VAX 4000 (BA440-Based) Systems

DSSI Upgrade Installation Guide

Order Number: EK–VV4SY–IG. B01

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Contents

Preface

Intended Audience

This document is intended for Digital Services personnel and licensed self-maintenance customers.

Customer Responsibilities

It is the customer's responsibility to perform a software backup before a Digital Services representative arrives at the site.

Digital Services Responsibilities

The Digital Services representative should contact the customer to ensure that the customer's software is backed up before arriving at the site.

Document Structure

Chapter 1 contains instructions for installing the DSSI upgrade option on a BA440–based system.

Chapter 2 contains instructions for installing the DSSI upgrade option on a BA441–based (rackmount) system.

Related Documents

The following is a list of related documents:

Documentation	Order Number
BA440/BA430 Enclosure Maintenance	EK–348AB–MG
KA681/KA691/KA692 CPU System Maintenance	EK–498AA–MG
VMS License Management Utility Manual	AA–LA33A–TE

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Installation

This chapter describes how to upgrade a VAX 4000 (BA440-based) system with the dual DSSI bulkhead assemblies.

---------- **Caution** ----------

Modules can be damaged by static discharge if an antistatic wrist strap is not worn or an antistatic mat is not used during handling. The wrist strap and mat are in the antistatic kit in the Digital Services toolkit.

1.1 System Requirements

The system must have VMS software, Version 5.5–2H4, VMS 6.1, or later to support the KFDDB–AF with the KA681, KA691, KA692, or KA694 CPU. Also, the system must have a Rev. K01 or higher BA440 backplane (54–19354–01). The DSSI daughter card is only supported on KA681, KA691, KA692, and KA694 CPUs.

1.2 Kit Inventory

The DSSI upgrade kit contains the following items:

- 1 Installation document (EK–VV4SY–IG. B01)
- 1 Dual DSSI daughter card (54–20569–01)
- 2 DSSI bulkhead assemblies with cable attached (70–22860–01)
- 2 Bus 2 labels (36–26883–D4)
- 2 Bus 3 labels (36–26883–D3)
- 2 Grant cards (M9047–00)
- 2 Filler panels (74–33507–01)
- 4 DSSI terminators (12–29258–01)

- 2 cable spacers (74–49137–01)

1.2.1 Unpacking the Kit

Follow these steps when unpacking the kit.

1. Make sure there is no external damage to the shipping container, such as dents, holes, or crushed corners.

2. Unpack the upgrade kit and check its contents against the content listing.

3. Do not unpack the DSSI daughter card at this time.

4. If any item is missing or damaged:

   a. Contact the customer's sales representative.

   b. Contact the customer's delivery agent.

1.2.2 Before Installing the Kit

Before installing the kit:

1. It is the customer's responsibility to back up the system disk before the Digital Services representative arrives. This is optional.

2. Run MDM diagnostics to verify system operation. This is optional.

3. Perform a VMS shutdown of the system before installing the kit.

1.3 Installing the Kit

To install the upgrade kit, do the following:

_____ **Note** _____

The ISE figures throughout these steps show the RF-series variety.

Handle ISEs with care. Dropping or bumping the ISE can damage the disk surface. Carry or hold the ISEs by their metal brackets to avoid damaging the drive module.

The possible items occupying this space are as follows:

- Single ISE — 1 OCP cable to remove

- Dual ISE — 2 OCP cables to remove

- Blank bezel — No cables to remove

_____

1. Unlock the front door by turning the front door key switch to the bottom position. Open both access doors simultaneously. Turn off the power switch on the power supply.

2. To make the DSSI installation easier, it is suggested that you remove the three ISEs (or blank bezels) starting from left to right. Refer to Figure 1–1.

3. If you choose to remove the ISEs, follow the alphabetized instructions below. If you choose not to remove the ISEs, go to Step 4.

   a. Loosen the single captive Phillips screw that secures the ISE front panel (Figure 1–1A).

   b. Separate the ISE front panel from the enclosure, being careful of the remote front panel cable, which is connected to the ISE front panel.

   c. Unplug the remote front panel cable from the module inside the ISE front panel and set the front panel aside (Figure 1–1B).

   _____ **Note** _____

   Keep track of which front panel belongs with which ISE, since the ISE must retain its original bus node ID plug.

   _____

   d. Loosen the upper and lower captive screws that hold the ISE in place (Figure 1–1C).

   e. Using the upper and lower finger cutouts on the ISE bracket, carefully pull the ISE out of its backplane connector and slide the drive out of the enclosure. Support the weight of the ISE as the ISE clears the enclosure (Figure 1–1C).

   _____ **Caution** _____

   Do not touch the drive module. The drive module contains sensitive electronic circuitry.

