

VAX 6000: Installing the VAXBI Option

Order Number EK-60BIA-IN-001

This manual is intended for Digital customer service engineers and self-maintenance customers installing the VAXBI option or the TK tape drive option. The VAXBI option includes the VAXBI card cages, power regulators, the DWMBB adapter, and cables.

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Preface

Intended Audience

This manual is written for Digital customer service engineers and self-maintenance customers who install the VAXBI option or the TK tape drive option.

Document Structure

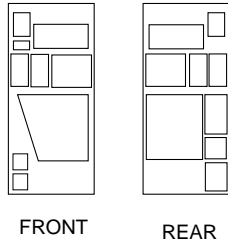
This manual uses a structured documentation design. There are many topics, organized into small sections for efficient reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure is descriptive text.

This manual has four chapters and one appendix, as follows:

- **Chapter 1, Specifications and Preparation**, gives an overview of the VAXBI option, including specifications.
- **Chapter 2, Installing the VAXBI Option**, gives instructions on how to install and cable the VAXBI card cage assembly, the DWMBB modules, and the power regulators in the system cabinet.
- **Chapter 3, Acceptance and Troubleshooting**, describes the acceptance procedure.
- **Chapter 4, Installing the TK Tape Drive Option**, gives instructions on how to install and cable the TK tape drive.
- **Appendix A, TK70 Tape Drive Instructions**, gives instructions on how to operate the tape drive.

Conventions Used in This Document

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



VAX 6000 Series Documents

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

Table 1: VAX 6000 Series Documentation

Title	Order Number
Operation	
<i>VAX 6000 Series Owner's Manual</i>	EK-600EA-OM
<i>VAX 6000 Series Vector Processor Owner's Manual</i>	EK-60VAA-OM
<i>VAX 6000 Vector Processor Programmer's Guide</i>	EK-60VAA-PG
Service and Installation	
<i>VAX 6000 Platform Technical User's Guide</i>	EK-600EA-TM
<i>VAX 6000 Series Installation Guide</i>	EK-600EA-IN
<i>VAX 6000 Installationsanleitung</i>	EK-600GA-IN
<i>VAX 6000 Guide d'installation</i>	EK-600FA-IN
<i>VAX 6000 Guia de instalacion</i>	EK-600SA-IN
<i>VAX 6000 Platform Service Manual</i>	EK-600EA-MG

Table 1 (Cont.): VAX 6000 Series Documentation

Title	Order Number
Options and Upgrades	
<i>VAX 6000: XMI Conversion Manual</i>	EK-650EA-UP
<i>VAX 6000: Installing MS65A Memories</i>	EK-MS65A-UP
<i>VAX 6000: Installing the H7236-A Battery Backup Option</i>	EK-60BBA-IN
<i>VAX 6000: Installing the FV64A Vector Option</i>	EK-60VEA-IN
<i>VAX 6000: Installing the VAXBI Option</i>	EK-60BIA-IN

Manuals specific to models are listed in Table 2.

Table 2: VAX 6000 Model Level Documentation

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

Associated Documents

Table 3 lists other documents that you may find useful.

Table 3: Associated Documents

Title	Order Number
System Hardware Options	
<i>VAXBI Expander Cabinet Installation Guide</i>	EK-VBIEA-IN
<i>VAXBI Options Handbook</i>	EB-32255-46
System I/O Options	
<i>CIBCA User Guide</i>	EK-CIBCA-UG
<i>CIXCD Interface User Guide</i>	EK-CIXCD-UG
<i>DEC LANcontroller 200 Installation Guide</i>	EK-DEBNI-IN
<i>DEC LANcontroller 400 Installation Guide</i>	EK-DEMNA-IN
<i>InfoServer 100 Installation and Owners Guide</i>	EK-DIS1K-IN
<i>KDB50 Disk Controller User's Guide</i>	EK-KDB50-UG
<i>KDM70 Controller User Guide</i>	EK-KDM70-UG
<i>RRD40 Disc Drive Owner's Manual</i>	EK-RRD40-OM
<i>RA90/RA92 Disk Drive User Guide</i>	EK-ORA90-UG
<i>SA70 Enclosure User Guide</i>	EK-SA70E-UG
<i>SA70/6000 Cabinet Series Upgrade Installation Guide</i>	EK-SA7CK-IN
Operating System Manuals	
<i>Guide to Maintaining a VMS System</i>	AA-LA34A-TE
<i>Guide to Setting Up a VMS System</i>	AA-LA25A-TE
<i>Introduction to VMS System Management</i>	AA-LA24A-TE
<i>ULTRIX-32 Guide to System Exercisers</i>	AA-KS95B-TE
<i>VMS Upgrade and Installation Supplement: VAX 6000 Series</i>	AA-LB36C-TE
<i>VMS Networking Manual</i>	AA-LA48A-TE
<i>VMS System Manager's Manual</i>	AA-LA00A-TE
<i>VMS VAXcluster Manual</i>	AA-LA27B-TE

Table 3 (Cont.): Associated Documents

Title	Order Number
Peripherals	
<i>HSC Installation Manual</i>	EK-HSCMN-IN
<i>H4000 DIGITAL Ethernet Transceiver Installation Manual</i>	EK-H4000-IN
<i>Installing and Using the VT320 Video Terminal</i>	EK-VT320-UG
<i>RV20 Optical Disk Owner's Manual</i>	EK-ORV20-OM
<i>SC008 Star Coupler User's Guide</i>	EK-SC008-UG
<i>TA78 Magnetic Tape Drive User's Guide</i>	EK-OTA78-UG
<i>TA90 Magnetic Tape Subsystem Owner's Manual</i>	EK-OTA90-OM
<i>TK70 Streaming Tape Drive Owner's Manual</i>	EK-OTK70-OM
<i>TU81/TA81 and TU/81 PLUS Subsystem User's Guide</i>	EK-TUA81-UG
VAX Manuals	
<i>VAX Architecture Reference Manual</i>	EY-3459E-DP
<i>VAX Systems Hardware Handbook — VAXBI Systems</i>	EB-31692-46
<i>VAX Vector Processing Handbook</i>	EC-H0739-46

Chapter 1

Specifications and Preparation

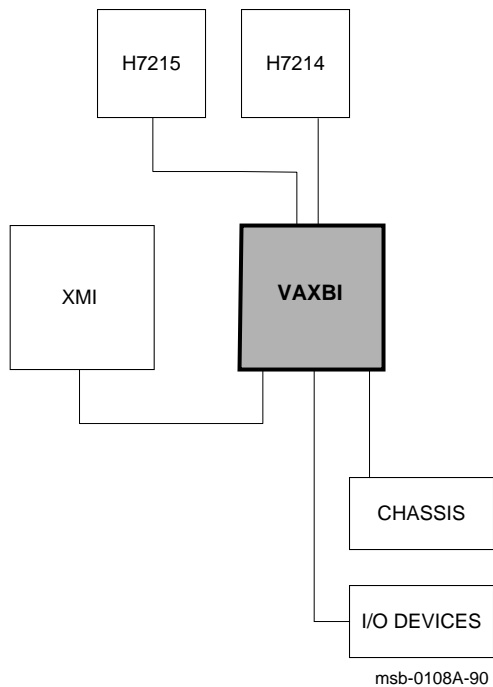
This chapter describes the VAXBI option and gives preparation guidelines for installing the VAXBI option in a VAX 6000 cabinet. Chapter 2 describes the installation. If you are also installing the TK70 tape drive option, see Chapter 4 for that installation procedure. Sections in this chapter include:

- VAXBI Option Description
- Prepare Area, Kit, and Tools
- Unpacking Checklist

1.1 VAXBI Option Description

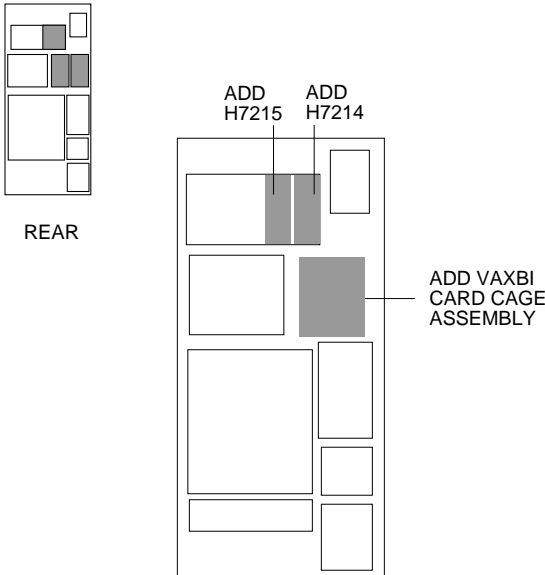
The VAXBI assembly can be installed to provide additional I/O. The two cages provide a single VAXBI channel. The interface between the VAXBI bus and the XMI bus is the DWMBB adapter. The DWMBB/A module is in the XMI card cage, and the DWMBB/B module is in the VAXBI card cage.

