Rackmount VAX 4000 Model 100/100A/105A/106A

Installation Information

Order Number: EK–465RA–IN. D01

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The postpaid Reader's Comments form at the end of this document requests your critical evaluation to assist in preparing future documentation.

S2884

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EC:

Warning! This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung! Dieses ist ein Gerät der Funkstörgrenzwerklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention! Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioeléctriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

ACOUSTICS: Preliminary declared values per ISO 9296 and ISO 7779/DIN EN27779:

	Sound Power Level L_{wAd}, B	**Sound Pressure Level L_{pAm}, dBA (Bystander Positions)**
Idle	4.9	33
Operating	4.9	33

Current values for specific configurations are available from Digital representatives. 1 B = 10 dBA.

SCHALLEMISSIONSWERTE: Verläufige Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779:

	Schalleistungspegel L_{wAd}, B	**Schalldruckpegel L_{pAm}, dBA (Zuschauerpositionen)**
Leerlauf	4,9	33
Betrieb	4,9	33

Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

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A Shelf Assembly

B Connecting Peripheral Device Cables

C Single to Dual DSSI Upgrade Procedure

D Hardware Specifications

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Preface

Overview

This manual describes how to install, upgrade, and test the rackmount VAX 4000 Model 100/100A/105A/106A system. This manual also refers to information on connecting the system to a network, connecting external options to the system, and booting the operating system.

Unless specifically stated, the term RM 4000-10xx refers to the *rackmount* VAX 4000 Models 100, 100A, 105A, and 106A. The term VAX 4000-10xx refers to the *desktop* VAX 4000 Models 100, 100A, 105A, and 106A.

Audience

This manual is intended for persons experienced in installing computer equipment.

Structure of This Manual

This manual is organized as follows:

Chapter 1, Installation Procedure – Contains the steps necessary to unpack and install the RM 4000-10xx, and if necessary, to convert a VAX 4000-10xx to an RM 4000-10xx.

Chapter 2, Operator Access – Contains the procedure to access the RM 4000-10xx for control switches and to load media.

Chapter 3, Troubleshooting and Diagnostics – Contains troubleshooting and diagnostic information for the RM 4000-10xx.

Chapter 4, Maintenance and FRU Replacement Procedures – Provides procedures specific to the RM 4000-10xx.

Appendix A, Shelf Assembly – Provides instructions to assemble the shelf that is used to mount the RM 4000-10xx in a cabinet.

Appendix B, Connecting Peripheral Device Cables – Provides cabling instructions to connect peripheral devices to the system.

Appendix C, Dual DSSI Upgrade Procedure – Contains the procedure to upgrade the RM 4000-10xx containing a single DSSI to a dual DSSI.

Appendix D, Hardware Specifications – Describes the hardware specifications for the RM 4000-10xx.

Appendix E, Upgrade and Return Forms – Contains the forms and procedure to return the required items to Digital.

Additional Information

- *VAX 4000 Model 100 Operator Information Manual* (EK-466AA-OP)
- *VMS Factory Installed Software User Guide*
- *VAX 4000 Model 100 Customer Technical Information Manual* (EK-467AA-TI)
- *VAX 4000 BA42B Enclosure Maintenance Manual* (EK-472AA-MG)
- *VAX 4000 Model 100 KA52 CPU Maintenance Manual* (EK-473AA-MG)
- *VAX 4000 BA42 Enclosure System Options Manual* (EK-474AA-MG)
- *VAX 4000 Model 100A Installation Information* (EK-502AA-IN)
- *VAX 4000 Model 100A Operator Information* (EK-503AA-OP)
- *VAX 4000 Model 100A Customer Technical Information* (EK-504AA-TI)
- *VAX 4000 Model 100A Troubleshooting and Diagnostics Information* (EK-505AA-TS)
- *VAX 4000-10xA or MicroVAX 3100-9x CPU Firmware From Tape* (EK-VX4FW-UP)
- *VAX 4000 Model 105A/106A Installation Information* (EK-512AA-IN)
- *VAX 4000 Model 105A/106A Operator Information* (EK-513AA-OP)
- *VAX 4000 Model 105A/106 Customer Technical Information* (EK-514AA-TI)
- *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* (EK-515AA-TS)

Conventions

The following conventions are used in this manual:

Convention	Description
MONOSPACE	Text displayed on the screen is shown in monospaced type.
italic type	Italic type emphasizes important information and indicates the complete titles of manuals.
Note	A note contains information that is of special importance to the user.
Caution	Contains information to prevent damage to equipment.
Warning	Contains information to prevent personal injury.

1
Installation Procedure

This chapter describes, step-by-step, how to install the RM 4000-10xx. The procedure to convert a VAX 4000-10xx to an RM 4000-10xx is also described.

1.1 Introduction

Installing the RM 4000-10xx requires:

1. Preparing the site
2. Unpacking the kit
3. Converting the desktop unit to a rackmount unit if required
4. Installing the shelf assembly
5. Installing the VAX 4000-10xx on the shelf
6. Installing the cable management bracket
7. Installing I/O terminators and/or option cables
8. Installing the cable barrier
9. Checking the power-up test results
10. Installing the front bezel
11. Connecting the system to a network
12. Connecting external options to the system
13. Booting the operating system

1.2 Installation Procedure

Follow each step sequentially in the following procedure to unpack and install the RM 4000-10xx system.

Step 1: Prepare the Site

Site preparation involves choosing a suitable location for the system cabinet. Follow these guidelines when choosing the location:

- The system unit should be placed where the room temperature is between 10°C and 35°C (50°F and 95°F) and the humidity is between 20% and 80% noncondensing.
- The system unit should be placed at least 1 m (3 ft) away from heaters, photocopying machines or other operating equipment.
- The system unit should be placed in a well-ventilated location with at least 1 m (3 ft) of clear space in the front, rear, and sides to allow for proper airflow and servicing.

Note

The system is mounted sideways on a slide shelf. Removable media is accessed on the left side; the power switch and cable ports are accessed on the right side.

- The system unit should not be exposed to direct sunlight or abrasive particles.
- The system should be placed within 4.57 m (15 ft) of the console terminal. (The console terminal is not supplied with the system kit.)

Note

Digital recommends that you DO NOT install the shelf in the lowest position in the cabinet. Installing and aligning the system with the bumpers and holes in the shelf is extremely difficult if the shelf is installed in the lowest cabinet position.

You must also select the location within the cabinet for the RM 4000-10xx. The system requires:

- 22.2 cm (8.75 in) of vertical cabinet mounting space
- 48.3 cm (19 in) of cabinet width mounting space
- 73.66 cm (29 in) minimum of cabinet depth mounting space:

  63.5 cm (25 in) for the system
  10.6 cm (4 in) for the cables

- Location of within 2 m (6 ft) of ac power source

The system unit must be mounted within cable routing distances. The RM 4000-10xx is shipped with a 7.58 m (25 ft) MMJ cable for connection to a console terminal. Refer to the appropriate documentation for other external option cable length requirements.

Note

The console terminal is not supplied with the system.

❶ VAX 4000-10xx System Unit

❷ DEC423 Terminal Cable (P/N 17-00811-03 / BC16E-25)

❸ One ThinWire Ethernet Connector (H8223) and Two Terminators (H8225)

❹ Power Cord (P/N 17-00606-16)

❺ Documentation and Software Licenses

❻ DSSI Terminator (P/N 12-29258-01)

❼ SCSI Terminator H8574-A (P/N 12-30552-01)

❽ Standard Ethernet Loopback Connector (P/N 12-22196-01)

❾ 25-Pin Adapter, D Sub to MMJ (P/N 17-32442-01 / H8575-A)

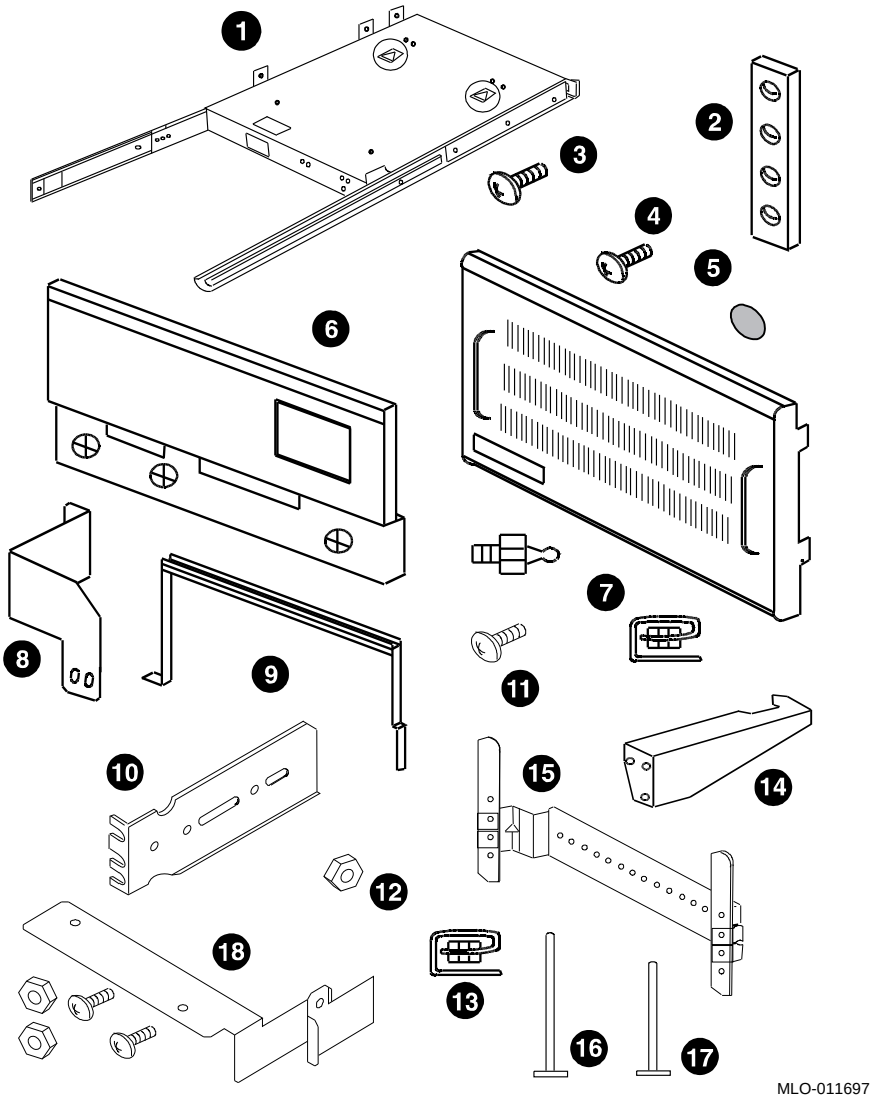
❿ Screw Lock Assembly (Qty 2) (P/N 90-08451-00)

⓫ VAX 4000 Model 100/100A/105A/106A Medallion (P/N 74-37642-28/31/32/34)

⓬ Shelf Kit (P/N 70-30949-01) (See Figure 1–2)

Installation Procedure

Figure 1–2 RM 4000-10xx Shelf Kit Contents (P/N 70-30949-01)



❶ Shelf Assembly

(The shelf comes partially assembled. See Appendix A if shelf is not assembled.)

❷ Chassis Slide Nut Bar, (Qty 4) (P/N 12-32830-01)

❸ Screw, Thread, 10-32 x 1/2, (Qty 22) (P/N 90-00063-39)

❹ Rackmount VAX 4000 Mounting Screws, (Qty 4) (P/N 90-009984-00)

❺ Bumper, Rubber, (Qty 4) (P/N 90-09538-01)

❻ Cable Barrier Kit, (Qty 1) (P/N 70-30960-01)

❼ Bezel, Vented Installation Kit, (Qty 1) (P/N 70-30934-01):

- U-nut, 10-32, (Qty 4) (P/N 90-07786-01)
- Ball Studs, (Qty 4) (P/N 90-11337-01)

❽ Shipping Bracket, (Qty 1) (P/N 74-46848-01)

❾ Shipping Strap, (Qty 1) (P/N 74-46849-01)

❿ Mounting Bracket, Long Rear, Both Left and Right (P/N 12-32829-01)

⓫ Screw, 8-32 x 3/8, (Qty 10) (P/N 90-00063-22)

⓬ Nut, kep 8-32 x .344E, (Qty 8) (P/N 90-06563-00)

⓭ U-nut, 10-32, (Qty 8) (P/N 90-07786-01)

⓮ Interlock Bracket, (Qty 1) (P/N 74-46988-01)

⓯ Cable Management Bracket, (Qty 1) (P/N 74-40319-01)

⓰ Tie Wrap, 7 inches, (Qty 2) (P/N 90-07880-00)

⓱ Tie Wrap, 11 inches, (Qty 2) (P/N 90-09617-00)

⓲ Door Restraining Kit, (Qty 1) (P/N 70-32585-01)

Installation Procedure

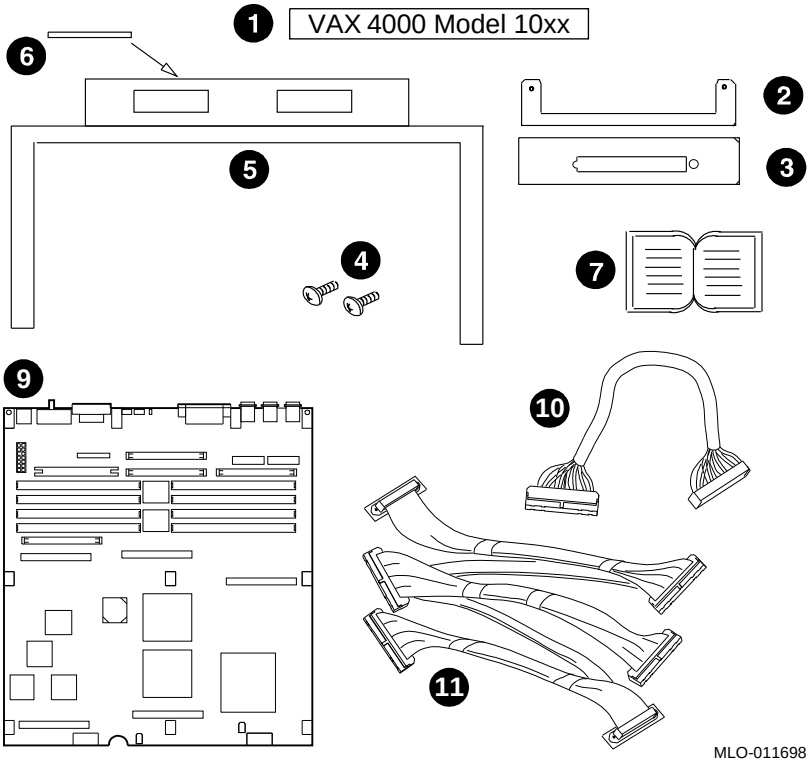
Field Installable Upgrade Kits

2. If you are converting a desktop system to an RM 4000-10xx system, ensure that you have the appropriate kits as described below:
   - To convert a VAX 4000 Model 100 to a rackmount VAX 4000 Model 100A with a single DSSI, you need the following items:
     – 2T-RAK41-AA Hardware Rackmount Kit (see Figure 1–3 for kit contents)
     – QZ-004AA-FW Firmware Upgrade Kit (refer to packing slip for kit contents)
     – QA-001AA-UW VMS Version 5.5.2H4 (refer to packing slip for kit contents)
     – 74-37642-31 Medallion, VAX 4000 Model 100A
   - To convert a VAX 4000 Model 100 to a rackmount VAX 4000 Model 100A with a dual DSSI, you need the following kit:
     – 2T-KFDDA-DF Single to Dual DSSI Upgrade and Rackmount Kit (see Figure 1–4 for kit contents)
   - To convert a VAX 4000 Model 100A/105A single/dual DSSI to a rackmount VAX 4000 Model 100A/105A single/dual DSSI respectively, you need the following kit:
     – 2T-RAK41-AA Hardware Rackmount Kit (see Figure 1–3 for kit contents)
   - To convert a VAX 4000-10xx single/dual DSSI to an RM 4000-106A single/dual DSSI respectively, you need the following kit:
     – 2T-RAK41-AB Hardware Rackmount Kit (see Figure 1–3 for kit contents)
   - To convert a VAX 4000-106A single/dual DSSI to an RM 4000-106A single/dual DSSI respectively, you need the following kit:
     – 2T-RAK41-AC Hardware Rackmount Kit (see Figure 1–3 for kit contents)

- To convert a VAX 4000 Model 100A/105A single DSSI to a rackmount VAX 4000 Model 100A/105A dual DSSI, you need the following kits:
  - 2T-RAK41-AA Hardware Rackmount Kit (see Figure 1–3 for kit contents)
  - 2T-KFDDA-AF Single to Dual DSSI Upgrade Kit (see Figure 1–5 for kit contents)
- To convert a VAX 4000 Model 100/100A single/dual DSSI to a rackmount VAX 4000 Model 105A single/dual DSSI you need the following kits:
  - 53XR-AA VAX 4000 Model 105A Upgrade Kit (See packing slip for kit contents)
  - 2T-RAK41-AA Hardware Rackmount Kit (See Figure 1–3 for kit contents)

Installation Procedure

Figure 1–3 2T-RAK41-AA/AB/AC Kit Contents (For Desktop to Rackmount System Conversion)



❶ VAX 4000 Model 10xx Medallion (P/N 74-37642-31/32/34)
❷ Bar Nut (P/N 74-46919-01)
❸ DSSI Plate Connector (P/N 74-46668-01)
❹ DSSI Plate Screws (Qty 2) (P/N 90-06001-02)
❺ Rackmount Cover Assembly (P/N 70-30948-01)
❻ Caution Label (Qty 1) (P/N 36-24385-01)
❼ Installation Manual (Qty 1) (P/N EK-465RA-IN)
❽ Shelf Assembly (Qty 1) (P/N 70-30949-01) (See Figure 1–2)
❾ 106A CPU Module (Qty 1) (P/N 54-21797-03) (2T-RAK41-AB only)
❿ Internal SCSI Cable (Qty 1) (P/N 17-02542-01) (2T-RAK41-AB/AC only)
⓫ DSSI Bus 0 Cable (Qty 1) (P/N 17-04189-01) (2T-RAK41-AB/AC only)

❶ Dual DSSI Card (Qty 1) (P/N 54-22444-01)

❷ Remote DSSI Bus Cable (Qty 1) (P/N 17-03778-01)

❸ Machine Screw 2.5 m (Qty 4) (P/N 90-10917-01)

❹ DSSI Terminator (Qty 2) (P/N 12-29258-01)

❺ Alignment Pin (Qty 4) (P/N 12-30363-01)

❻ Washer (Qty 4) (P/N 90-08877-00)

❼ Medallion, VAX 4000-10xx (Qty 1) (P/N 74-37642-31)

❽ Firmware Upgrade Kit (Qty 1) (P/N QZ-004AA-FW) (refer to packing slip for kit contents)

❾ VMS Version 5.5.2H4 Kit (Qty 1) (P/N QA-001AA-UW) (refer to packing slip for kit contents)

❿ VAX 4000-10xx Documentation Kit (Qty 1) (P/N QA-00HAA-GZ) (refer to packing slip for kit contents)

⓫ Hardware Rackmount Kit (Qty 1) (P/N 2T-RAK41-AA) (refer to Figure 1–3 for kit contents).