   _____

Figure 1–1   Removing an ISE

Phillips Screw

A

B

Remote Front
Panel Cable

C

Captive Screws

Remote Front
Panel Cable

Finger Cutouts
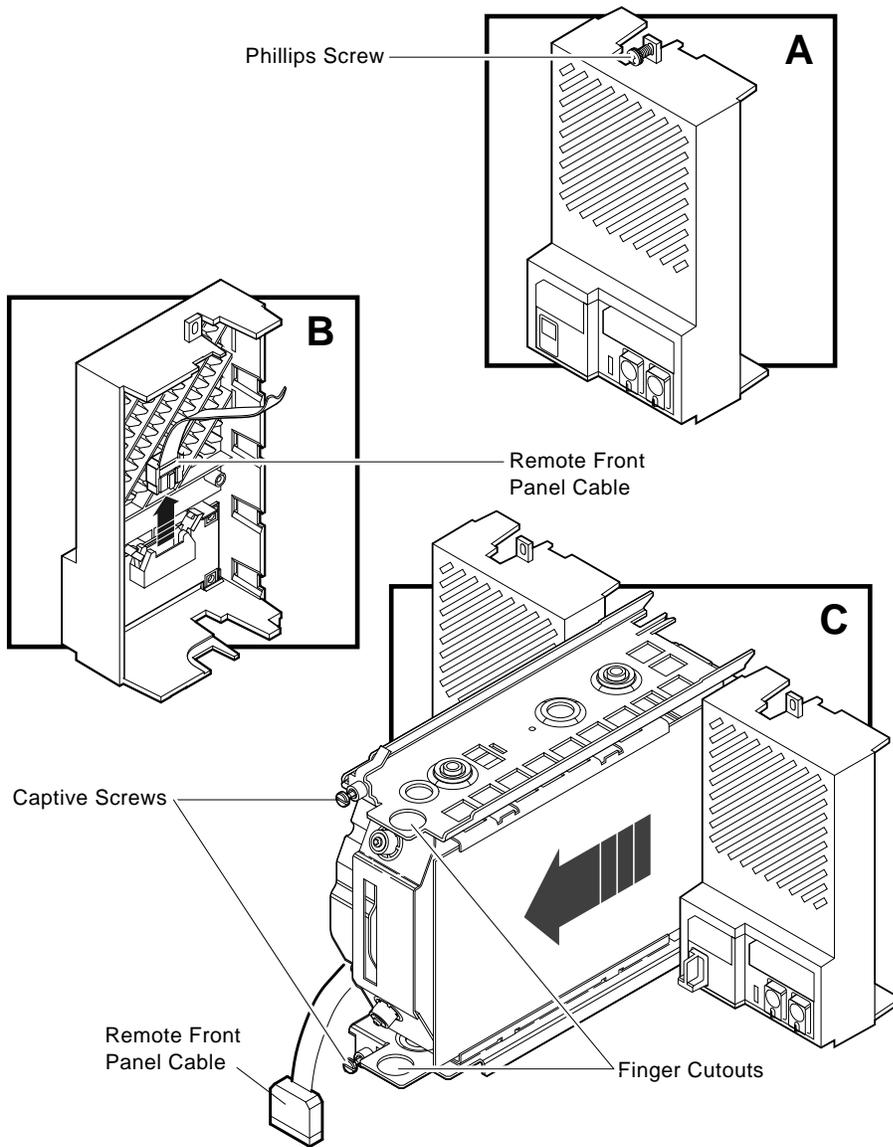
MLO-004210

4. Remove all Q–bus bulkheads and modules starting from left to right. Refer to Figure 1–2.

<hr>
Note
<hr>

Create a chart of the module order/placement and external cable connections to the modules to use as a reference when reinstalling the modules and cables.

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Note
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If there is a TK70/TQK70 tape drive/controller present, it is not necessary to remove the TQK70 cable from the machine. It is easier to disconnect the cable from the module and remove the module only.