Figure 1-1: VAXBI Card Cage Connections



The three major components you will install are the VAXBI assembly, the H7214 power regulator, and the H7215 power regulator.

Figure 1-2: Overview of VAXBI Installation

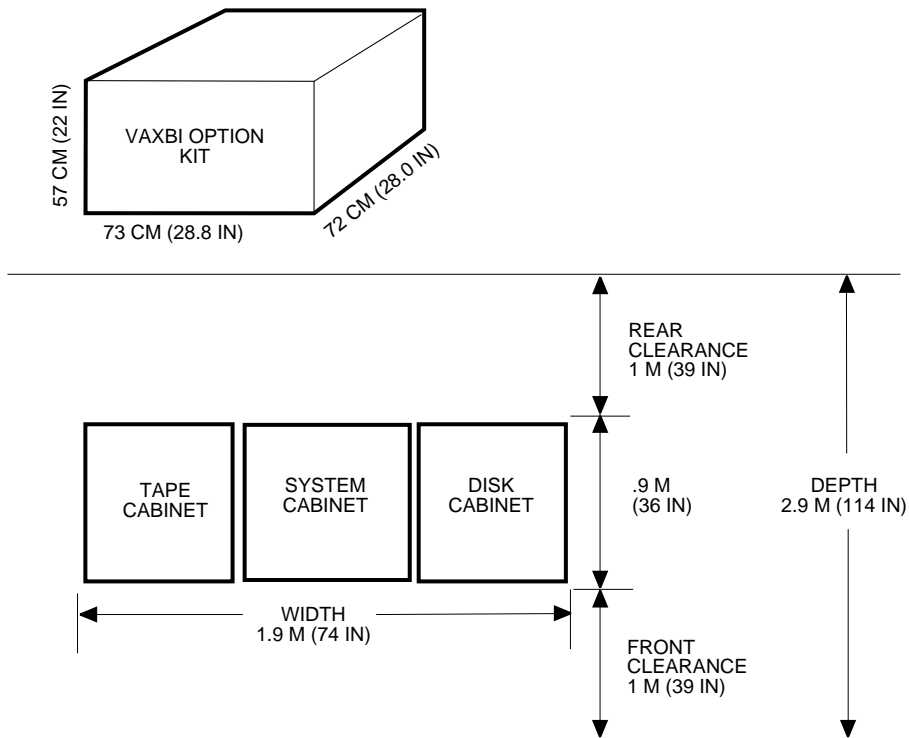


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1.2 Prepare Area, Kit, and Tools

Set up a work space near the system where you can store components and modules while you work on the VAXBI option installation. Some steps in this installation require two people. Prepare the system for shutdown.

Figure 1-3: System Space Requirements



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1-4 VAX 6000: Installing the VAXBI Option

1. Prepare an area near the system where you can place system components during the installation.
2. Perform an orderly shutdown of the system.
3. Turn the upper key switch on the front control panel to the Off position.
4. Pull the circuit breaker on the AC power controller to the Off position. The AC power controller is at the bottom rear of the cabinet.
5. Unplug the system power cord; wait 2 minutes for the capacitors to discharge.
6. Open the front and rear cabinet doors. Using a Phillips screwdriver, remove the ground straps from the doors. Remove the doors from the cabinet and set them aside.
7. Remove the two Phillips screws and drop the I/O bulkhead tray to expose the card cage area.
8. As you work, save all screws that you remove.

Table 1–1: Tools Required

Item	Description
VAXBI Tool Kit A2-M1094-10	Torque screwdriver, 11/32" nutdriver, large Phillips and flat screwdrivers, small Phillips screwdriver with magnetic tip
Other tools	3/8" and 5/16" nutdrivers, 7/16" socket wrench, flashlight

1.3 Unpacking Checklist

Carefully unpack the VAXBI option kit (DWMBB-D-DBP). Check the contents against Table 1-2. If any components are missing, note items on the bill of lading and do not start installation until you receive all components.

Table 1-2: VAXBI Option Kit

Part Number	Description
70-24126-02	VAXBI card cage assembly
H7214-A	Power regulator
H7215-A	Power regulator
T2018-00	DWMBB/A module
T1043-00	DWMBB/B module
17-01458-02	VAXBI ground strap
17-01569-01	DWMBB to H7206 power OK signal cable
17-01897-02	7" DWMBB I/O cables (two pairs)
74-35973-01	Cable retainer
74-35974-01	H7214 cover
36-33598-02	VAXBI module utilization label
36-12680-02	Ground symbol labels
EK-60BIA-IN	<i>VAX 6000: Installing the VAXBI Option</i>

Chapter 2

Installing the VAXBI Option

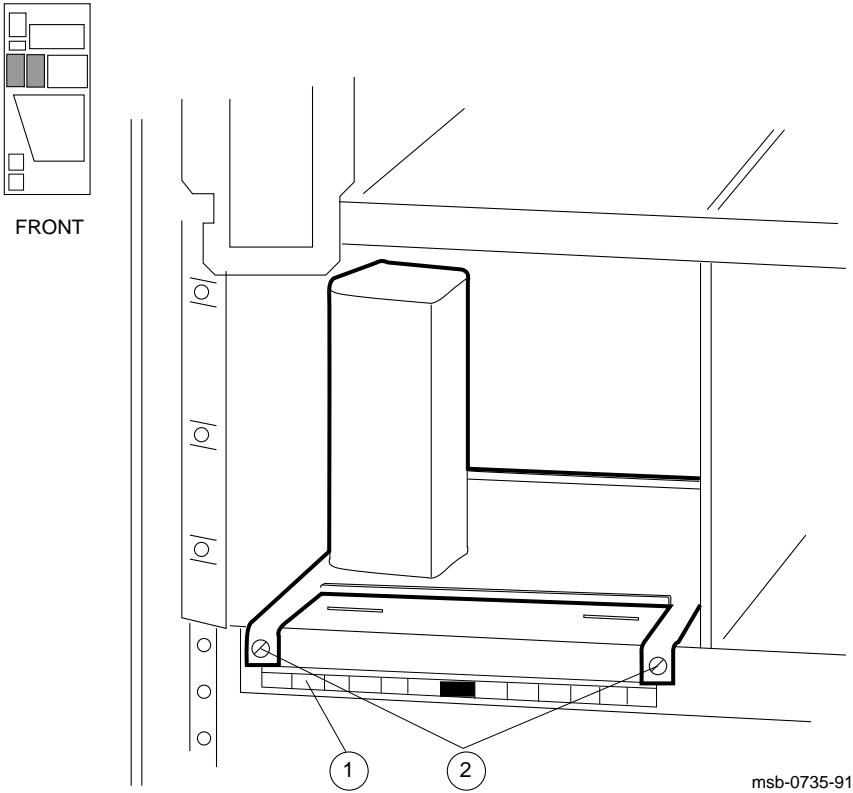
This chapter describes the installation of the VAXBI assembly into a VAX 6000 cabinet. Sections include:

- Remove the Baffle Assembly
- Install the VAXBI Assembly
- Install the H7214 Power Regulator
- Install the H7215 Power Regulator
- Install the DWMBB Modules

2.1 Remove the Baffle Assembly

Remove the baffle assembly installed in the VAXBI space. The assembly directs the airflow when the VAXBI card cages are not present.

Figure 2-1: Baffle Assembly



1. Remove the clear plastic door in front of the VAXBI area.
2. Peel and stick on the VAXBI label beneath the mounting bracket (see ❶ in Figure 2-1).
3. Using a flat screwdriver, remove two screws in front and slide the baffle assembly out of the cabinet (see ❷). Remove the two screws at the top of the VAXBI area. Save these four screws to attach the VAXBI assembly to the cabinet.

