VAX-11/785

INSTALLATION MANUAL

EP-SI785-IN-001
1 OF 1 DEC 1984

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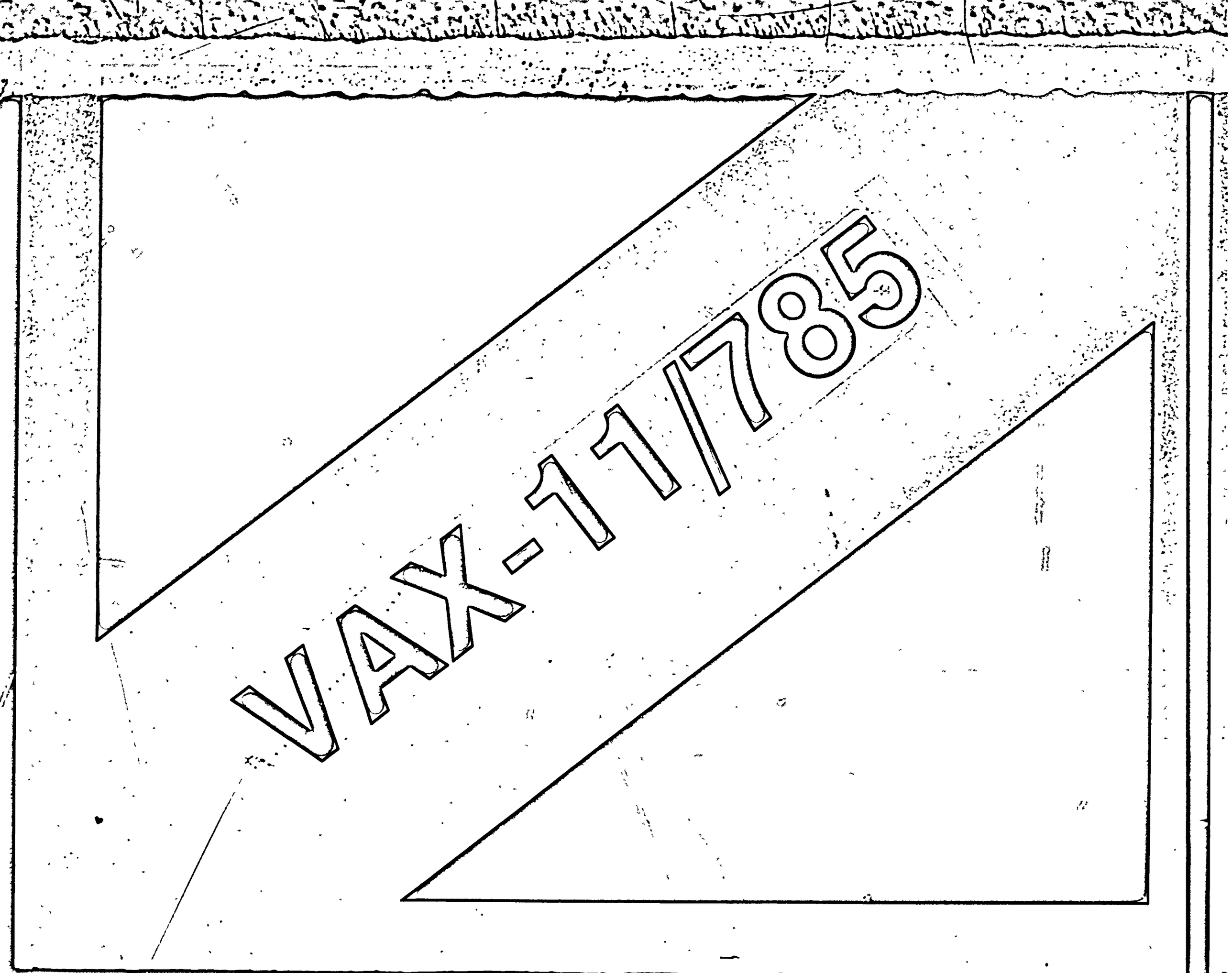
11/785
VAX-11

EK-SI785-IN-001

VAX-11/785 Installation Manual

Prepared by Educational Services
of
Digital Equipment Corporation

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- Class A Computing Devices

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

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FIGURES

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PREFACE

This manual provides installation procedures for a VAX-11/785 and its options It also describes the conversion from a VAX-11/780 to a VAX 11/785 In addition, it includes information on the new Federal Communications Commission (FCC) regulations

The following is a list of related documents

- *VAX-11/785 Central Processor Unit Technical Description* (EK-KA785-TD)
- *VAX-11/785 TB, Cache and SBI Control Technical Description* (EK-MM785-TD)
- *VAX-11/785 Console Subsystem Technical Description* (EK-KC785-TD)
- *MS780E Memory System Technical Description* (EK-MS78E-TD)
- *MS780 Memory System Technical Description* (EK-MS780-TD)
- *FP785 Floating Point Accelerator Technical Description* (EK-FP785-TD)
- *DW780 UNIBUS Adapter Technical Description* (EK-DW780-TD)
- *RH780 MASSBUS Adapter Technical Description* (EK-RH780-TD)
- *VAX-11/780 Power System Technical Description* (EK-PS780-TD)
- *VAX-11/785 Hardware User's Guide* (EK-11785-UG)
- *VAX Diagnostic User Guide* (EK-VX11D-UG)
- *VAX Maintenance Handbook, VAX Systems* (EK-VAXV1-HB)
- *VAX Maintenance Handbook, VAX-11/780* (EK-VAXV2-HB)
- *VAX Hardware Handbook, 1982-83* (EB-21710)
- *VAX Architecture Handbook, 1981* (EB-19580)
- *Computer Programming and Architecture The VAX 11* (EY-AX008-DP)
- *CI780 Computer Interconnect Technical Description* (EK-CI780-TD)
- *DS780 Diagnostic System User Guide* (EK-DS780-UG)
- *DS780 Diagnostic System Technical Description* (EK-DS780-TD)

Page vi intentionally left blank

- *System Maintenance Print Set* (MP01747-*)
- *Console Maintenance Print Set* (MP01748-*)
- *CPL Maintenance Print Set* (MP01749-*)
- *FPA Maintenance Print Set* (MP01754-*)

Documents may be ordered through the nearest DIGITAL sales office or the Peripherals and Supplies Group catalog, or from one of the following sources

Hardware documents

Digital Equipment Corporation
Publishing and Circulation Services, NRO3 1/W3
10 Forbes Road
Northboro, MA 01532

Handbooks and software manuals

Digital Equipment Corporation
Educational Services Distribution Center
12A Esquire Road
Brookside Industrial Park
North Billerica, MA 01862

Technical and service documents that support the VAX-11/785 (including maintenance print sets and diagnostic listings) are also available on microfiche For information on microfiche libraries contact

Digital Equipment Corporation
Micropublishing Systems, EPO/B5
30 North Avenue
Burlington, MA 01803

*The latest version is sent if no revision is specified

CHAPTER 1

CHAPTER 1
SYSTEM INSTALLATION

1.1 UNPACKING AND INSPECTION

CAUTION

Removing the equipment from the skids is a two-person procedure. Exercise extreme care to prevent the cabinets from rolling uncontrolled down the ramps or off either side of the skids when releasing the leveling feet. All leveling feet must be fully retracted before removing the cabinets from the skids.

1 Remove all equipment from the skids, following instructions on the boxes

2 Remove the shipping and accessory list from the "OPEN ME FIRST" box and check the contents of all boxes against the shipping list

3 Notify the branch manager or supervisor of any missing or incorrect items

NOTE

Advise the customer to contact the carrier about any missing items.

4 Inform the branch service manager of the DIGITAL Traffic and Shipping Department if the carrier does not have the missing items

5 Unpack the equipment following the instructions on the boxes

1.2 INSTALLATION

NOTE

End panel and expander panel part numbers *must* be checked against Figures 1-1 and 1-2 *prior* to installation to ensure that the correct hardware will be used.

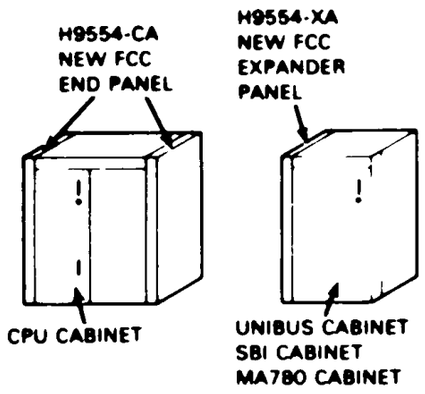
To install the equipment, follow the instructions in Figure 1-3

A END AND EXPANDER PANEL ARRANGEMENT AS SHIPPED WITH FCC-COMPLIANT OPTIONS

NOTE

1 CPU CABINETS COME WITH TWO END PANELS

2 EXPANDER CABINETS COME WITH ONE EXPANDER PANEL



B END AND EXPANDER PANEL ARRANGEMENT OF AN INSTALLED SYSTEM CONSISTING OF FCC COMPLIANT CABINET OPTIONS

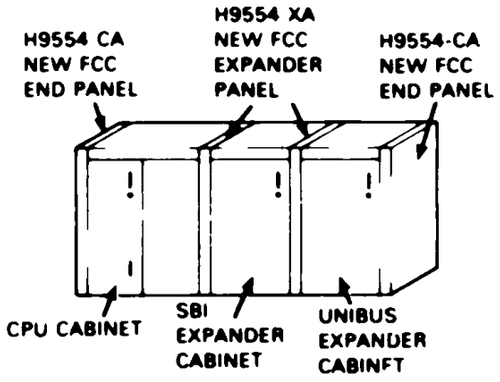
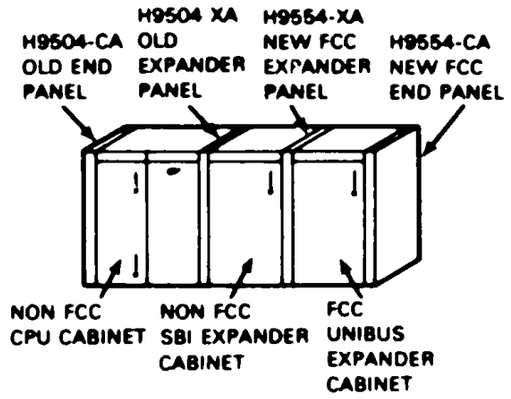


Figure 1-1 End Panel and Expander Panel Usage in FCC-Compliant Systems

A. END PANEL AND EXPANDER CONFIGURATION OF A SYSTEM COMPRISING NON FCC COMPLIANT CPU AND SBI CABINETS WITH AN FCC UNIBUS CABINET ADDED TO THE RIGHT SIDE

NOTE

THIS CABINET CONFIGURATION REQUIRES THE ADDITION OF AN FCC-COMPLIANT END PANEL TO THE RIGHT SIDE OF THE UNIBUS CABINET NOTE THAT THE OLD END PANEL, WHICH WAS ON THE RIGHT SIDE OF THE SBI CABINET MUST BE DISCARDED



B END PANEL AND EXPANDER PANEL CONFIGURATION OF A SYSTEM COMPRISING NON FCC COMPLIANT CPU AND UNIBUS CABINETS WITH AN FCC SBI CABINET IN THE MIDDLE

NOTE

THIS CONFIGURATION REQUIRES THE ADDITION OF AN FCC EXPANDER PANEL FOR THE RIGHT SIDE OF THE UNIBUS CABINET THE OLD EXPANDER PANEL WHICH WAS BETWEEN THE CPU AND UNIBUS CABINETS, MUST BE DISCARDED

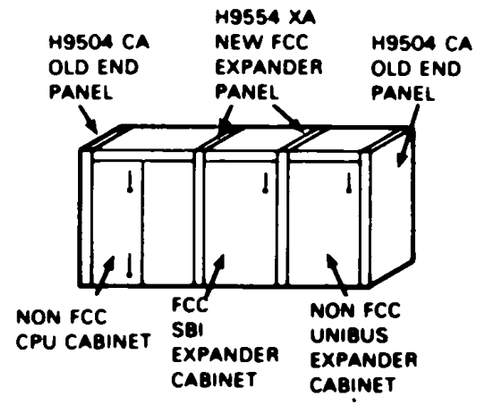
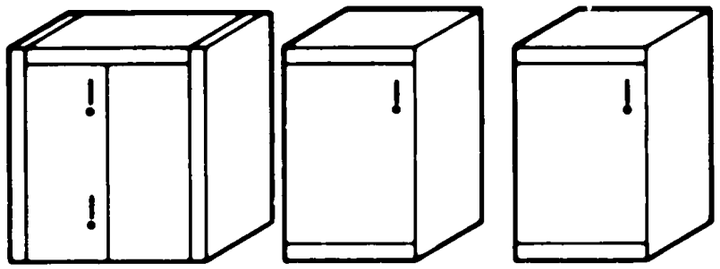


Figure 1-2 End Panel and Expander Panel Usage in Non FCC Compliant Systems

(1) ARRANGE THE EQUIPMENT WITH THE CPU CABINET ON THE LEFT THE SBI EXPANDER CABINET (IF APPLICABLE) IN THE MIDDLE AND THE UNIBUS CABINET ON THE RIGHT



(FRONT VIEW)

(2) UNLOCK ALL CABINET LOCKS

NOTE

THE KEYLOCK REQUIRES ONLY A QUARTER TURN TO BE LOCKED OR UNLOCKED THE KEY CAN BE REMOVED AFTER THE DOOR IS CLOSED AND LOCKED

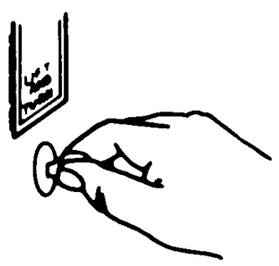


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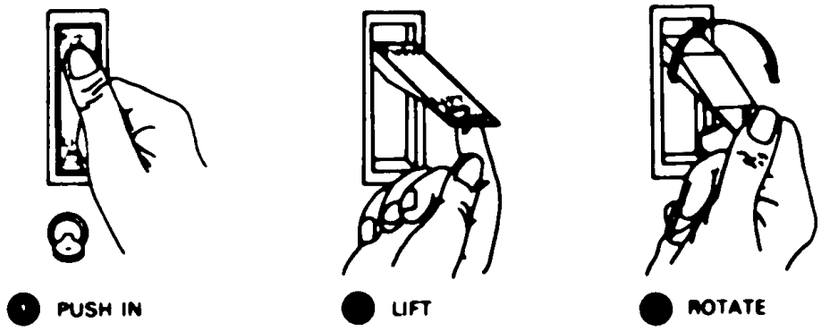
Figure 1-3 System Installation Procedure (Sheet 1 of 14)

(3) UNLATCH THE UNIBUS CABINET FRONT DOOR THE SBI EXPANDER CABINET DOORS, AND THE CPU CABINET DOORS BY PUSHING AT THE TOP OF THE HANDLES AND THEN LIFTING AND TURNING THE HANDLES UNTIL THE DOORS CAN BE OPENED



(4) UNHINGE AND REMOVE ALL FOUR CPU CABINET DOORS BOTH SBI EXPANDER CABINET DOORS AND THE UNIBUS CABINET FRONT DOOR

(5) UNLATCH THE UNIBUS CABINET BACK COVER PANEL AND THEN LIFT IT UP AND AWAY FROM THE CABINET

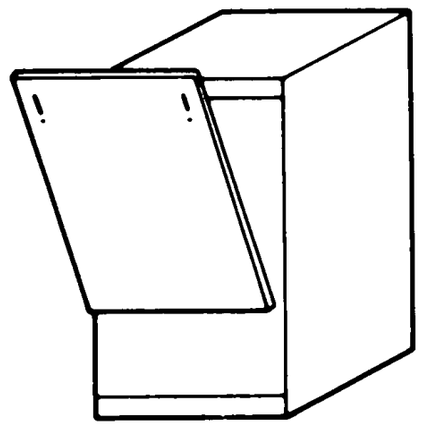


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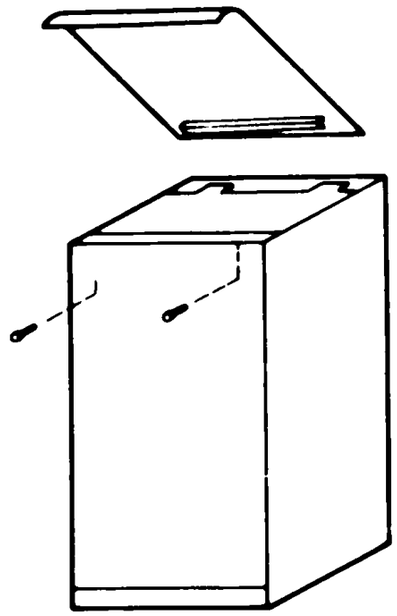
Figure 1-3 System Installation Procedure (Sheet 2 of 14)

(6) REMOVE TWO SCREWS FROM BENEATH THE UNIBUS CABINET BACK TO HORIZONTAL CROSSMEMBER AND THEN LIFT AND REMOVE THE TOP COVER



(7) REMOVE TWO SCREWS FROM BENEATH THE SBI EXPANDER CABINET BACK TOP HORIZONTAL CROSSMEMBER AND THEN LIFT AND REMOVE THE TOP COVER

(8) REMOVE TWO SCREWS FROM BENEATH THE CPU CABINET BACK TOP HORIZONTAL CROSSMEMBER AND THEN LIFT AND REMOVE THE TOP COVER

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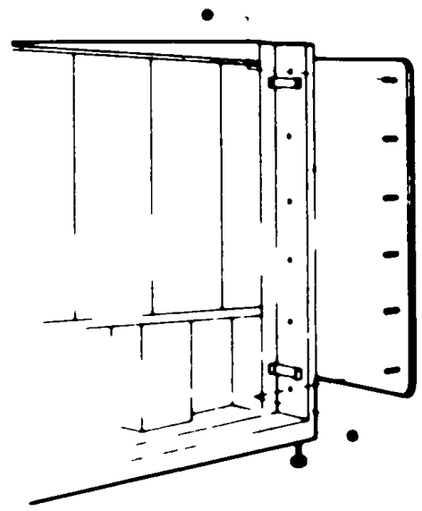
Figure 1-3 System Installation Procedure (Sheet 3 of 14)

(9) REMOVE 12 1/4-20 NUTS FROM THE CPU CABINET RIGHT FRONT AND BACK VERTICAL RAILS AND THEN REMOVE THE RIGHT END PANEL



(10) REMOVE 12 1/4-20 SCREWS AND NUTS FROM THE SBI EXPANDER CABINET LEFT FRONT AND BACK VERTICAL RAILS AND THEN REMOVE THE JOINER PANEL.