<hr>

Figure 1–2   Q–Bus Module Slots

Slot
Positions

12 11 10 9 8 7 6
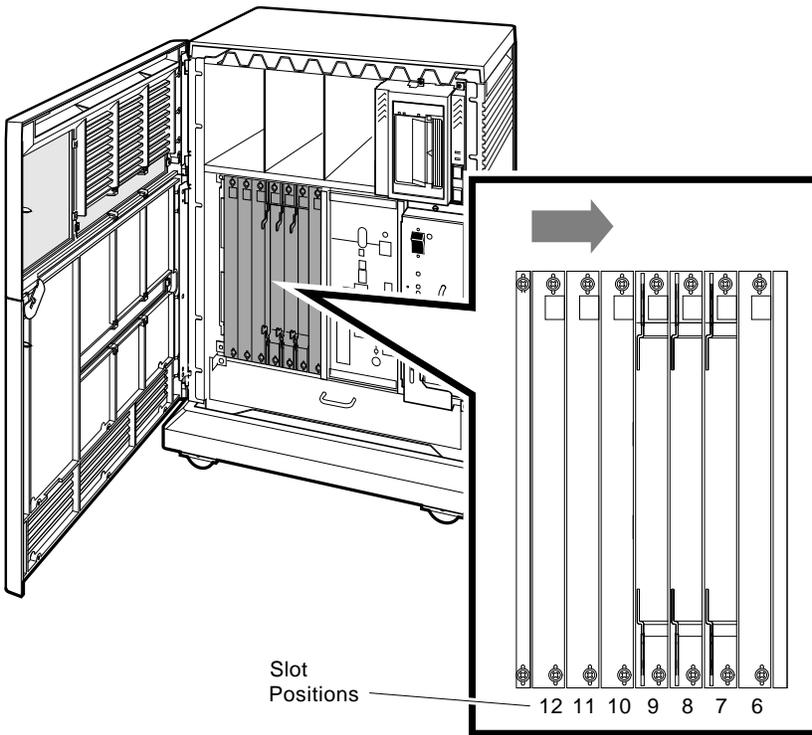
MLO-010190

The H3604 console module is to the right of slot 6. Refer to Figure 1–3. DO NOT remove the DSSI cables that are connected to the front of this console module.

5. Open the H3604 console module by turning the ¼-turn screws.

6. Swing the hinged panel to the left. Note the position of the internal cables connected to the H3604 module. Carefully disconnect the flat cable connected to the CPU.

_____ **Note** _____

It is not necessary to disconnect the smaller cable that connects to the short backplane power card.

_____

7. Remove the H3604 console module door by lifting it up. Lay it down in front of the enclosure.

8. Remove the memory modules.

9. Remove the CPU module.

Figure 1–3 The H3604 Console
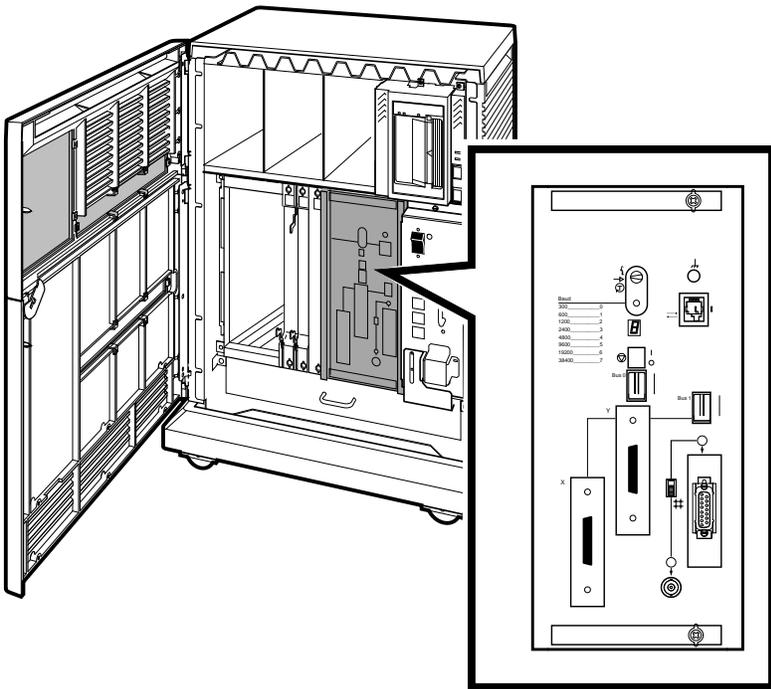
MLO-010191

10. Attach one "bus 2" label (36–26883–D4) to the Berg connector at the end of the DSSI cable assembly. Refer to Figure 1–4.

11. Attach the other "bus 2" label (36–26883–D4) to the front of the bulkhead assembly. Refer to Figure 1–4.

12. Attach one "bus 3" label (36–26883–D3) to the Berg connector at the end of the DSSI cable assembly. Refer to Figure 1–4.

13. Attach the other "bus 3" label (36–26883–D3) to the front of the bulkhead assembly. Refer to Figure 1–4.

Figure 1–4   Attaching the Bulkhead Labels
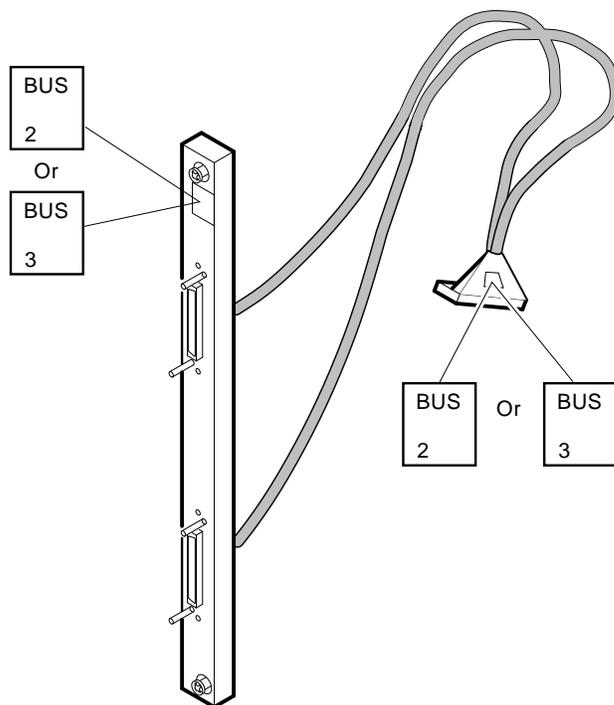
MLO-010192

14. Install the DSSI bus 2 bulkhead (70–22860–01). Figure 1–5 shows the position of the DSSI bulkheads inside the BA440 enclosure.