2.2 Install the VAXBI Assembly

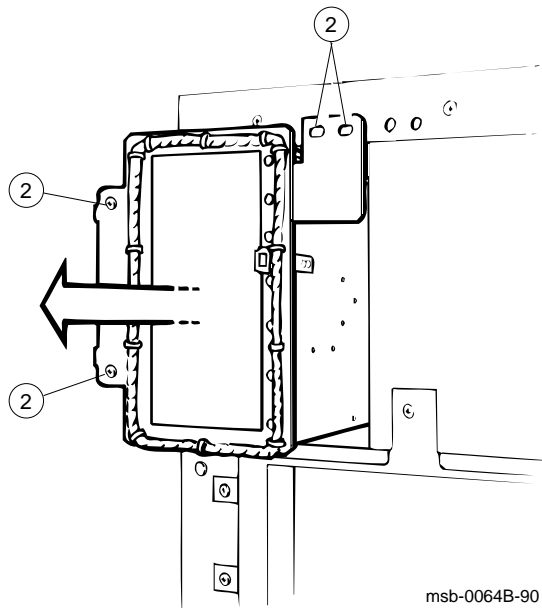
Tilt the system control assembly upward to allow clearance for the VAXBI assembly. Then slide the VAXBI assembly into the cabinet. Finally, make the necessary cable connections.

NOTE: *This step requires two people. One person must tilt the system control assembly upward to allow for clearance while the other person slides the VAXBI assembly into the cabinet.*

2.2.1 Disengage the System Control Assembly

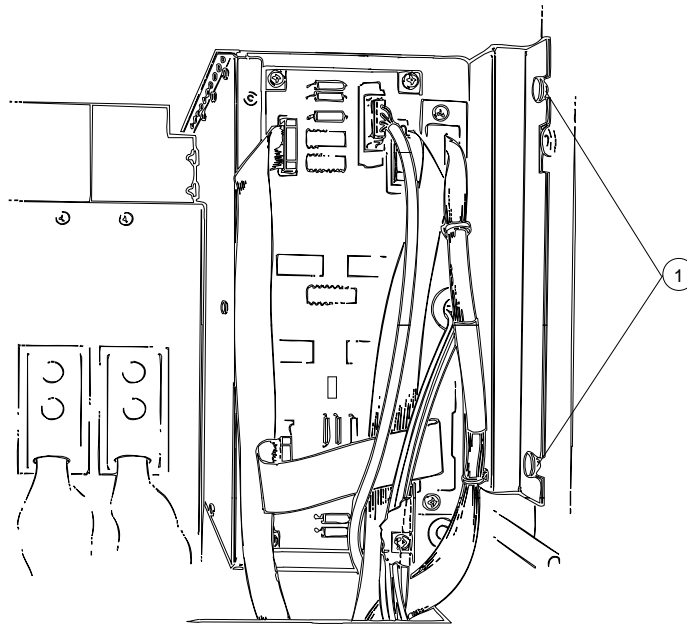
Working from the front and rear of the cabinet, remove the six mounting screws and slide the system control assembly forward.

Figure 2-2: System Control Assembly (Front View)



1. At the rear of the cabinet, loosen the two mounting screws that secure the system control assembly to the cabinet side (see ❶ in Figure 2-3).
2. At the front of the cabinet, loosen the four mounting screws (see ❷ in Figure 2-2). Remove three screws and, supporting the system control assembly with one hand, remove the last loosened screw with your other hand. Using both hands, carefully pull the system control assembly forward until you are able to tilt it upward.

Figure 2-3: System Control Assembly (Rear View)

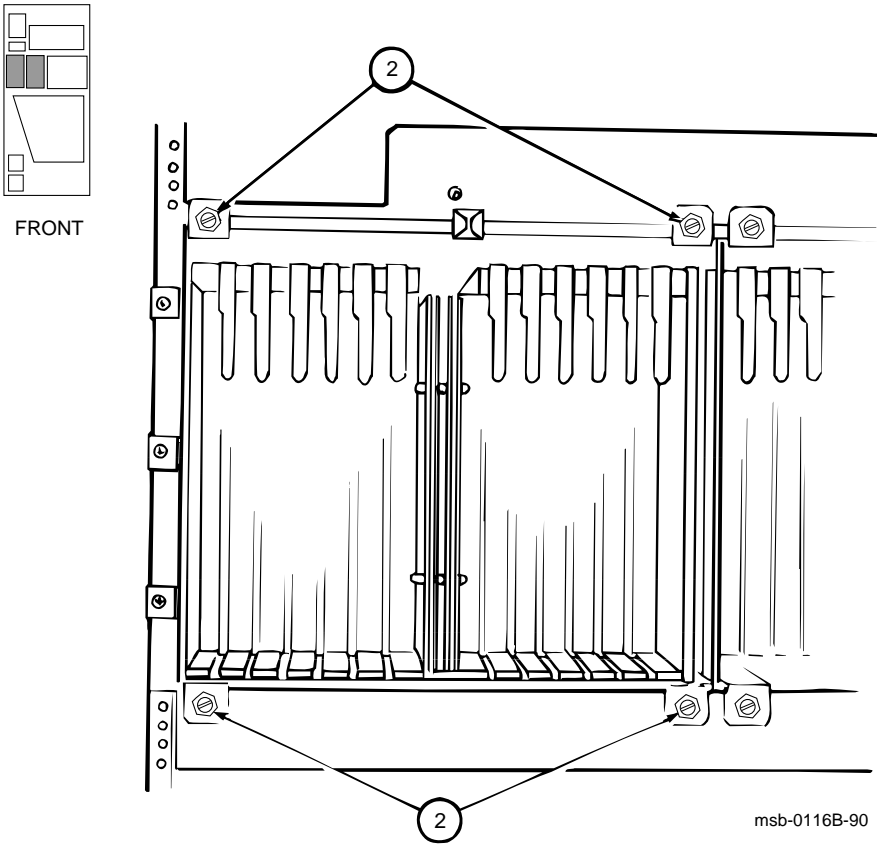


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2.2.2 Insert the VAXBI Assembly

Working at the front of the cabinet, insert the VAXBI assembly while the system control assembly is tilted up to allow for clearance. This step requires two people.

Figure 2-4: VAXBI Card Cages

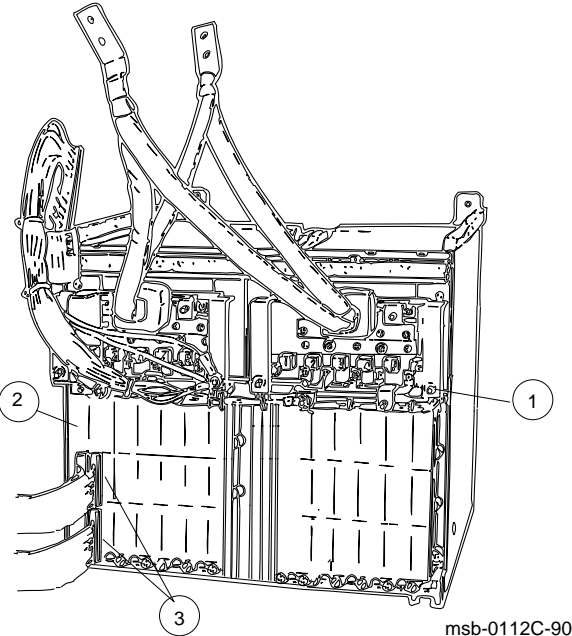


1. Slide the VAXBI assembly into the cabinet taking care not to damage the power harnesses or bus bars. You will also need to pull the assembly from the back.
2. Install a mounting screw in the upper left corner of the VAXBI assembly (see ❷ in Figure 2-4). Then carefully slide the system control assembly into the cabinet. Install the three remaining mounting screws that secure the VAXBI assembly to the cabinet.
3. Reinstall the six Phillips screws that secure the system control assembly to the cabinet (see Section 2.2.1).

2.2.3 Cable the VAXBI Assembly

Working mainly from the rear of the cabinet, install the three cables that are in the VAXBI option kit.