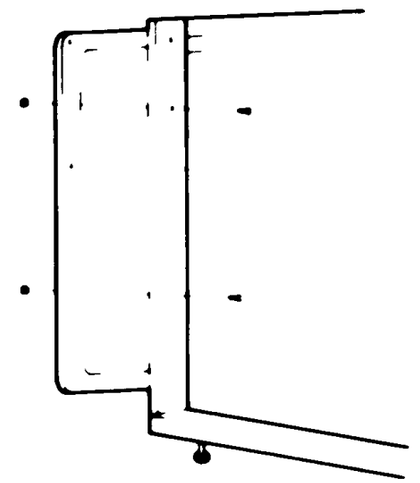


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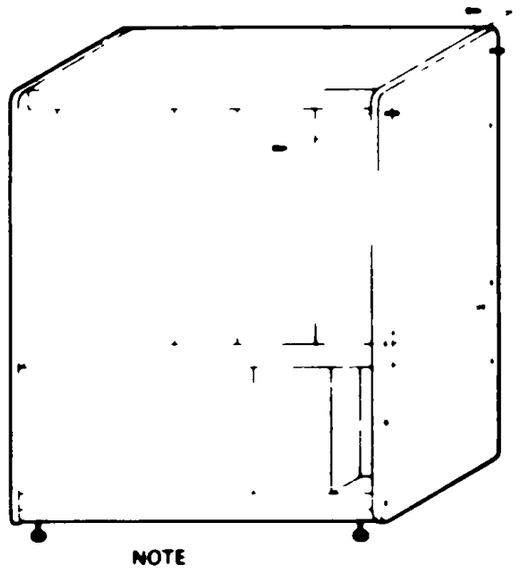
Figure 1-3 System Installation Procedure (Sheet 4 of 14)

(11) LOOSELY ATTACH THE JOINER PANEL REMOVED FROM THE SBI EXPANDER CABINET TO THE RIGHT END OF THE CPU CABINET WITH TWO 1/4-20 SCREWS INSERTED FROM THE CPU CABINET SIDE OF THE JOINER PANEL

NOTE

DO NOT USE NUTS AT THIS TIME TO ATTACH THE JOINER PANEL TO THE CPU CABINET



NOTE
FRONT OF CPU CABINET SHOWN

(12) POSITION THE SBI EXPANDER CABINET AGAINST THE CPU CABINET

NOTE

ADJUST THE LEVELER FEET ON BOTH CABINETS TO OBTAIN ALIGNMENT OF INTERCABINET SCREW HOLES

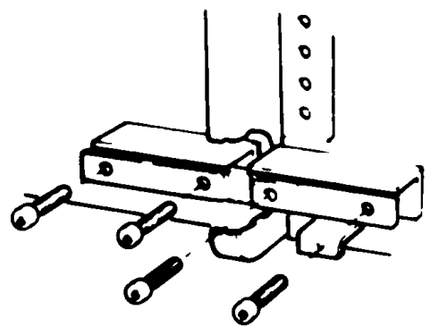


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Figure 1-3 System Installation Procedure (Sheet 5 of 14)

(13) INSTALL 10 ADDITIONAL 1/4-20 SCREWS IN THE EMPTY INTERCABINET HOLES AND THEN INSTALL 12 FINGER TIGHTENED 1/4-20 NUTS

NOTE

AFTER ALL SECURING HARDWARE HAS BEEN INSTALLED AND ALIGNED TIGHTEN ALL NUTS WITH A RATCHET WRENCH

(14) REMOVE 12 1/4-20 SCREWS AND 12 NUTS FROM THE UNIBUS CABINET LEFT FRONT AND BACK VERTICAL CROSSMEMBERS AND THEN REMOVE THE JOINER PANEL

(15) LOOSELY ATTACH THE JOINER PANEL REMOVED FROM THE UNIBUS CABINET TO THE OPEN END OF THE SBI EXPANDER CABINET WITH TWO 1/4-20 BOLTS INSERTED FROM THE SBI EXPANDER CABINET SIDE OF THE JOINER PANEL

NOTE

DO NOT USE NUTS AT THIS TIME TO ATTACH THE JOINER PANEL TO THE SBI EXPANDER CABINET

(16) POSITION THE UNIBUS CABINET AGAINST THE SBI EXPANDER CABINET (IF PRESENT)

NOTE

ADJUST THE LEVELER FEET ON BOTH CABINETS TO OBTAIN ALIGNMENT OF THE INTERCABINET BOLT HOLES

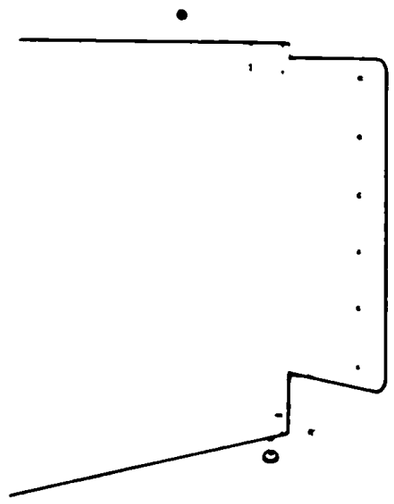
(17) INSTALL 10 ADDITIONAL 1-4-20 BOLTS IN THE EMPTY INTERCAB NET HOLES AND THEN SECURE THEM WITH 12 FINGER TIGHTENED 1-4-20 NUTS

NOTE

AFTER ALL SECURING HARDWARE HAS BEEN INSTALLED AND ALIGNED TIGHTEN NUTS WITH A RATCHET WRENCH

Figure 1-3 System Installation Procedure (Sheet 6 of 14)

(18) INSTALL THE CPU CABINET RIGHT END PANEL ON THE OPEN SIDE OF THE UNIBUS CABINET AND SECURE IT WITH 12 1/4 20 NUTS



(19) REINSTALL THE CPU CABINET TOP COVER AND SECURE IT WITH TWO 10 32 SCREWS

(20) REINSTALL THE UNIBUS CABINET TOP COVER AND SECURE IT WITH TWO 10 32 SCREWS

(21) REINSTALL THE SBI EXPANDER CABINET TOP COVER AND SECURE IT WITH TWO 10 32 SCREWS

Figure 1-3 System Installation Procedure (Sheet 7 of 14)

(22) CHECK THAT NO BRAIDED RFI SHIELDING OR SECURING CLIPS ARE DAMAGED OR MISSING

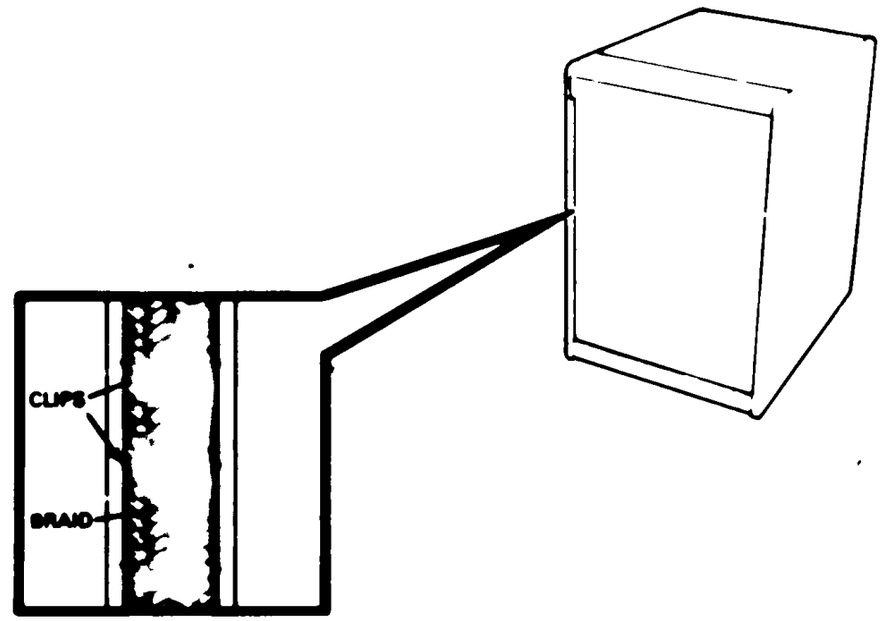


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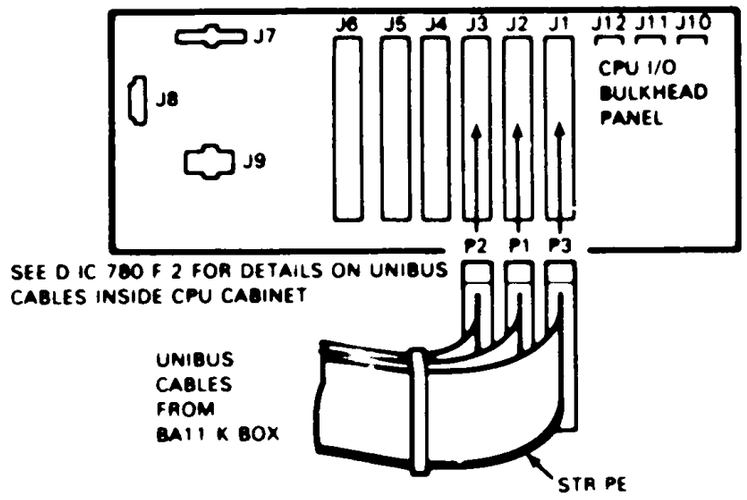
Figure 1-3 System Installation Procedure (Sheet 8 of 14)

(23) INSTALL THE THREE UNIBUS CABLES BY CONNECTING P2, P1 AND P3 OF THE THREE UNIBUS CABLES FROM THE BA11 K BOX IN THE UNIBUS EXPANDER CABINET TO JACKS J3 J2 AND J1, RESPECTIVELY, ON THE CPU CABINET SIDE I/O BULKHEAD PANEL

NOTE

IF AN SBI EXPANDER CABINET IS USED ROUTE THE THREE UNIBUS RIBBON CABLES THROUGH THE BOTTOM OF THE SBI CABINET AND CONNECT THEM AS DESCRIBED ABOVE



(24) CONNECT THE DIG TAL POWER CONTROL BUS CABLE (SHIPPED IN THE BOTTOM OF THE UNIBUS CABINET) FROM J8 ON THE 877 POWER CONTROLLER IN THE UNIBUS CABINET TO J8 ON THE CPU CABINET SIDE OF THE I/O BULKHEAD PANEL

IF AN SBI CABINET IS USED CONNECT THE DIGITAL POWER CONTROL BUS CABLE (SHIPPED IN THE BOTTOM OF THE SBI CABINET) FROM J4 OF THE 869 POWER CONTROLLER IN THE SB CABINET TO J8 OF THE CPU CABINET SIDE I/O BULKHEAD PANEL NEXT CONNECT THE POWER CONTROL BUS IN THE UNIBUS EXPANDER CABINET FROM J8 OF THE SBI CABINET SIDE I/O BULKHEAD PANEL

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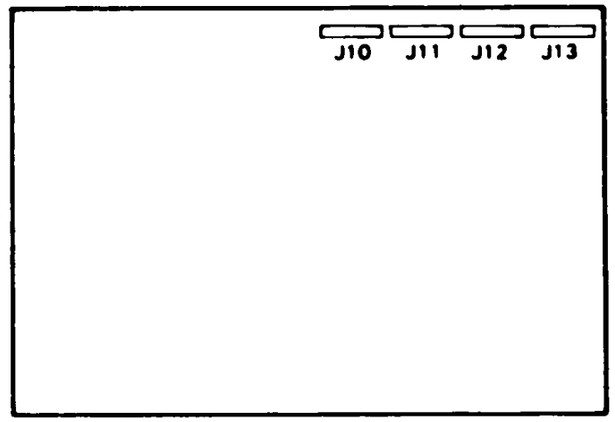
Figure 1-3 System Installation Procedure (Sheet 9 of 14)

(25) CHECK JUMPERS FOR JCS AND THE SID REGISTER ON J11 AND J13 ON THE CPU BACKPLANE THESE JUMPERS ARE INSTALLED IN THE STANDARD CONFIGURATION IN MANUFACTURING

JCS ADDRESS SELECTION		J11	
SLOT 18	SLOT 20	J11 X	J11 LL
0 TO 4K	5 TO 8K	OUT	IN (STANDARD)
5 TO 8K	0 TO 4K	IN	OUT

SID BITS			J13	
23	22	CPU	J13-NN	J13-RR
0	X	11/780	IN	IN
1	0	11/785	OUT	IN (STANDARD)
1	1	RESERVED	OUT	OUT



EXPANDED VIEW OF J10 J11 J12 AND J13

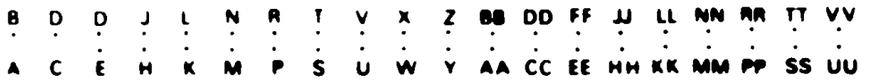


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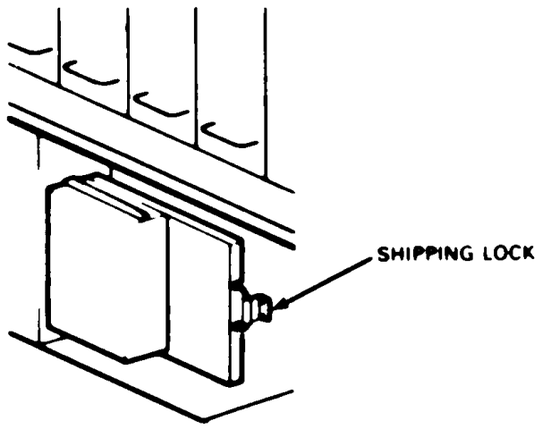
Figure 1-3 System Installation Procedure (Sheet 10 of 14)

(26) REMOVE THE DISKETTE DRIVE ASSEMBLY SHIPPING LOCK



(27) REFER TO PART II OPTIONS INSTALLATION FOR ADDITIONAL INSTALLATION PROCEDURES

(28) CHECK ALL INTERNAL AND EXTERNAL CABLING AND REINSTALL THE CABINET DOORS WHEN THE OPTION INSTALLATION IS COMPLETE SECURE THE LOCKS

(29) REINSTALL ALL DOORS AND COVERS

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Figure 1-3 System Installation Procedure (Sheet 11 of 14)