❶ Dual DSSI Card (Qty 1) (P/N 54-22444-01)

❷ Remote DSSI Bus Cable (Qty 1) (P/N 17-03778-01)

❸ Machine Screw 2.5 m (Qty 4) (P/N 90-10917-01)

❹ DSSI Terminator (Qty 2) (P/N 12-29258-01)

❺ Alignment Pin (Qty 4) (P/N 12-30363-01)

❻ Washer (Qty 4) (P/N 90-08877-00)

Step 3: Convert the VAX 4000-10xx to an RM 4000-10xx with Dual or Single DSSI

If you do not need to convert your desktop system to a rackmount system, proceed to **Step 4: Install the Shelf Assembly**.

To convert a desktop VAX 4000 Model 100 or 100A to a rackmount VAX 4000 Model 100A, perform the following procedure:

1. Ensure that the customer has backed up all data and shut down the system.
2. If upgrading from a Model 100 to Model 100A, perform the following steps. Otherwise, go to step 3.
   a. Install the VAX 4000-10xx Firmware Version 2.3 Upgrade Kit (P/N QZ-004AA-FW) if necessary. Use the instructions provided with the kit.
   b. Install VMS Upgrade Version 5.5.2H4 (P/N QA-001AA-UW) if necessary. Use the instructions provided with the kit.
3. If upgrading from a Model 100 or 100A to Model 105A, install the upgrade kit (P/N 53XR-AA) according to the directions provided with the kit. Otherwise, proceed to step 4.
4. Turn the power ON/OFF switch, located on the rear of the unit, to the OFF (O) position.
5. Disconnect the power cable from the unit.
6. Refer to Figure 1–6 and remove the external cables:
   a. Remove the external Q–bus cables:
      - Slide clip to the left.
      - Remove cable.
      - Slide clip to the right.
   b. Remove the external SCSI cable or terminator.
   c. Remove the external DSSI cable or terminator.
   d. Remove the Ethernet cable if necessary.
7. Remove the desktop enclosure cover (see Figure 1–6):
   a. Loosen (do not remove) the two captive screws ❶ (P/N 12-30338-05) on the rear of the unit holding the cover in place.

❶ Top cover screws (P/N 12-30338-05)

❷ Q–bus mounting hardware

❸ Locking/release tabs (one each side of bustle)

❹ Q–bus connectors

❺ DSSI connector

❻ SCSI connector

❼ Rear external bustle cover

❽ DSSI alignment pins (P/N 12-30363-01)

❾ DSSI connector screws (P/N 90-10917-01)

❿ SCSI connector screws (P/N 90-09643-00)

8. **If you are upgrading a VAX 4000 Model 100A/105A/106A, proceed to step 9 of this procedure.** If you are upgrading a VAX 4000 Model 100, remove the external bustle cover as follows (refer to Figure 1–6):

   a. Remove the two internal Q–bus cables (P/N 17-03545-01) from the rear of the unit by removing the mounting hardware ❷ (P/N 12-18672-01) holding the two Q–bus connectors ❹ to the bustle cover. **Save the mounting hardware.**

   b. Remove the DSSI internal I/O cable (P/N 17-03544-01) from the rear of the unit by removing the two cable screws ❾ on the DSSI connector ❺ and then pulling the cable straight back. **Save the cable screws.**

   c. Remove the internal SCSI cable (P/N 17-02944-01) from the rear of the unit by removing the two screws ❿ on the SCSI connector ❻ and then pulling the cable straight back. **Save the screws.**

   d. Remove the rear external bustle assembly ❼:

      - Push in the tabs ❸ on each side of the bustle ❼ and then remove the bustle by pulling the bustle to the rear and up off the frame.
      - Refer to Figure 1–7 and slide the metal grommeting ❷ attaching the frame ❶ to the enclosure I/O openings and pull the frame off the enclosure.

   e. Refer to Figure 1–6 and remove the two DSSI alignment pins ❽ from the bustle box.

   f. Proceed to step 10.

❶ Frame ❷ Metal grommeting

9. If you are upgrading a VAX 4000 Model 100A/105A/106A, refer to Figure 1–8 and remove the port cover ❻ as follows:

   a. Push on the tabs ❺ on each side of the port cover, and pull the cover to the rear and then up.

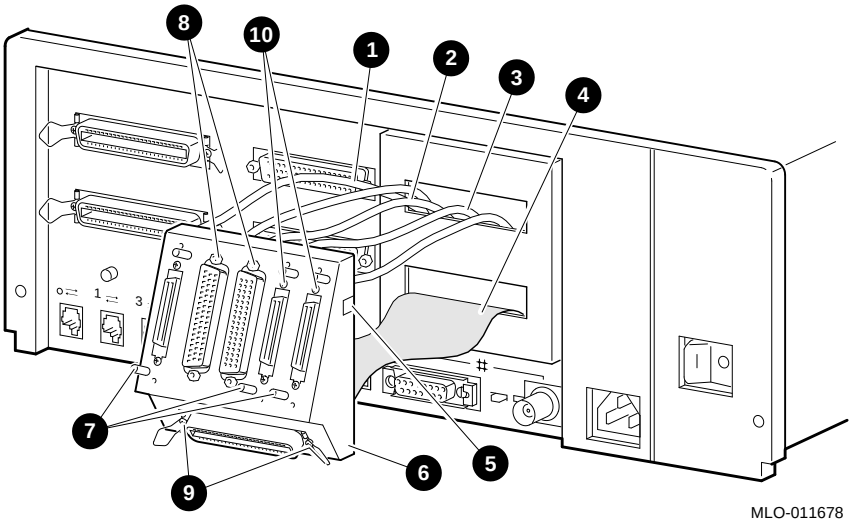
   b. Remove the alignment pins ❼ with a flat-blade screwdriver. **Save the alignment pins.**

   c. Remove the four Q–bus locking posts ❽ with a nut driver, and slide the Q–bus cable ❷ back into the enclosure. **Save the locking posts.**

   d. Remove the Phillips screws ❿ attaching the DSSI bus 0 and 1 cable ❶ ❸ connectors to the port cover ❻. Slide the cable(s) back into the enclosure. **Save the Phillips screws.**

   e. Remove the two screws ❾ from the internal SCSI cable ❹ connector, and slide the cable back into the enclosure. **Save the screws.**

Figure 1–8 VAX 4000-10xx Port Cover



❶ DSSI bus 0 cable (P/N 17-03544-01 or 17-04189-01)

❷ Q–bus cable (P/N 17-03545-01)

❸ DSSI bus 1 cable (P/N 17-03778-01)

❹ SCSI cable (P/N 17-02944-01)

❺ Tabs

❻ Port cover

❼ Alignment pins (P/N 12-30363-01)

❽ Q–bus locking posts (P/N 12-18672-00)

❾ SCSI connector screws (P/N 90-09643-00)

❿ Phillips screws (DSSI connector) (P/N 90-10917-01)

10. Reinstall the cables and the new top cover from the 2T-RAK41-AA/AB/AC kit:

    a. If upgrading a Model 100/100A/105A, refer to Figure 1–9 and reinstall the internal SCSI cable (P/N 17-02944-01) in the lower I/O cutout ❶ by reversing step 8c if you are upgrading a Model 100, or step 9e if you are upgrading a Model 100A/105A.

       If upgrading a Model 106A, refer to Figure B–5 and reinstall the internal SCSI cable (P/N 17-02542-01) in the new top cover provided with the 2T-RAK41-AA/AB/AC kit using the screws saved in step 8c or 9e.

    b. If upgrading a Model 100/100A/105A, reinstall the DSSI bus 0 cable (P/N 17-03544-01) in the upper I/O cutout ❷. If upgrading a Model 106A, reinstall the DSSI bus 0 cable (P/N 17-04189-01) in the lower I/O cutout ❶ and the upper I/O cutout ❷. Refer to Figure 1–9 and install as follows:

       - Install the bar nut assembly ❸ and DSSI plate connector ❹ using the screws ❺ (bar nut assembly, DSSI plate connector, and screws are provided with the 2T-RAK41-AA/AB/AC kits).
       - Install the DSSI cable by inserting the cable and tightening the two cable screws saved in step 8b if you are upgrading a Model 100, or step 9d if you are upgrading a Model 10xx.

❶ SCSI (Lower) I/O cutout

❷ DSSI (Upper I/O cutout

❸ Bar nut assembly (P/N 74-46919-01)

❹ DSSI plate connector (P/N 74-46668-01)

❺ Screws (Qty 2) (P/N 90-06001-02)

c. Refer to Figure 1–10. Attach the internal Q–bus cables ❶ to the new rackmount top cover bustle ❷ by reinstalling the mounting hardware saved in step 8a if you are upgrading a Model 100, or step 9c if you are upgrading a Model 10oA/105A/106A.

d. Attach the caution label ❹ from the 2T-RAK41-AA kit to the new top cover bustle ❷. Position the label so that it can be read when facing the rear of the unit.

❶ Internal Q–bus cables (P/N 17-03545-01)

❷ Rackmount top cover (P/N 70-30948-01) bustle

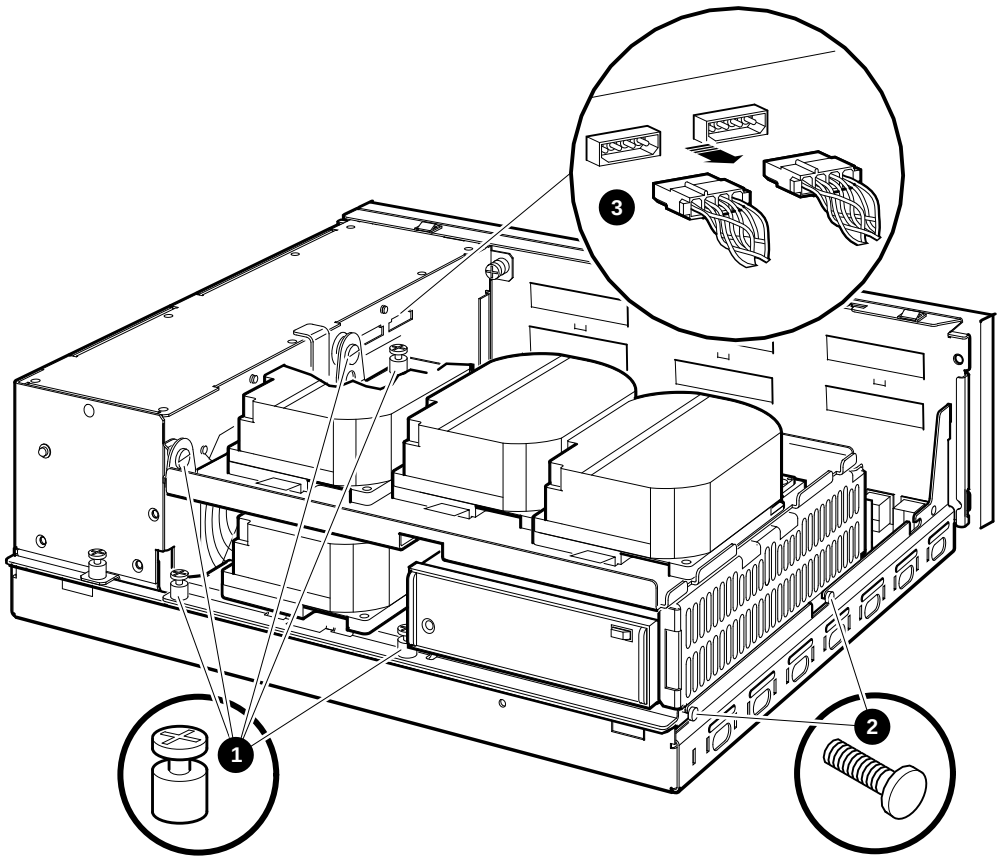
❸ Screws (P/N 12-30338-05)

❹ Caution label (P/N 36-24385-01)

11. If you are converting a VAX 4000-10xx single DSSI to an RM 4000-10xx dual DSSI, or if you are upgrading a VAX 4000 Model 100/100A/105A to a 106A, perform the following steps. **If you are not making these conversions, proceed to step 12 of this procedure.**

    a. Refer to Figure 1–11. Remove the upper and lower drive mounting shelves together as a single unit (it is not necessary to disassemble the shelves themselves). Unscrew all six screws from the shelves; leave the captive screws ❶ in position and save the Phillips screws ❷ for reinstallation of the shelves. Remove the internal power cables ❸.

Figure 1–11 Disconnecting the Internal Power Cables



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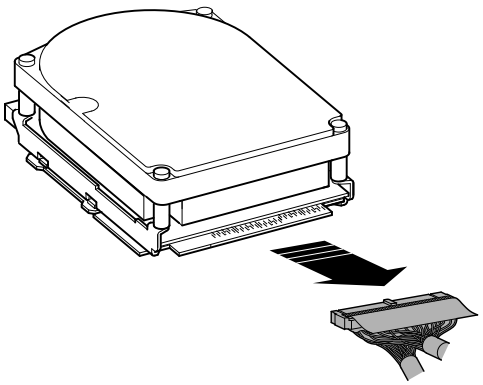
❶ Captive Screws (5)

❷ Phillips Screws (2)

❸ Internal Power Cables

b. Disconnect the internal DSSI bus connectors from all drives mounted on the shelves. It is not necessary to disconnect the power cable from each drive. Figure 1–12 shows one drive as an example.

Figure 1–12 Disconnecting Internal DSSI Connectors



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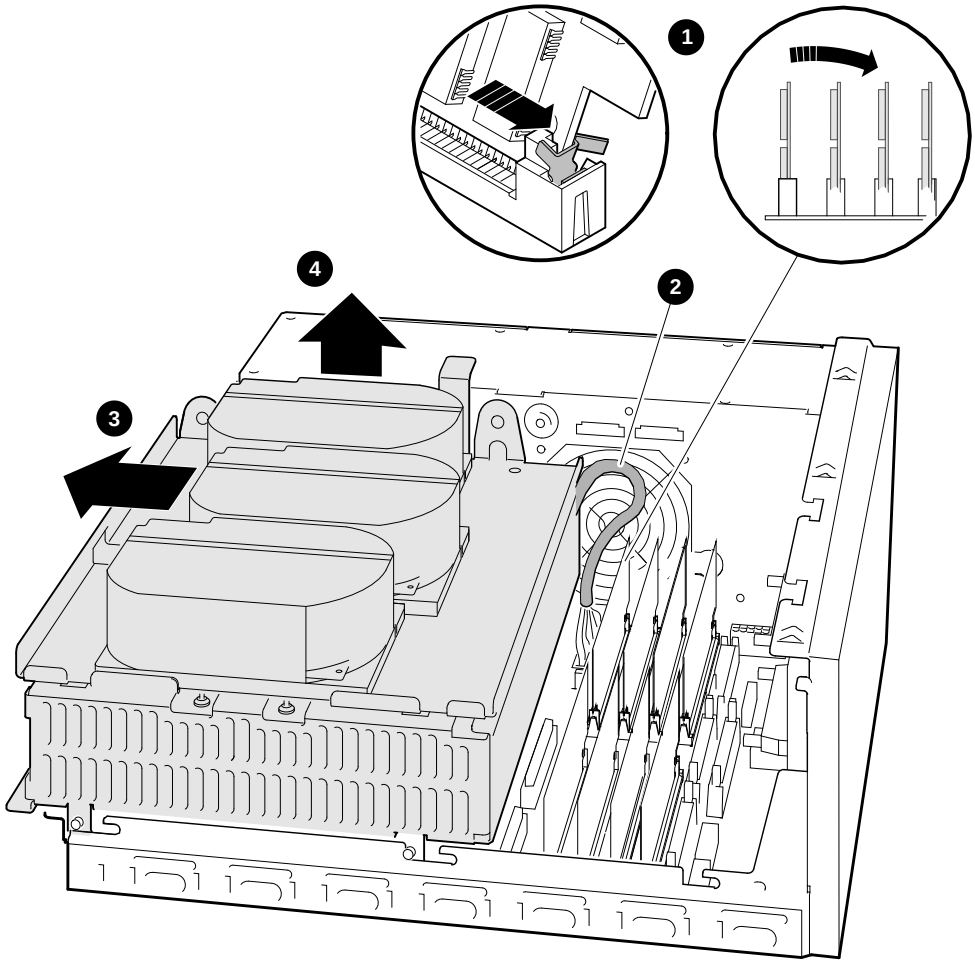
c. Disconnect the internal SCSI cable from the backplane (see Figure 1–13:

- Release the memory module nearest the internal SCSI connector by pressing the tabs on each end, and tip it backward ❶.
- Disconnect the internal SCSI cable ❷ from its connector on the backplane.

d. Remove the shelves by sliding them forward ❸ and lifting them up ❹ and away from the enclosure (see Figure 1–13). Leave the memory module tipped backward until the shelves are reinstalled.

Figure 1–13 Disconnecting the Internal SCSI Cable



❶ Releasing the memory module and tipping it backward

❷ Internal SCSI cable

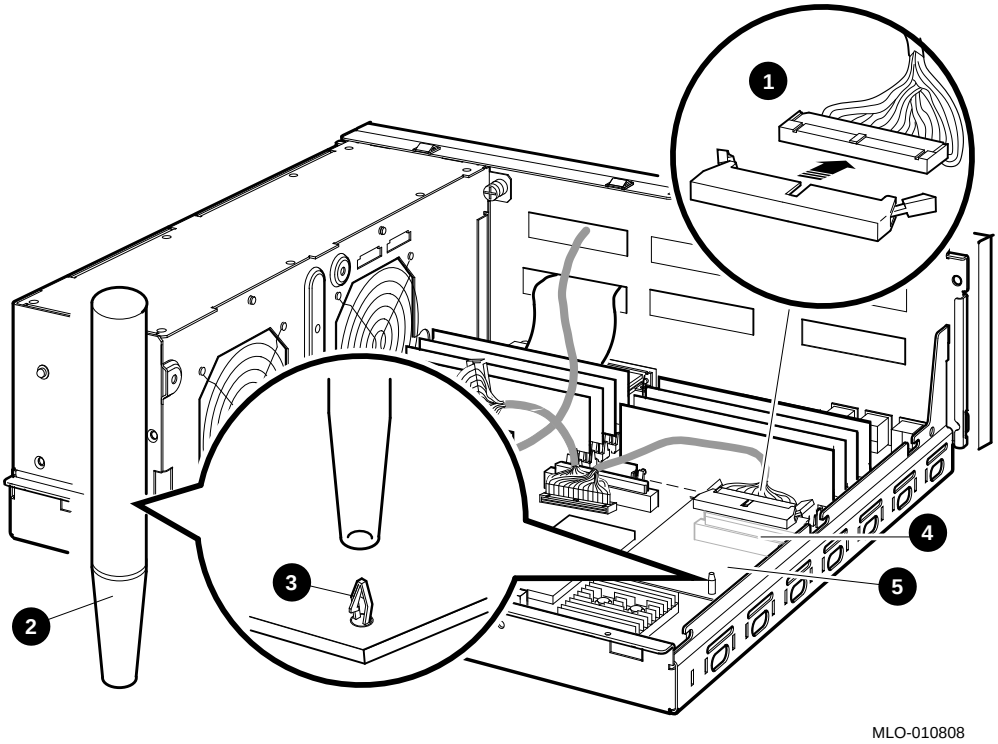
❸ Sliding the shelf forward

❹ Lifting the shelf up

e. Refer to Figure 1–14. Disconnect the DSSI cable from the DSSI connector ❶.

f. Remove the single DSSI card ❺ by gently prying it loose from the backplane connector ❹. Use a standoff tool ❷ to compress the post so that the corner of the card can be lifted off of the standoff ❸. Lift the card out and place it on an antistatic mat.