Figure 2-5: VAXBI Backplane Cables and Power Connections



1. Install the 17-01458-02 ground strap to the VAXBI assembly (see ❶ in Figure 2-5) using a nutdriver and kepnut. Fasten the filter end of the cable near the assembly bus bars with the lug pointed upward. Fasten the other end of the ground strap to the chassis above.
2. Install the 17-01569-01 cable. At the front of the cabinet, connect the cable to J11 on the H7206-B power and logic unit. J11 is located on the right side of the unit and is the third connector from the front. Route the cable directly to the VAXBI backplane and connect it to slot 1, segment C1 (see ❷).
3. Install the two pairs of DWMBB cables (17-01897-02) between the VAXBI and XMI cages (see ❸). These cables connect XMI slot E segments D and E with the nearest VAXBI card cage (slot 1, segments D and E).

NOTE: *You will install the DWMBB/A module into slot E of the XMI card cage. If another module is in slot E, it must be removed and inserted into the next open XMI slot.*

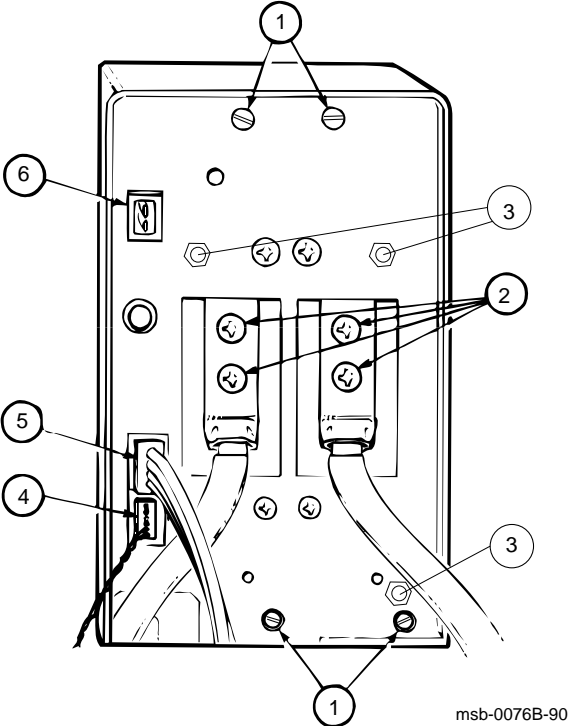
Table 2-1: VAXBI Assembly Cables to Be Installed

Part Number	Description
17-01458-02	VAXBI ground strap. Connects the VAXBI backplane to the cabinet chassis.
17-01569-01	DWMBB to H7206 power OK signal cable. Connects from slot 1, segment C1, to J11 of H7206-B.
17-01897-02	7" DWMBB cables (two pairs), from XMI slot E (segments D and E) to VAXBI cage slot 1 (segments D and E).

2.3 Install the H7214 Power Regulator

Working mainly from the rear of the cabinet, install the H7214 power regulator. Attach the cables. For reference, check the H7214 power regulator that is already installed in the cabinet.

Figure 2-6: H7214 Power Regulator (Rear View)



NOTE: Check the H7214 power regulator before installing. The H7214 ground reference wire is connected to the regulator's circuit board and return bus bar by a screw and a washer. Make sure the wire is intact and properly connected. Tuck the wire out of the way when inserting the regulator into the cabinet.

From the rear of the system cabinet:

1. Slide the H7214 power regulator into the far right end of the power regulator area. Tighten the four slotted screws (see ❶ in Figure 2-6). Remove the protective covering from the H7214.
2. Connect the bus bar leads (attached to the VAXBI assembly) by installing four screws. See ❷. The black bus bar lead connects to RTN. The red bus bar lead connects to +5V.

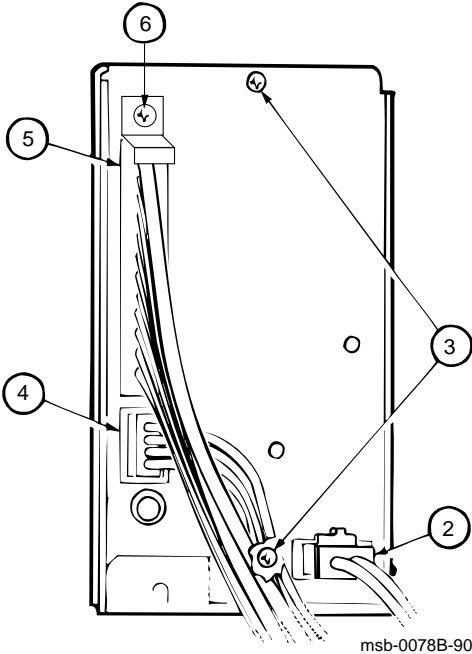
CAUTION: You must use 5/16 inch screws. If you use the longer 7/16 inch screws, the power regulators may short out.

3. Find the 74-35974-01 plastic cover. Using a 5/16 inch nutdriver, install the cover with three nuts. See ❸.
4. Connect the 17-01525-01 remote sense cable to J4. See ❹. (The remote sense cable is part of the power harness.)
5. Connect the 17-01666-01 control/status cable to J1. See ❺.
6. If you are installing an Ethernet, connect the +13.5V cord (part of 17-01496-01) to J2. See ❻.
7. Working from the front of the cabinet, use a slotted screwdriver to tighten the captive screw to the H7214 power regulator.
8. The 17-01447-01 bulk power cable is clamped to the cabinet top. Release the cable and plug both ends into the power regulator connectors.

2.4 Install the H7215 Power Regulator

Working mainly from the rear of the cabinet, install the H7215 power regulator. For reference, check the H7215 power regulator that is already installed in the cabinet.

Figure 2-7: H7215 Power Regulator (Rear View)



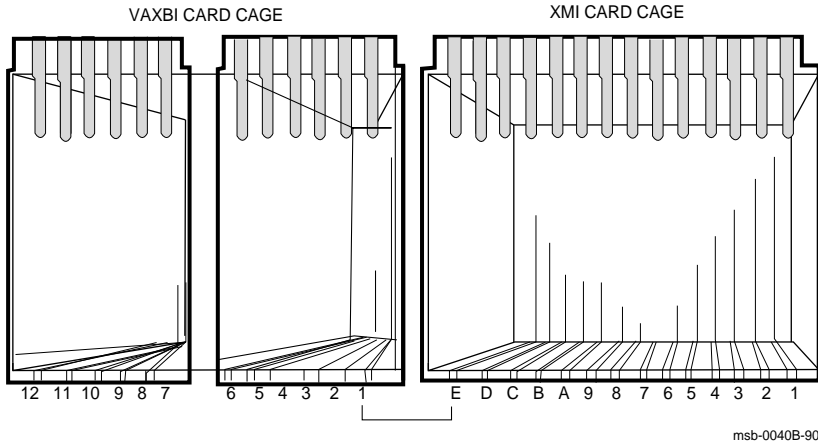
From the rear of the system cabinet:

1. Disconnect the 2-pin Mate-N-Lock connector to the Interlock switch. The connector is located at the bottom of the regulator space.
2. Slide the H7215 power regulator in to the left of the H7214. Reconnect the 2-pin Mate-N-Lock connector. See ❷ in Figure 2-7.
3. Using a flat screwdriver, tighten the two screws at the top and bottom of the regulator. See ❸.
4. Connect the 10-pin connector (part of the control/status cable) to J2. See ❹.
5. Connect the 32-pin power distribution cable (17-01523-01) to J3. See ❺. This connector is keyed.
6. Using a 5/16 inch nutdriver, attach the cable retainer (74-35973-01) with a nut. See ❻.
7. At the front of the cabinet, use a slotted screwdriver to tighten the captive screw to the H7215 power regulator.

2.5 Install the DWMBB Modules

Install the DWMBB modules. The DWMBB/A module is installed in the XMI card cage; the DWMBB/B module is installed in the VAXBI card cage.

Figure 2-8: VAX 6000 Series Slot Numbers



NOTE: *You will install the DWMBB/A module into slot E of the XMI card cage. If another module is in slot E, it must be removed and inserted into the next open XMI slot.*

At the front of the cabinet:

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

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

2. Install the DWMBB/B module (T1043) in slot 1 of the VAXBI (see Figure 2-8).
3. Install the DWMBB/A module (T2018) in slot 14 (or E) of the XMI card cage.
4. Insert any other modules into the VAXBI card cages.
5. Mark the position of each module on the VAXBI label.
6. Replace and latch the XMI and VAXBI clear plastic doors.

