
>>>Z n<RET>          ! n is the node ID of the
                        ! attached processor
```

- b. Examine the RCX50 self-test enable bit:

```
>>>E/E 3<RET>
P      20098176      08 ! 08 indicates bit is
                        ! enabled
                        ! 18 indicates bit is
                        ! disabled
```

- c. If the RCX50 self-test enable bit is enabled (08), disable it:

```
>>>D/E 3 18<RET>
```

- d. Break the logical connection:

```
>>>CTRL/P
```

NOTE

For more information on the RCX50 self-test enable bit, see the *VAX 8200/8300 Owner's Manual*.

5. Check the contents of the processor's EEPROM. (See the *VAX 8200/8300 Owner's Manual* for instructions.) Check the parameters listed in Table 8-2).

Table 8-2: EEPROM Parameters to Check When Replacing the Processor Module

EEPROM Parameter	Contents in Primary Processor	Contents in Attached Processor
Serial number	Belongs to module; do not change.	Belongs to module; do not change.
Logical console node number.	Don't care	Node ID of primary processor (must be 2). ^❶

❶ If the logical console node number in the attached processor is anything other than the node ID of the primary processor, the attached processor must be moved into the slot dedicated to the primary processor before the node number can be changed. See the *VAX 8200/8300 Owner's Manual* for details.

6. Check also the following parameters:
 - Default boot device
 - Latest patches
 - Console baud rate
7. Close the processor cabinet front door.

Appendix A

Excerpts From The Duct Help File

A.1 INTRODUCTION

The DUCT utility copies diagnostics from a source tape or disk. This source medium is known throughout DUCT as the source tape/disk. DUCT copies to the directory or subdirectory in which DUCT resides.

DUCT consists of three primary functions (initialize, new option add on, and update) and four other functions (query, verify, execute, and console media). These functions are explained in this document.

A.2 HELP

The user may request help by typing H whenever DUCT prompts for input. H is an appropriate answer to any question in DUCT.

A.3 EXECUTION MODE

Although the execution menu provides the user with the option of on-line execution, batch execution is the recommended mode, for these two reasons:

1. Batch mode quickly frees the terminal for other work.
2. Batch mode prints a log which remains in the user's directory.

A.4 DUCT FUNCTIONS

A.4.1 Initialize

Select initialize when installing a new VAX/VMS system. Initialize determines the system's hardware configuration and lists this configuration at the terminal.

Since device controllers (and possibly other devices) are not included in this listing, run DUCT in new option add on mode to fill in the missing devices. Alternatively, edit the file DUCT.DEV after the interactive phase of initialize but before batch execution. To do this, follow these steps:

1. Select exit at the execution menu.
2. Edit DUCT.DEV; add the names of the missing devices.
3. Rerun DUCT.
 - a. Select the execution menu.
 - b. From the execution menu, select batch.

DUCT should reside in the system maintenance (SYSMAINT) account. This account should have privileges that allow starting and initializing a batch queue. If DUCT.COM does not execute in batch mode because no batch queue exists, create a batch queue by typing @NEWBATCH. This procedure attempts to start a dormant queue; if that fails, it creates and starts a new queue called SYS\$BATCH. This procedure does not delete any queues.

A.4.2 New Option Add On

Select new option add on to copy the diagnostics that support new devices.