Figure 1–14 Removing the Single DSSI Card



❶ DSSI Connector

❷ Standoff removal tool

❸ Standoff

❹ Backplane connector

❺ Single DSSI Card (P/N 54-21837-01)

g. If you are upgrading a VAX 4000 Model 100/100A/105A to a 106A, replace the CPU module with the CPU module that is provided in the 2T-RAK41-AB/53XRA-BW kit. Refer to Section 4.9 for the CPU removal and replacement procedures.

h. Refer to Figure 1–15. Install the dual DSSI card ❶ (provided with the 2T-KFDDA-AF/DF kit) onto the backplane. Align the new card on the standoffs ❷ so that it is positioned above the backplane connector, then gently seat it onto the connector and the standoffs.

i. Connect the DSSI bus 1 cable ❺ (provided with the 2T-KFDDA-AF/DF kit) into the DSSI card connector that is closest to the front of the system (see Figure 1–15).

j. Reconnect the DSSI bus 0 cable ❹ into the DSSI card connector that is closest to the rear of the system (see Figure 1–15).

k. Replace the shelves by reversing step 11d.

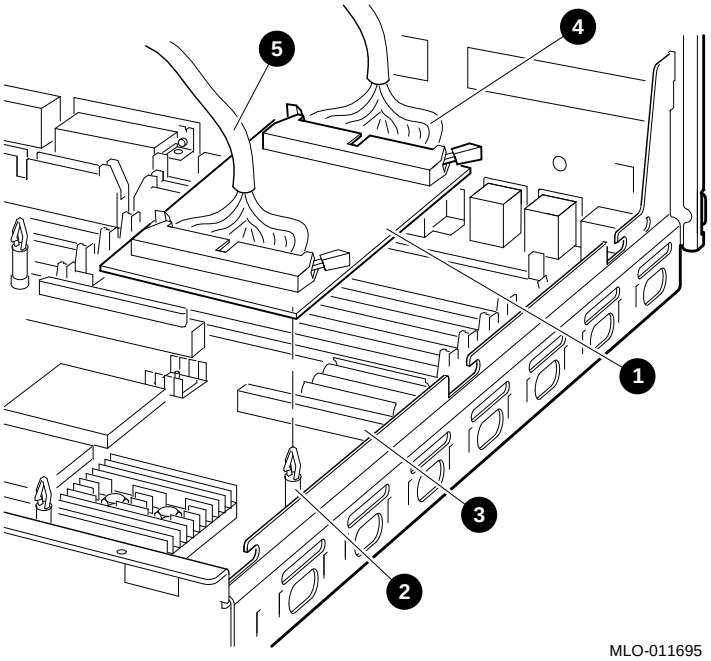
l. Connect the internal SCSI connector by reversing step 11c.

m. Connect the internal DSSI bus connectors to all drives mounted on the shelves by reversing step 11b.

n. Connect the power cables by reversing step 11a.

Installation Procedure

Figure 1–15 Installing the Dual DSSI Card



❶ Dual DSSI Card (P/N 54-22444-01)

❷ Standoff

❸ Backplane Connector

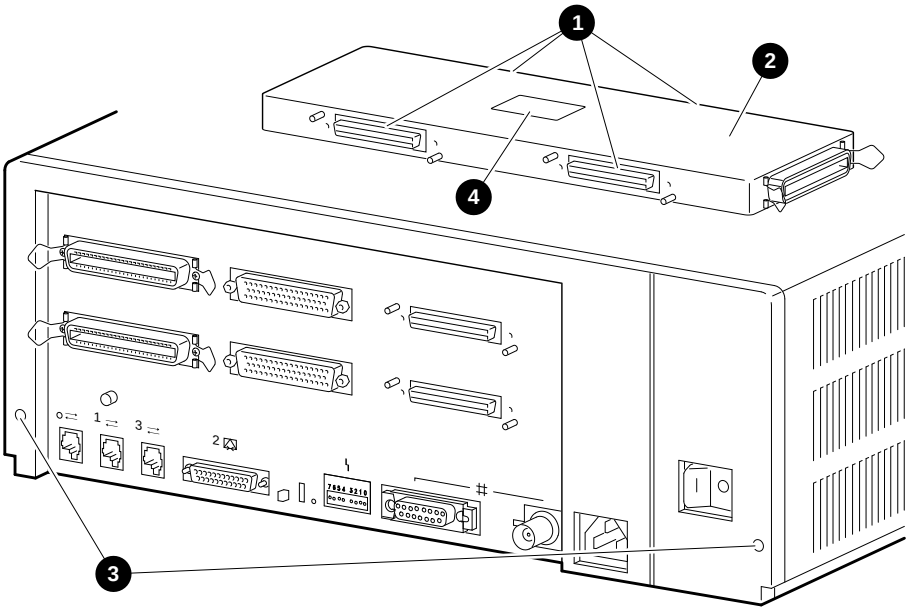
❹ DSSI Bus 0 Cable (P/N 17-03544-01 or 17-04189-01)

❺ DSSI Bus 1 Cable (P/N 17-03778-01)

12. Refer to Figure 1–16 and partially install the new rackmount top cover ❷.
13. If present, reinstall the DSSI connector for the DSSI bus 1 cable (P/N 17-03778-01) (provided with the 2T-KFDDA-AF/DF kit) on the top cover using the screws saved in step 8b if you are upgrading a Model 100, or step 9d if you are upgrading a Model 100A/105A/106A.
14. Connect the Q–bus and SCSI cables to the CPU module (refer to Figure 4–5 for module locations).
15. Fully install the cover by tightening the two captive screws ❸ in the rear of the unit to hold the cover in place.

Installation Procedure

Figure 1–16 Installing New Rackmount Top Cover



❶ DSSI/Q–bus cable connector ports

❷ Rackmount top cover (P/N 70-30948-01)

❸ Top cover screws (P/N 12-30338-05)

❹ Caution label (P/N 36-24385-01)

❶ VAX 4000 Model 100A/105A/106A Medallion (P/N 74-37642-31/32/34)

❷ Rackmount top cover (P/N 70-30948-01)

Installation Procedure

Step 4: Install the Shelf Assembly

Warning

The VAX 4000-10xx system when mounted on the shelf weighs 27 kg (60 lbs) depending on the configuration. Ensure that you use the appropriate number of personnel when installing the shelf.

Note

If shelf is not assembled, see Appendix A for instructions.

To install the shelf assembly, refer to Figure 1–18 and proceed as follows:

1. Lift the slide locking arms and the slide shelf out far enough to reach the screws ❶ and nuts ❷ holding the front mounting brackets ❺ to the slides ❹.
2. Ensure that the screws ❶ and nuts ❷ holding the front mounting brackets are tight. The front mounting bracket comes attached to the slide.
3. Install the rear mounting bracket ❸ to the slides ❹ as shown in Figure 1–18. Do not tighten the screws ❶.
4. Return the slides ❹ to the locked position.

Note

Figure shows setup for standard cabinet depth (25 in). Slots used may differ depending on cabinet depth.

❶ Screws (P/N 90-00063-22)

❷ Kep Nuts (P/N 90-06563-00)

❸ Rear Mounting Bracket (P/N 12-32829-01)

❹ Locking Slides (P/N 12-39896-01)

❺ Front Mounting Bracket (P/N 12-32831-01)

❻ Locking Slide Mechanism

Installation Procedure

Step 5: Install the VAX 4000-10xx System on the Shelf

Warning

The VAX 4000 Model 10xx system when mounted on the shelf weighs 27 kg (60 lbs) depending on the configuration. Ensure that you use the appropriate number of personnel when installing the system on the shelf.

Note

Digital recommends that you do not install the shelf in the lowest position in the cabinet. Installing and aligning the system with the bumpers and holes in the shelf is extremely difficult if the shelf is installed in the lowest cabinet position.

To install the system on the shelf, refer to Figure 1–21 and perform the following steps:

1. Lift the slide locking arms ❶ and fully extend the shelf ❸. Ensure that the slide locks latch the shelf in place.

Caution

Only use the hardware provided with the shelf assembly kit. Never use mounting screws longer than 5/16 inch to prevent damage to internal components. Always use bumpers between the shelf and the system unit.

2. Install the self-sticking bumpers ❺ (P/N 90-09538-01) on shelf as shown in Figure 1–21.
3. Position the system on the shelf with the I/O port facing the right side of the cabinet as viewed from the front.

❶ Slides

❷ Latch

❸ Shelf

❹ Screws (4) (P/N 90-09984-00)

❺ Bumpers (4) (P/N 90-09538-01)
Use of bumpers is mandatory.

Step 6: Install Cable Management Bracket

Install the Cable Management Bracket in the rear of the cabinet (see Figure 1–22:

1. Install four U-nuts ❶ on cabinet rail.
2. Install cable management bracket ❸ to rails by inserting screws ❷ through the cable management bracket, then through the rail, then through the U-nuts.

Note

Due to the large variety of available cabinets, it is beyond the scope of this manual to cover installation and dressing of cables within the cabinet, or placement of the cable management bracket. Refer to your system cabinet documentation or cabinet vendor for cabinet cabling instructions.

❶ U-nuts (P/N 90-07785-01)

❷ Screws (P/N 90-00063-39)

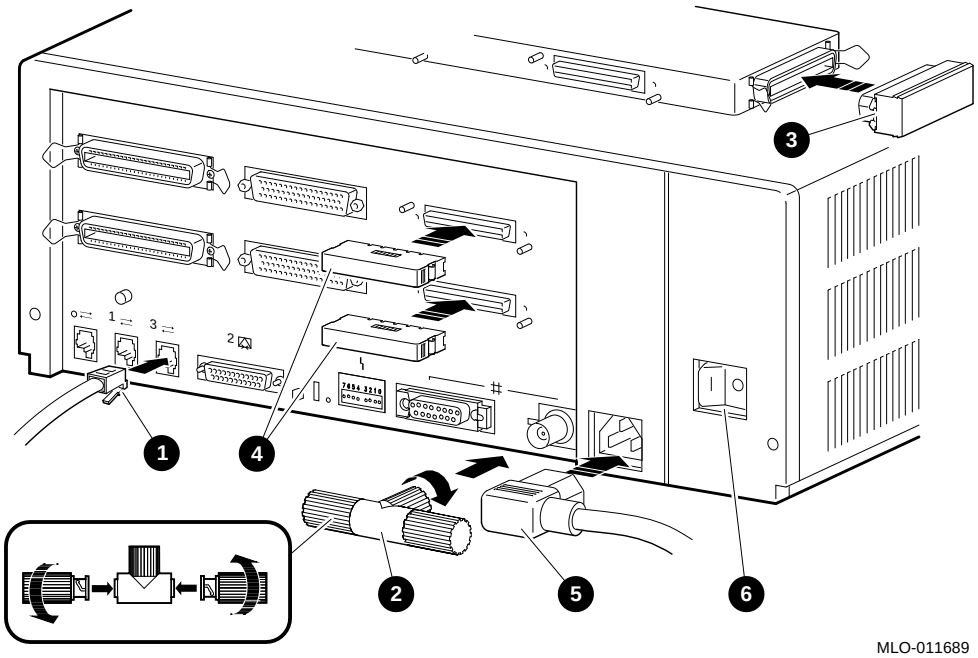
❸ Cable Management Bracket (P/N 74-40319-01)

Step 7: Install I/O Terminators and/or Option Cables

To install I/O terminators, console cable and power cord refer to Figure 1–23 and perform the following steps:

1. Connect the Console Terminal:
   a. Connect one end of the terminal cable ❶ to the modified modular jack (MMJ) port 3. The system is shipped with a label covering ports 0 and 1. After port 3 is properly identified as the console port, the OPA0 arrow label may be removed.
   b. Connect the other end of the terminal cable ❶ to the console terminal.
2. Connect the ThinWire Terminator:
   a. Assemble the T-connector and the two terminators to form a ThinWire terminator ❷.
   b. Connect the ThinWire terminator ❷ to the ThinWire Ethernet port.
3. Connect the SCSI Terminator:
   a. Connect the SCSI terminator ❸ to the SCSI port.
   b. Close the bail lock loops.
4. Connect the DSSI terminators ❹ to the DSSI ports.
5. Connect the Power Cord:
   a. Ensure that the ON/OFF switch ❻ is in the OFF (O) position.
   b. Connect the power cord ❺ to the system unit.
   c. Connect the other end of the power cord to an ac power source.
6. Use four tie wraps (P/N 90-07880-00 Qty 2, and P/N 90-09617-00 Qty 2) to secure the console terminal cable and power cord to the cable management bracket.

Figure 1–23 Making Console Connections



❶	Terminal cable	❹	DSSI terminators
❷	ThinWire terminator	❺	Power cord
❸	SCSI terminator	❻	ON/OFF switch

Installation Procedure

Refer to Appendix B and the *VAX 4000 Model 10xx Operator Information Manual* for information on connecting cables to the system for the following options:

- Connect the I/O MMJ ports 0 through 1.
- Connect the I/O asynchronous connectors.
- Connect the I/O synchronous connectors.
- Connect the I/O RS232 full modem port.
- Connect the external DSSI cables.
- Connect the external SCSI cables.
- Connect the I/O Q–bus connectors.

Note

Due to the large variety of available cabinets, it is beyond the scope of this manual to cover installation and dressing of cables within the cabinet, or placement of the cable management bracket. Refer to your system cabinet documentation or cabinet vendor for cabinet cabling instructions.

❶ Cabinet rails
❷ Tabs (3)
❸ Cable barrier (P/N 74-47072-01)
❹ Screws (3) (P/N 90-00026-03)
❺ Rubber washer (3) (P/N 90-10837-01)
❻ Metal washer (3) (P/N 90-08200-00)
❼ Slides
❽ Shelf

Step 9: Check the Power-Up Test Results

The power-up test can take several minutes to complete, depending on the number of options installed and the default console terminal settings you use.

To check the power-up test results:

1. Turn on the console terminal. Wait until the power-up test is complete. Refer to the terminal documentation for more information.
2. Check the terminal settings. Refer to the *VAX 4000 Model 10xx Operator Information Manual* for the list of correct settings.
3. Refer to Figure 1–23 and turn on the system unit by setting the ON/OFF switch ❻ to the ON (|) position.
4. If the power-up test results on the screen are similar to the results in Example 1–1, the system has passed the power-up test. Go to step 10.
5. If the power-up test results on the screen are not similar to the results in Example 1–1, the system has not passed the power-up test. See Example 1–2 for a typical failure.

Note

If a failure occurs, refer to *VAX 4000 Model 10xx Troubleshooting and Diagnostics Information Manual*.

Example 1–1 Successful Power-Up Test Screen

```
KA52-A V1.1, VMB 2.14  ❶
Performing normal system tests.
72..71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..
56..55..54..53..52..51..50..49..48..47..46..45..44..43..42..41..  ❷
40..39..38..37..36..35..34..33..32..31..30..29..28..27..26..25..
24..23..22..21..20..19..18..17..16..15..14..13..12..11..10..09..
08..07..06..05..04..03..
Tests completed.  ❸
>>>  ❹
```

❶ Central Processing Unit (CPU) Name, Firmware Version Number, and Virtual Memory Boot (VMB) Version Number

❷ Read-Only Memory (ROM) based diagnostics countdown

❸ Status Message

❹ Console Prompt

If SIMM_OD is not present or not plugged in correctly, the system responds with a display similar to the following example:

Example 1–2 Unsuccessful Power-Up Test Screen

```
KA52-A V1.1, VMB 2.14
Performing normal system tests.
72..71..70..69..68..67..66..65..64..63..62..
                                                    ❶
? Test_Subtest_DC_88  Loop_Subtest=05  Err_Type=FF   DE_NO_Memory_present.lis
Vec=0000  Prev_Errs=0000  P1=E04EE04E  P2=00000000   P3=00000000  P4=00001006
P5=00000000  P6=7F337F7F  P7=00000000  P8=00000000   P9=FFFF0000 P10=2006270C
r0=00000008  r1=21018000  r2=E04EE04E  r3=80000000   r4=01000000  r5=04000000
r6=00000002  r7=00000000  r8=00000000  r9=20140758  r10=FFFFFFFE r11=FFFFFFFF
 dser=0000 cesr=00000000 icsr=01 pcsts=F800 pcctl=FC00 cctl=00000006
 bcetsts=03E0 bcedsts=0400 cefsts=00007E80 nests=00 mmcdsr=01FFFE40
 mesr=00000000
                                                              ❷
Error:  SIMM Set 0 (0A,0B,0C,0D), SSR = E04E
 SIMM_0A = 16MB      SIMM_0B = 16MB      SIMM_0C = 16MB      SIMM_0D = 00MB ??

Total of 0MB, 0 good pages, 0 bad pages, 0 reserved pages
Normal operation not possible. ❸

>>>
```

❶ Error Message

❷ Error Summary showing SIMM "0D" is missing

❸ Status Message

Step 10: Install the Front Bezel

To install the front bezel:

1. Install four U-nuts ❶ and ball studs ❷ onto the cabinet rails ❹ as shown in Figure 1–25.

Note

If the system is to be shipped in the cabinet, install the shipping strap and bracket (see Section 4.2).

2. Lift the locks on the slides and slide the system into the cabinet.
3. Install the front bezel ❸ on the cabinet by aligning the mounting holes with the ball studs. Press the bezel against the ball studs.
4. If necessary, affix the self-adhesive medallion ❻ (provided with the system or with the 2T-KFDDA-DF or 2T-RAK41-AA/AB/AC kits) to the lower left corner of the bezel.