Chapter 3

Acceptance and Troubleshooting

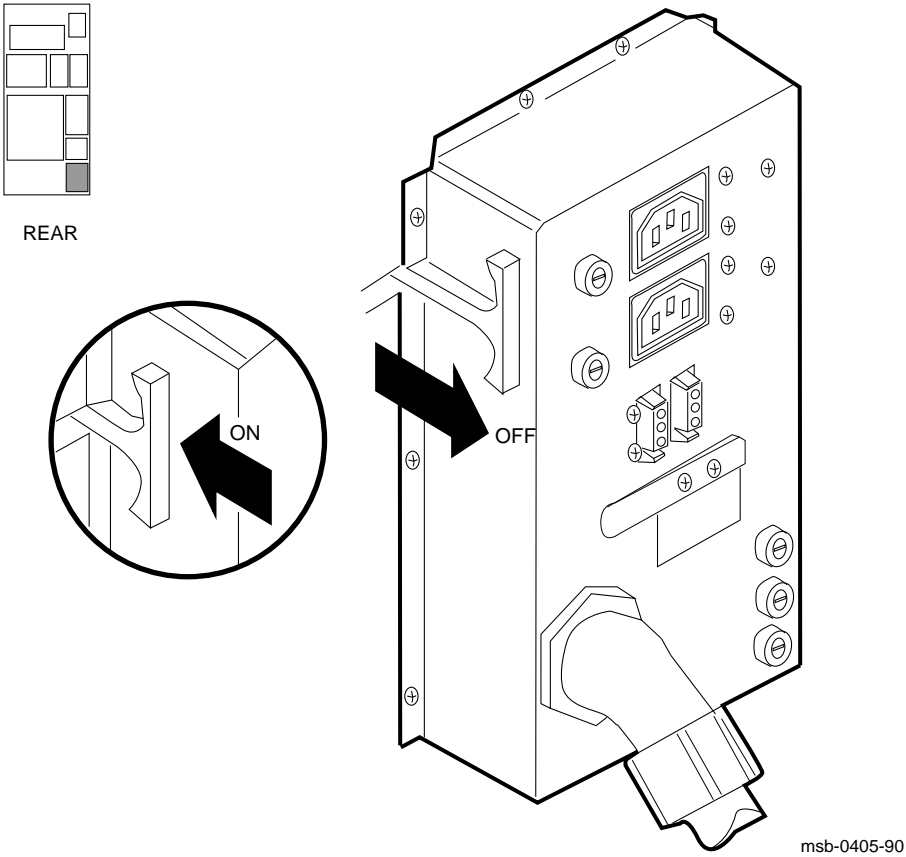
This chapter discusses the acceptance procedure and troubleshooting guidelines for the VAXBI option. See the *VAX 6000 Platform Service Manual* for more information on troubleshooting. Sections include:

- Restore Power to System
- Check Self-Test Results
- VAXBI Troubleshooting
- H7206-B Diagnostic LEDs

3.1 Restore Power to System

Close up the cabinet and restore power systematically before turning the key switch to the Enable position.

Figure 3-1: AC Power Controller Circuit Breaker



3-2 VAX 6000: Installing the VAXBI Option

1. Close the I/O bulkhead tray to cover the card cages.
2. Rehang and close the front and rear cabinet doors.
3. Plug in the system power cord.
4. Push the circuit breaker on the AC power controller to the On position. The AC power controller is at the bottom rear of the cabinet. See Figure 3-1.
5. Turn the upper key switch on the front control panel to the Enable position; the system should power up and run self-test. If the system does not power up, check to see that all modules are seated properly in the card cages.
6. If the self-test results print, but you have self-test failures, see Section 3.2.

3.2 Check Self-Test Results

Check the self-test results to see if all XMI and VAXBI nodes passed. The self-test printout contains an additional line when the optional VAXBI adapter is part of the system configuration. The XBI line provides information on the node numbers and self-test status for modules in the VAXBI card cages.

Figure 3-2: Self-Test Results

```

#123456789 0123456789 0123456789 0123456789 012345#
F E D C B A 9 8 7 6 5 4 3 2 1 0 NODE #
① A A . . M M M M . . P P P P TYP
② O + . . + + + + . . + + + + STF
. . . . . . . . . . E E E B BPD
. . . . . . . . . . + + + + ETF
. . . . . . . . . . E E E B BPD
. . . . . + + . + . + - + + . XBI E + ③
. . . . A4 A3 A2 A1 . . . . ILV
. . . . 64 64 64 64 . . . . 256 Mb

Console = V2.00 RBDs = V2.00 EEPROM = 2.00/2.00 SN = SGO1234567

>>>
msb-0701H-91

```

The system configuration shown in Figure 3-2 has a DWMBB adapter.

- ① The TYP line in this printout indicates that adapters in this configuration are in XMI slots D and E.
- ② Because the DWMBB adapter does not have a module-resident self-test, its entry for the STF line will always be "o".
- ③ The test results for the DWMBB/A and DWMBB/B modules are indicated on the XBI line, at the far right. In this example, the DWMBB modules have passed self-test (XBI E +). The results of the VAXBI I/O adapter self-tests are shown in columns 0 through F, which stand for the VAXBI node numbers; in this configuration, node numbers 1, 2, 3, 4, 6, 8, and 9 are used. The adapter at node 3 failed its self-test. If you receive failures within a VAXBI card cage, check the cabling and then run diagnostics for the respective modules, if needed.

When a DWMBB passes self-test, each node on that VAXBI is indicated by symbols + and -, indicating the self-test status for that node number on the VAXBI. A period (.) indicates that that node number is not used. When a DWMBB fails self-test, the failure is reported, and the VAXBI device self-tests are not displayed.

XMI entries use slots 1 through E, while the VAXBI can have entries in slots 0 through F. An XMI slot and node number are the same; VAXBI slot and node numbers are not identical. Node plugs (labeled 1 to 12) in the VAXBI backplane are used to identify the number of a node.

3.3 VAXBI Troubleshooting

Check the items listed in Table 3-1 if the system fails to power up.

Table 3-1: VAXBI Troubleshooting Checklist

Symptom	Possible Cause
No power to cages	Clear plastic door not in place or not latched.
Intermittent module response	Poor contact at connector
	Loose cabling at backplane
	Power connector attached with 7/16" screw instead of 5/16" screw
Module does not appear on self-test results	Loose cabling at backplane
	System not configured correctly

Clear plastic doors cover the VAXBI and XMI card cages. If these doors are opened when power is still on, a power interlock switch cuts off power from the regulators to either the VAXBI side or to the XMI side, depending on the door opened.

Before turning power back on, make sure the clear plastic doors are in place and latched. You can then push the reset switch on the H7206-B power and logic unit (see Figure 3-3) to return power to the system.

If you receive intermittent module response, or the module does not show up on self-test as being present at all, make sure the module is seated properly, a node ID plug is in place, and the backplane cabling is correct.

Modules may fail self-test because of poor contact at the connector. A thorough cleaning of the gold pads on the module and of the connector in the card cage corrects this contact failure. If the connections seem to be faulty, clean the contact areas of the connector and module. Table 3-2 lists tools and supplies for connector cleaning.