Configuration a   If you are not expanding the Q–bus to another enclosure, install the DSSI bus bulkheads in slots 12 and 11. See Figure 1–6.

Configuration b   If you are expanding the Q–bus to another enclosure, install the DSSI bus bulkheads in slots 11 and 10, and install the Q–bus expander module in slot 12 of this enclosure. Install another Q–bus expander in slot 1 of the other expander enclosure.

_____ **Note** _____

A filler panel and a Q–bus grant card must be installed behind each DSSI bulkhead in configuration b.

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Figure 1–5 Possible DSSI Bulkhead Configurations
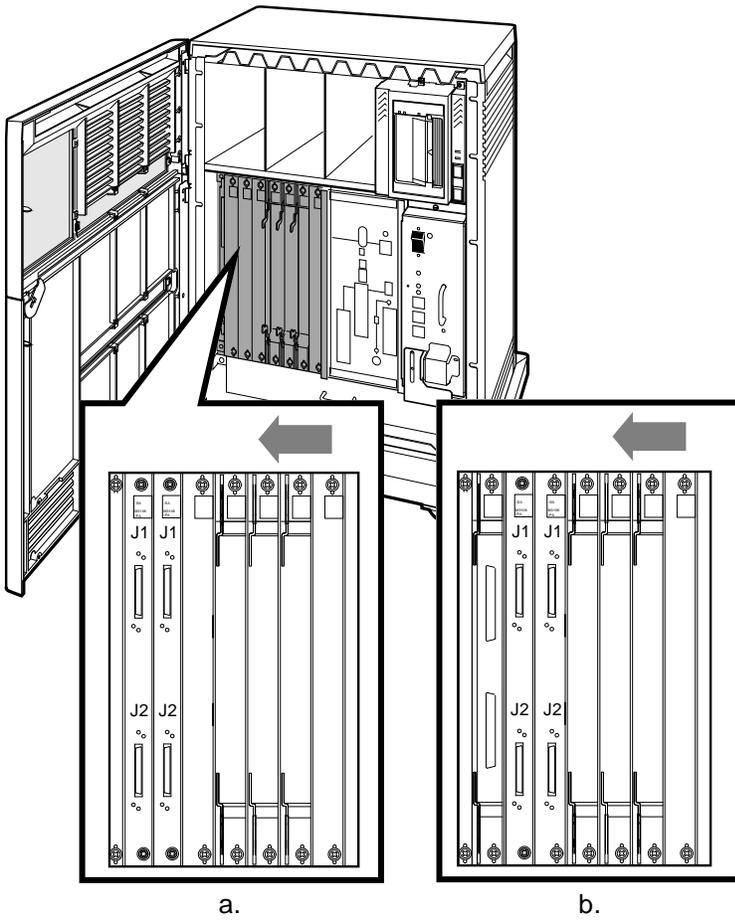
MLO-010193

To route the DSSI bus bulkhead cables:

_____ **Note** _____

The easiest way to install the cable is by pulling the connector through
while pushing the cable at the other end.

_____

- Route the bus 2 DSSI cables up through the opening to the left of slot
  12 (slot 11 if you are expanding the Q–bus) and dress them through the
  card cage/mass-storage divider until they reach the slots for the CPU
  module. Keep these cables toward the rear of the divider.

- Push the connector through the rear half of the CPU slot. Refer to
  Figure 1–6.

- Route the bus 3 DSSI cables up through the opening to the left of slot
  11 (slot 10 if you are expanding the Q–bus) and dress them through the
  card cage/mass-storage divider until they reach the slots for the CPU
  module. Keep these cables toward the front of the divider.

- Push the connector through the front half of the CPU slot. Refer to
  Figure 1–7.

- There are sheet metal partitions that separate the mass-storage
  cavities. The cable spacer will be placed on the right sides of the first
  and second partitions from the left. Figure 1–8 shows the partitions
  and the cable spacer in the installed positions.

  The cable spacer is for dressing the cables in a manner so that they do
  not restrict air flow through the module card cage.

- Remove adhesive liner from the cable spacer.

- The cable spacer is self-locating. Put the spacer "legs" into the storage
  divider as shown in Figure 1–8. The spacer will catch itself into place
  at the bottom of the partition.

- Press the spacer against the partition to secure it in place.

- Move the bus 2 cables under the spacer's rear legs and stack them
  vertically.

- Move the bus 3 cables under the spacer's front legs and stack them
  vertically.

- Repeat the previous five steps for the second cable spacer.

- Make certain that the bus 2 cables are positioned underneath the wide sheet metal web that runs the center length (front to back) of the leftmost mass-storage cavity. This will allow proper air flow through the module card cage.