❶ U-nuts (P/N 90-07786-01)

❷ Ball studs (P/N 90-11337-01)

❸ Bezel (P/N 74-30961-01)

❹ Cabinet rails

❺ Bezel hand grips

❻ VAX 4000 Model 10xx medallion (P/N 74-37642-31/32/34)

Step 11: Connecting the System to a Network

For more information on connecting the system to a network, see the *VAX 4000 Model 10xx Operator Information Manual.*

Step 12: Connecting External Options to the System

For more information on connecting external options to the system, see the *VAX 4000 Model 10xx Operator Information Manual.*

Step 13: Booting the Operating System

If the hard disks are factory installed, then the system is supplied with factory installed software (FIS) on the system disk. Boot the operating system following the procedures in the *VMS Factory Installed Software User Guide.*

2

Operator Access and Control Procedure

The RM 4000-10xx is designed to be mounted in a cabinet enclosure. To access the operation and control switches, or to load media devices, the unit must be extended outside the cabinet by performing the following two steps:

1. Remove the front bezel by pulling on the bezel hand grips ❶ (see Figure 2–1).
2. Lift both slide locks and fully extend the slides.

For identification and description of all switches, indicators, operation of load media, and system setup for networks and external options, see the *VAX 4000 Model 10xx Operator Information Manual* supplied with your system.

For a description of the RM 4000-10xx console and boot device commands, as well as special system security features, refer to the *VAX 4000 Model 10xx Customer Technical Information Manual* supplied with your system.

3
Troubleshooting and Diagnostics

Note

Before performing any troubleshooting or diagnostic tests, ensure that the end user has backed up all disks to their satisfaction and has shutdown the system software. It is the end user's responsibility to ensure all system software and data is backed up and the system is shutdown properly.

Remove the cable barrier before installing any loopback or test cables. Refer to Figure 1–24.

For all troubleshooting and diagnostic information, refer to the *VAX 4000 Model 10xx Troubleshooting and Diagnostics Information Manual*.

4

Maintenance and FRU Replacement Procedures

Note

Before performing any maintenance or FRU replacement procedures, ensure that the end user has backed up all disks to their satisfaction, and has shutdown the system software. It is the end user's responsibility to ensure that all system software and data has been backed up and the system is shutdown properly.

This chapter provides procedures for:

- Accessing the RM 4000-10xx
- Removing and installing the shipping strap and bracket
- Removing the enclosure cover
- Removing and replacing the internal Q–bus cables
- Removing and replacing the DSSI bus 0 cable (P/N 17-03544-01 or 17-04189-01)
- Removing and replacing the DSSI bus 1 cable (P/N 17-03778-01)
- Removing and replacing the internal SCSI cable (P/N 17-02944-01 or 17-02542-01)
- Removing and replacing the DSSI card (single or dual)
- Removing and replacing the CPU module

4.1 Accessing the RM 4000-10xx

The RM 4000-10xx is designed to be mounted in a cabinet enclosure. To access the unit, the unit must be extended outside the cabinet by performing the procedure described in Chapter 2.

4.2 Removing and Installing the Shipping Strap and Bracket

To remove the shipping strap and bracket, perform the following steps:

Note

The shipping bracket should be removed before removing the shipping strap, and the shipping strap should be installed before installing the shipping bracket.

Shipping Bracket

- To install or remove the rear shipping bracket you must first access the rear of the cabinet (refer to your system cabinet documentation for the access procedure).
- To install the rear shipping bracket:
  a. Install four U-nuts ❷, ❺ to the cabinet rails on the right side of the cabinet, directly behind and above the system. See Figure 4–1 for hole locations.
  b. Install the rear shipping bracket ❶ to the cabinet rails using two Phillips head screws ❸.
  c. Attach the rear shipping bracket ❶ to the shelf assembly using two Phillips screws ❹.
- To remove the rear shipping bracket:
  a. Locate the rear shipping bracket ❶ on the right side of the cabinet, directly behind the system unit (see Figure 4–1).
  b. Remove two Phillips head screws ❹ attaching the rear shipping bracket to the shelf assembly. Install the screws into the empty U-nuts ❺ on the cabinet rail.

❶ Rear shipping bracket (P/N 74-46848-01)

❷ U-nuts (P/N 90-07786-00)

❸ Phillips screws (P/N 90-00063-39)

❹ Phillips screws (P/N 90-00063-39)

❺ U-nuts (P/N 90-07786-00)

Shipping Strap

The shipping strap is held in place by a single screw (P/N 90-00063-39) located on top of the shelf. To remove the shipping strap, refer to Figure 4–2 and:

1. Remove the front bezel.
2. Pull the shelf out.
3. Remove the screw holding the strap in place.
4. Lift the strap from the end with the screw until it clears the top of the unit.
5. Push down on the strap at the front of the shelf to free the strap.
6. If present, cut the tie wrap restraining the Q–bus cables to the cable bundle and install the Q–bus cables in the top cover bustle. Refer to Section B.8 for Q–bus cable installation instructions.

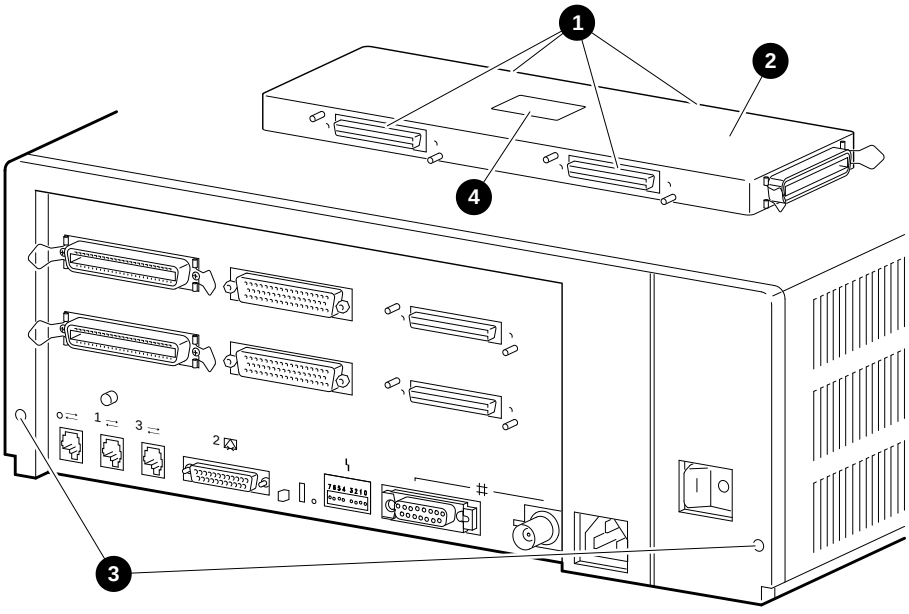
To install the shipping strap perform steps 1 through 6 in reverse order.

4.3 Removing the Rackmount Enclosure Cover (P/N 70-30948-01)

To remove the rackmount enclosure cover:

1. Fully extend the shelf containing the RM 4000-10xx to be serviced from the cabinet. Observe the cables as the unit is being pulled out to ensure that they do not get pinched or caught in the cabinet.
2. Remove the cable barrier by loosening the three captive screws (see Figure 1–24.
3. Turn the power ON/OFF switch, located in the rear of the unit, to the OFF (O) position. Figure 1–23 shows the location of the ON/OFF switch.
4. Disconnect any cables that are connected to the enclosure cover I/O ports or any cables ❶ attached to the top cover ❷. Remove the ac power cord.
5. Loosen (do not remove) the two captive screws ❸ in the rear of the unit holding the cover in place (see Figure 4–3).

Figure 4–3 Removing the Rackmount Enclosure Cover



❶ Internal Q–bus cables and DSSI cables (two each, front and rear of bustle)

❷ Rackmount top cover (P/N 70-30948-01)

❸ Captive screws (P/N 12-30338-05)

❹ Caution label (P/N 36-24385-01)

Caution

To prevent damage to internal cables and components, do not remove cover more than 4.4 cm (2 in) without disconnecting the internal Q-bus cable from the CPU board.

6. Slide the top cover forward 4.4 cm (2 in.) maximum, and disconnect the internal Q–bus and SCSI cables from the CPU module inside the enclosure. Figure 4–5 shows the location of the internal Q–bus cable and SCSI cable.
7. If present, remove the two DSSI connectors from the top cover by removing the four screws and pulling the cable straight back. See Figure 4–4.
8. Slide the cover completely off by pushing forward and upward. Ensure that the internal Q–bus and DSSI cables do not get caught on any modules or disk drives located inside of the enclosure.

To reinstall the cover:

1. Partially install the top cover.
2. If present, connect the two DSSI connectors by inserting them into the top cover bustle ports and installing the four screws that were removed in step 7 of the removal procedure (see Figure 4–4).
3. Install the top cover to within 4.4 cm (2 in) of the system unit.
4. Connect the internal Q–bus and SCSI cables to the CPU module inside of the enclosure (see Figure 4–5 for module location).
5. Fully install the cover and tighten the two captive screws ❸ in the rear of the unit (see Figure 4–3).

Figure 4–4 Removing and Installing the Two DSSI External Bus Connectors

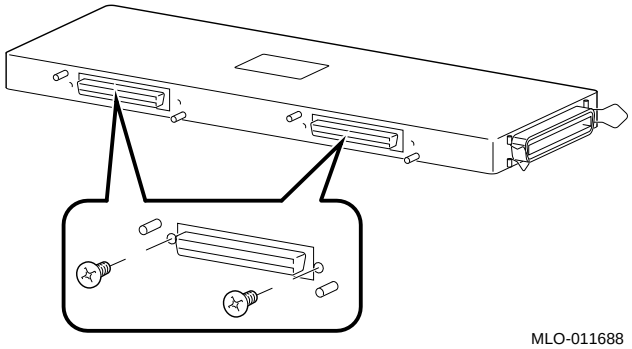


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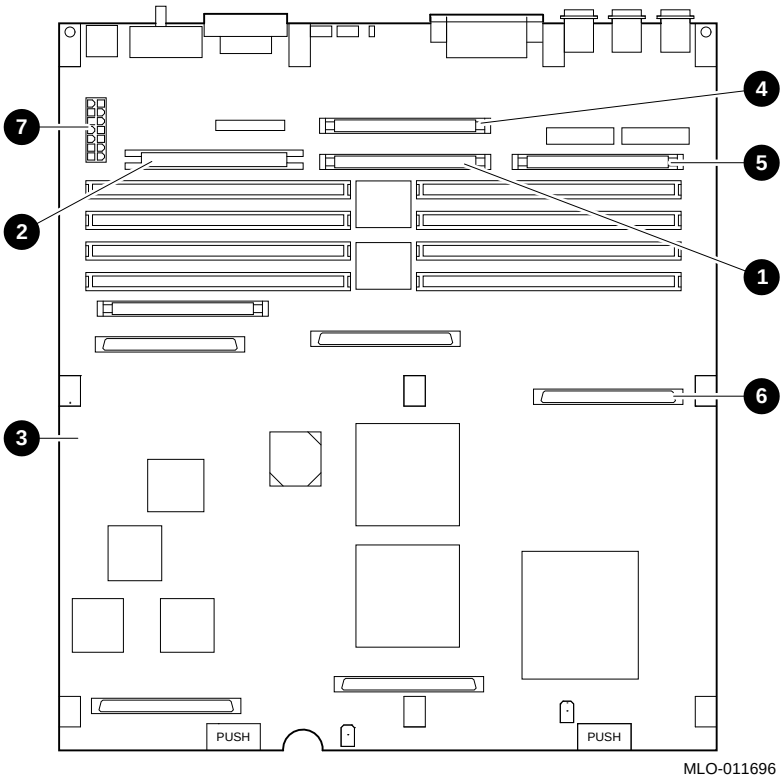
Figure 4–5 Internal Connectors



❶ Q–bus Input/Output Cable Connector

❷ SCSI Cable Connector

❸ CPU Module

❹ Synchronous Cable Connector

❺ Asynchronous Cable Connector

❻ DSSI Connector

❼ CPU Power Connector

❶ Q–bus connectors (P/N 17-03545-01)

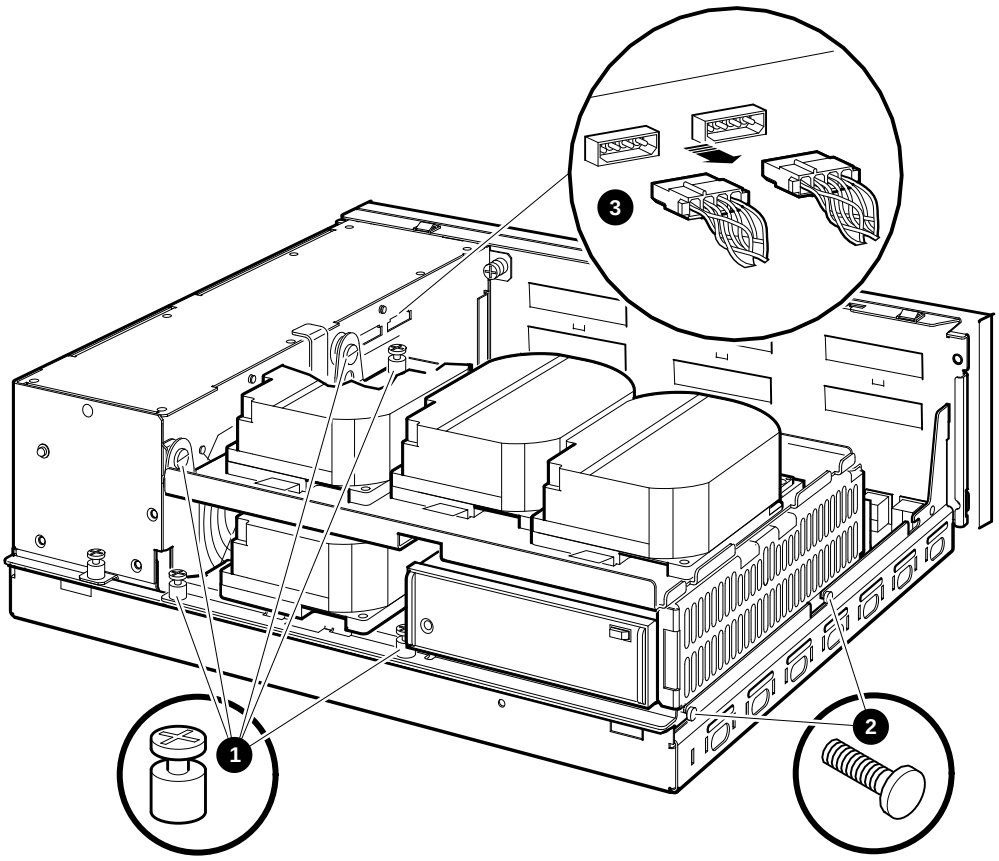
❷ Q–bus mounting hardware (P/N 12-18672-01)

4.6 Removing and Replacing the DSSI Bus 1 Cable (P/N 17-03778-01)

To remove and replace the DSSI bus 1 cable (P/N 17-03778-01), perform the following procedure:

1. Access the unit according to the procedure in Section 4.1.
2. Remove the enclosure cover according to the procedure in Section 4.3.
3. Refer to Figure 4–8. Remove the upper and lower drive mounting shelves together as a single unit (it is not necessary to disassemble the shelves themselves). Unscrew all six screws from the shelves; leave the captive screws ❶ in position and save the Phillips screws ❷ for reinstallation of the shelves. Remove the internal power cables ❸.

Figure 4–8 Disconnecting the Internal Power Cables



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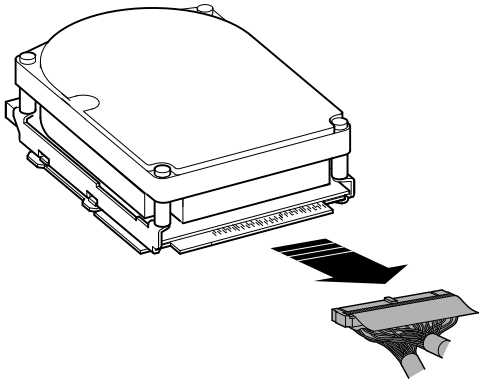
❶ Captive Screws (5)

❷ Phillips Screws (2)

❸ Internal Power Cables

4. Disconnect the internal DSSI connectors from all drives mounted on the shelves. It is not necessary to disconnect the power cable from each drive. Figure 4–9 shows one drive as an example.

Figure 4–9 Disconnecting Internal DSSI Connectors



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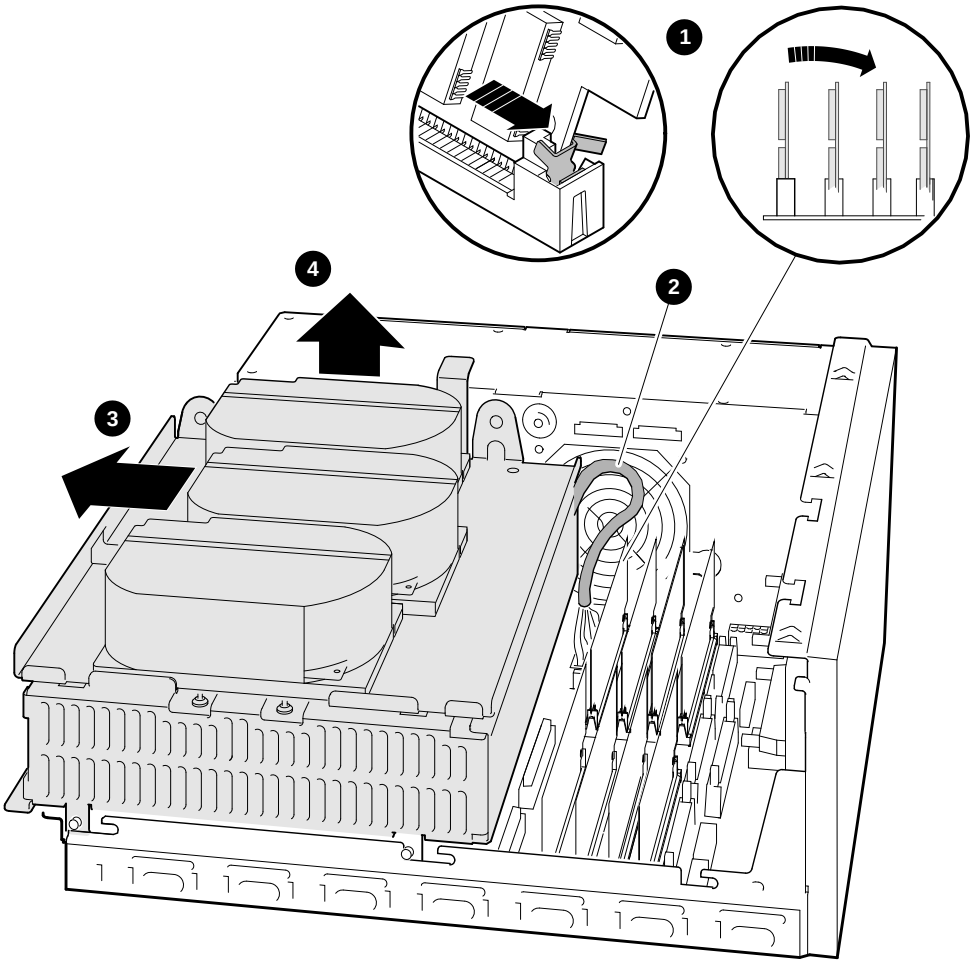
5. Disconnect the internal SCSI cable from the backplane (see Figure 4–10):
   a. Release the memory module nearest the internal SCSI connector by pressing the tabs on each end, and tip it backward ❶.
   b. Disconnect the internal SCSI cable ❷ from its connector on the backplane.
6. Remove the shelves by sliding them forward ❸ and lifting them up ❹ and away from the enclosure (see Figure 4–10). Leave the memory module tipped backward until the shelves are reinstalled.