(30) CHECK THE RF SEALS AROUND THE DOOR AND COVERS FOR CONTINUITY TO DO THIS INSERT A THIN STRIP OF PAPER INTO EACH SEAM AROUND DOORS AND COVERS AND CHECK FOR RESISTANCE WHILE MOVING THE STRIP ALONG THE SEAM IF THERE IS NO RESISTANCE, THE SEAM WILL NOT PROVIDE AN EFFECTIVE RF SEAL IN WHICH CASE IT MUST BE ADJUSTED UNTIL A PROPER RF SEAL IS ATTAINED

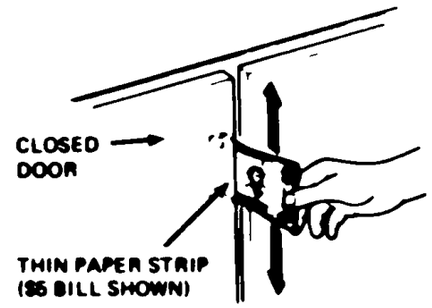

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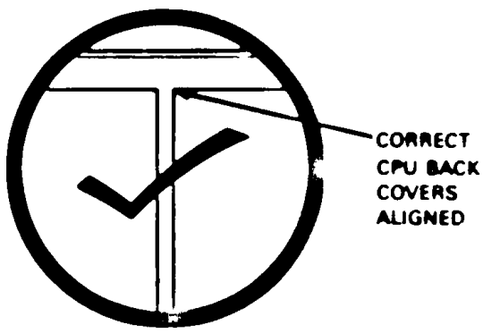
Figure 1-3 System Installation Procedure (Sheet 12 of 14)

(31) CHECK THAT THE EQUIPMENT DOORS AND COVERS ARE ALIGNED ON THE CABINETS AND ADJUST LEVELER FEET AS NECESSARY TO ACHIEVE PROPER ALIGNMENT

NOTE

DOORS MUST BE PROPERLY ALIGNED ON CABINETS SO THAT RFI SUPPRESSION FEATURES OF CABINETS WILL REMAIN VALID



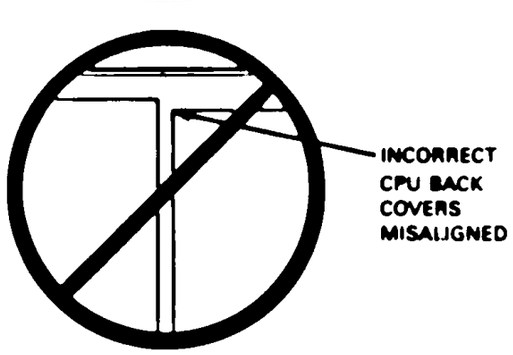


Figure 1-3 System Installation Procedure (Sheet 13 of 14)

(32) LOCATE THE CONSOLE TERMINAL NEAR THE FRONT OF THE CPU CABINET

(33) PLUG THE CONSOLE TERMINAL I/O CABLE INTO CONNECTOR LOCATION D OF THE I/O CONNECTOR PANEL AT THE LOWER BACK OF THE CPU CABINET

(34) CONNECT THE CONSOLE TERMINAL POWER CABLE TO AN EXTERNAL CUSTOMER AC OUTLET NEAR THE TERMINAL

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Figure 1-3 System Installation Procedure (Sheet 14 of 14)

1.3 POWER CHECK

Figure 1-4 illustrates various ac power receptacles and plugs The CPU cabinet and the SBI expander cabinet (if used) require three-phase ac power The UNIBUS expander cabinet requires single-phase ac power

Measure the voltage between each of the three phases and neutral on the three-phase power source receptacles

Measure the voltage between the source and neutral lines on the single-phase power source receptacles, and also to ground and between earth ground and neutral (8 volts maximum)

The ac power receptacles must meet the specifications listed in Table 1-1

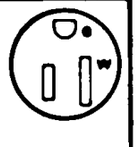
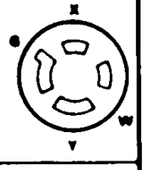
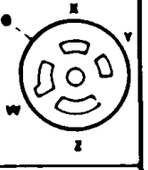
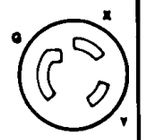
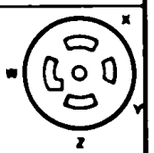
SOURCE	PLUG	RECEPTACLE
120 V 15 A 1-PHASE	 HUBBEL ø5965-C NEMA ø 5-15P DEC ø 90-05965	 ø5965 5-15R 12-05951
120 V 20 A 1-PHASE	 HUBBEL ø5911 NEMA ø L5-20P DEC ø 12 11105	 ø5910 L5-20R 12 11104
120/208-240 V 20 A 2-PHASE or 120/208 V 20 A 3-PHASE Y	 HUBBEL ø5911 NEMA ø L14-20P DEC ø 12 11046	 ø5910 L14-20R 12 11048
120/208 V 20 A 3-PHASE Y	 HUBBEL ø2911 NEMA ø L21 20P DEC ø 12 11208	 ø2910 L21 20R 12 11210
240 V 15 A 1 PHASE	 NEMA ø 6 15P DEC ø 90 05953	 6 15R 12 11204
240 V 20 A 1 PHASE	 HUBBEL ø2321 NEMA ø L6 20P DEC ø 12 11192	 ø2320 L6 20R 12 11191
240/416 V 20 A 3 PHASE Y	 NEMA ø NOT NEMA DEC ø 12 00010	 NOT NEMA 12 11260
120/208 V 30 A 3 PHASE Y	 HUBBEL ø2811 NEMA L21 30P DEC 12 12314	 ø2810 L21 30R 12 12316

Figure 1-4 Power Plugs and Receptacles

Table 1-1 AC Power Requirements

Three-Phase	Nominal	Minimum	Maximum
Vac	120	100	127
Hz	50	49	61
Hz	60	59	61
Current in amps			20
Vac	240	200	254
Hz	50	49	51
Hz	60	59	61
Current in amps			10
Single-Phase (for UNIBUS expander cabinet)			
Vac	120	90	132
Hz	50	47	63
Hz	60	47	63
Current in amps	12		
Vac	240	180	264
Hz	50	47	63
Hz	60	47	63
Current in amps	7		10

CHAPTER 22

CHAPTER 2
CHECKOUT AND ACCEPTANCE PROCEDURE

2.1 SYSTEM INITIAL START-UP PROCEDURE

1 Check that all circuit breakers (Figure 2-1), including those in the system power supplies, are off.

2 Check that all power control sense switches are in the remote position.

3 Check that the auto restart switch on the control panel (top front of system cabinet) is in the off position

4 Connect the power cable for the system cabinet to the customer power source Connect the power cable for the UNIBUS expander cabinet to the customer power source. Connect the power cable for the console terminal and the other free-standing peripheral devices to the customer power source. Note that the system cabinet (and the SBI expander cabinet) and the RP06 disk drive require, if used, three-phase ac power The UNIBUS expander cabinet and the remaining peripheral devices require single-phase ac power

5 Set the main circuit breaker on the power controller to on (up).

6 Check that the memory blower (the middle blower) is functioning

7 Set the three secondary circuit breakers on the 869 power control module to on

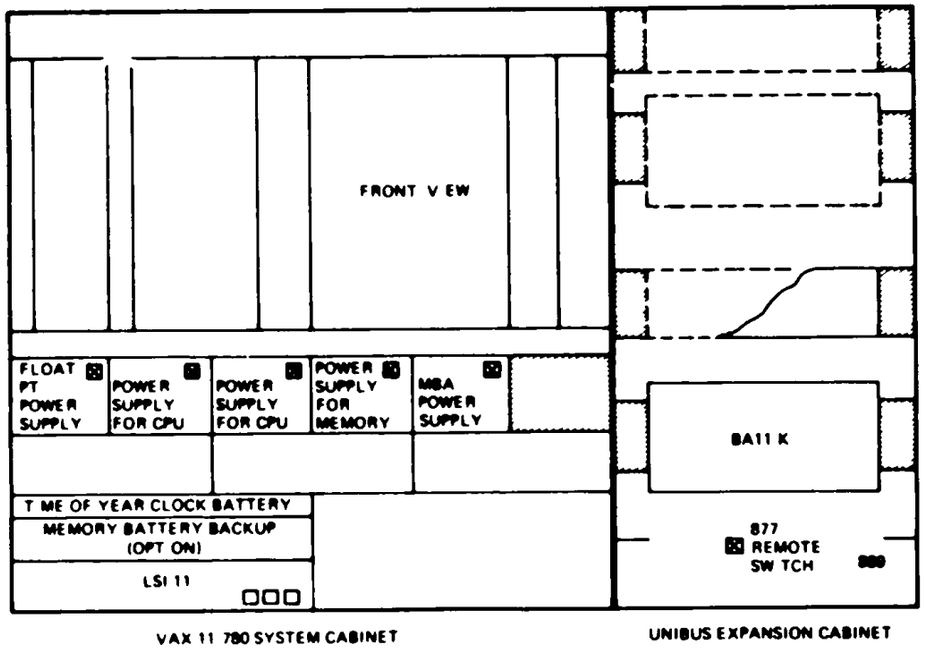
8 Set all remaining circuit breakers (including the following) to the on (up) position

- a H7111 battery back-up circuit breakers
- b H7112 battery back-up circuit breakers (if used)
- c 869 circuit breakers in the CPU cabinet and the CPU expander cabinet
- d 877 circuit breakers in the UNIBUS expander cabinet
- e All circuit breakers on free-standing peripheral devices

9 Check that the console terminal power is on The LSI-11 halt enable switch should be set to enable (up), the LSI-11 power switch set to on (up), and the LTC switch set to off (down).

10 Set the five-position key switch on the control panel to the local position

11 Check that all blowers are functioning



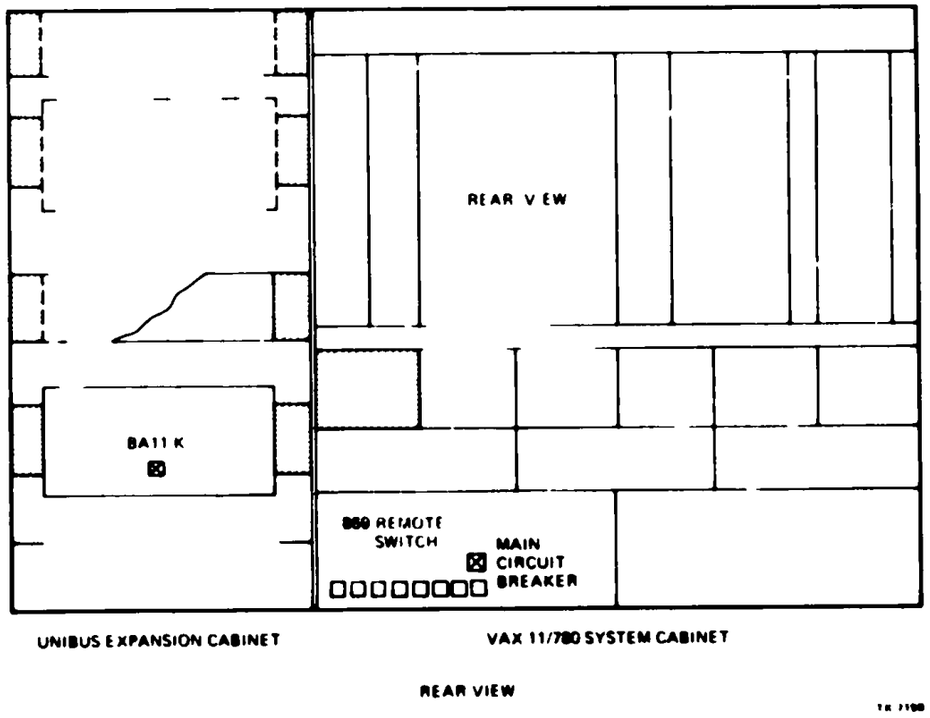


Figure 2-1 Circuit Breaker Locations

2.2 SYSTEM CHECK-OUT PROCEDURE

The system check-out procedure consists of running all diskettes listed in Table 2-1.

Table 2-1 on Separate Sheet

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The check-out procedure includes running microdiagnostics (RX2A and either RX3A or RX8A), running macrodiagnostics, and then booting VMS and running UETP

NOTE

In the following procedures, items in blue indicate input to be typed at the console terminal.

Table 2-1 Basic VAX-11/785 Diskette Directory

RX Number	Diagnostic Title	Part Number
2A	11785 Microdiagnostic #1	AS-T623?-DE
3A *	11785 Microdiagnostic #2	AS-T679?-DE
5	11785 Microdiagnostic #4	AS-T791?-DE
7	VAX11780 Diagnostic Supervisor	AS-E160?-DE
EVSAA.EXE	VAX Diagnostic Supervisor	
EVSAA.HLP	Supervisor Help File	
DIAGBOO.EXE	VAX Diagnostic Secondary Boot Program	
SBBBOO.CMD	VAX Diagnostic Supervisor Boot Command	
8A *	11785 Microdiagnostic #3	AS-T680?-DE
25	VAX-11 Instruction #2	AS-F748?-DE
EVKAC.EXE	Floating Point Instruction	
EVKAC.HLP	Help File for EVKAC EXE	
EVKAD.EXE	Compatibility Mode Instruction	
EVKAE.EXE	Privileged Arch Instruction	
EVKAE.HLP	Help File for EVKAE EXE	
EVKAM.EXE	VAX Memory User Mode Test	
EVKAM.HLP	Help File for EVKAM EXE	
61	11780/11785 VAX Bus and Autosizer	AS-T139?-DE
ESCAA.EXE	MASSBUS Channel Adapter Diagnostic	
ESCBA.EXE	UNIBUS Channel Adapter Diagnostic	
EVCEA.EXE	VAX UNIBUS Switch Function	
EVCEA.HLP	Help File for EVCAE.EXE	
EVSBA.EXE	VAX Autosizer	
EVSBA.HLP	Help File for EVSAB.EXE	
62	VAX-11 Instruction #1	AS-T140?-DE
EVKAA.EXE	VAX-11 Hardcore Instruction	
EVKAB.EXE	VAX-11 Architectural Instruction	
EVKAB.HLP	Help File for EVKAB.EXE	

*Run either RX3A or RX8A

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2.2.1 Bootstrapping the System

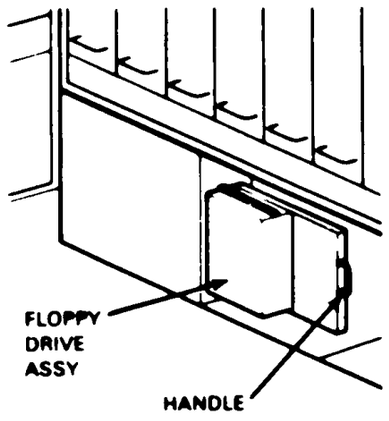
Insert console diskette RX1A VAX-11/785 console package into the drive assembly, following the instructions in Figure 2-2

① UNLOCK AND OPEN THE FRONT DOORS OF THE CPU CABINET

② GRASP THE HANDLE ON THE SIDE OF THE DISKETTE DRIVE ASSEMBLY AND SWING THE DRIVE OUT PERPENDICULAR TO THE CPU CABINET

NOTE

DISKETTES CANNOT BE INSERTED IF THE DRIVE ASSEMBLY IS NOT PERPENDICULAR TO THE CPU CABINET



③ GRASP THE DISKETTE AT THE LABEL AND REMOVE IT FROM THE PROTECTIVE COVER

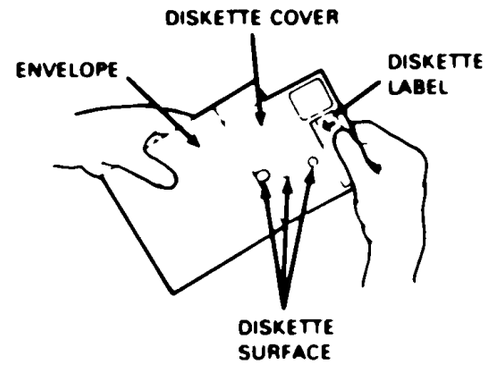


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Figure 2-2 Diskette Loading Procedure (Sheet 1 of 3)