Figure 1–8 shows the installed cable spacer and the proper orientation of the cables behind the spacer legs.

Figure 1–6 DSSI Configuration Bus 2 Cabling
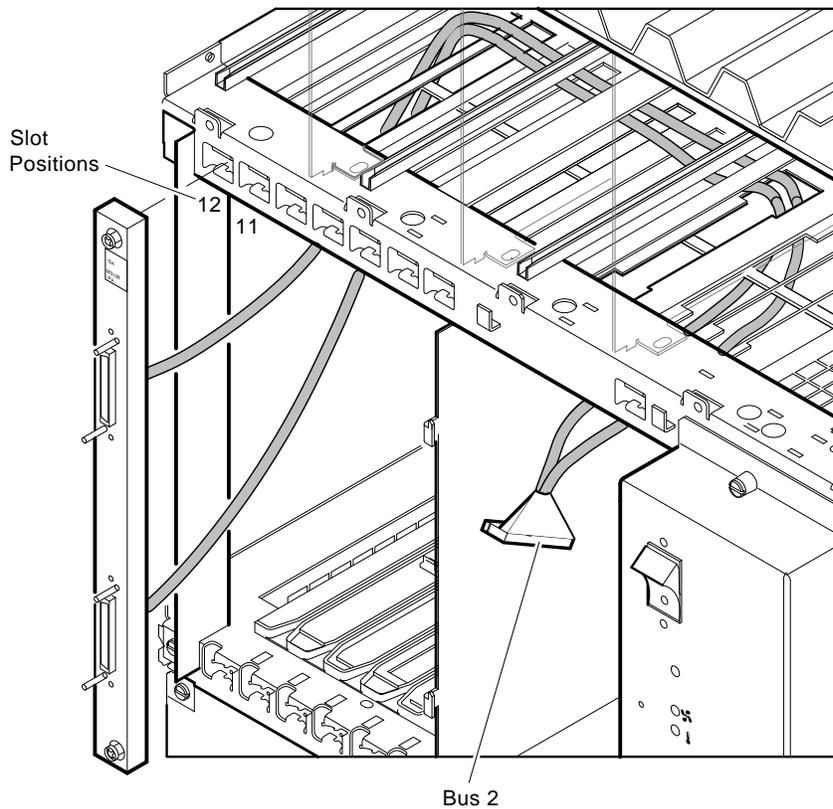
MLO-010194