Figure 4–10 Disconnecting the Internal SCSI Cable



❶ Releasing the memory module and tipping it backward

❷ Internal SCSI cable

❸ Sliding shelves forward

❹ Lifting shelves up

❶ DSSI cable

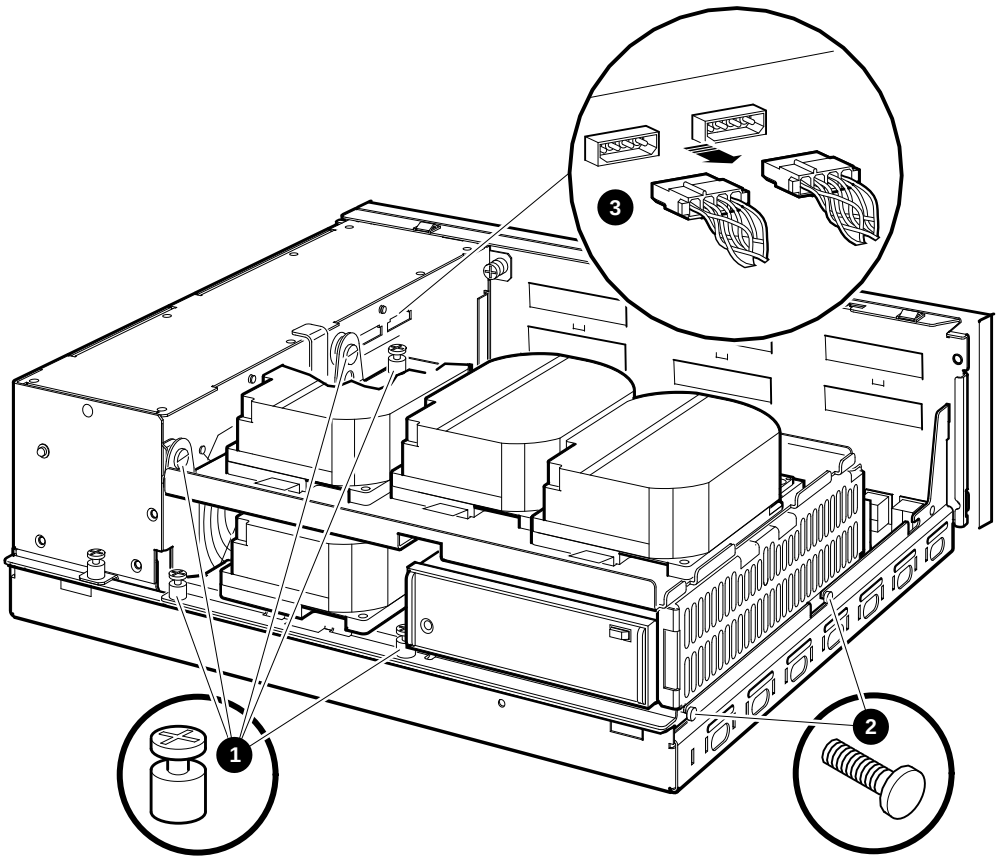
❷ Removing DSSI cable from DSSI connector

4.8 Removing and Replacing the DSSI Card

To remove and replace a DSSI card, either single or dual, follow this general procedure:

1. Access the unit according to the procedure in Section 4.1.
2. Remove the enclosure cover according to the procedure in Section 4.3.
3. Refer to Figure 4–13. Remove the upper and lower drive mounting shelves together as a single unit (it is not necessary to disassemble the shelves themselves). Unscrew all screws from the shelves; leave the captive screws ❶ in position and save the Phillips screws ❷ for reinstallation of the shelves. Remove the internal power cables ❸.

Figure 4–13 Disconnecting the Internal Power Cables



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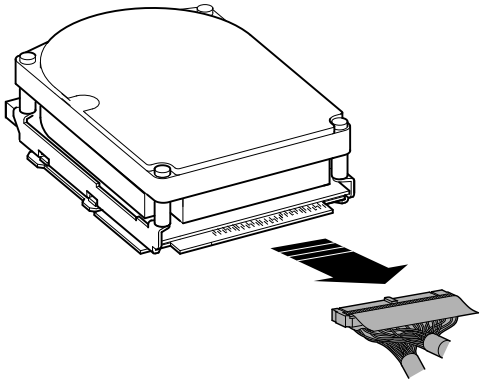
❶ Captive Screws (5)

❷ Phillips Screws (2)

❸ Internal Power Cables

4. Disconnect the internal DSSI connectors from all drives mounted on the shelves. It is not necessary to disconnect the power cable from each drive. Figure 4–14 shows one drive as an example.

Figure 4–14 Disconnecting Internal DSSI Connectors



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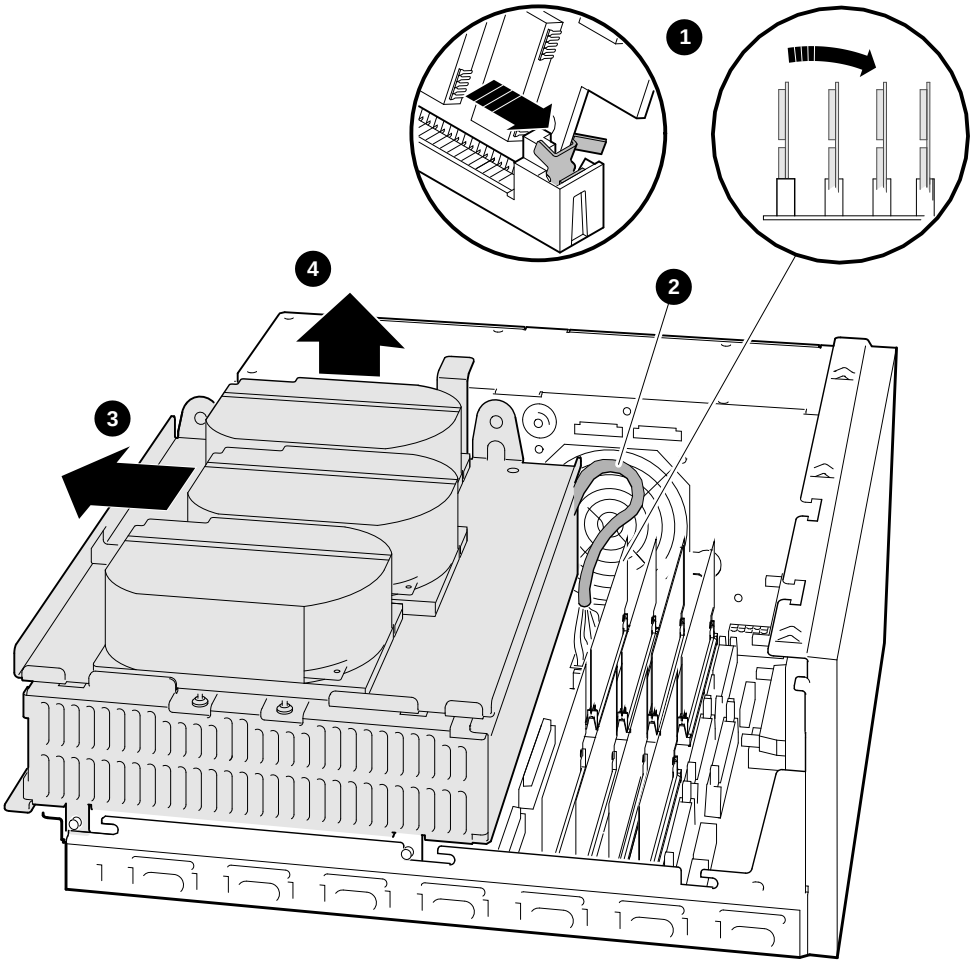
5. Disconnect the internal SCSI cable from the backplane (see Figure 4–15):
   a. Release the memory module nearest the internal SCSI connector by pressing the tabs on each end, and tip it backward ❶.
   b. Disconnect the internal SCSI cable ❷ from its connector on the backplane.
6. Remove the shelves by sliding them forward ❸ and lifting them up ❹ and away from the enclosure (see Figure 4–15). Leave the memory module tipped backward until the shelves are reinstalled.

Figure 4–15 Disconnecting the Internal SCSI Cable



❶ Releasing the memory module and tipping it backward

❷ Internal SCSI cable

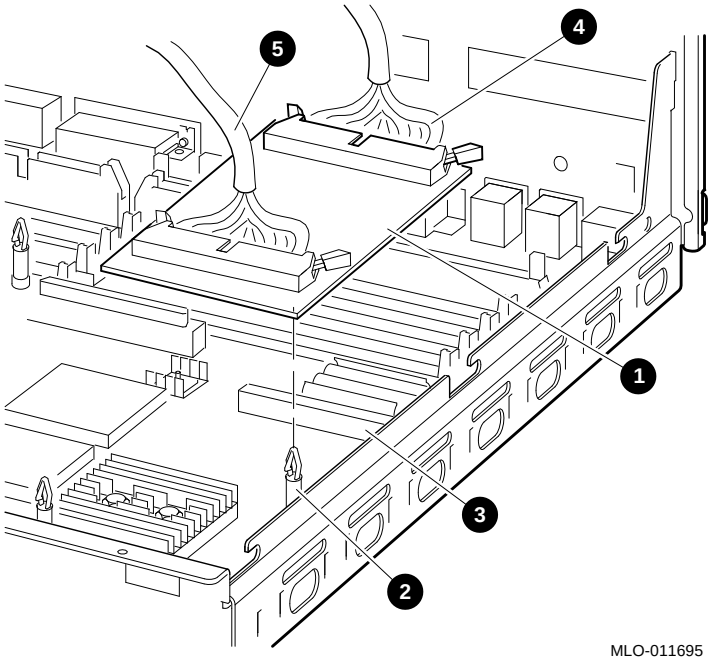
❸ Sliding shelves forward

❹ Lifting shelves up

❶ DSSI Connector
❷ Standoff removal tool
❸ Standoff
❹ Backplane connector
❺ Dual DSSI Card

9. Install the replacement DSSI card ❶ onto the backplane. Figure 4–17 shows installing a dual DSSI card. Align the new card on the standoffs ❷ so that it is positioned above the backplane connector, then gently seat it onto the connector and the standoffs.
10. Install the DSSI cables into the new DSSI card:
    a. Connect the DSSI bus 1 cable ❺, if present, into the DSSI connector that is closest to the front of the system. Figure 4–17 shows the installation of a dual DSSI card.
    b. Reconnect the DSSI bus 0 cable ❹ into the DSSI connector that is closest to the rear of the system (see Figure 4–17).
11. Replace the shelves by reversing step 6.
12. Connect the internal SCSI connector by reversing step 5.
13. Connect the internal DSSI connectors to all drives mounted on the shelves by reversing step 4.
14. Connect the power cables by reversing step 3.
15. Reinstall the top cover by reversing the procedure in Section 4.3.

Figure 4–17 Installing the Dual DSSI Card



❶ Dual DSSI Card (P/N 54-22444-01)

❷ Standoff

❸ Backplane Connector

❹ DSSI Cable (P/N 17-03544-01 or 17-04189-01)

❺ DSSI Cable (P/N 17-03778-01)

4.9 Removing and Replacing the CPU Module

To remove and replace the CPU module, use the following procedure:

1. Refer to Section 4.8 and remove the DSSI card.
2. Remove all SIMMs from the CPU module (see Figure 4–18).

Caution

Static electricity can damage integrated circuits. Wear a wriststrap and place an antistatic mat under the system unit when working with the internal parts of the system unit.

Caution

Carefully note the position of each memory module that you remove; they must be reinstalled later into the same slots.

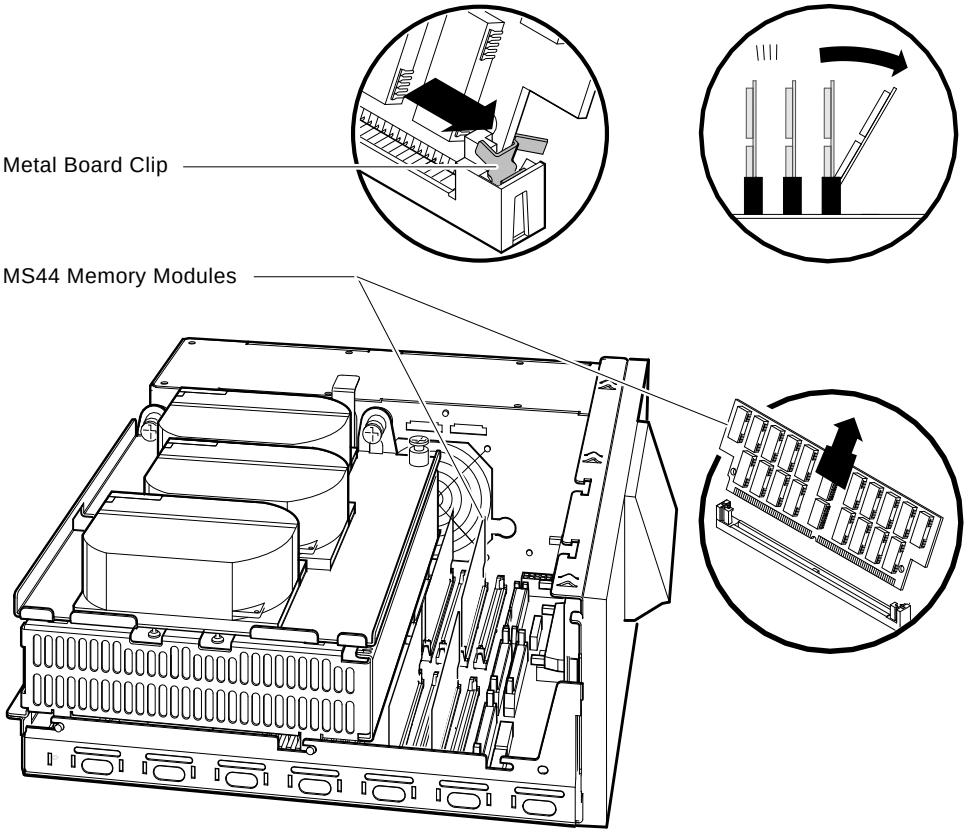
Beginning with the SIMMs closest to the front of the enclosure, remove each as follows:

a. Release the memory module by pressing the metal board clips on the memory module connector away from the center.

b. Tip the memory module toward the rear.

c. Lift the memory module up and out of the enclosure, and place it on an antistatic mat.

Figure 4–18 Removing a SIMM



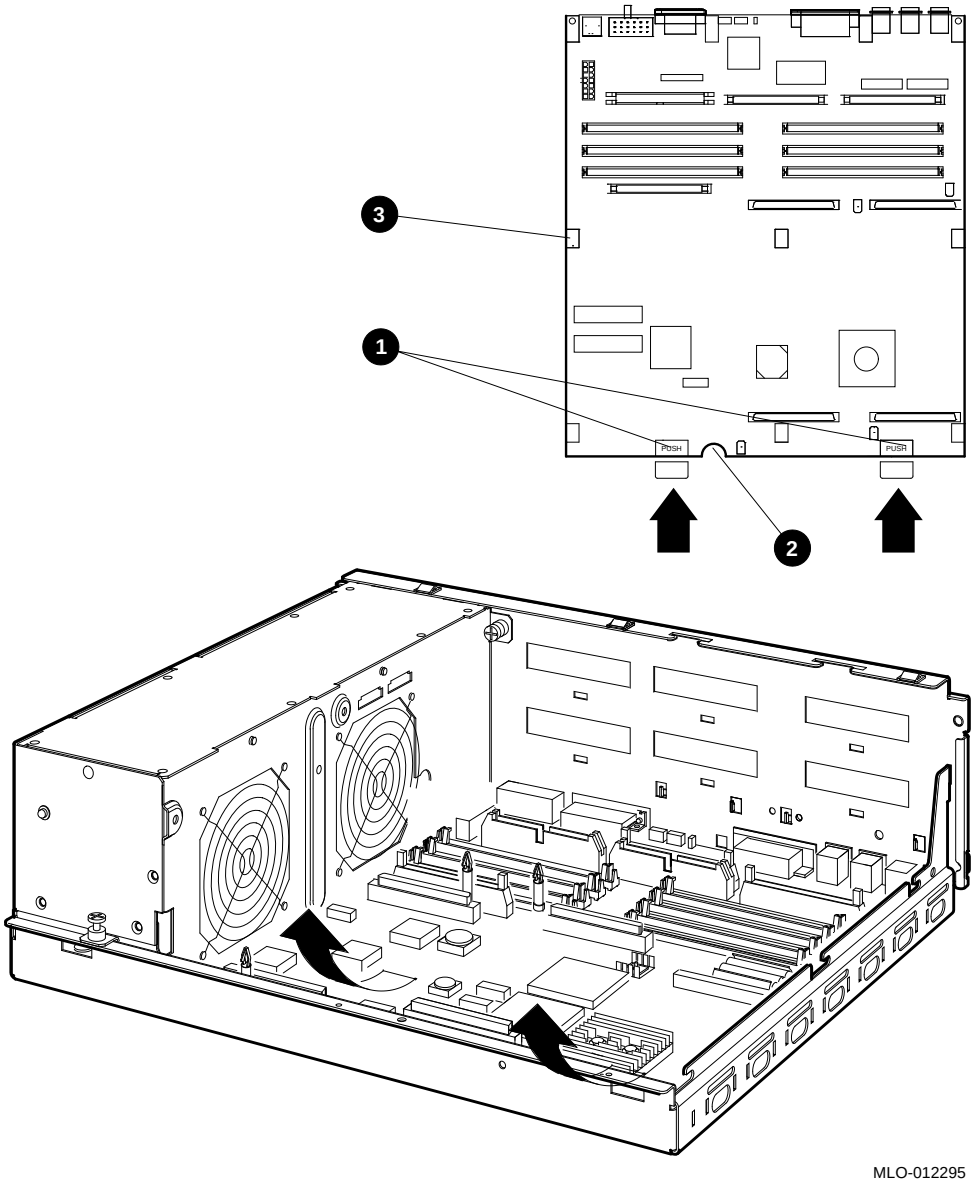
3. Remove all remaining cables from the CPU module (see Figure 4–5).
   a. Disconnect any internal communications options cables that are present in your system from the CPU module.
   b. Disconnect the CPU power cable from the CPU module.
4. To remove the CPU module, follow these steps:

Caution

Ensure that you do not damage any of the CPU module components by exerting too much force on them.

   a. Press the two spring clips (marked by arrows in Figure 4–19) that secure the CPU module in position. The CPU module moves forward under the tension of the connector gaskets. If necessary, slide the CPU module back until it disengages from the ten keyhole cutouts (refer to Figure 4–19).
   b. Use your finger, in the semicircular cutout on the front edge of the CPU module, to lift up the front edge of the CPU module (refer to Figure 4–19).
   c. While supporting the front of the CPU module with one hand, guide the connectors on the back of the CPU module out of the corresponding cutouts on the back of the enclosure.
   d. Remove the CPU module from the enclosure.