1. Specify no more than 16 devices in one session.
2. When prompted, enter a device name, such as RM05 or VT100. (As each name is entered, DUCT checks its database to determine that the device is supported and that the name is spelled correctly.)
3. Press CTRL/Z after all device names are entered. (DUCT displays the file containing the list of devices.)

DUCT generates a command file which can be executed either on-line or in batch mode.

A.4.3 Update

Select update when a diagnostic update tape or disk with a higher release level than the last used medium arrives at the computing facility. The release level is prominently displayed on the medium's label.

Update compares the revision levels of level 2, 3, 4, and 5 .EXE files and copies only those files that require updating. All associated files (such as .HLP, .DOC, and .DAT) are copied if they have the same file name as the .EXE file. In addition, DUCT contains a table of tag-alongs which are copied every time their control file is copied. DUCT also contains a list of files that are always updated, as well as another list, by CPU type, that is always updated.

NOTE

Run verify, using the latest version of DUCT, before and after running update.

A.4.4 Query

Select query to extract information from the DUCT database. This is an EVNDX-like database with diagnostic information for every diagnostic-supported piece of hardware.

The following diagnostic information is available:

- For a piece of hardware, the diagnostics that support it.
- For a diagnostic, all hardware it supports.
- All known information about a diagnostic.
- The names of all diagnostics.
- The designations of all supported hardware.
- The tag-along table (see Section A.4.3).

A.4.5 Verify

Select verify to verify the update level of the diagnostic account. The DUCT database includes current revision levels for all diagnostics. Verify compares this revision level against the revision level stored within a diagnostic. DUCT flags differences in these revisions.

Verify has some limitations, which are listed below:

- Verify can check a diagnostic's revision level only if it is coded in the image in binary. (Verify cannot check an ASCII message.) This includes levels 2, 3, 4, and 5 diagnostics.
- Verify is unable to check revision levels that are listed in EVNDX as N/A.

NOTE

Verify is meaningful only if the most recent version of DUCT is used. The most recent version of DUCT always appears at the head of the most recent diagnostic update medium.

A.4.6 Execute

Select execute if you have already run DUCT and one of the following is true:

- The command file that was generated, DUCT.COM, did not execute properly because of the hardware.
- You want to add or delete some files from the command file or its auxiliary file, DUCT.DIA, which contains a truncated list of diagnostics to be copied.
- You did not complete the last session.
- You want to rerun the last session.

Never select execute without having selected initial, new option, or update in a previous session.

A.4.7 Console Media

Select console media to build console media from a number of sources (such as distribution media, console files resident in a directory, and even console media). The DUCT user is not restricted to one source.

DUCT collects all necessary files from the sources and, when the appropriate console menu option is chosen, DUCT builds and copies the console image to the console tape or disk.

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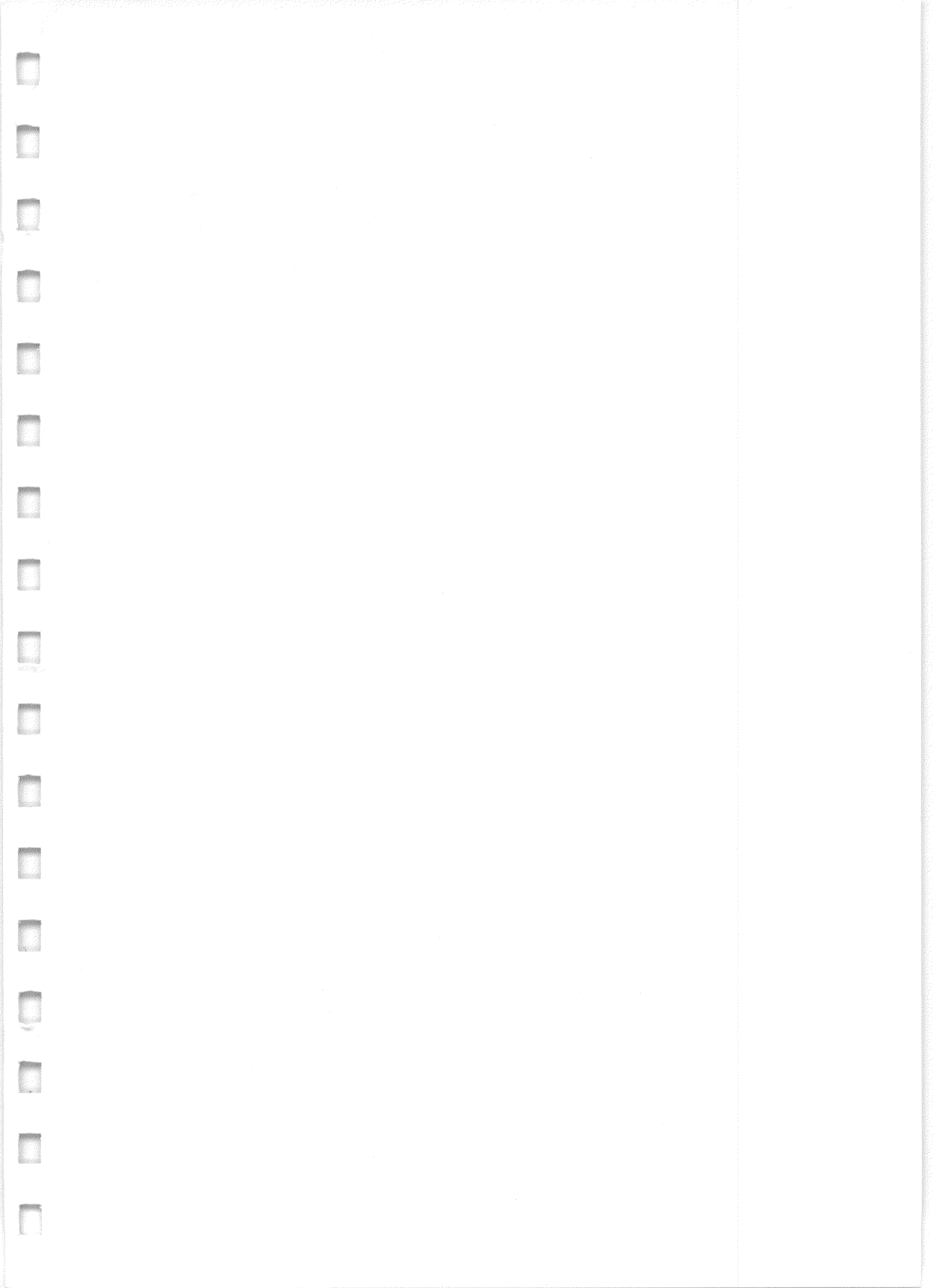
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