Figure 1–7   DSSI Configuration Bus 3 Cabling

Slot
Positions

12

11

Bus 3

MLO-010195
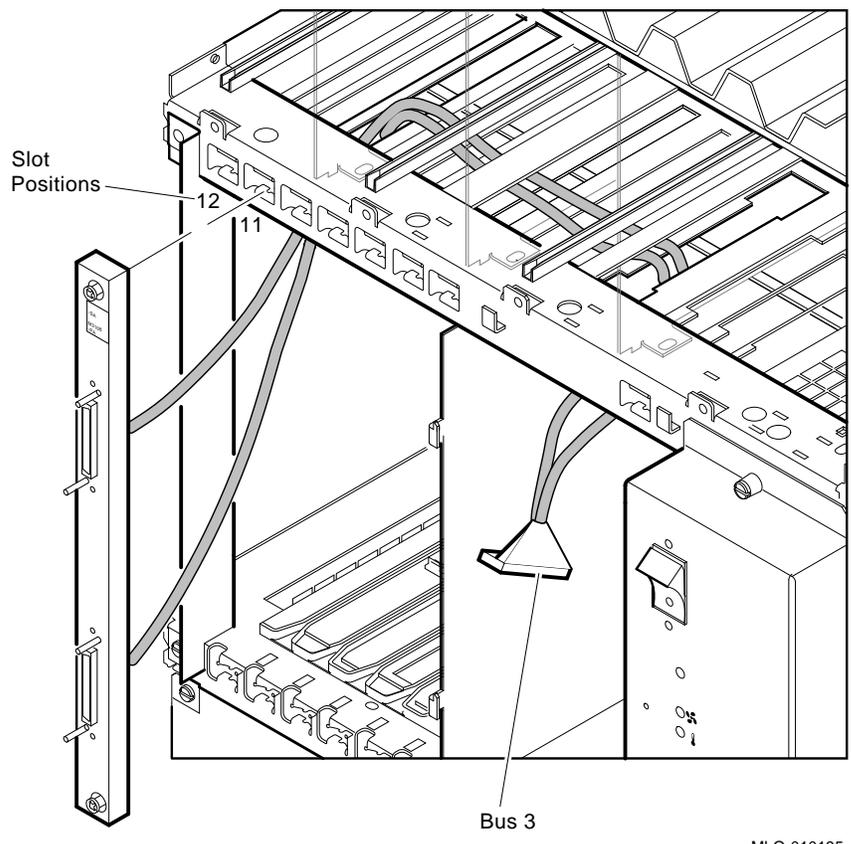
Figure 1–8 DSSI Configuration for the Bus 2 and Bus 3 Cabling
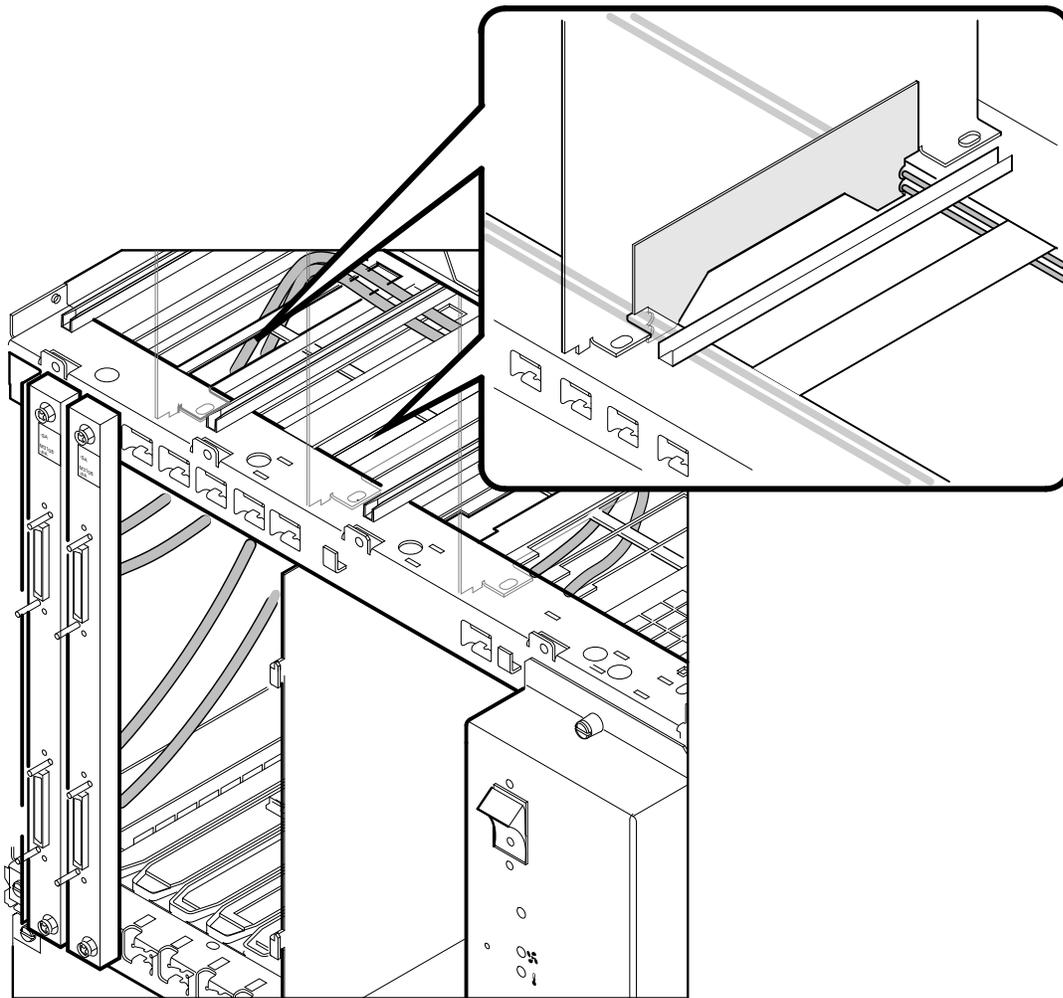
MLO-012344

15. If you are using Q–bus expansion, do the following:

    a. Install a filler panel (74–33507–01) into the lower half of slots 11 and 10.

    b. Install a Q–bus grant card (M9047) into the top half of slots 11 and 10 using the guide on the filler panel.

16. Pull all the cables slack into the CPU area.

17. Secure each bulkhead to the card cage using its captive screws.

18. Install the DSSI bus daughter card (54–20569–01) on the CPU module.

    a. Remove the DSSI daughter card from its packaging.

    b. Open the ejector handles on the daughter card connectors.

    c. Turn the daughter card so the component side is facing down.

    d. Align the connector on the daughter card with the corresponding connector on the CPU module.

    e. Align the standoff holes on the daughter card with the standoff posts on the CPU module.

    f. Push the daughter card onto the CPU module until it locks in place.

    g. Check to ensure that the connectors are firmly seated. Refer to Figure 1–9.