Table 3-2: VAXBI Connector Cleaning Supplies

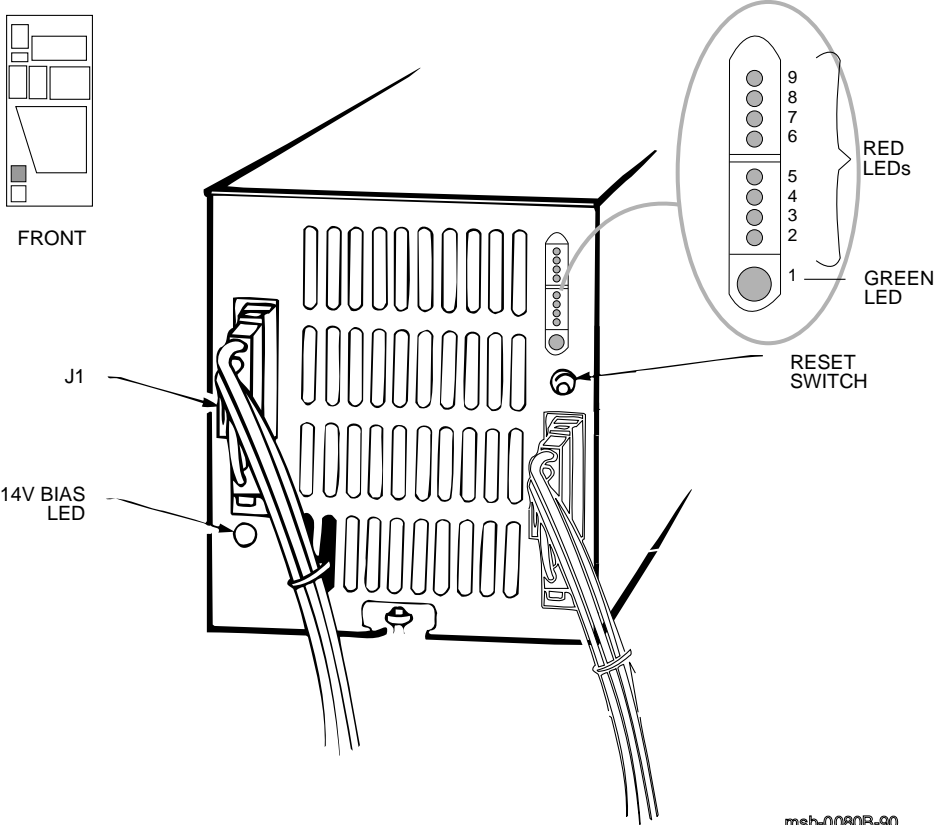
Item	Part Number	Function
VAXBI tool kit	A2-M1094-10	Maintaining card cages
Paddle wipe handle	47-00116-02	Holding paddle wipes
Paddle wipes	12-26321-01	Cleaning contact area inside ZIF connectors
Gold-wipes™	49-01603-00	Cleaning module connector contact area
Protective goggles	29-16141-10	Eye protection
Nitrile gloves	29-26403-00	Hand protection

™Gold-wipes is a trademark of TEXWIPE.

3.4 H7206-B Diagnostic LEDs

The H7206-B power and logic unit has one green and eight red LEDs in the upper righthand corner and a larger green LED in the lower lefthand corner.

Figure 3-3: H7206-B Diagnostic LEDs



The H7206-B power and logic unit has 10 indicator LEDs and one reset switch.

The nine LEDs in the upper right corner of the H7206-B are explained in Table 3-3. Refer to Figure 3-3 for LED numbering.

The green +14V bias LED lights to indicate when the bias supply on the fan/power module is working.

WARNING: *When the +14V bias LED is off, do not assume that the bulk supply is deenergized. This LED does not indicate the presence or absence of the 300V bulk supply.*

Table 3-3: H7206-B LEDs

LED	Color	Meaning
9	Red	Fault (airflow, interlock, overtemperature)
8	Red	XMI-1 module in XMI-2 card cage
7	Red	H7214 or H7242 installed incorrectly
6	Red	VAXBI—H7214 fault
5	Red	VAXBI—H7215 fault
4	Red	XMI—H7242 fault
3	Red	XMI—H7214 fault
2	Red	XMI—H7215 fault
1	Green	+14V logic bias is okay

LEDs 2 through 6 are latched on to indicate regulator faults. Reset these LEDs by turning the key switch to Off and back to Enable or Standby, or by pressing the reset switch (see Figure 3-3). LEDs 5 and 6 are always lit in Standby mode, since the VAXBI side is off in this key position.

The H7206-B LEDs may not indicate problems with regulators if the status cables are not correctly seated.

Chapter 4

Installing the TK70 Tape Drive Option

This chapter describes the installation of a TK70 tape drive into a VAX 6000 cabinet. Operating instructions are given in Appendix A.

Sections include:

- TK70 Tape Drive Option Description
- Install the TK Tape Drive
- Check the TK Tape Drive Load Path

4.1 TK70 Tape Drive Option Description

The TK70 tape drive can be installed to provide an in-cabinet console load device. The TBK70 adapter is the interface between the tape drive and the VAXBI. The tape drive is installed in the system control assembly in the upper left front of the cabinet.

Figure 4-1: TK70 Tape Drive Location

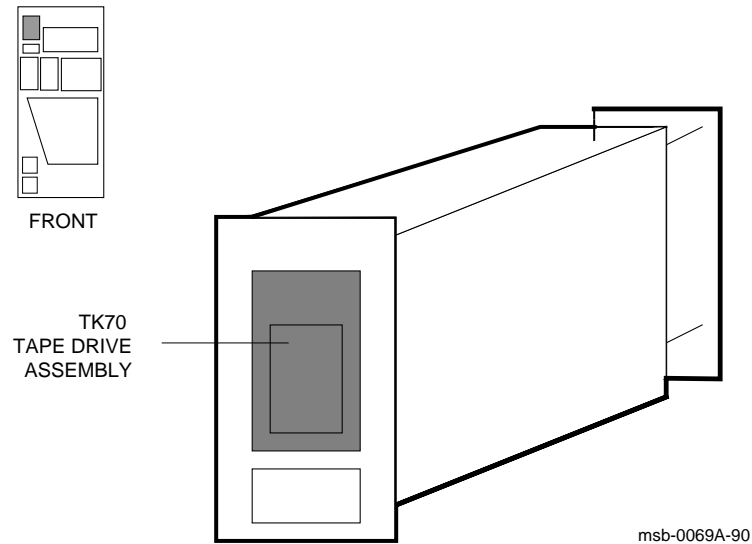


Table 4-1 lists the items in the TK70 tape drive option kit.

Table 4-1: TK70 Tape Drive Option Kit

Part Number	Description
TK70-AA	Tape drive
74-41495-01	Tape drive housing
T1035-00	TBK70 controller
17-02833-01	Signal cable, from tape drive to system control assembly
17-02632-01	Signal cable, from system control assembly to VAXBI back-plane
EK-60BIA-IN	<i>VAX 6000: Installing the VAXBI Option</i>

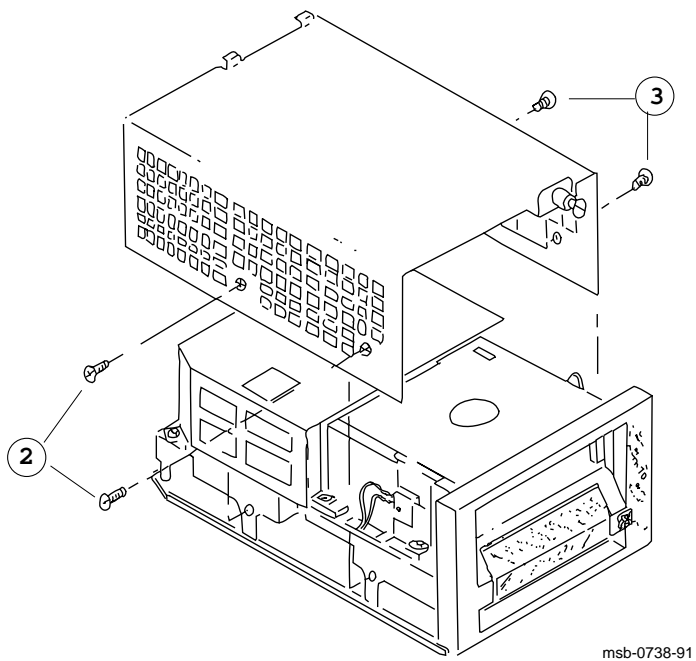
4.2 Install the TK Tape Drive

First, attach the tape drive housing to the tape drive. Next remove the plastic filler bezel from the system control assembly. Then install and cable the tape drive. Insert the TBK70 module into the VAXBI card cage. You will need a small Phillips screwdriver and a flat screwdriver.

4.2.1 Attach the Tape Drive Housing

Attach the housing to the tape drive with four Phillips screws.