CAUTION

HOLD THE DISKETTE ONLY BY THE LABEL AREA

DO NOT TOUCH ANY EXPOSED AREA OF THE DISKETTE

NEVER WRITE ON THE DISKETTE COVER

IF THE DISKETTE BECOMES DIRTY OR DUSTY, DO NOT ATTEMPT TO CLEAN IT DISPOSE OF IT INSTEAD

NEVER INSERT A DIRTY OR DUSTY DISKETTE INTO THE DRIVE ASSEMBLY

DO NOT USE PAPER CLIPS ON THE DISKETTE

KEEP THE DISKETTE AWAY FROM ANY METAL OR OTHER MATERIAL THAT MIGHT BE MAGNETIZED

DO NOT BEND THE DISKETTE

DO NOT EXPOSE THE DISKETTE TO HEAT OR SUNLIGHT

RETURN THE DISKETTE TO ITS PROTECTIVE COVER WHENEVER IT IS REMOVED FROM THE DRIVE ASSEMBLY

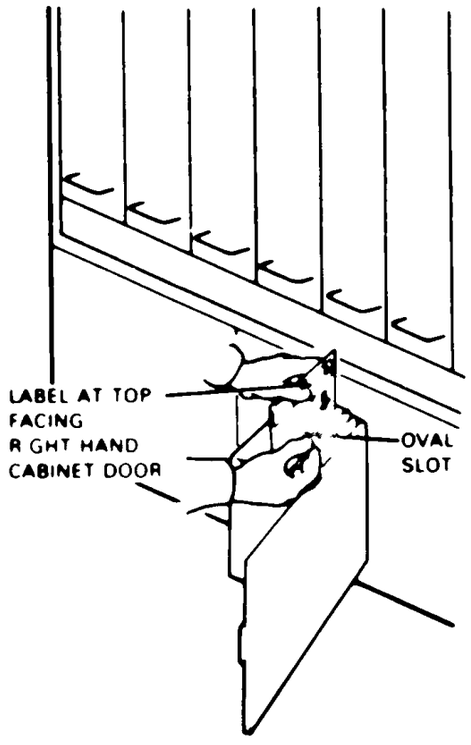
STORE DISKETTES FLAT IN BOXES WHEN NOT IN USE

④ SQUEEZE THE DRIVE ASSEMBLY HANDLE WITH THE THUMB AND FOREFINGER, THE HANDLE WILL SPRING ASIDE

MKV84-2201

Figure 2-2 Diskette Loading Procedure (Sheet 2 of 3)

⑤ HOLD THE DISKETTE BY THE LABEL AREA AND INSERT IT INTO THE DRIVE ASSEMBLY



⑥ CLOSE THE DRIVE ASSEMBLY SLOT COVER

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Figure 2-2 Diskette Loading Procedure (Sheet 3 of 3)

NOTE

If the system has been turned off, turn it on by setting the auto restart switch to off and the keyswitch to local. If the system has already been powered on, and it is not in the console mode (>>> prompt), momentarily set the LSI-11 halt/enable switch to halt (down). This will output the PC+2 of the LSI-11 and produce an ODT prompt (@) on the console terminal. Type 173000G to bring the system to console mode.

With the auto restart switch set to off, turn the keyswitch to local The console software (CONSOL.SYS) loads into the LSI-11 memory from the diskette The control store then loads into the VAX-11/785 CPU from the SSunnn WCS file, where nnn is the writable control store version number The console is now in the console I/O mode of operation

Type

>>>B

to boot the CPU from the default device (DEFBOO CMD)

2.2.2 Running Microdiagnostics

1 Microdiagnostic Test #1 The RX2A Microdiagnostic Volume 1 diskette is used to run the following diagnostics

- ETKAB VAX-11/785 (KA785) microdiagnostic monitor
- ETKAD VAX-11/785 (KA785) hardcore test stream
- ETKAH VAX-11/785 (KA785) microdiagnostic test #1

NOTE

The names of these tests are printed out as microdiagnostic test #1 runs.

A Insert RX2A, VAX-11/785 microdiagnostic #1 diskette (AS-T623?-DE), into the the disk drive (Figure 2-2)

B Notify the console that the test (T) will enter the control mode (C) by typing

>>>T/C

C Run two (2) passes (PA) of microdiagnostic (DI) tests by typing, after the microdiagnostic (MIC >) prompt

MIC >DI PA 2

D Remove the microdiagnostic #1 diskette from the disk drive (Figure 2-2)

2 Microdiagnostic Test #3 The Microdiagnostic #3 diskette is used to run ETKAR, VAX-11/785 (KA785) microdiagnostic test #3, to test systems with MS780-E memory

A Insert RX8A, VAX-11/785 microdiagnostic #3 diskette (AS-T680? DE), into the disk drive (Figure 2 2)

B Run the microdiagnostic #3 test by typing, after the prompt

MIC > DI PA 2

C Remove the microdiagnostic #3 diskette from the disk drive assembly

NOTE

If the system being installed contains an MS780-C memory, use RX3A microdiagnostics diskette #2 in place of RX8A.

2.2.3 Running Macrodiagnostics

1 Install the standard console diskette RX1A

2 Reload, after bringing up the console prompt, the VAX-11/785 microcode by typing

>>>LOAD WCS

3 Remove the standard console diskette

4 Install the diagnostic supervisor diskette RX7

5 Type the following

>>>L ESSAA EXF/S FF00

>>>S 10000

6 Remove the diagnostic supervisor diskette

7 Run the VAX autosizer EVSBA, located on diskette RX61

NOTE

The autosizer passes configuration information to the diagnostic supervisor. It creates a series of attach commands, based on the hardware it found during its sizing process, which it passes to the supervisor and which may be written to the console load medium for later use. Running EVSBA at this time determines which devices are configured properly and which are not. Fix any hardware not "seen" by the autosizer and then rerun the autosizer until each device is "seen." Proceed to step 8.

8 Install VAX INSTR #1 diskette RX62

9 Type, after the prompt (DS>) the following

DS> L EVKAB

DS> ATTACH KA785

Use the attach command if EVSBA has not been run and answer the following questions

NOTE

These questions appear only if the prompt mode is entered by pressing returns.

Device Link? HUB

Device Name? KA0

G-floating instructions? Y

H-floating instructions? Y

JCS last address? 1FFF

ACC TYPE 1 or 0? 1

Then type the following

DS> SEL KA0

DS> START

10 Remove the VAX INSTR #1 diskette

11 Run the remainder of the diskettes listed in Table 2-1

2.2.4 Booting VMS and Running UETP

1 Boot VMS by typing, after the console prompt

>>>BOOT DDn

"DD" is the device type and "n" is the unit number See Table B-1 for a list of device types.

2 Log into the SYSTEST account

USERNAME SYSTEST
PASSWORD UETP

NOTE
This password will not echo when you type it.

3 Run UETP

To run UETP, type

```
$ @UETP
```

NOTE
Refer to the *VAX/VMS User's Guide* (AA-D643C-TE) for information on running UETP.

CHAPTER 3

CHAPTER 3
UNPACKING AND INSPECTING OPTIONS

NOTE
See the *VAX-11/780 Installation Manual* (EK-SI780-IN or EK-SI78F-IN) for installation information on the following options: DW780, DR780, RH780, MS780, and CI780.

3.1 GENERAL

Unpacking and inspecting of options consists of:

1 Setting up a static discharge system

2 Unpacking and inspecting option component parts

CAUTION
Small component parts such as cardcage assemblies, modules, and chips must be unpacked and inspected on the static discharge system mat to prevent equipment damage from static electricity discharges.

3.2 STATIC DISCHARGE SYSTEM SET-UP

NOTE
The following information is for the field service representative. The self-maintenance customer must follow similar precautions.

1 Unpack a Velostat™ static discharge system (CD kit number A2-W0299-10)

2. Unfold the Velostat™ mat

3 Attach the 15-foot ground cord to the mat snap fastener

4 Connect the 15-foot ground cord alligator clip to a good electrical ground point in the VAX-11/785

5 Attach the wrist strap to your wrist

6 Connect the wrist strap grounding strap to a convenient part of the mat

---

Velostat™ is a trademark of the Minnesota Mining and Manufacturing Company

3.3 UNPACKING

1 Check that the shipping container is sealed and undamaged and that the correct number of containers was shipped Report any differences to the customer and also on a LARS report form

CAUTION

Use the static discharge system when handling component parts small enough to be placed on the the static discharge system mat. Use of the mat will prevent equipment damage from static electricity discharges.

2 Open the containers one at a time, starting with the one marked "Open Me First." Check the contents against the packing slip and record any missing items on the installation report.

NOTE

If any items are missing, the customer should check with the carrier.

Packing materials (such as foam fillers and plastic inserts) should be retained if reshipment is expected.

3.4 INSPECTING

Inspect the equipment for any damage If any damage is found notify the customer and also record it on the installation report Damaged components requiring replacement should be immediately reported to the branch service manager

CAUTION

Use the static discharge system when handling component parts small enough to be placed on the static discharge system mat. Use of the mat will prevent equipment damage from static electricity discharges.

CHAPTER 4

CHAPTER 4
FP785 FLOATING-POINT ACCELERATOR

4.1 GENERAL

The FP785 is a high-performance, floating-point accelerator for single- and double-precision floating-point instructions and POLY, EMOD, and MULL

The FP785 consists of

- Five extended hex modules (M7540, M7541, M7542, M7543, and M7544)
- H7100 power supply
- Interconnecting power supply cables

CAUTION

FP785 modules contain components that can be damaged by electrostatic discharge. Do not handle without the use of a Velostat™ kit, (CD kit A2-W0299-10) or other approved antistatic material. See Chapter 3 for the installation of the Velostat™ kit.

4.2 FP785 INSTALLATION

1 Shutdown the system (Figure 4-1)

2 Install the FP785 (Figure 4-2)

4.3 FP785 DIAGNOSTICS

1 Power up the system (Figure 4-3)

2 Run one pass for each of the following diagnostics

a ETKAJ

b EVKAC

c UETP

NOTE

Chapter 2 describes the running of diagnostics.

(1) HALT THE SYSTEM BY LOGGING IN AND TYPING

```
USERNAME  SYSTEM
PASSWORD  MANAGER
$ @SYS$SYSTEM  SHUTDOWN
HOW MANY MINUTES UNTIL SHUTDOWN? 0
REASON? MAINT
DO YOU WANT TO SPIN DOWN THE DISKS? NO
```

(2) TURN THE KEYSWITCH TO OFF

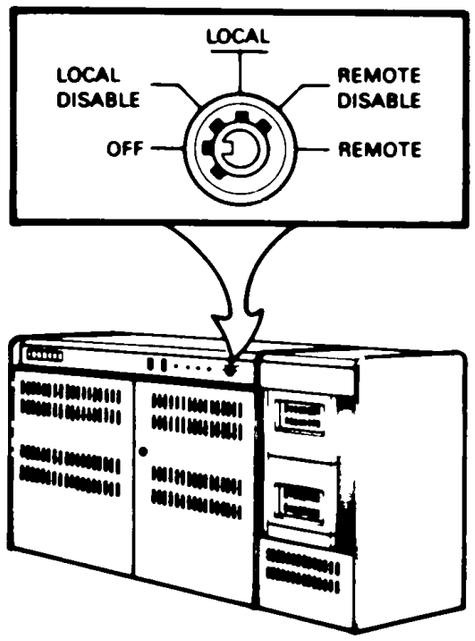
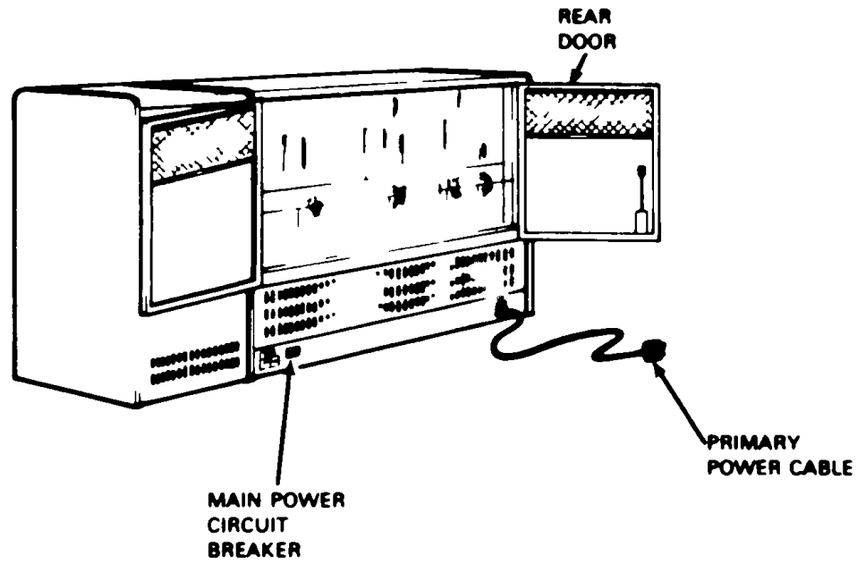


Figure 4-1 System Shutdown Procedure (Sheet 1 of 2)

(3) SET THE MAIN POWER CIRCUIT BREAKER TO OFF (DOWN)



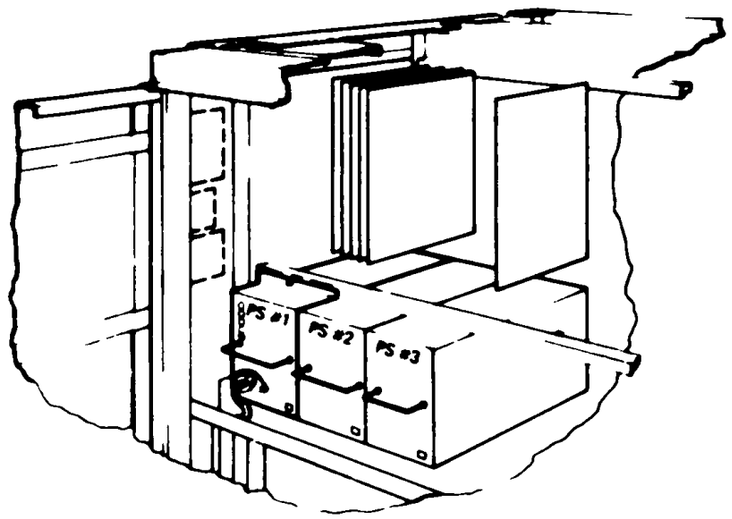
(4) DISCONNECT THE PRIMARY POWER CABLE FROM THE OUTLET

MKV84-2087

Figure 4-1 System Shutdown Procedure (Sheet 2 of 2)

(1) TURN OFF THE SYSTEM POWER (FIGURE 4 1)

(2) REMOVE THE BLANK POWER SUPPLY PANEL FROM POWER SUPPLY SLOT 1.



(3) INSTALL THE H7100 POWER SUPPLY IN SLOT 1

(4) ENGAGE THE STUD WITH THE SLIDE LOCK ASSEMBLY AT THE REAR OF POWER SUPPLY 1

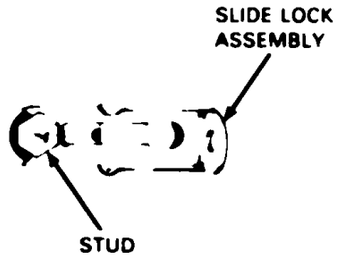


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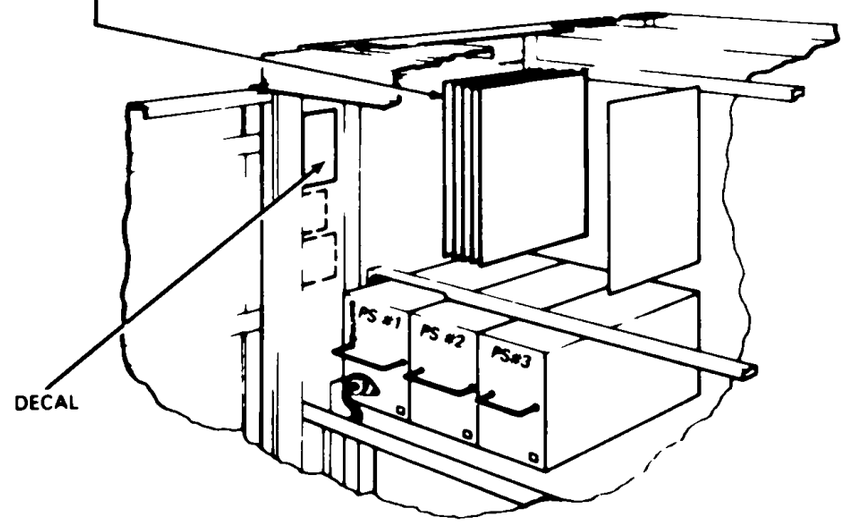
Figure 4-2 FP785 Installation Procedure (Sheet 1 of 4)

(5) REMOVE THE MODULE SIMULATORS FROM BACKPLANE SLOTS 24 THROUGH 28.