Figure 1–9 Installing the DSSI Daughter Card

Standoffs

Connectors

DSSI
Module
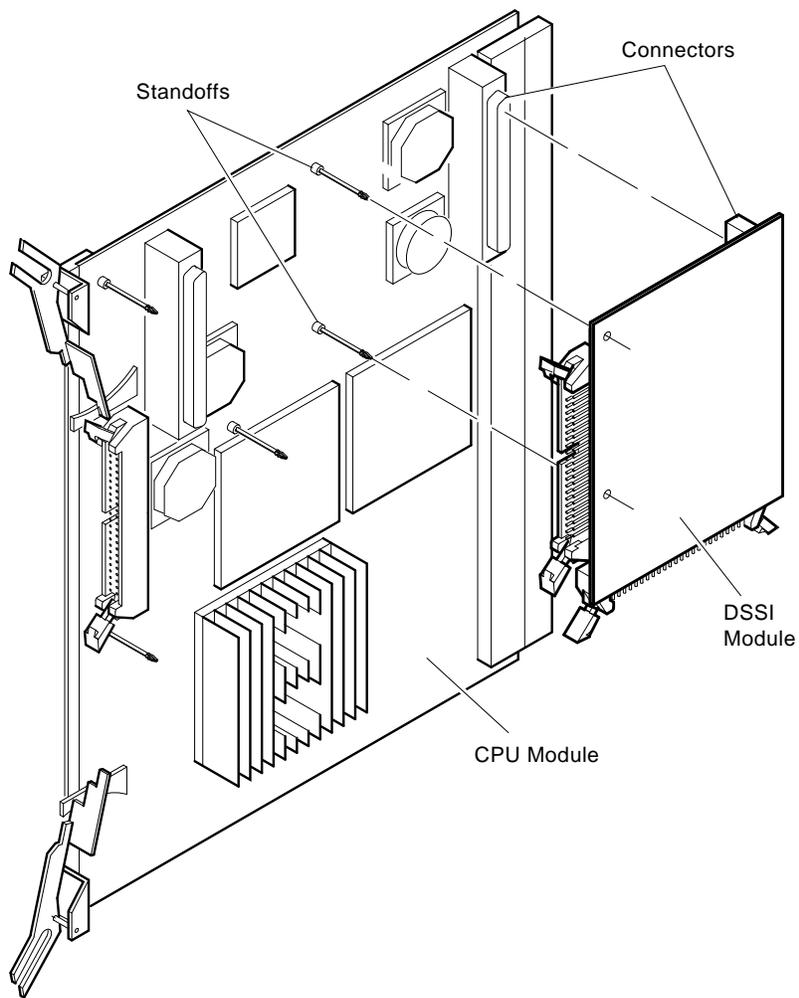
CPU Module

MLO-010198

19. Position the CPU module halfway into its slot so the cables can reach the daughter card.

20. Connect the DSSI bus 2 and bus 3 cable connectors to the corresponding connectors on the DSSI daughter card. The connectors are keyed and marked "Bus 2" and "Bus 3" in the etch for proper assembly. Refer to Figure 1–10. Make sure the connectors lock in place.

21. Ensure the DSSI cables are out of the way so you can insert the CPU module into the backplane connector.

_____ **Suggestion** _____

Service loops should be created with the cable slack to allow the CPU module/DSSI daughter card to slide into and out of the slot easier. Loop the bus 3 cable toward the front of the unit touching the mother board and loop the bus 2 cable toward the back of the unit touching the mother board.