Figure 4-2: Tape Drive Housing

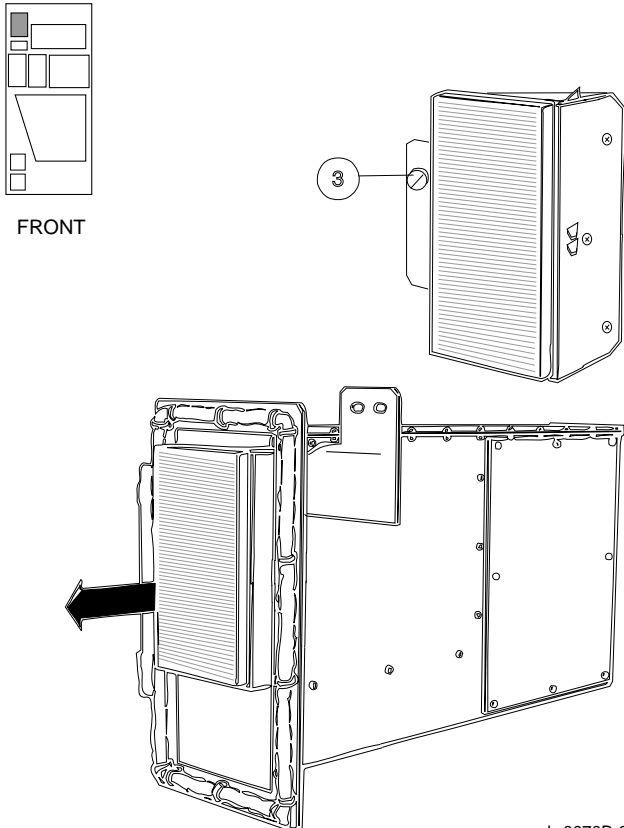


1. Place the housing over the tape drive, as shown in Figure 4-2. The captive screw on the housing should be at the front of the tape drive, on the right side.
2. Using a small Phillips screwdriver, install the two flathead Phillips screws on the left side of the tape drive (see ❷ in Figure 4-2).
3. Install the two panhead Phillips screws on the right side of the tape drive (see ❸).

4.2.2 Prepare the Cabinet and Remove the Filler Bezel

Turn off the system and remove the filler bezel.

Figure 4-3: Filler Bezel Removal



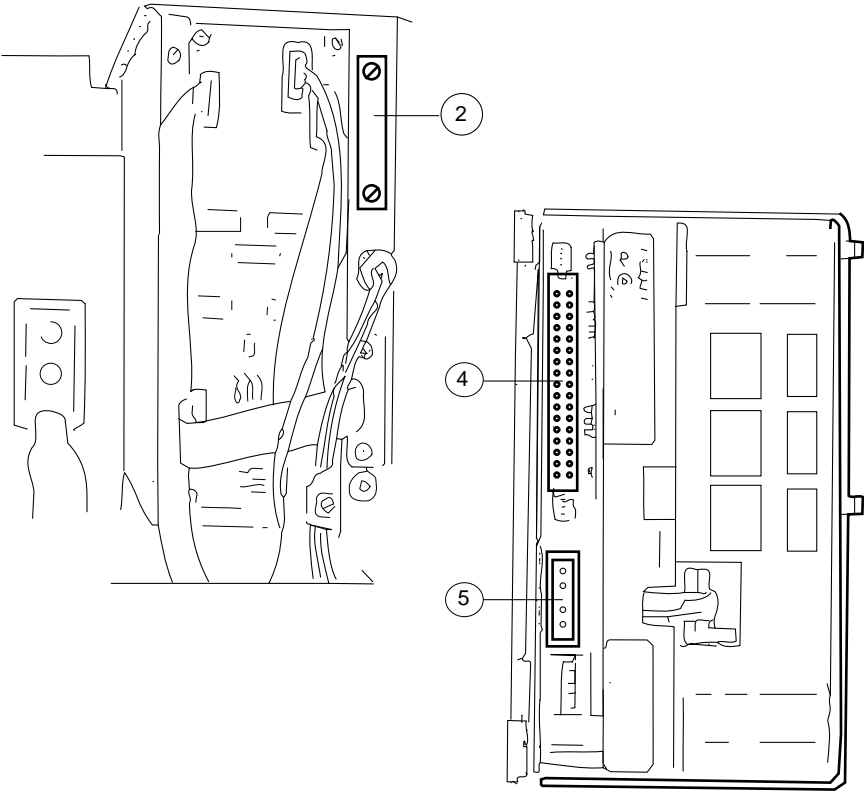
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1. Turn the system control panel upper key switch to the Off position.
2. Open the front door of the cabinet.
3. Remove the filler bezel from the system control assembly. The bezel is held in place by one slotted screw (see ③ in Figure 4-3).

4.2.3 Cable the TK Tape Drive

Remove the metal plate from the system control assembly. Then connect the cables and insert the TK tape drive into the system control assembly. There are two signal cables and one power cable.

Figure 4-4: Plate Removal and TK70 Tape Drive Connectors



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1. Open the rear door of the cabinet.
2. Locate the small metal plate at the right of the power sequencer module (see ❷ in Figure 4-4). Remove the plate by removing two screws.
3. Take the 17-02833-01 ribbon cable from the kit and on the large connector, remove one screw and loosen one screw. When installing, make sure the retaining clips are positioned to go through the opening made by removing the metal plate in Step 2.

From the front of the cabinet, push the connector through the opening. Make sure that the red line on the cable is at the bottom of the cable. Using a small Phillips screwdriver, install the two connector screws.

Thread the other end of the cable through the cable guide toward the front of the cabinet.

4. Connect the other end of the 17-02833-01 cable into the TK drive at the top left (see ❹).
5. Plug the 4-wire power connector into the bottom left of the TK drive (see ❺). The power cable is already in the system control assembly.
6. Slide the tape drive into the opening, being careful not to twist the signal cable.

As you push the unit in, hold the signal cable flush to the left side of the unit so that it remains untangled and is installed smoothly. Tuck the end loop in if it protrudes when the TK unit is installed.

7. Tighten the captive screw on the left side of the tape drive.
8. At the rear of the cabinet, connect the 17-02632-01 cable to the system control assembly (this cable connects to the 17-02833-01 connector installed in Step 3). Push the retaining clips down to lock into place.

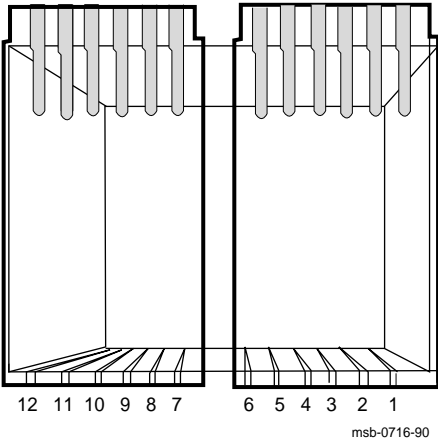
Table 4-2: TK Tape Drive Cables to Be Installed

Part Number	Description
17-02632-01	Ribbon cable, from the system control assembly to the VAXBI slot of the TBK70 module, segment D2.
17-02833-01	Ribbon cable, from the tape drive to the system control assembly.
	4-wire power cord, from system control assembly to tape drive.

4.2.4 Install the TBK70 Module

**Next install the TBK70 module into the VAXBI card cage.
Then connect the signal cable to the VAXBI backplane.**

Figure 4-5: Numbering of VAXBI Slots



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

1. Remove the plastic door in front of the VAXBI card cage. Install the TBK70 module into the desired VAXBI slot. Replace the door.
2. At the rear of the cabinet, route the 17-02632-01 signal cable (red stripe down) to the VAXBI slot that holds the TBK70 module. Insert the connector into segment D2. Thread the extra cable up through the cable clamp.
3. Close the front and rear cabinet doors.
4. Turn the system control panel upper key switch to the Enable position.

4.3 Check the TK Tape Drive Load Path

In console mode, you can use the Z command to "attach" to the TK controller on the VAXBI. Run a ROM-based test to verify that the load path works properly. Return the console to the boot processor.

Example 4-1: TK ROM-Based Diagnostic

```
① >>> SHOW CONFIGURATION
      Type          Rev
1+ KA64A      (8082) 0007
2+ KA64A      (8082) 0007
3+ KA64A      (8082) 0007
4+ KA64A      (8082) 0007
7+ MS65A      (4001) 0084
8+ MS65A      (4001) 0084
9+ MS65A      (4001) 0084
A+ MS65A      (4001) 0084
D+ DEMNA      (0C03) 0600
E+ DWMBB/A    (2002) 0001 ②

XBI E
1+ DWMBB/B    (2002) 0001
2+ CIBCA      (0108) 41C1
4+ TBK70      (410B) 0307 ②

③ >>> Z/BI:4 E
      ?33 Z connection successfully started.

④ T/R
⑤ RBD4> D2/TR/T=6/C

      ;T1035_TK      1.00
      ;T06
      ;
      ; P⑥ 6      410B 00000001
      ;00000000 00000000 00000000 00000000 00000000 00000000 00000000

⑦ RBD4> QUIT
⑧ ^P
      ?31 Z connection terminated by ^P
      >>>
```

- ① Put a blank cartridge in the TK drive. Make sure it is not write-protected. The blank tape is required for proper running of the TK RBDs. (If you are unfamiliar with the TK, see the *VAX 6000 Series Owner's Manual*.)
- ② In this example, the DWMBB adapter is XMI node E. The TK controller (TBK70) is VAXBI node 4.
- ③ Enter the Z command, using the /BI qualifier. The system console communicates with the module at VAXBI node 4 on the VAXBI whose adapter is at XMI node E. The system responds to the Z command with a message.
- ④ Enter the command T/R to invoke the module's ROM-based diagnostic monitor.
- ⑤ The diagnostic monitor prompt is RBD4>, where 4 is the VAXBI node number. Enter the command D2/TR/T=6/C. The diagnostic performs a read/write test.
- ⑥ The diagnostic prints out several lines of information. Check for a P in the first field of the diagnostic completion message, which indicates that the test passed.
- ⑦ Enter QUIT, which stops execution of the ROM diagnostic monitor and resets the controller.
- ⑧ Enter CTRL/P, which reattaches the console to the boot processor. The system responds to CTRL/P with a message.