(6) INSTALL THE FP785 MODULES IN SLOTS 24 THROUGH 28

	29	28	27	26	25	24	23
A		M	M	M	M	M	
		7	7	7	7	7	
B		5	5	5	5	5	
		4	4	4	4	4	
C		4	3	2	1	0	

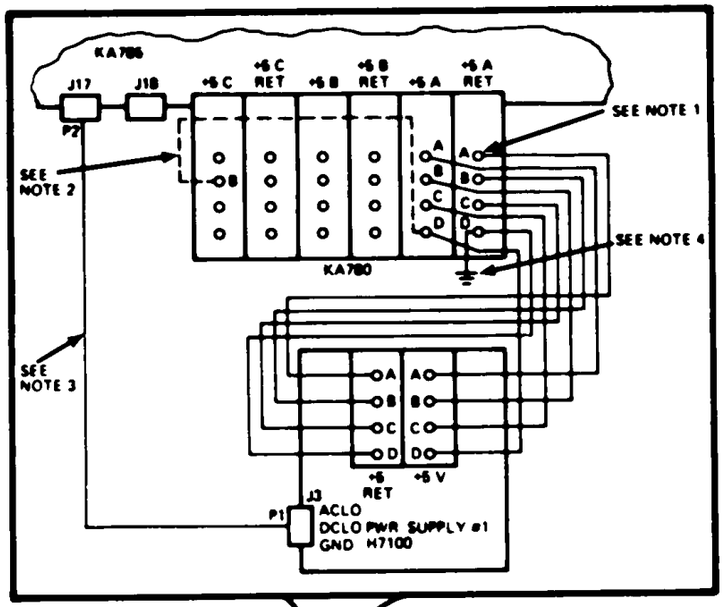


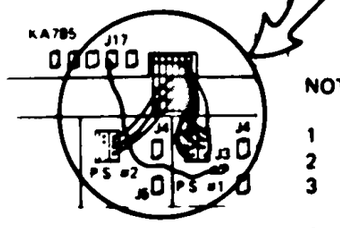
(7) ATTACH THE DECAL

MKV84-2089

Figure 4-2 FP785 Installation Procedure (Sheet 2 of 4)

(8) INTERCONNECT THE FP785 AND THE H7100





NOTE

1 COVER TERMINALS WITH PLASTIC NUTS
2 REMOVE JUMPER WIRE (+5C B TO +5A D) WHEN FP785 IS INSTALLED
3 REMOVE END OF CABLE PLUGGED INTO J13 OF DW780 AND PLUG IT INTO J3 OF POWER SUPPLY
4 VERIFY THAT WIRE FROM KA785 (+5 RET D) TO CAB FRAME REMAINS CONNECTED WHEN INSTALLTION OF WIRE FROM P S NO 1 (+5 RET D) TO KA785 (5 RET D) IS COMPLETE

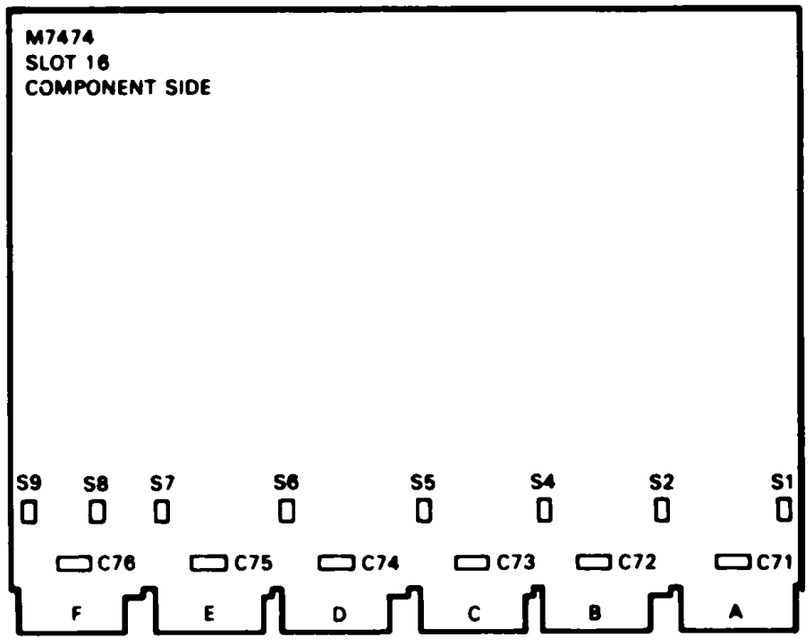
MKV84-2080

Figure 4 2 FP785 Installation Procedure (Sheet 3 of 4)

(9) TORQUE GROUND AND +5 V WIRES ON POWER SUPPLY TO 30 INCH POUNDS

(10) CONNECT POWER SUPPLY 1 AC POWER CABLE TO J1, J3, J4, OR J5 OF THE 869 POWER CONTROLLER

(11) REMOVE M7474 FROM BACKPLANE SLOT 16 AND TURN ON SWITCHES S1, S2, S4, S5, S6, S7, S8, AND S9 (THE ON POSITION IS AWAY FROM THE MODULE FINGERS) ALL OTHER SWITCHES ARE OFF



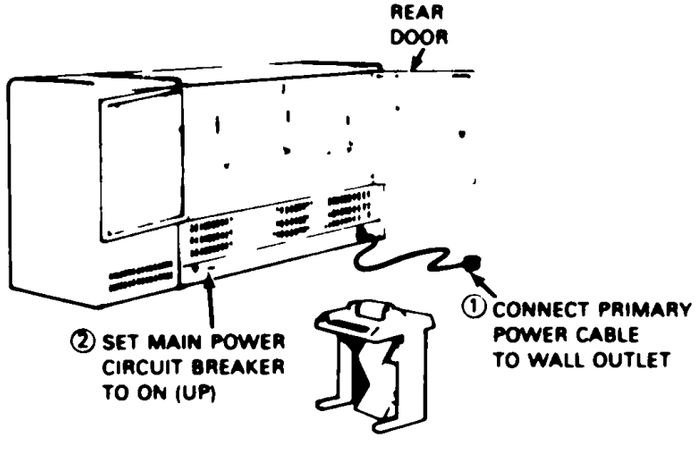
(12) REINSTALL M7474

MKV84-2081

Figure 4-2 FP785 Installation Procedure (Sheet 4 of 4)

① CONNECT THE PRIMARY POWER CABLE TO THE WALL OUTLET

② SET THE MAIN POWER CIRCUIT BREAKER TO ON (UP)



③ TURN THE KEYSWITCH TO LOCAL

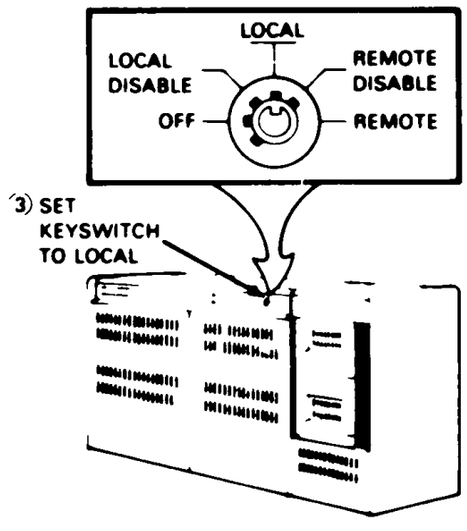


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Figure 4-3 System Power-Up Procedure

CHAPTER 5

CHAPTER 5
780UP UPGRADE KIT INSTALLATION

5.1 GENERAL

5.1.1 Upgrade Configuration

Upgrading a KA780 to a KA785 consists of replacing the CPU cardcage and backplane assembly, inserting new CPU modules, replacing the memory board in the LSI-11, and attaching a new logo to the CPU cabinet

NOTE

The following configuration rules must be followed:

1. **Check that all system options are at the minimum acceptable revision or higher. See Section 5.2 for information on revision levels.**

2. **The FP785 is not interchangeable with the FP780. The FP785 can be used only with the KA785, and the FP780 only with the KA780.**

5.1.2 Upgrade Variations

Four variations of the upgrade kit are available The variation is indicated on the outside of the upgrade kit master carton

- 780UP-XA standard upgrade kit, includes FPA
- 780UP-XB standard upgrade kit, does not include FPA
- 780UP-XC special upgrade kit, includes FPA
- 780UP-XD special upgrade kit, does not include FPA

The standard upgrade kit is for existing VAX 11/780 systems The special upgrade kit is for customers who took early delivery of a VAX-11/780 with the intention of upgrading it to a VAX 11/785 Special upgrades always go into FCC-compliant cabinets

Upgrade kits contain the following

- Twenty CPU modules
- Five FPA modules *
- One MSV11-EA LSI-11 memory module
- One CPU cardcage and backplane assembly

*Upgrade Kits 780UP XA and 780UP XC only

- Two logo strips†
- Diagnostic diskettes ‡
- Documentation

5.2 REVISION CONTROL

The starting revision level of VAX-11/785 and VAX-11/780-5 systems is Rev 00. The revision levels of kernel options, individual options, and software that are compatible with Rev 00 are detailed below.

5.2.1 Kernel Options

The revision level of the system depends upon the revision levels of the kernel options Table 5-1 indicates the revision levels of the kernel options required for system Rev 00.

Table 5-1 Kernel Options Revision Levels

Kernel Option	Revision Level
KA785	00
MS780-C	1B
MS780-F	00

5.2.2 Individual Options

To be compatible with the VAX-11/785 or VAX-11/780-5 system, individual options must be at specified revision levels These revision levels are listed in Table 5-2.

5.2.3 Software

The levels of microcode and VMS required for VAX-11/785 and VAX-11/780-5 systems are listed in Table 5-3

†Upgrade Kits 780UP XA and 780UP XB only Upgrade Kits 780UP XC and 780UP XD each include only one logo strip

‡Upgrade Kits 780UP XA and 780UP XC each include eight diskettes Upgrade Kits 780UP XB and 780UP XD each include seven diskettes

Table 5-2 Individual Options Revision Levels

Option	Revision Level
DW780	1B
FP785	00
RH780	04, AA1, or B1 (see note)
DR780	00
CI780	01
MA780	01

NOTE: Option RH780 Rev 04 or Rev AA1 is the minimum revision required for all VAX-11/785 and VAX-11/780-5 systems. Option RH780 Rev B1 replaces the M8277 with the M8274, which is needed for high speed RP07s.

VAX-11/785 and VAX-11/780-5 systems may contain a mixture of RH780s with Rev 04 (AA1) and RH780s with Rev B1 with no compatibility problems.

The above configuration revisions are valid at FCS of the product (summer 1984). Refer to the VAX-11/785 revision matrix document for the most recent revision information.

Table 5-3 Software Revision Levels

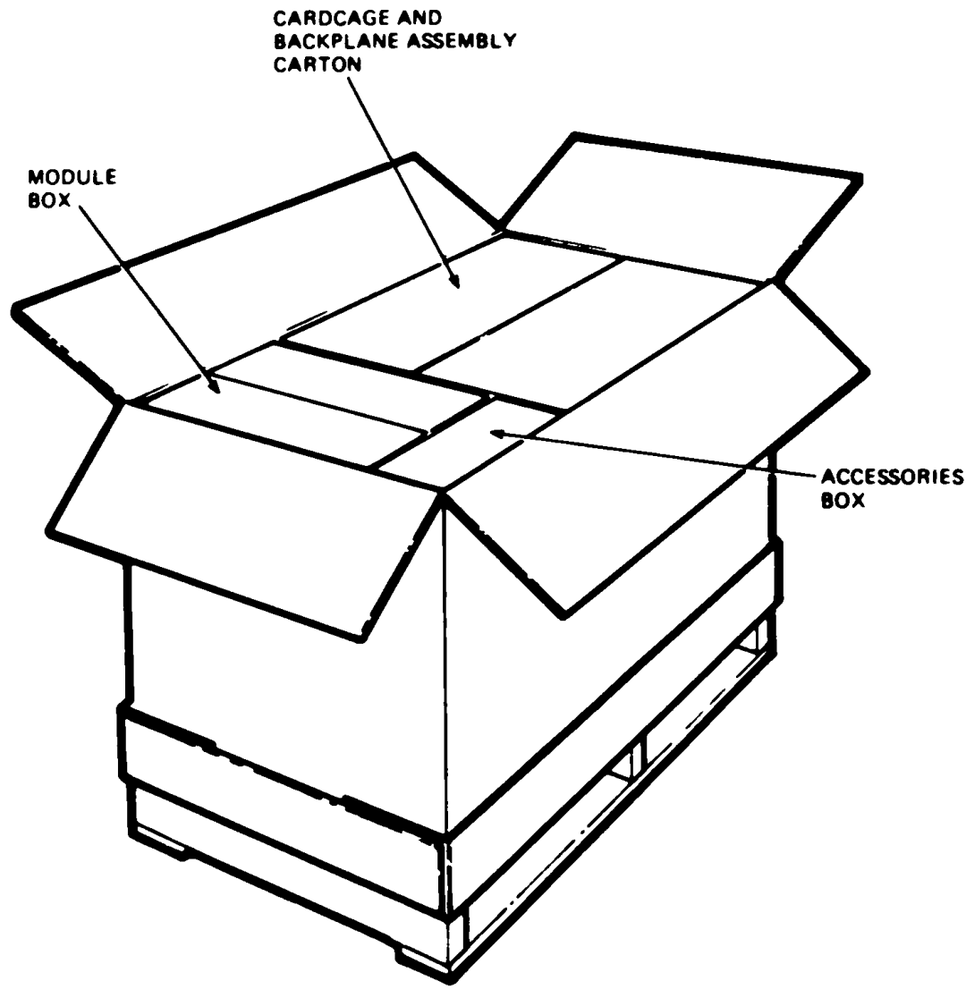
Software	Revision Level
Microcode	01
VMS	3 6 (version)

5.3 UNPACKING AND INSPECTING UPGRADE KIT

The upgrade kit is shipped in one large container bolted and strapped to a skid This is the master carton and it contains four smaller cartons

- One accessories box
- Two module boxes
- One CPU cardcage and backplane assembly carton

See Figure 5-1 for the location of these boxes in the master carton



Figue 5-1 780UP Master Carton

Remove the shipping list from the outside of the upgrade kit master carton and check the contents of the four inner boxes against this list Notify the branch manager or supervisor of any missing or incorrect items The following sections detail the distribution of materials among the four boxes

NOTE
Save all packing materials. The KA780 hardware is returned to manufacturing in this packaging.

5.3.1 Accessories Box

The accessories box contains the following items.

- *VAX-11/785 Installation Manual*
- MSV11-EA LSI-11 memory module
- VAX-11/785 print set
- KA785 print set
- KC785 print set
- FP785 print set*
- Logo strips†
- Diagnostic diskettes‡
- Decals (module utilization and ECO)
- Return label
- Tape for sealing cartons
- Nylon strapping

5.3.2 Module Boxes

The module boxes are stacked one on the other in one end of the master carton Each module box can hold up to 14 modules The complete set of CPU (and, if applicable, FPA) modules is packaged in these.