Figure 4–19 Removing the CPU Module



❶ Spring clips

❷ Semicircular cutout

❸ Keyhole cutouts (10)

5. To install the new CPU module, follow these steps:

   a. Place the CPU module in the enclosure so that the connectors on the CPU module align with the corresponding cutouts in the back panel of the enclosure. Use the ThinWire Ethernet port as an anchor point to correctly adjust the position of the CPU module.

   b. Align the keyhole cutouts in the CPU module with the corresponding standoff pillars in the base of the enclosure.

   Caution

   Ensure that you do not damage any of the CPU module components by exerting too much force on them.

   c. Press the CPU module at the two positions marked PUSH. The spring clips push the standoff pillars into the keyhole cutouts that secure the CPU module in position (see Figure 4–19).

6. To complete reassembly, reverse steps 1 through 3.

To remove and replace all other FRUs in the RM 4000-10xx, refer to the following manuals:

- *VAX 4000 BA42B Enclosure Maintenance Manual*
- *VAX 4000 Model 10xx KA52 CPU Maintenance Manual*
- *VAX 4000 BA42B Enclosure System Options Manual*

A

Shelf Assembly

This appendix describes how to assemble the shelf and slides that will be used to mount the RM 4000-10xx in a cabinet.

The shelf assembly contains the following parts:

Item	Description	Part Number
❶	Shelf	74-46669-01
❷	Slides	12-39896-01
❸	Mounting Brackets (Rear)	12-32829-01
❹	Mounting Brackets (Front)	12-32831-01
❺	Screws, #8, Qty 18	90-00063-22
❻	Kep nuts, #8, Qty 8	90-06563-00
❼	Interlock bracket, Qty 1[1]	74-46988-01
❽	Caution label, Qty 2	36-24385-01
❾	Caution label, weight, Qty 1	36-32445-01
❿	Part number label, Qty 1	36-13209-02

[1]**All systems are shipped with an interlock bracket. The interlock bracket only functions in systems containing a shelf interlock system.**

❶ Screws (P/N 90-00063-22)

❷ Kep nuts (P/N 90-06563-00)

❸ Rear Mounting Bracket (P/N 12-32829-01)

❹ Locking Slides (P/N 12-39896-01)

❺ Front Mounting Bracket (P/N 12-32831-01)

❻ Slide Locking Mechanism

❶ Shelf (P/N 74-46669-01)

❷ Slides

❸ Locking Latch

❹ Locking mechanism handle

❺ Screws (P/N 90-00063-22) (four each side)

❻ Shipping bracket mounting holes

❼ Interlock bracket mounting holes

❽ Caution labels (Qty 2) (P/N 36-24385-01)

❾ Caution label (P/N 36-32445-01)

❿ Part number label (P/N 36-13209-02)

B

Connecting Peripheral Device Cables

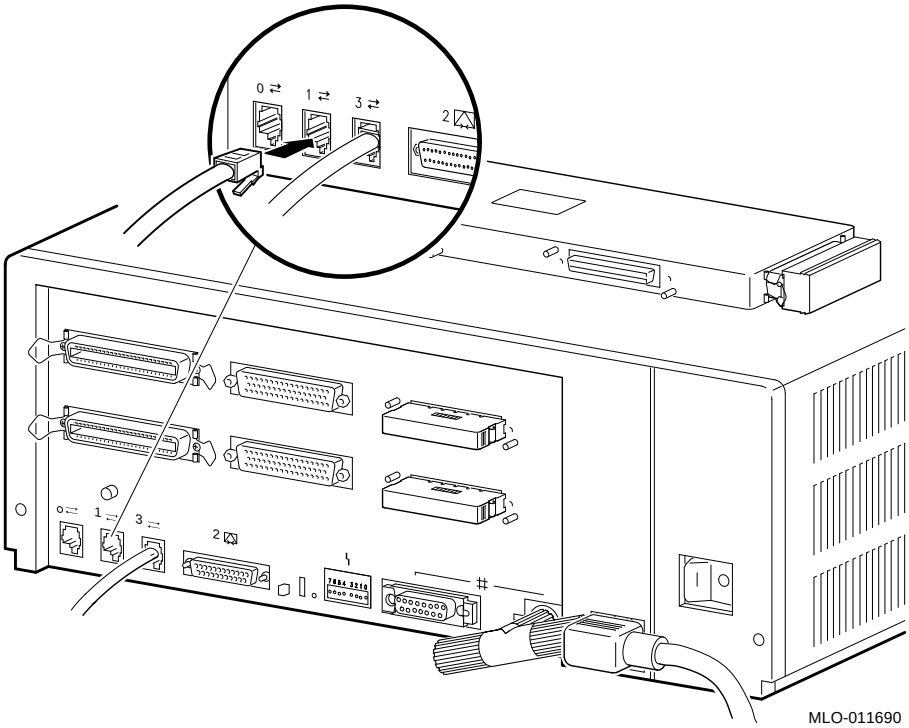
This appendix describes the following procedures to connect cables for peripheral devices to the RM 4000-10xx system:

- Connecting a peripheral cable to MMJ port 0 and 1
- Connecting a peripheral cable to asynchronous port A
- Connecting a peripheral cable to asynchronous port A (DHW42-CA)
- Connecting a peripheral cable to synchronous port 0 and 1, and to the modem port
- Connecting a peripheral cable to the asynchronous modem control port
- Connecting cables to external SCSI ports
- Connecting cables to external DSSI ports
- Connecting cables to top cover cable ports:
  - Q–bus cable ports
  - DSSI cable ports

B.1 Connecting a Peripheral Cable to MMJ Port 0 and 1

To connect a peripheral cable to MMJ port 0 and 1, insert the cable as shown in Figure B–1.

Figure B–1 Connecting a Peripheral Cable to MMJ Port 0 and 1

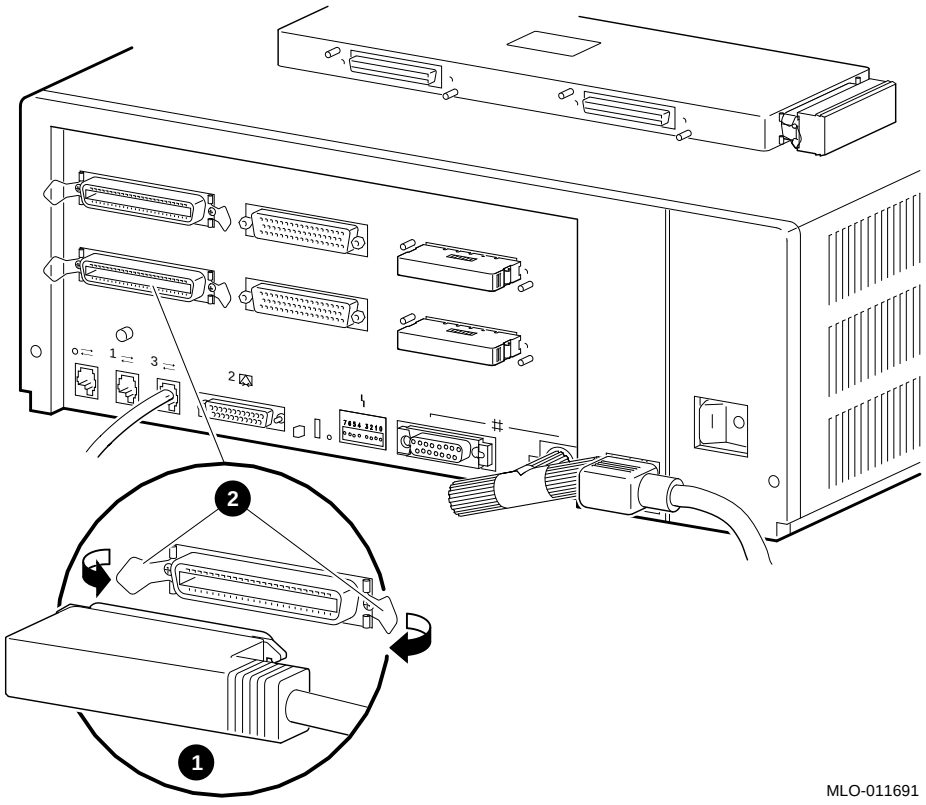


B.2 Connecting a Peripheral Cable to Asynchronous Port A

To connect a peripheral cable to asynchronous port A, refer to Figure B–2 and perform the following steps:

1. Insert cable.
2. Close bail loops.

Figure B–2 Connecting a Peripheral Cable to Asynchronous Port A

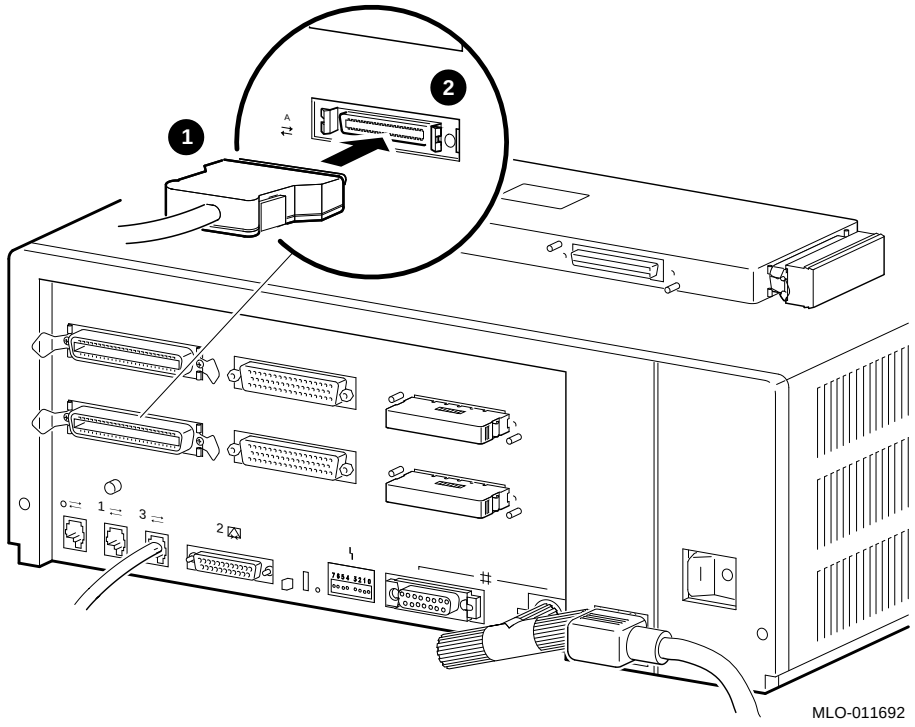


B.3 Connecting a Peripheral Cable to Asynchronous Port A (DHW42-CA)

To connect a peripheral cable to asynchronous port A (DHW42-CA), refer to Figure B–3 and perform the following steps:

1. Slide clip ❷ to the left.
2. Insert cable ❶.
3. Slide clip ❷ to the right.

Figure B–3 Connecting a Peripheral Cable to Asynchronous Port A (DHW42-CA)

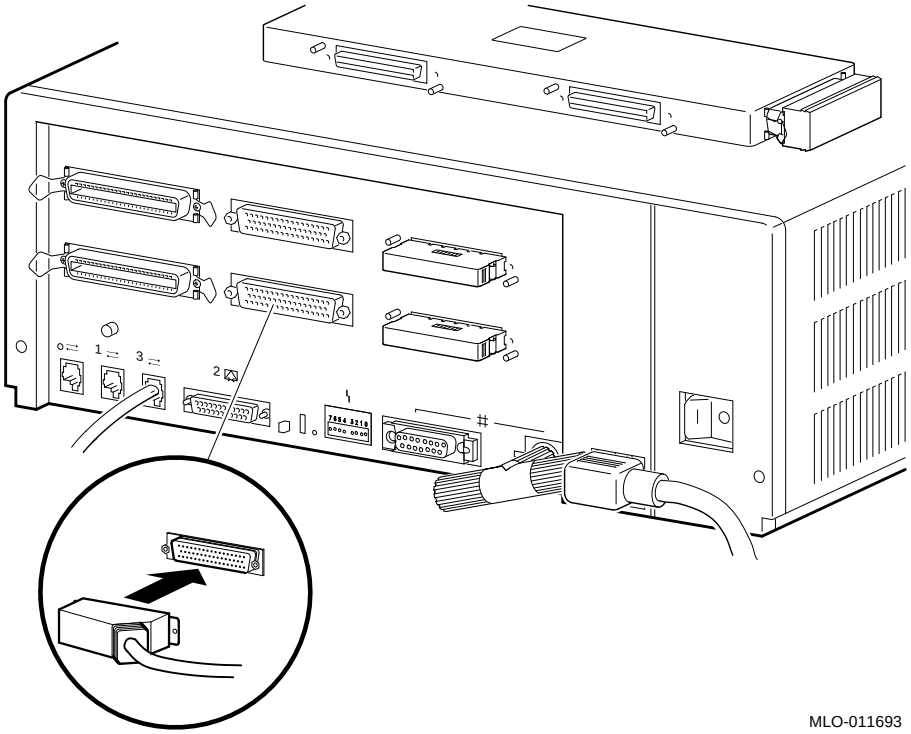


B.4 Connecting a Peripheral Cable to Synchronous Port 0 and 1, and to the Modem Port

To connect a peripheral cable to synchronous port 0 and 1, and to the modem port, refer to Figure B–4 and perform the following steps:

1. Insert cable.
2. Screw clamping screws.

Figure B–4 Connecting a Peripheral Cable to Synchronous Port 0 and 1, and to the Modem Port



B.5 Connecting a Peripheral Cable to the Asynchronous Modem Control Port

You can connect peripherals that use EIA-232 connectors to the asynchronous modem control port (port 2) on the back of the system unit. Alternatively, the supplied EIA-232 to DEC423 adapter (H8575-A) allows you to connect peripherals that use DEC423 connectors. To connect a peripheral to the asynchronous modem control port, refer to the following steps:

1. If you are connecting a peripheral using EIA-232 cables:
   a. Set the ON/OFF switch on the peripheral to the OFF (O) position.
   b. Connect the 25-pin D-sub connector of the peripheral cable to the asynchronous modem control port.
   c. If the connector has screws on either side, tighten them using a small screwdriver.
   d. Connect the other end of the peripheral cable to the correct port on the peripheral.
   e. Set the ON/OFF switch on the peripheral to the ON (|) position.
2. If you are connecting a peripheral using DEC423 cables:
   a. Set the ON/OFF switch to the OFF (O) position.
   b. Connect the 25-pin D-sub connector of the peripheral cable to the asynchronous modem control port.
   c. Tighten the screws on each side of the adapter using a small screwdriver.
   d. Connect the EIA-232 to DEC423 adapter to the asynchronous cable.
   e. Connect the DEC423 cable to the the MMJ port on the adapter.
   f. Connect the other end of the DEC423 cable to the correct port on the peripheral.
   g. Set the ON/OFF switch on the peripheral to the ON (|) position.

The following EIA-232 cable is available: 2T-BC22F-10. The peripheral you are using may require a null-modem extension cable. See the peripheral documentation or contact your local Digital Sales Representative for information on the correct null-modem cable you would use.

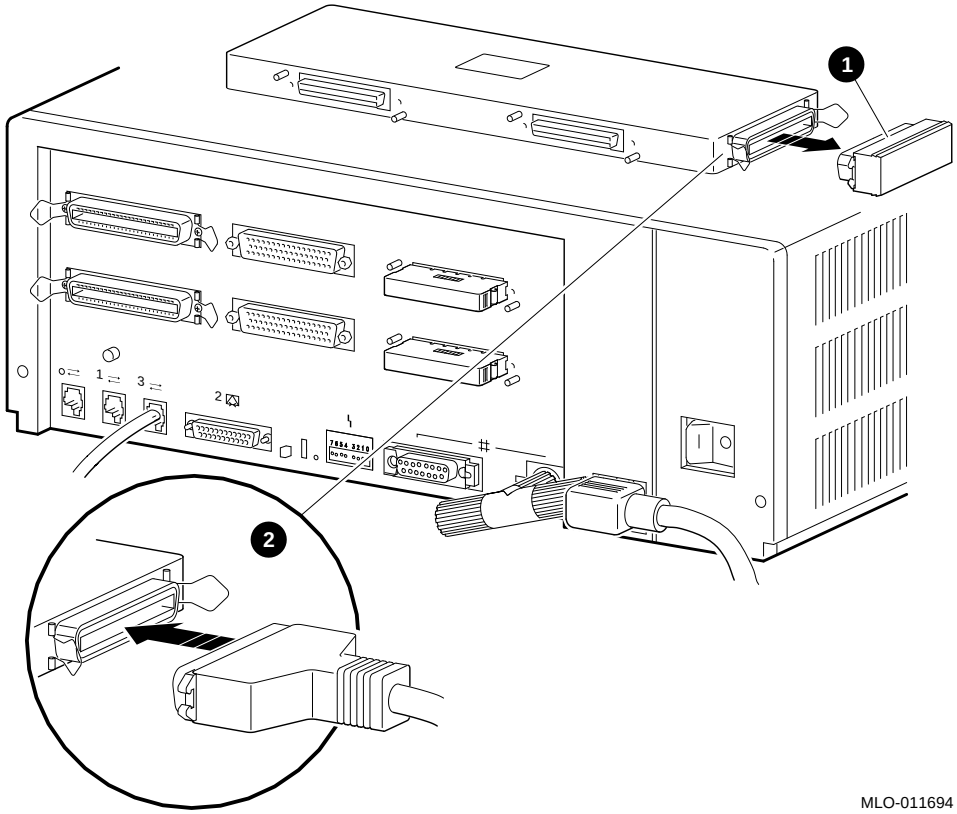
B.6 Connecting Cables to SCSI Cable Ports

To connect the SCSI cable ports, refer to Figure B–5 and perform the following steps:

1. Remove the SCSI terminator from the SCSI port ❶.
2. Insert cable ❷.

To disconnect the SCSI cables, reverse the steps in this procedure.