Appendix A

TK70 Tape Drive Instructions

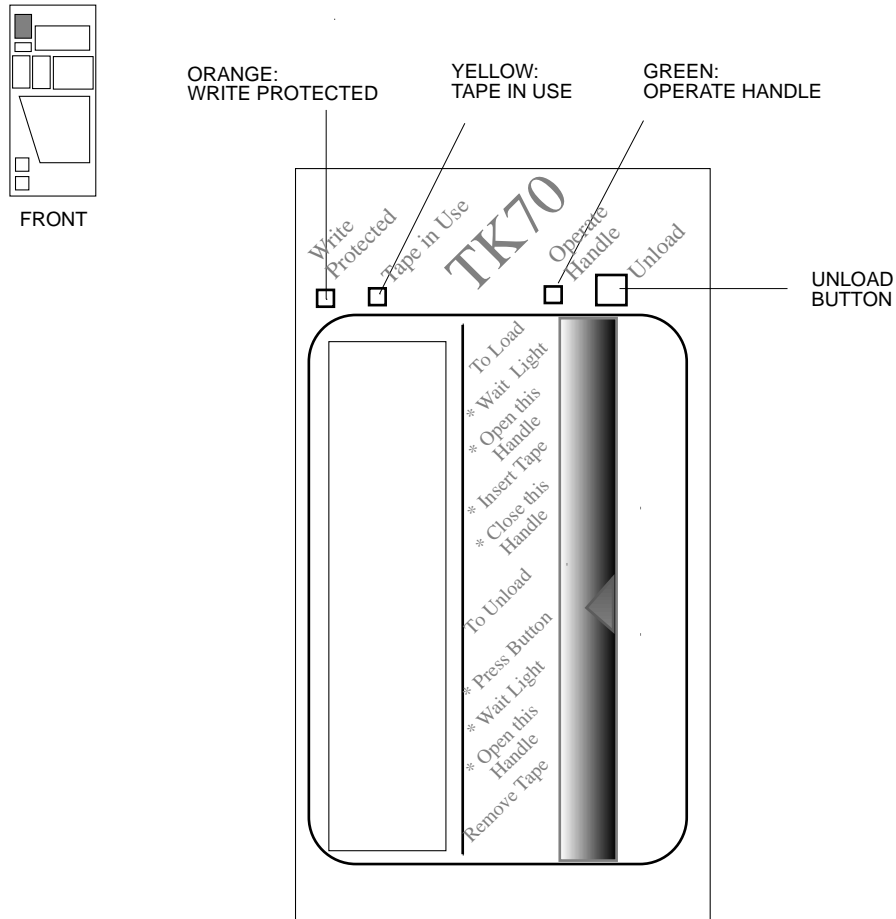
The TK70 tape drive holds one tape cartridge that contains the magnetic tape on a single reel. When a tape cartridge is inserted, the tape is automatically threaded onto a reel inside the drive. The tape must be entirely rewound before the cartridge can be removed from the drive. Rewinding can take up to 90 seconds.

The TK70 can read data from a tape that was written by a TK50, but it cannot overwrite a tape originally written by a TK50. A TK50, however, cannot read data from a tape written by a TK70.

A.1 Controls and Indicators

The TK70 tape drive has three lights, a beeper, an unload button, and a cartridge insert/release handle. Table A-1 lists the functions of TK tape drive controls and indicators that are shown in Figure A-1.

Figure A-1: TK Tape Drive



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A-2 VAX 6000: Installing the VAXBI Option

Table A-1: TK70 Light Summary

Light	State	Condition
Green (Operate Handle)	On	OK to operate handle.
	Off	Do not operate handle.
	Blinking	Defective cartridge. Pull the handle to the open position and remove cartridge. Try another cartridge.
Yellow (Tape in Use)	Steady	Drive ready.
	Blinking	Drive in use.
Orange ¹ (Write Protected)	On	Tape write protected.
	Off	Tape write enabled.
All three lights	Blinking	Drive fault. Attempt to reset the fault by pressing the unload button.

¹The orange light is on when any of the following conditions exist:

- Cartridge write protect switch is in the protected position.
- Cartridge is software write protected.
- Attempt was made to mount or initialize a cartridge previously written in a TK50 drive.

A.2 Loading a Tape

To load a tape, follow these steps:

1. When the green light is on steadily, pull the handle to the open position.
2. With the label facing out, insert the tape cartridge.
3. Push the cartridge in until it is completely inside the drive.
4. Push the handle to the closed position. The yellow light blinks, indicating that the tape is loading. When the yellow light stays on steadily, the drive is ready for use.

NOTE: *If the green light blinks or if all three lights blink, the loading has failed.*

A.3 Unloading a Tape

To unload a tape, follow these steps:

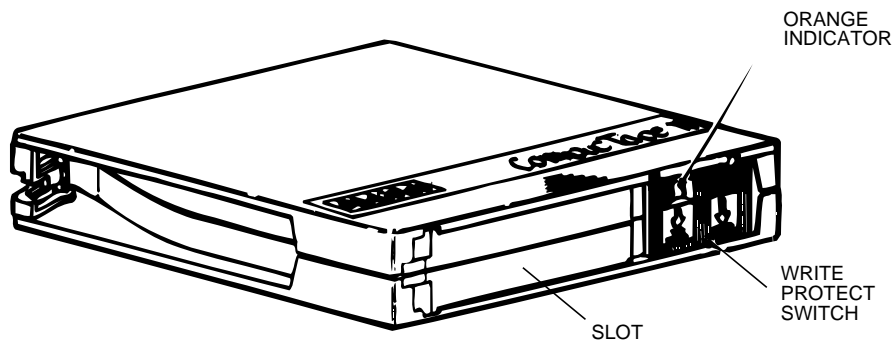
1. Press the unload button or execute an appropriate operating system unload command. The yellow light blinks as the tape rewinds.
2. When the green light turns on and the beep sounds, pull the handle to the open position. The cartridge will partially eject.
3. Remove the cartridge.
4. Push the handle to the closed position.

NOTE: *If all three lights blink, the unload has failed.*

A.4 Write-Protecting Your Tape Cartridge

Write-protecting a tape cartridge prevents accidental erasure of information stored on the tape. To write-protect a tape, slide the tape's write-protect switch to the left so that the small orange rectangle is visible, as shown in Figure A-2.

Figure A-2: TK Tape Cartridge



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A.5 Labeling a Tape Cartridge

To label your tape cartridge:

- Write your identifying information on the label. Note the recording density: TK70 = 296 Mbytes.
- Put the label into the slot on the front of the cartridge. See Figure A-2.
- Use only the labels supplied with the tape cartridge. Stick-on labels applied to the top, bottom, or sides of the cartridge can loosen and jam or damage the tape drive.
- Write only on the label. Do *not* write on the tape cartridge with a pen or pencil.

A.6 Tape Handling and Storage Guidelines

To add life to your tapes and protect data, follow these guidelines:

- Do not drop or bang the cartridge.
- Store tape cartridges upright in a dust-free environment.
- Keep tape cartridges away from direct sunlight, heaters, and other sources of heat. Store tape cartridges in an even temperature between 10° and 40°C (50° to 104°F).
- Keep tape cartridges away from sources of electromagnetic interference, such as terminals, motors, and video or X-ray equipment.

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