1 Open both module boxes and remove the top pad from each box (Figure 5-2) Set the pads aside

2 Leave all modules in the module boxes until ready to insert them into the cardcage

*Upgrade Kits 780UP-XA and 780UP-XC only

†Upgrade Kits 780UP-XA and 780UP-XB each contain two logo strips (VAX-11/785 and VAX-11/780-S systems) Upgrade Kits 780UP-XC and 780UP-XD each contain only one logo strip (VAX 11/785 systems)

‡Upgrade Kits780UP-XA and 780UP-XC each contain eight diskettes Upgrade Kits 780UP-XB and 780UP-XD each contain seven diskettes

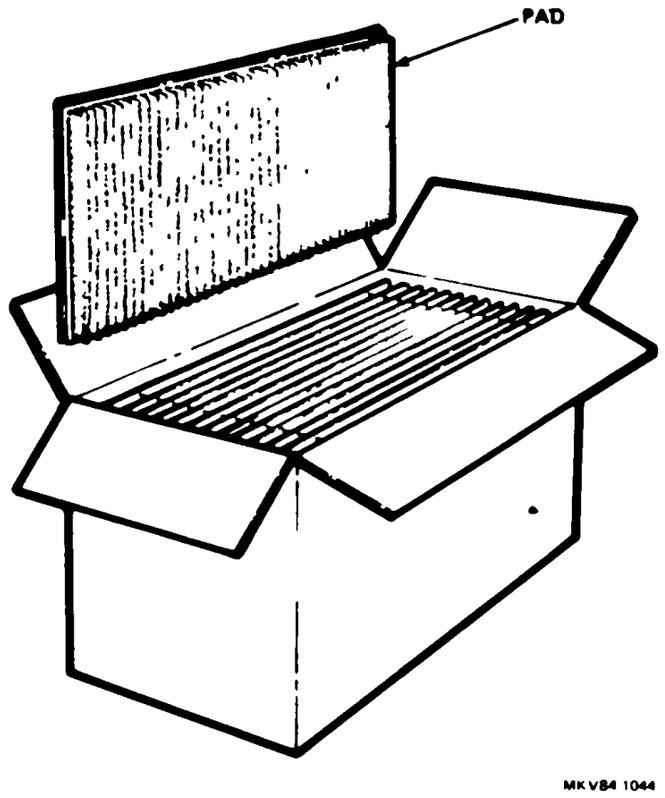


Figure 5-2 Module Box

5.3.3 Cardcage and Backplane Assembly Carton

1 Slit the tape and open the flaps of the cardcage and backplane assembly carton, with the carton remaining in the master carton

2 Remove the top half-slotted carton insert (Figure 5-3) by pulling it straight up and out of the box Set the half-slotted carton aside

3 Remove the tray from the backplane and set it aside (Figure 5-3)

4 Place your hands in the handholds on either side of the cardcage and backplane assembly wrapper (Figure 5-3) Lift the wrapper straight up and out of the carton The bottom half-slotted carton will remain in the cardcage and backplane assembly carton

5 Place the cardcage and backplane assembly on its side on the work surface.

6 Open the ends of the cardcage and backplane assembly wrapper

7 Carefully raise the edges of the upper part of the wrapper and slide the pad out of the cardcage side support (Figure 5-4)

8. Remove the bus bar support from under the bus bar (Figure 5-4) Do not remove the tape from the bus bar support

9 Tip the cardcage and backplane assembly onto the center of the wrapper, while carefully sliding the wrapper bottom pad out of the cardcage side support.

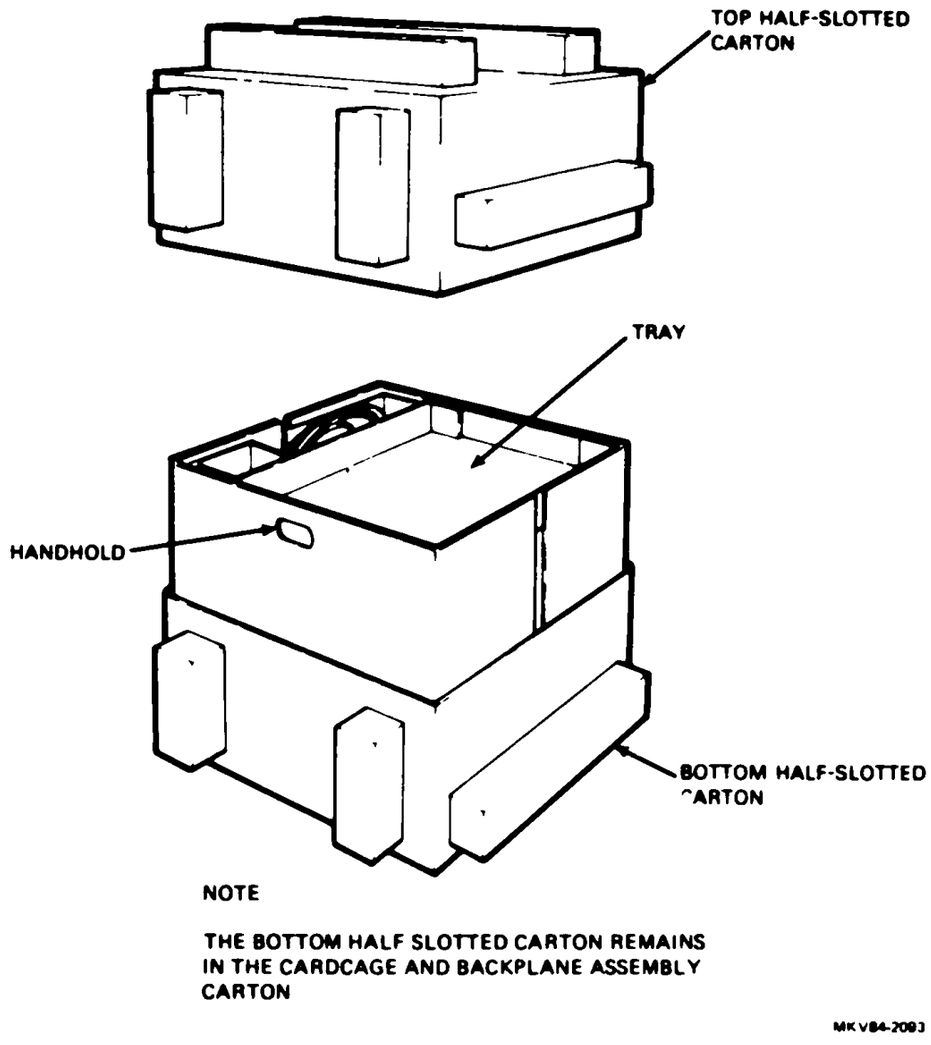


Figure 5-3 Cardcage and Backplane Assembly Packaging

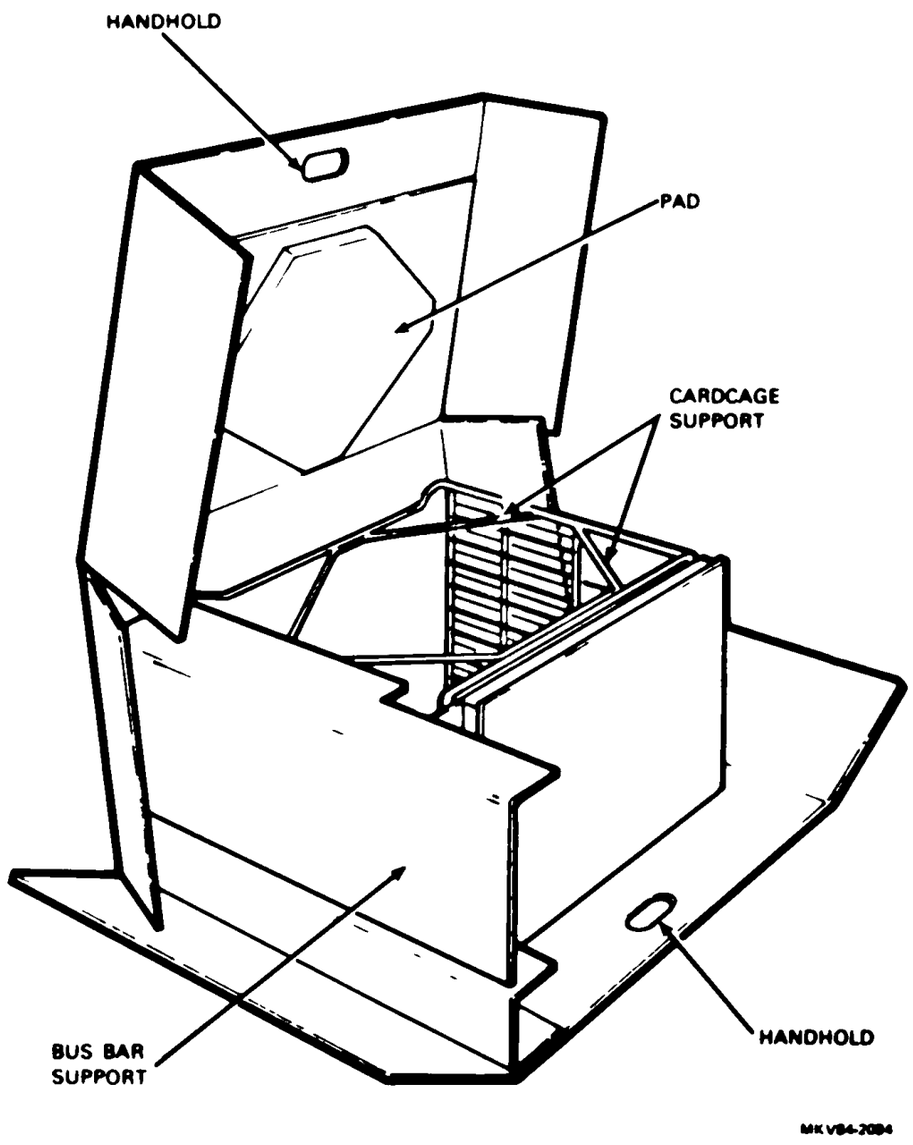


Figure 5-4 Cardcage and Backplane Assembly Wrapper

5.4 UPGRADE PROCEDURE

5.4.1 System Shut Down

1 Type @SYS$SYSTEM.SHUTDOWN and answer the questions asked

2 Examine the SID register by typing.

>>>E/ID 3E

Note the contents of bits 0 through 11, the serial number field This information will be used later in this procedure

3 Turn the keyswitch to off

4 Set the main power circuit breaker on the 869 power controller to off (down)

5 Disconnect the primary power cable from the outlet

6 Power down the LSI-11.

7 Set the circuit breakers to off (down) on power supplies 2 and 3, and on power supply 1 if present

5.4.2 KA780 Cardcage and Backplane Assembly Removal

1 Remove all modules from the CPU cardcage

2 Remove the right rear door of the CPU cabinet

3 Disconnect all cables from the CPU backplane See Figure 5-5 for the location of the following cables

a Disconnect all CPU power bus cables at the power supply end Leave these cables connected to the backplane Save all screws and washers

b Disconnect the ground wire from the cabinet frame

c Remove and set aside the six SBI cables connecting J1 through J6 of the CPU backplane to J1 through J6 of the UBA backplane

NOTE

Before removing the following cables, mark the "J" number on the end of each cable with masking tape.

d Disconnect the plugs from the Mylar™ connectors J14 through J20

Mylar™ is a trademark of DuPont de Nemours and Co Inc

e Disconnect the front panel connector cable (P/N 9107747-02) by unplugging P9 from connector J9 on the CPU backplane Temporarily drape the loose portion of this cable over the cable management rack so that it will not interfere with the removal of the cardcage and backplane assembly

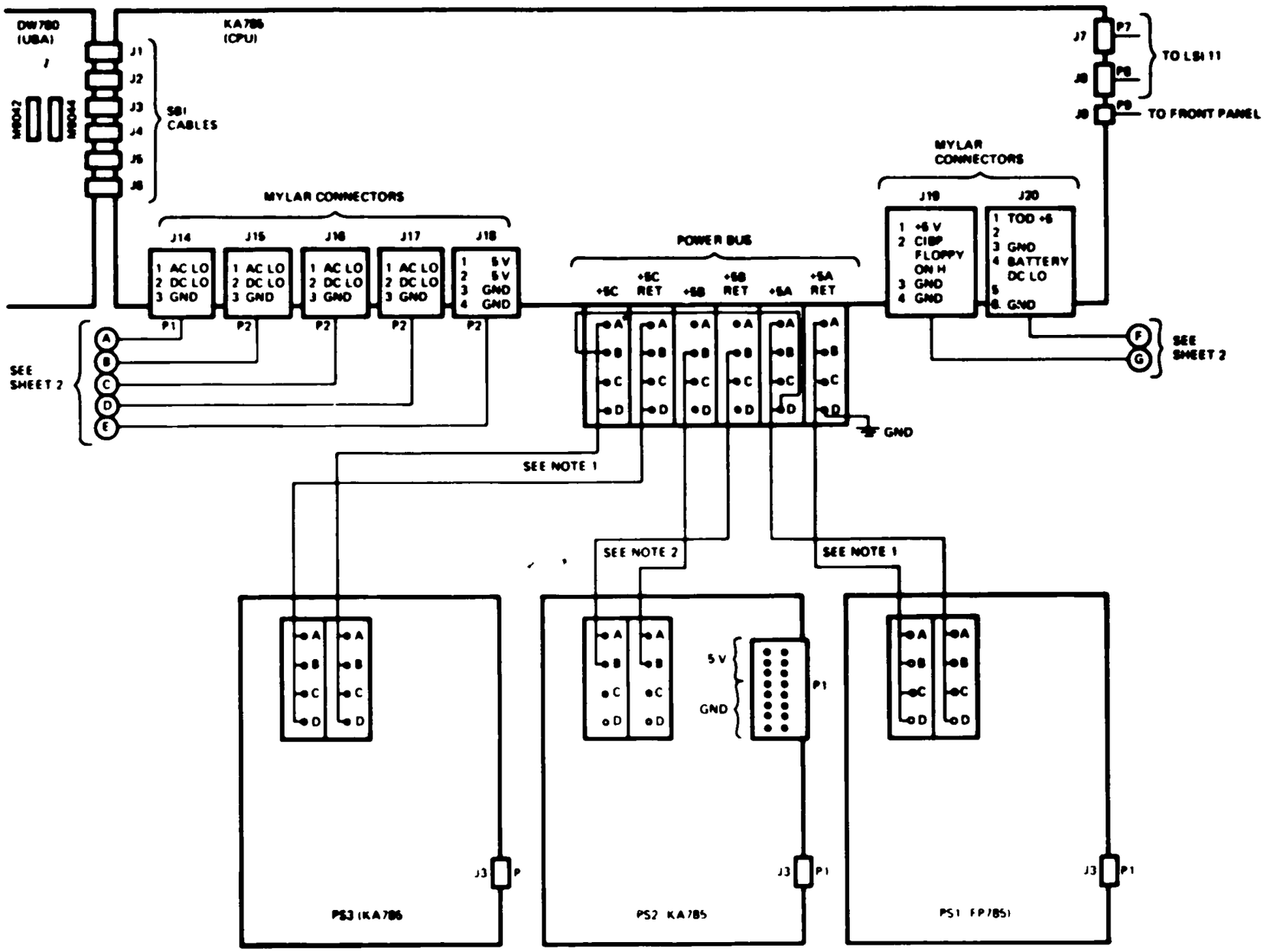
f Disconnect the LSI-11 bus cables (P/N BC05L-10) by unplugging P7 and P8 from connectors J7 and J8 respectively on the CPU backplane Temporarily lay these cables in the bottom of the cabinet so that they will not hinder removal of the cardcage and backplane assembly

4 Remove the M9042 UNIBUS paddle card and the M9044 UNIBUS terminator module from the pin side of the UBA backplane Temporarily lay the M9042 module with cables attached across the top of the cable management rack Set aside the M9044 module

5 Remove and save the four screws and washers from the top back of the CPU cardcage and backplane assembly

6 Remove and save the four screws and washers from the bottom front of the CPU cardcage and backplane assembly

7 Slide the CPU cardcage and backplane assembly out from the rear of the cabinet



NOTE 1 CONNECT A TO A B TO B C TO C AND D TO D
NOTE 2 CONNECT B ON POWER BUS TO A ON POWER SUPPLY AND C ON POWER BUS TO B ON POWER SUPPLY

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Figure 5-5 KA785 Backplane Interconnects (Sheet 1 of 2)

FROM * (KA785)			TO
A	J14	P1	DW780 J14 P2
B	J15	P2	PS 3 (KA785) J3 P1
C	J16	P2	SFT J8 P2
D	J17	P2	PS 1 (FP785) J3 P1 DW780 J13 P1
E	J18	P2	DW780 +5 RET (D) +5 (D) J15 P6 PS 2 (KA785) (5 V, GND) P1 MS780 J19 P5 RH780 (optional) J15 P4 RH780 (optional) J15 P3 SFT J7 P1
F	J20	P2	TOD CLOCK PS J1 P1
G	J19	P1	SCP J3 P2 RX01 RELAY J1 P3

*DISCONNECT CABLE AT THIS POINT ONLY

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Figure 5 5 KA785 Backplane Interconnects (Sheet 2 of 2)

5.4.3 KA785 Cardcage and Backplane Assembly Installation

1 Remove the acrylic cover from the KA785 backplane

2 Slide the KA785 cardcage and backplane assembly into the cabinet from the rear

3 Fasten the cardcage and backplane assembly at the bottom front using the four reserved screws and washers Do not tighten the screws

4 Fasten the cardcage and backplane assembly at the top back with the four reserved screws and washers

5 Tighten the front screws

6 Connect the backplane cables Refer to Figure 5-5 for the location of these cables

- a Attach the power bus cables to the power supplies
- b Attach the ground wire to the cabinet frame
- c Connect P7 and P8 of the LSI-11 bus cable to J7 and J8 respectively on the CPU backplane
- d Connect P9 of the console cable to J9 on the CPU backplane
- e Insert the plugs into Mylar™ connectors J14 through J20 Figure 5-5 (sheet 2) lists all connections to these plugs
- f Connect the SBI cables from J1 through J6 of the CPU to J1 through J6 of the UBA.