Figure B–5 SCSI Cable Ports



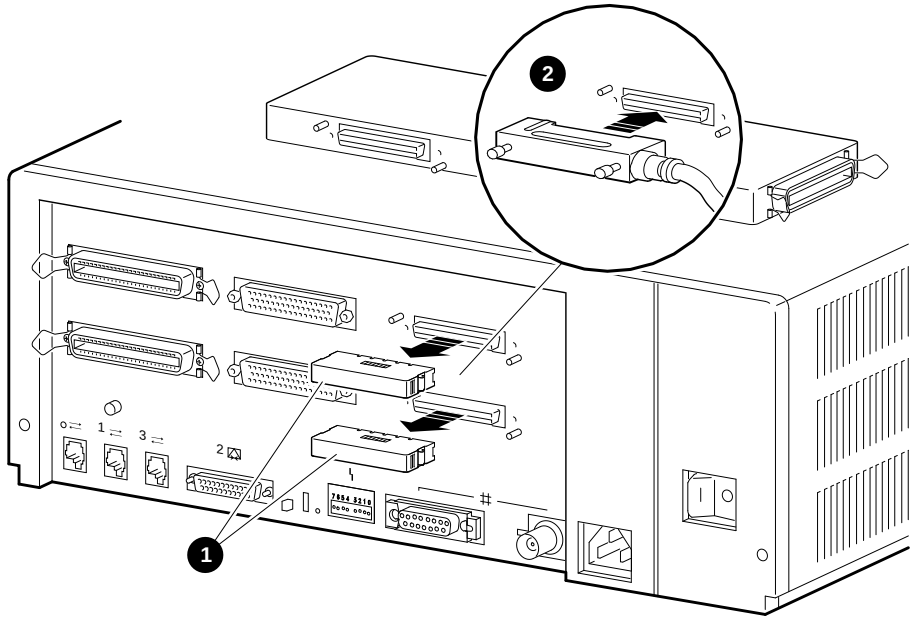
B.7 Connecting External DSSI Bus Cables to Internal DSSI Bus Cable Ports

To connect the DSSI cable ports, refer to Figure B–6 and perform the following steps:

1. Remove the DSSI terminators from the DSSI ports ❶.
2. Insert cable ❷ and tighten screws.

To disconnect the DSSI cables, reverse the steps in this procedure.

Figure B–6 DSSI Cable Ports



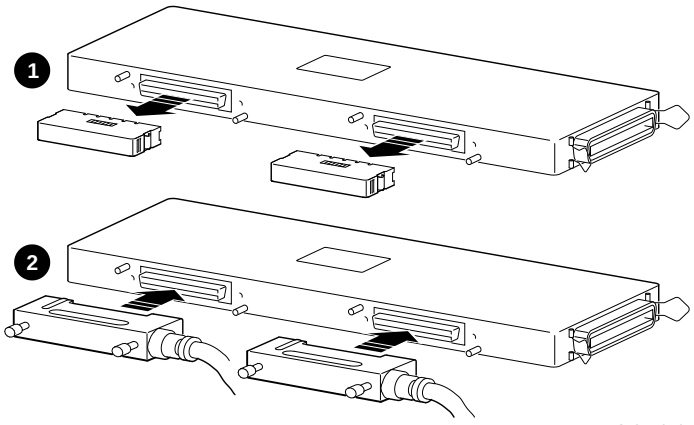
B.8.2 Connecting External Bus DSSI Cables to External Bus DSSI Cable Ports

To connect the DSSI cable ports, refer to Figure B–8 and perform the following steps:

1. Remove the DSSI terminator from the DSSI port(s) ❶.
2. Insert cable(s) ❷ and tighten screws.

To disconnect the DSSI cables, reverse the steps in this procedure.

Figure B–8 DSSI Cable Ports



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C

Single to Dual DSSI Upgrade Procedure

To upgrade the rackmount VAX 4000 Model 100 or 10xx single DSSI to an RM 4000-10xx dual DSSI follow the procedure in this appendix. **If you are upgrading a VAX 4000-10xx model to an RM 4000-10xx, you must make the conversion by following the procedure described in Chapter 1, Step 3: Convert the VAX 4000-10xx to a RM 4000-10xx.**

To upgrade a rackmount VAX 4000 Model 100 single DSSI to an RM 4000-100A dual DSSI, you need the following kit:

- 2T-KFDDA-CF Single-to-Dual DSSI Upgrade Kit (see Figure C–1 for kit contents)

To upgrade a rackmount VAX 4000 Model 100A/105A/106A single DSSI to a rackmount VAX 4000 Model 100A/105A/106A dual DSSI, you need the following kit:

- 2T-KFDDA-AF Single-to-Dual DSSI Upgrade Kit (see Figure C–2 for kit contents)

Single to Dual DSSI Upgrade Procedure

❶ Dual DSSI Card (Qty 1) (P/N 54-22444-01)

❷ Remote DSSI Bus Cable (Qty 1) (P/N 17-03778-01)

❸ Machine Screw 2.5 m (Qty 4) (P/N 90-10917-01)

❹ DSSI Terminator (Qty 2) (P/N 12-29258-01)

❺ Alignment Pin (Qty 4) (P/N 12-30363-01)

❻ Washer (Qty 4) (P/N 90-08877-00)

❼ Medallion, VAX 4000-100A (Qty 1) (P/N 74-37642-31)

❽ Firmware Version 2.3 Upgrade Kit (Qty 1) (P/N QZ-004AA-FW) (refer to packing slip for kit contents)

❾ VMS Upgrade Version 5.5.2H4 Kit (Qty 1) (P/N QA-001AA-UW) (refer to packing slip for kit contents)

❿ VAX 4000-10xx Documentation Kit (Qty 1) (P/N QA-00HAA-GZ) (refer to packing slip for kit contents)

⓫ Rackmount Cover Assembly (P/N 70-30948-01)

⓬ Caution Label (Qty 1) (P/N 36-24385-01)

⓭ Installation manual (Qty 1) (P/N EK-465RA-IN)

❶ Dual DSSI Card (Qty 1) (P/N 54-22444-01)

❷ Remote DSSI Bus Cable (Qty 1) (P/N 17-03778-01)

❸ Machine Screw 2.5 m (Qty 4) (P/N 90-10917-01)

❹ DSSI Terminator (Qty 2) (P/N 12-29258-01)

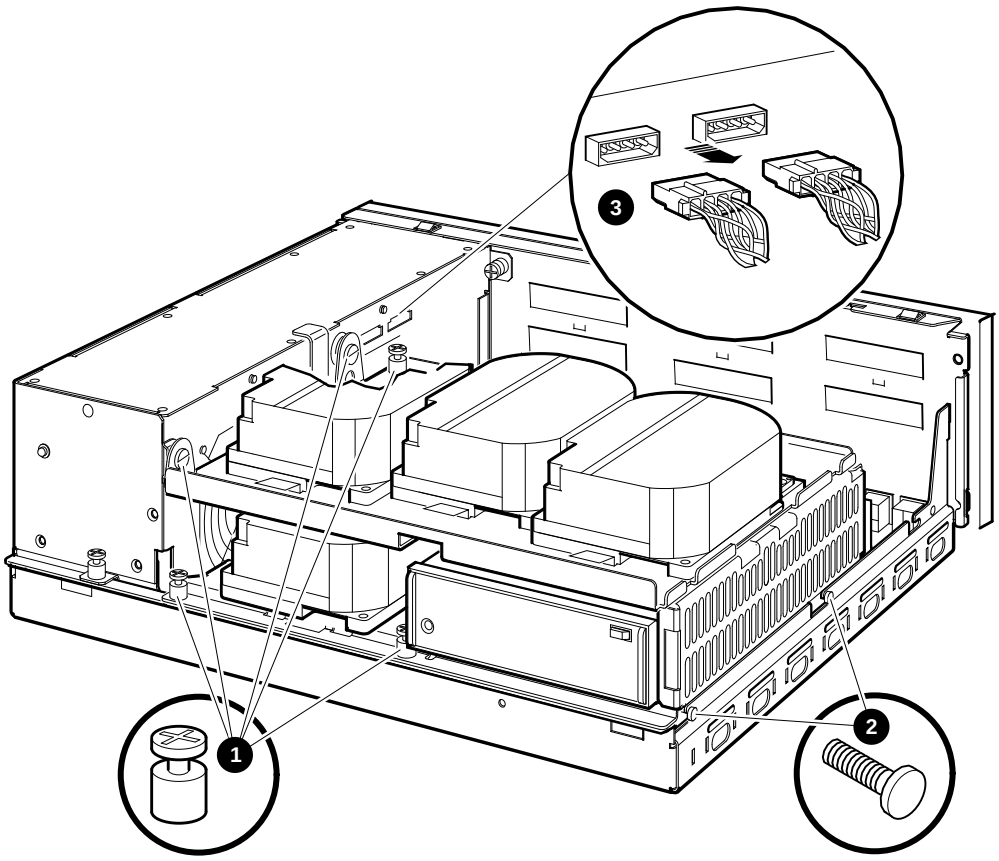
❺ Alignment Pin (Qty 4) (P/N 12-30363-01)

❻ Washer (Qty 4) (P/N 90-08877-00)

Single to Dual DSSI Upgrade Procedure

1. Unpack and inspect all upgrade kits, and report any missing or damaged items to your local Digital sales representative.
2. Ensure the customer has backed up all data and shut down the system.
3. If required, install Firmware Version 2.3 Upgrade Kit (P/N QZ-004AA-FW) or a higher version per instructions included with the kit.
4. If required, install VMS Upgrade Version 5.5.2H4 (P/N QZ-001AA-UW) per instructions included with the kit.
5. Access the unit by extending the system outside the cabinet as described in Section 4.1.
6. Remove the enclosure cover as described in Section 4.3.
7. Refer to Figure C–3. Remove the upper and lower drive mounting shelves together as a single unit (it is not necessary to disassemble the shelves themselves). Unscrew all screws from the shelves; leave the captive screws ❶ in position and save the Phillips screws ❷ for reinstallation of the shelves. Remove the internal power cables ❸.

Figure C–3 Disconnecting the Internal Power Cables



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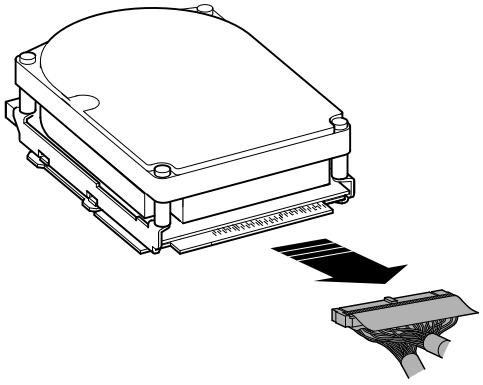
❶ Captive Screws (5)

❷ Phillips Screws (2)

❸ Internal Power Cables

8. Disconnect the internal DSSI connectors from all drives mounted on the shelves. It is not necessary to disconnect the power cable from each drive. Figure C–4 shows one drive as an example.

Figure C–4 Disconnecting Internal DSSI Connectors



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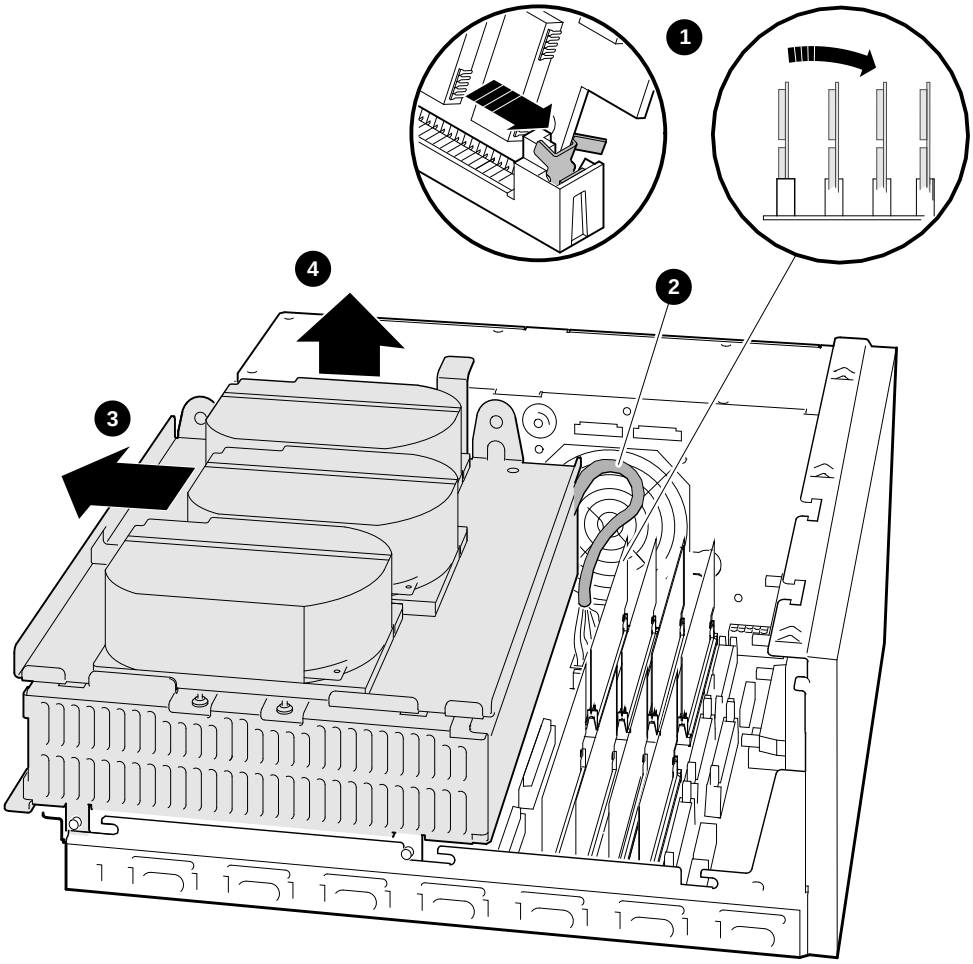
9. Disconnect the internal SCSI cable from the backplane (see Figure C–5):
   - Release the memory module nearest the internal SCSI connector by pressing the tabs on each end, and tip it backward ❶.
   - Disconnect the internal SCSI cable ❷ from its connector on the backplane.
10. Remove the shelves by sliding them forward ❸ and lifting them up ❹ and away from the enclosure (see Figure C–5). Leave the memory module tipped backward until the shelves are reinstalled.

Figure C–5 Disconnecting the Internal SCSI Cable



❶ Releasing the memory module and tipping it backward

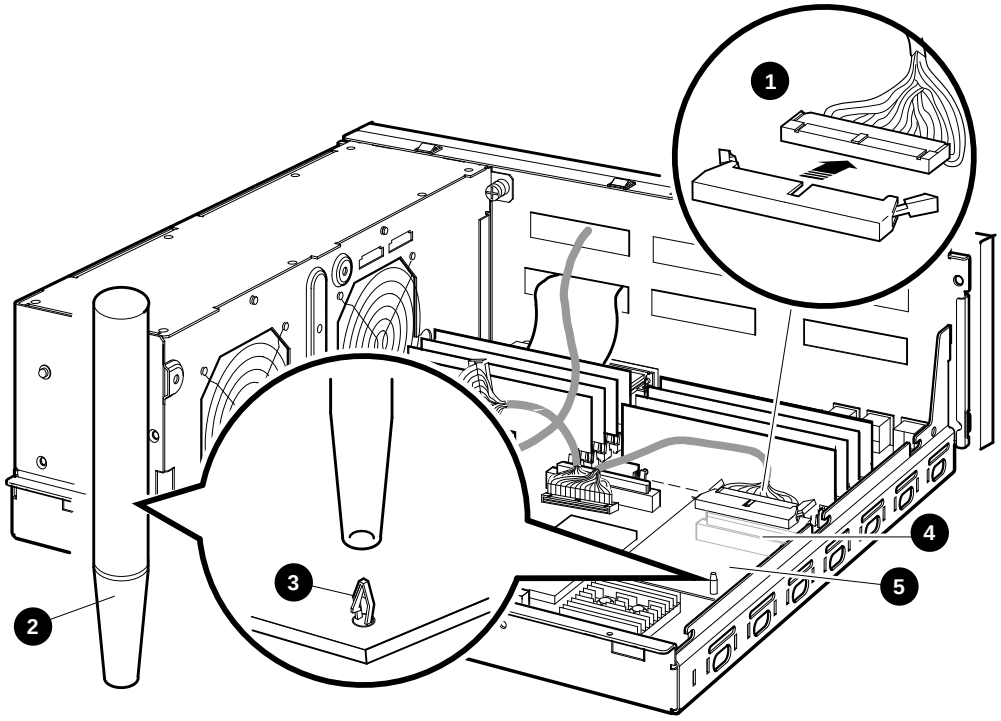
❷ Internal SCSI cable

❸ Sliding shelves forward

❹ Lifting shelves up

11. Refer to Figure C–6. Disconnect the DSSI cable from the DSSI connector ❶.
12. Remove the single DSSI card ❺ by gently prying it loose from the backplane connector ❹. Use a standoff tool ❷ to compress the post so that the corner of the card can be lifted off of the standoff ❸. Lift the card out and place it on an antistatic mat.

Figure C–6 Removing the Single DSSI Card



❶ DSSI Connector (P/N 17-03544-01 or 17-04189-01)

❷ Standoff removal tool

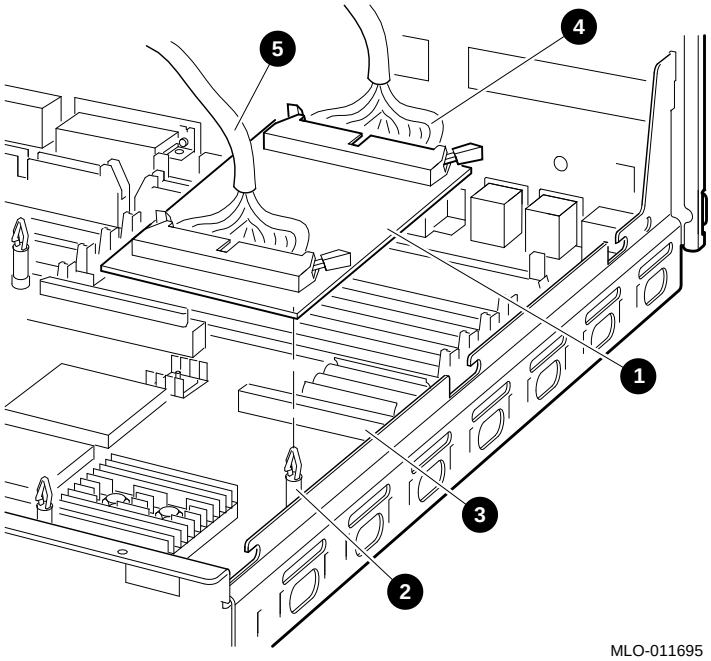
❸ Standoff

❹ Backplane connector

❺ Single DSSI Card (P/N 54-21837-01)

13. Refer to Figure C–7. Install the dual DSSI card ❶ onto the backplane connector ❸. Align the new card on the standoffs ❷ so that it is positioned above the backplane connector, then gently seat it onto the connector and the standoffs.
14. Connect the DSSI bus 1 cable ❺ into the DSSI connector that is closest to the front of the system (see Figure C–7).
15. Reconnect the DSSI bus 0 cable ❹ into the DSSI connector that is closest to the rear of the system (see Figure C–7).
16. Replace the shelves by reversing step 11d.
17. Connect the internal SCSI connector by reversing step 11c.
18. Connect the internal DSSI connectors from all drives mounted on the shelves.
19. Connect the dc power cables by reversing step 11a.
20. Reinstall the enclosure cover by reversing the procedure in Section 4.3.
21. If necessary, install the caution label (P/N 36-24385-01) on the center of new top cover bustle so that it can be read when facing the rear of the unit.