7 Connect the UBA cables (Install the M9042 UNIBUS paddle card and the M9044 UNIBUS terminator into the pin side of the UBA backplane)

8 Connect the primary power cable to the outlet and power up the system to verify that power is operating properly before inserting the modules

9 Power down the system and disconnect the primary power cable

10 Insert the CPU modules following the module utilization chart in Figure 5-6

11 Install the SID register and JCS jumpers (J13 and J11 respectively on the CPU backplane).

- a See Figure 1-13, step 25, for the location of J13 and J11 Check that the jumpers called out in that figure are properly installed
- b Set the SID serial number field Remove from KA785 J13-V through J13-VV any jumpers necessary to duplicate the jumper configuration of KA780 J13-V through J13-VV This gives the KA785 the same serial number as the removed KA780

NOTE

Be sure to remove jumpers from J13-V through J13-VV only.

12 Install the KA785 module utilization sticker on the inside of the cabinet in place of the existing KA780 sticker

13 Attach the acrylic backplane cover over the CPU backplane

14 Replace the CPU cabinet right rear door

MODULE UTILIZATION KA785		
29	M7477	CIB
28	M7544	FCT *
27	M7543	FAD *
26	M7542	FML *
25	M7541	FMH *
24	M7540	FNM *
23	M7476	USC
22	7014103	Blank Module
21		
20	M7475	JCS
19		
18	M7475	JCS
17		
16	M7474	CLK
15	M7473	ICL
14	M7472	CEH
13	M7471	DAP
12	M7470	DCP
11	M7469	DDP
10	M7468	DEP
9	M7467	DBP
8	M7466	IRC
7	M7465	IDP
6	M7464	TBM
5	M7463	CDM
4	M7462	CAM
3	M7461	SBH
2	M7460	SBL
1	M7459	TRS
*FPA Option – Install 7014103 when not ordered		

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Figure 5-6 KA785/FP785 Module Utilization Chart

5.4.4 LSI-11 Memory Module Installation

NOTE
Refer to Figure 5-7 for the locations of the LSI-11 modules.

1 Remove and save the screws from both sides of the LSI-11 front cover

2 Remove the LSI-11 cover

3 Remove the LSI-11 module retainer

4 If M7264 is not a -YA variation, remove the module and make the following changes (See Figure 5-8)

a. Remove the wire wrap at W2

b Install a wire wrap at W4.

c Install a jumper (0 ohm resistor) at W9

d Remove the wire wrap at W11

e Reinsert the M7264.

5 Remove the M7944 from slot 3 row A/B

NOTE
Do not ship the M7944 to manufacturing. Return this module to the customer.

6 Check that switches S1 through S5 on the M8044 and the 32K byte LSI-11 memory module from the upgrade kit are closed (Figure 5-9) Insert the M8044 in slot 3 row A/B (See Figure 5-7.)

7 Do the following if this installation is to be equipped with remote diagnosis If it is not, go on to step 8.

a. Detach the cables from the M9400, slot 3 row C/D, and remove the module

b. Check the jumpers on the M8017 against Table 5-4 and Figure 5-10 Make any necessary changes to the jumper configuration on M8017

c Insert the M8017 in slot 3 row C/D

d Reattach the cables and insert the M9400 in slot 4 row C/D

8 Reinstall the LSI-11 module retainer

9 Replace the LSI 11 cover

10 Replace the reserved screws and tighten

1	M7264 LSI 11 CPU MODULE				1
2	M7946		M7940		2
3	M7944		M9400-YE		3
4					4
	A	B	C	D	

(A) BEFORE MEMORY MODULE INSTALLATION

1	M7264-YA LSI 11 CPU MODULE				1
2	M7946		M7940		2
3	M8044-EA		M9400-YE		3
4					4
	A	B	C	D	

(B) AFTER MEMORY MODULE INSTALLATION

1	M7264-YA LSI 11 CPU MODULE				1
2	M7946		M7940		2
3	M8044-EA		M8017 AA		3
4			M9400-YE		4
	A	B	C	D	

(C) AFTER MEMORY MODULE INSTALLATION AND WITH REMOTE DIAGNOSIS

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Figure 5-7 LSI-11 Module Placement

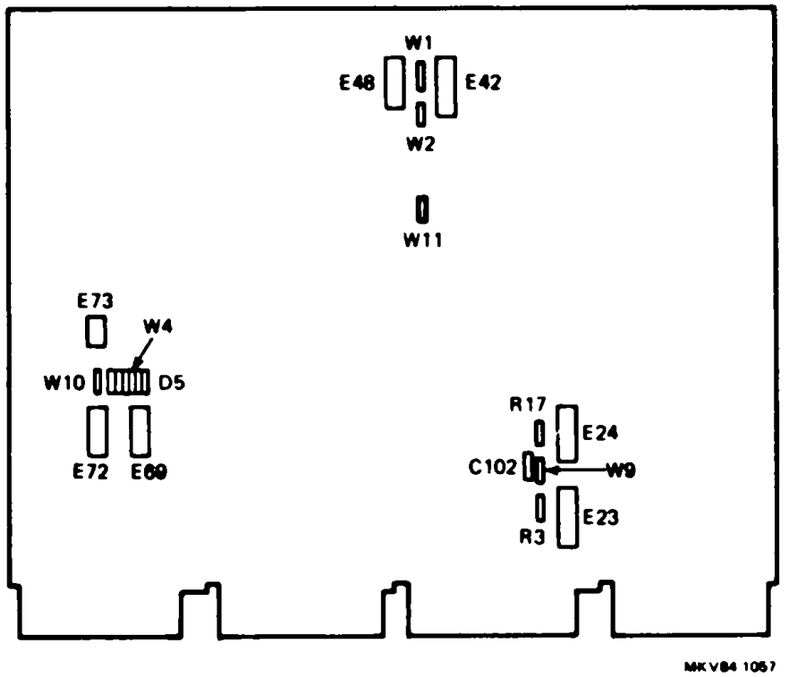

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Figure 5-8 M7264 Jumper Locations

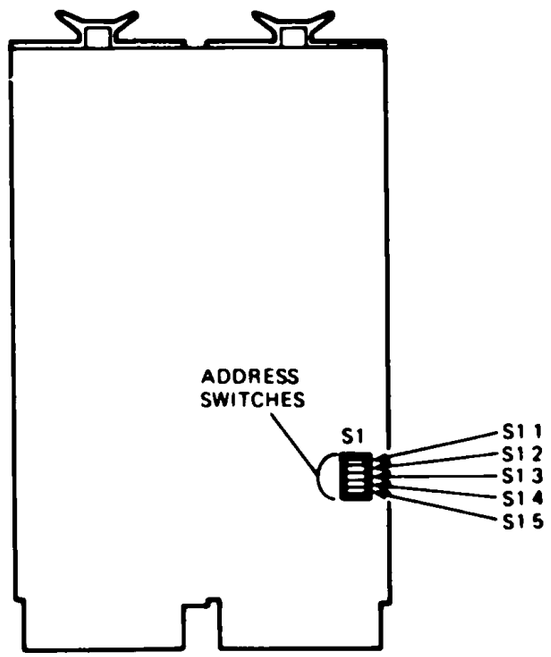

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Figure 5-9 M8044 Switchpack Location

Table 5-4 DLV11-E Jumper Configurations for the M8017-AA (KC780-DA)

Jumper State From Factory In	Out	Jumper Removed or Inserted at Field Installation	Description
A3			These jumpers are for bits 3-12 of the address word Device address 17756X is set Bits 0, 1, and 2 are hardwired on the module to address the four device registers as follows X=0 RCSR X=4 XCSR X=2 RBUF X=6 XBUF
	A4		
	A5		
A7	A6		
A8			
A9			
A11	A10		
A12			
	V3	Insert V3	These jumpers determine vector generation during an interrupt An inserted jumper asserts the corresponding address bit on the LSI-11 bus This jumper configuration implements interrupt vector address 310 (octal) for receiver interrupts and 314 (octal) for transmitter interrupts
	V4		
	V5		
V6			
V7			
	V8		
For 300 Baud Only			
R0		Remove R0	This configuration sets the receiver and transmitter for 300 baud (enables common speed operation)
	R1	Insert R1	
R2			
R3			
T0		Remove T0	This configuration sets the transmitter to 300 baud It is identical to the "R" jumpers
	T1	Insert T1	
	T2		
	T3	Insert T3	
For 1200 Baud Only			
R0		Remove R0	This configuration sets the receiver and transmitter for 1200 baud (enables common speed operation)
	R1		
R2		Remove R2	
R3			
T0		Remove T0	This configuration sets the DF03 transmitter to 1200 baud It is identical to the "R" jumpers
	T1		
	T2		
	T3	Insert T3	

Table 5-4 DLV11-E Jumper Configurations for the M8017-AA (KC780-DA) (Cont)

Jumper State From Factory In	Out	Jumper Removed or Inserted at Field Installation	Description
BG		Remove BG	Disable break generation operation without parity Parity type –does not apply when "P" is removed
	P		
	E		
	1		Operation with 8 data bits per character
	2		
	PB		Programmable baud rate function disabled
C			Common speed operation enabled
C1			
	S		Split speed operation disabled
	S1		
	H		Halt on framing error disabled
	B		Boot on framing error disabled
B			
FD			Data terminal ready is not forced continuously true
FR			Request to send is not forced continuously true
RS			Request to send is enabled
	FB		Force busy is disabled
	M1		Factory test jumper
	M2		Maintenance jumpers disabled
	M3		
INIT	DCOK		UART clear signal enabled
SD1 to SD	SD1 to DS	Remove SD1 to SD Insert SD1 to DS	Data set ready is enabled Change jumpers Cut the etch on side 2 between SD1 and SD if it has not been cut

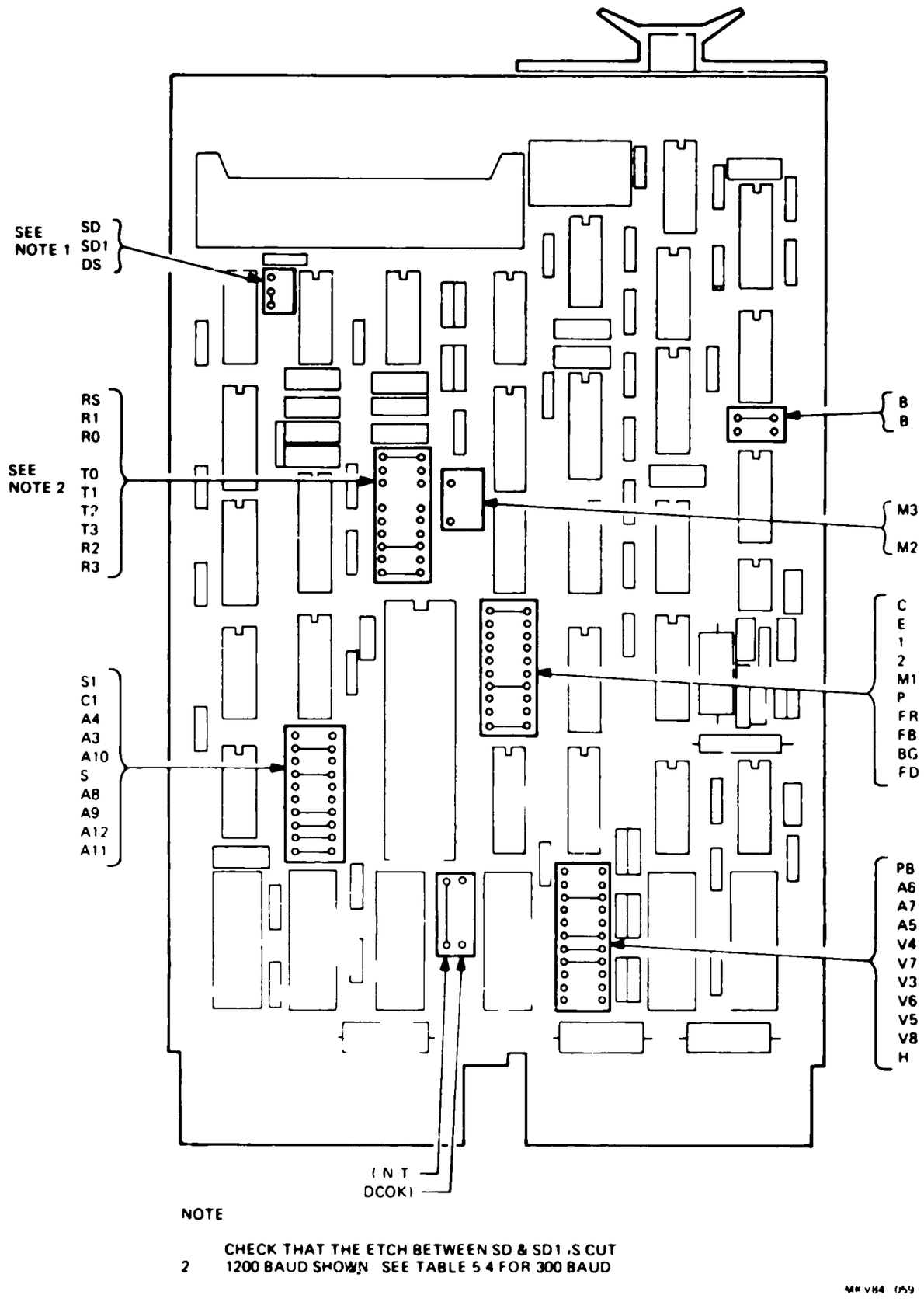

Figure 5-10 M8017-AA Jumper Configuration

5.4.5 Logo Installation

Attach the logo to the CPU front panel If two logos are included in the accessories box, it is necessary to decide which logo to install The logo to be used is determined by the type of CPU cabinet. The VAX-11/785 logo may be attached only to FCC-compliant cabinets If the cabinet is not FCC-compliant, use the VAX-11/780-5 logo.

5.5 KA780 PACKAGING

5.5.1 Cardcage and Backplane Assembly

1 Place the KA780 cardcage and backplane assembly on the wrapper with the backplane surface up (Figure 5-4) Note that the corrugated pads are off-center on the sides of the wrapper. Position the cardcage and backplane assembly so that the bus bar is toward the end of the wrapper that is further from the pads

2 Tip the cardcage and backplane assembly on its side, easing the corrugated pad into the cardcage side support

3 Place the bus bar support under the bus bar (Figure 5-4) Tuck the power cables into the support

4 Fold the wrapper around the cardcage and backplane assembly Ease the corrugated pad into the cardcage side support

5 Fold in the wrapper end flaps (Figure 5-4)

6 Tape the ends of the wrapper

7 Lift the cardcage by the wrapper handholds and place the cardcage and backplane assembly in the bottom half-slotted carton in the master carton (Figure 5-3)

8 Place the tray over the backplane (Figure 5-3)

9 Place the top half-slotted carton over the cardcage and backplane assembly

10 Close the flaps and seal the cardcage and backplane assembly carton

5.5.2 Modules

Pack the KA780 and, if applicable, the FP780 modules in the two module cartons

1 Check that a corrugated-and-foam pad is in the bottom of each module carton, foam side up. The modules must rest on the foam

2 Insert the modules, one per slot, into the cartons

3 Place a corrugated-and-foam pad on top of the modules in each carton The foam side must be toward the modules

4 Close the flaps and seal each module carton

5.5.3 Packing the Master Carton

1 Stack the module boxes, one on the other, in the end of the master carton (Figure 5-1)

2 Fold the accessories box on the score lines and tape the ends shut Place the box in the corner of the master carton, at the end of the module cartons (Figure 5-1) The accessories box is needed to keep the module cartons in place during shipment

3 Close the flaps and seal the master carton Attach the return label over the original shipping label

5.6 CHECK-OUT PROCEDURE

5.6.1 System Power Up

1 Reconnect the primary power cable to the outlet

2 Set the main power circuit breaker on the 869 power controller to on (up)

3 Set the circuit breakers on power supplies 2 and 3, and on power supply 1 if present, to on (up)

4 Power up the LSI-11

5 Load the console diskette RX1A in the diskette drive

6 Turn the auto restart switch to off

7 Turn the keyswitch to local to boot the system

8 Check the serial number field of the SID register by typing

>>>E/ID 3E

Check that bits 0 through 11 match the result shown in Section 5 4 1, step 2 If they do not match, power down the system and correct the jumper configuration (see Section 5 4 3, step 11)

5.6.2 Diagnostics

See Section 2 2 for information on running diagnostics Run all microdiagnostics and macrodiagnostics indicated in Chapter 2, and run UETP

5.6.3 Documentation

1 Update the Site Management Guide

2 Fill out a LARS Report

APPENDIX A

APPENDIX A
FCC COMPLIANCE GUIDELINES

NOTE

This appendix pertains to computer systems installed in geographical areas over which the Federal Communications Commission (FCC) has jurisdiction (all the areas covered by United States Customs).