Figure C–7 Installing the Dual DSSI Card



❶ Dual DSSI Card (P/N 54-22444-01)

❷ Standoff

❸ Backplane Connector

❹ DSSI Connector (P/N 17-03544-01 or 17-04189-01)

❺ DSSI Connector (P/N 17-03778-01)

D

Hardware Specifications

This appendix lists the hardware specifications of the following devices:

- System unit
- Internal SCSI device
- KA52-AA CPU
- KA53-AA CPU
- KA54-AA CPU
- Internal DSSI device

D.1 System Unit Specifications

The following tables list the specifications for the rackmount VAX 4000 Model 100/100A/105A/106A.

Table D–1 System Specifications: RM 4000-10xx

Subject	Description
Processor	KA52 (NVAX) Model 100/100A KA53 (NVAX) Model 105A KA54 (NVAX) Model 106A
Boot and diagnostic firmware ROM	512 KB.
DRAM memory	Expandable from 16 MB using one set of four 4 MB SIMMs to a maximum of 128 MB using two sets of four 16 MB SIMMs. These are MS44 memory options.
Hard disk	RF35, RF36 and RF31T (the system supports a maximum of three disk devices in the enclosure.)
Tape drive	TZ30, TZK10, TZK11, TLZ06, TLZ07.
Compact disc drive	RRD42/RRD43.
Terminals	Supports the VT series.
Interfaces	One or two DSSI buses, one synchronous SCSI bus, one ThinWire Ethernet port[1], one standard Ethernet port[1] (thickwire), three MMJ ports, one modem port. Optional: 8 or 16 additional asynchronous DEC423 MMJ ports or 8 additional synchronous modem ports, 2 synchronous ports.
Input voltage	Automatically adjusting ac input. Range: 100 Vac to 120 Vac or 220 Vac to 240 Vac.
Maximum inrush current	2.0 amperes (A) at 220 Vac.
Maximum running current	2.2 A at 110 Vac, 1.1 A at 220 Vac.
Steady state current	2.2 A at 100 Vac, 1.1 A at 220 Vac.
Maximum power consumption	200 watts (W).
Frequency	49 Hz to 61 Hz.

[1]Both Ethernet types cannot be used simultaneously.

Table D–2 System Unit Metrics

System Unit	Weight[1] kg (lb)	Height cm (in)	Width cm (in)	Depth cm (in)
System	18.0 (40.0)	17.78 (7.0)	46.35 (18.26)	38.74 (15.25)
System with shelf	27 (60)	22.2 (8.75)	48.3 (19.0)	63.5 (25.0)

[1]Depends on configuration

Table D–3 System Storage Conditions

Storage Condition	Range or Value
Temperature range	5°C to 50°C (41°F to 122°F)
Relative humidity	10% to 95% at 66°C (noncondensing)
Altitude	0 m to 2400 m (0 ft to 8000 ft)
Maximum wet bulb temperature	32°C (90°F)
Minimum dew point	2°C (36°F)

Hardware Specifications

Table D–4 System Operating Conditions and Nonoperating Conditions

Operating Conditions	Range or Value
Temperature range	10°C to 32°C (50°F to 90°F) with TZ30 tape drive; otherwise 10°C to 35°C (50°F to 97°F)
Temperature change rate	11°C (20°F) per hour maximum
Relative humidity	10% to 90% noncondensing (20% to 80% if tape device installed)
Altitude	2400 m (8000 ft) at 36°C (96°F)
Maximum wet bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)
Nonoperating Conditions	**Range or Value**
Temperature range	-40°C to 66°C (-40°F to 151°F)
Relative humidity	10% to 95% at 66°C (151°F)
Altitude	4900 m (16 000 ft)
Maximum wet bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)

D.2 Internal DSSI Device Specifications

The following tables list the specifications for the internal DSSI devices.

Table D–5 Hard Disk Drive Specifications

Formatted Storage Capacity	RF31T	RF35	RF36
Per Drive (MB)	381	852	1600
Blocks per track	57	57	54-108
Blocks per drive	744 534	1 664 628	3 125 408
Buffer size (KB)	512	512	512
Performance	**RF31T**	**RF35**	**RF36**
Transfer rate to or from media (MB/second)	3.3	3.3	3.3
Data transfer rate (MB /second)	4.0	4.0	5.0
Average seek time (milliseconds)	5.5	9.5	9.7
Maximum seek time, full stroke (milliseconds)	–	19	19
Average latency (milliseconds)	5.6	5.6	5.6
Average access (milliseconds)	11.1	15.1	15.3

Hardware Specifications

Table D–6 TZ30 Tape Drive Specifications

Subject	Description
Mode of operation	Streaming
Media	12.77 mm (0.5 in) unformatted magnetic tape
Bit density	2624 bits/cm (6667 bits/in)
Number of tracks	22
Transfer rate (at host)	62.5 Kb/s
Tape speed	190 cm/s (75 in/s)
Track format	Multiple track serpentine recording
Cartridge capacity	95 MB, formatted (approximate)

Table D–7 TZK10 QIC Tape Drive Specifications

Subject	Description
Mode of operation	Streaming
Media	DC6320, DC6525, or Digital approved equivalent. See the *VAX 4000 Model 10xx Operator Information Manual*
Track width: write	0.1778 mm +0.0000, -0.0127 mm (0.0070 in +0.000, -0.0005 in)
Track width: read	0.1270 mm +0.0127, -0.0000 mm (0.0050 in +0.0005, -0.0000 in)
Bit density	16 Kb/in
Number of tracks	26
Transfer rate	200 KB/s at average streaming mode, 1.5 MB/s at SCSI maximum
Tape speed	305 cm/s (120 in/s)
Track format	Multiple track serpentine recording
Cartridge capacity	320 MB or 525 MB, formatted (approximate), depending on the QIC tape used.

Table D–8 TZK11 QIC Tape Drive Specifications

Subject	Description
Mode of operation	Streaming
Media	DC9200, DC9200XL, or Digital approved equivalent. See the *VAX 4000 Model 105A/106A Operator Information Manual*
Track width: write	0.1778 mm ± 0.00038 mm (0.0070 in ± 0.00015 in)
Track width: read	0.0762 mm ± 0.00038mm (0.0030 in ± 0.00015 in)
Bit density	40,640 bits/in
Number of tracks	42
Transfer rate	300 KB/s at average streaming mode, 3 MB/s at SCSI maximum
Tape speed	70.9 inches/sec with QIC-2GB cartridge
Track format	Multiple track serpentine recording
Cartridge capacity	2 GB or 2.5 GB, formatted (approximate), depending on the QIC tape used.

Hardware Specifications

Table D–9 TLZ06 Cassette Tape Drive Specifications

Subject	Description
Mode of operation	Streaming and start/stop
Media	TLZ04-CA, TLZ06-CA, or Digital approved equivalent. See the *VAX 4000 Model 10xx Operator Information Manual*
Bit density	114 Mb/in
Transfer rate (sustained)	183 KB/s noncompression
Recording format	Digital Data Storage (DDS, DC)

Table D–10 TLZ07 Cassette Tape Drive Specifications

Subject	Description
Mode of operation	Streaming and start/stop
Media	TLZ04-CA, TLZ06-CA, TLZ07-CA, or Digital approved equivalent. See the *VAX 4000 Model 10xx Operator Information Manual*
Bit density	114 Mb/in
Transfer rate (sustained)	400 KB/s noncompression
Recording format	Digital Data Storage (DDS, DC)

Table D–11 RRD42 Compact Disc Drive Specifications

Subject	Description
Acceptable discs	CD-ROM mode-1 data discs CD-ROM mode-2 data discs
Disc capacity	600 MB
Rotation speed: innermost track	530 r/min at CLV = 1.4 m/s
Rotation speed: outermost track	200 r/min at CLV = 1.2 m/s
Sustained data transfer rate	150 KB/s
Burst data transfer rate	1.5 MB/s
Access time: full stroke	650 ms
Access time: average	380 ms

Table D–12 RRD43 Compact Disc Drive Specifications

Subject	Description
Acceptable discs	CD-ROM mode-1 data discs CD-ROM mode-2 data discs
Disc capacity	600 MB
Rotation speed: innermost track	530 r/min at CLV = 1.4 m/s (Audio) 1060 r/min at CLV - 1.4 m/s (Data)
Rotation speed: outermost track	200 r/min at CLV = 1.2 m/s (Audio) 400 r/min at CLV = 1.2 m/s (Data)
Sustained data transfer rate	150 KB/s (Audio) 300 KB/s (Data)
Burst data transfer rate	1.5 MB/s (Audio) 4.2 MB/s (Data)
Access time: full stroke	650 ms (Audio) 1000 ms (Data)
Access time: average	380 ms (Audio) 250 ms (Data)

KA52-AA CPU Specifications

The Model 10xx system uses the timesharing KA52-AA CPU (54-21797-01).

Central Processing Unit	
Addressing modes	General register: 8
	Program counter: 4
	Index: 9
Clock rate	286 MHz (14 ns cycle)
Data path width	64 bits
Number of data types	Hardware: 9
	Software emulated: 7
Number of instructions	Hardware: 242
	Microcode assisted: 21
	Software emulated: 41
General purpose registers	16 (32-bit wide)
	Interval timer: 1 (programmable)
	Programmable timers: 2
I/O bus interface	One Q22–bus interface with 8192 entry scatter /gather map
Q–bus backplane termination	123 ohms

Memory Management and Control	
Page size	512 bytes
Virtual address space	4 GB
Physical memory space	128 MB
Number of memory sets	2 sets

Architecture	
Instruction prefetch buffer size	16 bytes
Primary Cache	
Data stored	Instruction and data
Write algorithm	Write-through
Size	8 KB

Architecture	
Speed	14 nanoseconds (READ)
Associativity	Two-way
Backup Cache	
Data stored	Instruction stream and data
Write algorithm	Write-back
Size	128 KB
Speed	42 nanoseconds
Associativity	Direct mapped
Translation buffer	
Size	96 entry
Associativity	Fully associative
Q22–bus address translation Q22–bus map cache	
Size	16 entry
Associativity	Fully associative
Q22–bus I/O bus buffer size	
Input	32 bytes
Output	4 bytes
Q22–bus Maximum I/O bandwidth	
Block mode DMA read	2.4 MB/second
Block mode DMA write	3.3 MB/second

Ethernet Port	
Supported protocols	Ethernet V2.0 (IEEE 802.3)
Supported media types	Standard or ThinWire
Data path width	1 bit
Data rate	10 Mb/second
Buffer size	
Transmit buffer	128 bytes
Receiver buffer	128 bytes

Hardware Specifications

Digital Storage System Interconnect (DSSI)	
Number of DSSI interfaces	1 (or 2 with KFDDA option)
Maximum number of supported devices	7 (or 14 with KFDDA option)
Data path width	8 bits
Maximum bandwidth	4 MB/second
Maximum queue I/O rate	1200/second
Buffer size	
Transmit buffer	256 bytes
Reciever buffer	256 bytes
Console Serial Lines	
Interface standards	EIA RS-423-A/CCITT V.10 X.25
	EIA RS-232-C/CCITT V.28
	DEC-423
Data format	1 start bit, 8 data bits, 0 parity bits, 1 stop bit
Baud rates	300; 600; 1200; 2400; 4800; 9600; 19 200; 38 400
Ordering Information	
Included as part of base system.	
Operating System Support	
VMS	Version 5.5.2H4
Diagnostic Support	
MicroVAX Diagnostic Monitor	Release 137A and later
Self-tests	Yes
Related Documentation	
EK-473AA-MG	*KA52 CPU System Maintenance*

KA53-AA CPU Specifications

The Model 105A system uses the timesharing KA53-AA CPU (54-21797-02).

Central Processing Unit	
Addressing modes	General register: 8
	Program counter: 4
	Index: 9
Clock rate	333 MHz (12 ns cycle)
Data path width	64 bits
Number of data types	Hardware: 9
	Software emulated: 7
Number of instructions	Hardware: 242
	Microcode assisted: 21
	Software emulated: 41
General purpose registers	16 (32-bit wide)
	Interval timer: 1 (programmable)
	Programmable timers: 2
I/O bus interface	One Q22–bus interface with 8192 entry scatter /gather map
Q–bus backplane termination	123 ohms

Memory Management and Control	
Page size	512 bytes
Virtual address space	4 GB
Physical memory space	128 MB
Number of memory sets	2 sets

Architecture	
Instruction prefetch buffer size	16 bytes
Primary Cache	
Data stored	Instruction and data
Write algorithm	Write-through
Size	8 KB

Hardware Specifications

Architecture	
Speed	12 nanoseconds (READ)
Associativity	Two-way
Backup Cache	
Data stored	Instruction stream and data
Write algorithm	Write-back
Size	512 KB
Speed	42 nanoseconds
Associativity	Direct mapped
Translation buffer	
Size	96 entry
Associativity	Fully associative
Q22–bus address translation Q22–bus map cache	
Size	16 entry
Associativity	Fully associative
Q22–bus I/O bus buffer size	
Input	32 bytes
Output	4 bytes
Q22–bus Maximum I/O bandwidth	
Block mode DMA read	2.4 MB/second
Block mode DMA write	3.3 MB/second

Ethernet Port	
Supported protocols	Ethernet V2.0 (IEEE 802.3)
Supported media types	Standard or ThinWire
Data path width	1 bit
Data rate	10 Mb/second
Buffer size	
Transmit buffer	128 bytes
Receiver buffer	128 bytes

Digital Storage System Interconnect (DSSI)	
Number of DSSI interfaces	1 (or 2 with KFDDA option)
Maximum number of supported devices	7 (or 14 with KFDDA option)
Data path width	8 bits
Maximum bandwidth	4 MB/second
Maximum queue I/O rate	1200/second
Buffer size	
Transmit buffer	256 bytes
Reciever buffer	256 bytes

Console Serial Lines	
Interface standards	EIA RS-423-A/CCITT V.10 X.26
	EIA RS-232-C/CCITT V.28
	DEC-423
Data format	1 start bit, 8 data bits, 0 parity bits, 1 stop bit
Baud rates	300; 600; 1200; 2400; 4800; 9600; 19 200; 38 400

Ordering Information
Included as part of base system.

Operating System Support	
VMS	Version 5.5-1HN

Diagnostic Support	
MicroVAX Diagnostic Monitor	Release 137A and later
Self-tests	Yes

Related Documentation	
EK-473AB-MG	*KA53 CPU System Maintenance*

KA54-AA CPU Specifications

The Model 106A system uses the timesharing KA54-AA CPU (54-21797-03).

Central Processing Unit	
Addressing modes	General register: 8
	Program counter: 4
	Index: 9
Clock rate	400 MHz (10 ns cycle)
Data path width	64 bits
Number of data types	Hardware: 9
	Software emulated: 7
Number of instructions	Hardware: 242
	Microcode assisted: 21
	Software emulated: 41
General purpose registers	16 (32-bit wide)
	Interval timer: 1 (programmable)
	Programmable timers: 2
I/O bus interface	One Q22–bus interface with 8192 entry scatter /gather map
Q–bus backplane termination	123 ohms
Memory Management and Control	
Page size	512 bytes
Virtual address space	4 GB
Physical memory space	128 MB
Number of memory sets	2 sets
Architecture	
Instruction prefetch buffer size	16 bytes
Primary Cache	
Data stored	Instruction and data
Write algorithm	Write-through
Size	8 KB

Architecture	
Speed	10 nanoseconds (READ)
Associativity	Two-way
Backup Cache	
Data stored	Instruction stream and data
Write algorithm	Write-back
Size	512 KB
Speed	42 nanoseconds
Associativity	Direct mapped
Translation buffer	
Size	96 entry
Associativity	Fully associative
Q22–bus address translation Q22–bus map cache	
Size	16 entry
Associativity	Fully associative
Q22–bus I/O bus buffer size	
Input	32 bytes
Output	4 bytes
Q22–bus Maximum I/O bandwidth	
Block mode DMA read	2.4 MB/second
Block mode DMA write	3.3 MB/second

Ethernet Port	
Supported protocols	Ethernet V2.0 (IEEE 802.3)
Supported media types	Standard or ThinWire
Data path width	1 bit
Data rate	10 Mb/second
Buffer size	
Transmit buffer	128 bytes
Receiver buffer	128 bytes

Hardware Specifications

Digital Storage System Interconnect (DSSI)	
Number of DSSI interfaces	1 (or 2 with KFDDA option)
Maximum number of supported devices	7 (or 14 with KFDDA option)
Data path width	8 bits
Maximum bandwidth	4 MB/second
Maximum queue I/O rate	1200/second
Buffer size	
Transmit buffer	256 bytes
Reciever buffer	256 bytes
Console Serial Lines	
Interface standards	EIA RS-423-A/CCITT V.10 X.26
	EIA RS-232-C/CCITT V.28
	DEC-423
Data format	1 start bit, 8 data bits, 0 parity bits, 1 stop bit
Baud rates	300; 600; 1200; 2400; 4800; 9600; 19 200; 38 400
Ordering Information	
Included as part of base system.	
Operating System Support	
VMS	Version 5.5-1HN
Diagnostic Support	
MicroVAX Diagnostic Monitor	Release 137A and later
Self-tests	Yes
Related Documentation	
EK-513AA-OP	*VAX 4000 Model 105A/106A Operator Information*

E

Upgrade and Return Forms

The Customer Service Engineer who performs an upgrade that requires returns must complete and return each of the three forms contained in this appendix.

Return the Customer Service Worksheet to the local contracts administrator.

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

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

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

Call the Sales Support Team (1-800-832-6277 or DTN 264-8990) if you need help.

The items to be returned are dependent on the upgrade and may be:

- M7606, KA630, KA650, KA655, or KA660 CPU Modules
- M7608, M7609, MS630, MS650-AA, MS650-BA, or MS650-BB Memory Modules
- Whole systems

Upgrade and Return Forms

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

- System type: DV-41SXX-XX or 2T-416XX-XX
- Activity code: I
- Type of call: I
- Action taken: D
- P/L segment code: HPS

Reader's Comments

Rackmount VAX 4000
Model 100/100A/105A/106A
Installation Information
EK-465RA-IN. D01

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Thank you for your assistance.

I rate this manual's:	Excellent	Good	Fair	Poor
Accuracy (product works as manual says)	☐	☐	☐	☐
Completeness (enough information)	☐	☐	☐	☐
Clarity (easy to understand)	☐	☐	☐	☐
Organization (structure of subject matter)	☐	☐	☐	☐
Figures (useful)	☐	☐	☐	☐
Examples (useful)	☐	☐	☐	☐
Index (ability to find topic)	☐	☐	☐	☐
Page layout (easy to find information)	☐	☐	☐	☐

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