A.1 GENERAL

The FCC has created new rules that require computers and computer devices to comply with set standards for reducing radio frequency interference (RFI) [also known in broader terms as electromagnetic interference (EMI)] to television and radio communications. The new rulings are directed towards the entire computer industry for computers and devices that are marketed in the United States

NOTE

The FCC defines a computer as a specific class of restricted radiation device that generates radio frequency (RF) energy and uses digital techniques and may radiate RF energy as an undesired by-product. Specifically, it is any electronic device or system that generates and uses timing signals and pulses at a rate in excess of 10,000 pulses (cycles) per second and uses digital techniques.

Equipment which has been manufactured in compliance with the FCC RFI rules must be both installed and operated properly to ensure that the state of compliance is maintained This requires that the installer become familiar with the FCC RFI rules and also that the installer understands the following FCC compliance guidelines that outline the cause and prevention of RFI

NOTE

Computer products used in non-US installations are exempt from the FCC compliance ruling, but may be required to meet similar rules in the country where they are installed (for example, VDE rules in West Germany).

NOTE

For computers used in the USA there are exemptions to the FCC compliance ruling:

- **A computing device used in any transportation vehicle including motor vehicles and aircraft.**
- **An electronic control or power system used by a public utility or in an industrial plant.**
- **Industrial, commercial, and medical test equipment.**
- **A computing device used in an appliance, such as a microwave oven, dishwasher, or clothes dryer.**
- **Specialized medical computing devices (generally used at the direction of or under the supervision of a licensed health care practitioner) whether used in a patient's home or a health care facility. Non-specialized medical devices marketed through retail channels for use by the general public are not exempted. This exemption also does not apply to computers used for record keeping or any purpose not directly concerned with medical treatment.**
- **Carriers transporting radio frequency devices without trading in them.**
- **RF devices manufactured solely for export.**
- **The manufacture, assembly, or installation of RF devices for its own use by a public utility engaged in providing electric service, provided, however, that no such device shall be operated if it causes harmful interference to radio communications.**
- **RF devices for use by the US government or agency thereof, provided, however, that this exception shall not be applicable to any device after it has been disposed of by such government or agency.**

A.2 FCC COMPLIANCE RULINGS

The new FCC rulings were primarily created to reduce the potential for RFI produced by home computers However, the new rulings were changed to also include commercial and industrial computers The potential for EMI/RFI has been a growing issue for the past several years due to the large number of home and personal computing devices being marketed to US consumers

EMI can be defined as any electrical disturbance that causes an undesirable response or a malfunction in a piece of equipment. RFI is often used interchangeably with EMI; however, RFI is usually restricted to the radio frequency band of 10 KHz to 10 GHz. The FCC compliance ruling pertains to the 300 KHz to 1 GHz frequency range.

Many electrical devices, in addition to computers, are capable of producing EMI Switching devices used in power supplies, rotating electrical machinery, ignition systems, radio and TV receivers and generators all can produce EMI. EMI can also come from natural sources, such as lightning discharges, precipitation, solar activity, and sand and dust storms Computer-emitted interference signals usually originate from one or more particular components or devices.

Computer equipment electrical interference problems are solved by redesign or suppression methods Redesign may simply involve replacement of component parts Suppression of interference can be accomplished by filtering, grounding, shielding, rerouting of cables, using coaxial cables, or a combination of these

NOTE

Digital Equipment Corporation has decided at this time to use shielding techniques for most RFI suppression, rather than electronic redesign of equipment to meet FCC compliance rules. However, some equipment EMI has been suppressed by electronic redesign only.

A.3 FCC COMPUTER DEFINITIONS

The FCC compliance ruling defines computer devices as being either Class A or Class B

A.3.1 Class A Computing Device

A Class A computing device is marketed for use in a commercial, industrial, or business environment, exclusive of a device which is marketed for general public or home usage

A.3.2 Class B Computing Device

A Class B computing device is marketed for use in a residential environment, notwithstanding use in a commercial, business or industrial environment Examples of such devices include, but not are not limited to, electronic games, personal computers, calculators, and similar electronic devices that are marketed for use by the general public.

A.3.3 Personal Computing Device

A personal computer is an electronic computer that is marketed for such use as in the home, notwithstanding business applications Such computers are considered Class B computing devices Computers that use a standard television receiver for a display device or meet all of the following conditions are considered examples of personal computers

- Marketed through a retail outlet or a direct mail order catalog
- Notices of sale or advertisement are distributed or directed to the general public or hobbiest user, rather than restricted to commercial users
- Operates on a battery or 120 volt electrical supply

A.4 SYSTEM INTEGRATION

The non-interference requirement of the new FCC compliance ruling states, "The operator of a computing device may be required to stop operating his device upon a finding that the device is causing harmful interference and is in the public interest to stop operation until the interference problem has been corrected."

Therefore, equipment that is manufactured FCC-compliant must be maintained, both during system installation/integration and during equipment operation. Maintaining compliance requires that the user possess a knowledge of the applicable FCC rules, observe basic system integration guidelines, and perform visual equipment checks during initial installation and also during any preventive or periodic maintenance. EMI testing may be required if an apparently unresolvable interference problem occurs.

A.4.1 Understanding of User Responsibility

The user is responsible for compliance of the entire system if the user assembled the system for purpose of resale.

Even if the user has bought only FCC-compliant devices, improper interconnection of the devices, for example, can raise the noise level dramatically. Thus the "final integrator," the person who assembled the system and added the last piece of equipment that could raise the system EMI level, must assume responsibility that the assembled system is "quiet" and FCC compliant.

A.4.2 "Grandfathered" Product Definition

Any commercial or industrial component product or computer device first put into production before October 1, 1981, is considered to be "grandfathered" and was allowed to be manufactured as was until October 1, 1983. Units manufactured after October 10, 1983, must meet the technical requirements of the FCC rulings.

During the next few years, many commercial systems may consits of some "grandfathered" untested products as well as some Class A tested products. These systems are called "mixed systems", and they comply with FCC regulations.

Products already built before the rules went into effect do not have to be tested or labeled. If you sell one of these systems it does not have to be labeled because change of ownership does not change the label status of products, with one exception. If equipment is unlabeled because of end-use exemption, and is later moved to a non-exempt environment, it must then be labeled.

If you are selling systems into the commercial or industrial market and have been adding components to the system, compliance retesting may be required. For example, if you add a labeled disk drive to an existing Class A system, retesting is not required. However, the addition of subassemblies, such as memory boards, requires your engineers to re-evaluate the system to make sure that it continues to comply with FCC requirements.

A.4.3 Equipment Add-Ons

Check the compliance status of any equipment that is being added to a Class A product. The new FCC ruling prohibits any add-on to an FCC-compliant labeled product that would cause the resulting product to fail the appropriate Class A or Class B FCC compliance criteria.

NOTE

Adding on to a grandfathered system must not raise the system emission level more than 6 dB.

Only options which Digital Equipment Corporation has determined will not take the product out of compliance will be used on, or as spares for, compliant products.

A.4.4 Cables

The interference potential of a computer system is greatly affected by the number of peripherals, the interconnecting cables, and the "handshaking" that takes place between the computer and the peripheral. Therefore, all interconnecting cables must be checked for the proper part number and also for any damage which could result in EMI being generated.

CAUTION

The interconnection of FCC EMI-compliant labeled products with cables that would cause the resultant equipment configuration to fail the appropriate Class A or Class B FCC EMI criteria is prohibited.

A.5 COMPLIANCE CHECKING

A.5.1 Cabinets

Specially designed equipment cabinets lessen EMI signals by absorbing the radiated energy. Therefore, it is vital that all cabinet components (doors, covers, etc.) be maintained with the same status as when the equipment was manufactured (FCC compliant).

A.5.2 Doors

Check that doors have not been bent out of alignment with the cabinet. Any discontinuity along the door edge could render door RF gaskets or the fingerstock ineffective at RFI frequencies.

CAUTION

All cabinet doors, covers, and panels must be secured after maintenance and also during normal equipment operation.

Door-to-gasket continuity can be checked via insertion of a thin strip of paper between a closed door and the mating gasket. If there is no resistance to movement of the paper strip the door does not have an effective RF seal.

A.5.3 Covers and Panels

Because of the timing frequencies used in most computer devices, any misalignment or omission of covers and panels could result in interfering signals being radiated from the equipment. Any openings can function as slot antennas at higher frequencies and, therfore, increase the amplitude of unwanted signal radiation.

A.5.4 RF Gaskets and Fingerstock

Cabinet gaskets and fingerstock require a certain uniform pressure with the mating piece to provide an effective electrical seal. This pressure can only be maintained when undamaged gaskets and fingerstock are compressed by doors or panels which have been properly closed and locked.

A.5.5 Line Filters

Filters consist of metal boxes that house components such as capacitors, inductors, resistors, and diodes in network configurations.

Line filters carry the interference back to the source via the ground connection instead of allowing it to travel to the power lines. Therefore, it is necessary that filters be checked to make sure that the metal box is in good contact with the metal it is bolted to.

Signal wire filters are usually built into connectors, but may be housed in separate metal boxes. These filters carry the interference to the RF shield, without lessening the desired signal. Signal filters should be checked to assure that they are well bonded to the metal I/O bulkhead.

A.5.6 RF Bonds

Good RF bonding is essential in interference reduction A poor RF bond creates an impedance that raises the RF potential of the connection, causing it to function as an antenna that radiates interference.

The material and configuration of shield connections is also important In the audio frequency ranges a stranded wire used as a shield connection may offer zero impedance, but this same wire acts as an inductor at radio frequencies Shielded cables employ metal backshells which make a 360-degree peripheral shield connection, and carry it to the mating connector mounted on the I/O bulkhead This makes a very low impedance connection

The connection at each end of a shielded conductor should be checked for good metal-to-metal contact between the connector and I/O bulkhead Any corrosion and dirt must be removed

A.6 EQUIPMENT LABELS

Many system builders buy subassemblies which they integrate into their own products The subassemblies do not have to be tested or labeled, but the completed products do

A.6.1 FCC Labels on Compliant Products

Class A computing devices are required to be marked with a conspicuously placed label advising the operator of an interference possibility Figure A-1 provides some examples of these labels

A.6.2 FCC Labels on FCC-Exempt-Ordered Products

Certain exempt users of Digital Equipment Corporation FCC-compliant products render these products non-compliant by integrating into them options or subassemblies which are not completely compliant

In such instances the equipment installer (DIGITAL Field Service or Customer/OEM/Third Party) is responsible for removing the FCC-compliance notice labels from the Digital Equipment Corporation equipment involved

A.6.3 Removal of FCC Labels

A.6.3.1 Removal of FCC Labels by DIGITAL Field Service – Labels on Digital Equipment Corporation equipment installed by DIGITAL Field Service will be removed when the following notice appears on the shipping container(s)

CAUTION

This equipment has been sold for an FCC-Exempt end use. The enclosed packing list lists certain items that are to be delabeled.

After you have removed the label from the appropriate equipment notify the branch supervisor in writing and also inform the equipment user

CAUTION

No attempt should be made to remove labels from options or spared subassemblies in the repair centers. DIGITAL field service will assume no responsibility for this. Modules will be returned to stock status and upgraded to the latest revision per the repair plans for each option.

COMPUTER

THIS EQUIPMENT COMPLIES WITH THE REQUIREMENTS IN PART 15 OF FCC RULES FOR A CLASS A COMPUTING DEVICE OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA MAY CAUSE UNACCEPTABLE INTERFERENCE TO RADIO AND TV RECEPTION, REQUIRING THE OPERATOR TO TAKE WHATEVER STEPS ARE NECESSARY TO CORRECT THE INTERFERENCE

PERIPHERAL

THIS EQUIPMENT HAS BEEN TESTED WITH A CLASS A COMPUTING DEVICE AND HAS BEEN FOUND TO COMPLY WITH PART 15 OF FCC RULES SEE INSTRUCTION MANUAL. OPERATION IN A RESIDENTIAL AREA MAY CAUSE UNACCEPTABLE INTERFERENCE TO RADIO AND TV RECEPTION, REQUIRING THE OPERATOR TO TAKE WHATEVER STEPS ARE NECESSARY TO CORRECT THE INTERFERENCE

WARNING

THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OR PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA MAY CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS/HER OWN EXPENSE MAY BE REQUIRED TO TAKE MEASURES TO CORRECT THE INTERFERENCE

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Figure A 1 FCC Labels for Compliant Products

A.6.3.2 Removal of FCC Labels by Customer/OEMs/Third Parties – Labels on Digital Equipment Corporation equipment installed by the customer, original equipment manufacturer (OEM), or third party will be removed by these people when the following notice appears on the shipping container(s)

NOTE

DIGITAL Field Service assumes no delabeling responsibility for action or inaction of the customer, OEM, or the third party.

NOTE

DIGITAL Field Service may be contracted for assistance in any delabeling decisions and/or actions due to Point of Manufacture (POM) products configured in the field. DIGITAL Field Service can assist you in resolving potential problems with regulatory compliance. Because the equipment operator is responsible for the final equipment configuration meeting and maintaining EMI compliance, it is Digital Equipment Corporation's policy to offer assistance (on a time and materials basis) when so requested, but not to "police" the computer industry.

A.7 BULLETINS

A.7.1 DIGITAL Bulletins

Digital Equipment Corporation has published a question and answer brochure that provides an overview of the FCC rulings and customer responsibilities for compliance You can read about the sixteen FCC-related questions that Digital Equipment Corporation customers most often ask by ordering

FCC Computer Regulations Questions and Answers
EA 23749 98/82 011 07 100
Digital Equipment Corporation

A.7.2 FCC Bulletins

Maintaining compliance requires that the user completely understand his responsibility and also that the user learn system integration rules which include the "grandfathered" product definition, interconnection of cables, equipment add-on status, etc All of this is described in certain FCC bulletins that you, the "final integrator," should obtain for your own interpretation

Table A-1 lists some of the FCC bulletins you may obtain They are available from

FCC Consumer Assistance Office
Washington, DC 20554
(phone 202-632 7000)

Table A-1 FCC Bulletins

Computer Rules (47 CFR Part 15, Subpart J)
Measurement Procedures for Computers (47 CFR Part 15, Subpart J, Appendix A)
Marketing Rules (47 CFR Part 2, Subpart I)
Certification/Verification Rules (47 CFR Part 2, Subpart J)
Importation Rules (47 CFR Part 2, Subpart K)

NOTE:
1. **Parts 2 and 15 are contained in Volume II of the FCC rules. Volume II can be purchased from the U.S. Government Printing Office, Washington, D.C. 20402.**
2. **Penalties for non-compliance of the FCC rules are described in sections 501 through 504, inclusive.**

APPENDIX B

APPENDIX B
VMS BOOT PROCEDURE

To perform a normal, non-interactive boot from standard devices, use the boot command (which is abbreviated B) as shown below

```
>>>BOOT ddn <RET>          ! Boot device "dd" unit "n"
```

(Example >>>B DR2 <RET> boots RM05 unit 2 using DRBOO.CMD)

See Table B-1 for a list of device types

Table B-1 Device Types

Device	Device Name
RA60	DUn
RA80	DUn
RA81	DUn
RM05	DRn
RP07	DBn

The console reads the specified device from the boot command line. If the third character is an integer in the range 0-7, it strips off the unit number and deposits it into R3, and then executes the appropriate ddBOO.CMD command file. Two-character device names are handled in a similar manner, the console assumes a unit number of zero. When the device name is other than the two types just mentioned, the console searches for nnnBOO.CMD, where "nnn" is the three character sequence following the boot command

Only one boot file per device type is provided on the console diskette. This is due to the size of the VAX-11/785 writable control store (WCS), which does not leave enough space on the diskette for boot files for all units