_____

Figure 1–10   Connecting the DSSI Cables to the Daughter Card

Bus 3

Bus 2
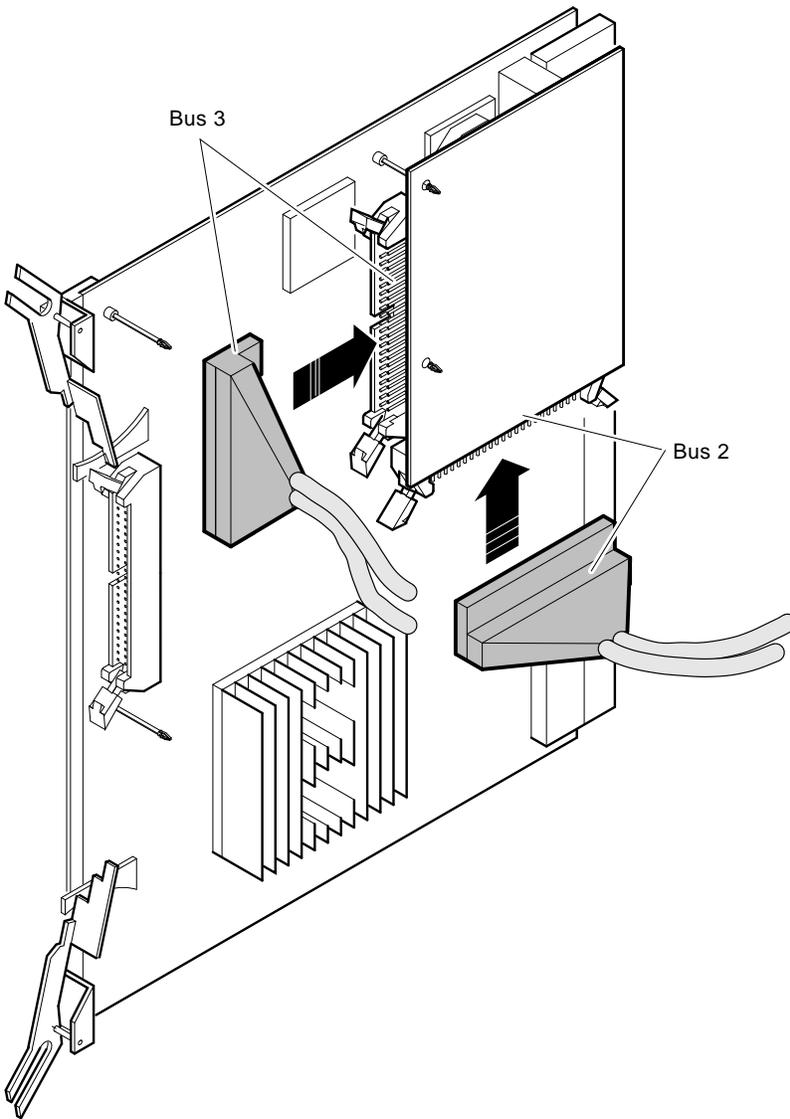
MLO-010199

22. Push the CPU module into its slot and lock it in place.

23. Reinstall the memory modules into their original slots starting from left to right. Refer to the Suggestion above to get the DSSI cables out of the way. It may be necessary to manually move the DSSI cables while installing the first memory module.

24. Reinstall the Q–bus options or blank panels. Refer to the chart you made before you removed the options for reference.

25. Reconnect the internal cables to the H3604 console module. Close and lock the H3604 console module.

--- **Note** ---

Ensure the H3604 console module backplane power card is fully inserted before installing the H3604 console module cover.

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26. Reconnect any cables belonging to the H3604 console module.

27. Reverse the ISE removal procedure to reinstall the ISEs. Ensure that the original ISE control panel goes with each ISE.

28. If you installed an expander unit, connect the expander cable at this time. Refer to the expander documentation.

29. Attach a DSSI terminator (12–29258–01) to any unused Bus 2 or Bus 3 bulkhead port.

30. Turn on the power to the system and expander boxes, if any. Have the customer perform a VMS boot to the system. Run diagnostics to verify system operation.

31. Check the power up procedure to determine which ID plugs are used.

    Until overridden by the SET DSSI_ID console command, DSSI bus 2 and 3 will assume the same IDs as Bus 0 and 1, respectively. You can change the DSSI ID by the SET DSSI_ID console command. Refer to the *VAX 4000 Model 500A/600A/700A Operation* manual to set and examine DSSI device parameters from console mode.

32. Have the customer reinstall the system backup information. This is optional.

2

Installation on a Rackmount System

This chapter describes how to upgrade a VAX 4000 (BA441-based) rackmount system with the dual DSSI bulkhead assemblies.

―――――――――― **Caution** ――――――――――

Modules can be damaged by static discharge if an antistatic wrist strap is not worn or an antistatic mat is not used during handling. The wrist strap and mat are in the antistatic kit in the Digital Services toolkit.

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2.1 System Requirements

The system must have VMS software, Version 5.5–2H4, VMS 6.1, or later to support the KFDDB–AF with the KA681, KA691, KA692, or KA694 CPU. Also, the system must have a Rev. K01 or higher BA441 backplane (54–19354–01). The DSSI daughter card is only supported on KA681, KA691, KA692, and KA694 CPUs.

2.2 Kit Inventory

The DSSI upgrade kit contains the following items:

- 1 Installation document (EK–VV4SY–IG. B01)

- 1 Dual DSSI daughter card (54–20569–01)

- 2 DSSI bulkhead assemblies with cable attached (70–22860–01)

- 2 Bus 2 labels (36–26883–D4)

- 2 Bus 3 labels (36–26883–D3)

- 2 Grant cards (M9047–00)

- 2 Filler panels (74–33507–01)

- 4 DSSI terminators (12–29258–01)

2.2.1 Unpacking the Kit

Follow these steps when unpacking the kit.

1. Make sure there is no external damage to the shipping container, such as dents, holes, or crushed corners.

2. Unpack the upgrade kit and check its contents against the shipping invoice.

3. Do not unpack the DSSI daughter card at this time.

4. If any item is missing or damaged:

   a. Contact the customer's sales representative.

   b. Contact the customer's delivery agent.

2.2.2 Before Installing the Kit

Before installing the kit:

1. It is the customer's responsibility to back up the system disk before the Digital Services representative arrives. This is optional.

2. Run MDM diagnostics to verify system operation. This is optional.

3. Perform a VMS shutdown of the system before installing the kit.

2.3 Installing the Kit

To install the upgrade kit, do the following:

1. Extend the stabilizing foot (feet) on your cabinet.

2. Turn the main ON/OFF power switch to OFF and disconnect the power cord from the power controller.

3. Release the two captive fasteners on each side of the bezel that secure the chassis to the cabinet rails and pull the VAX 4000 forward.

4. Remove all Q–bus bulkheads and modules starting from left to right. Refer to Figure 2–1.

_____ **Note** _____

If there is a TK70/TQK70 tape drive/controller present, it is not necessary to remove the TQK70 cable from the machine. It is easier to disconnect the cable from the module and remove the module only.

_____

Figure 2–1   Q–Bus Module Slots
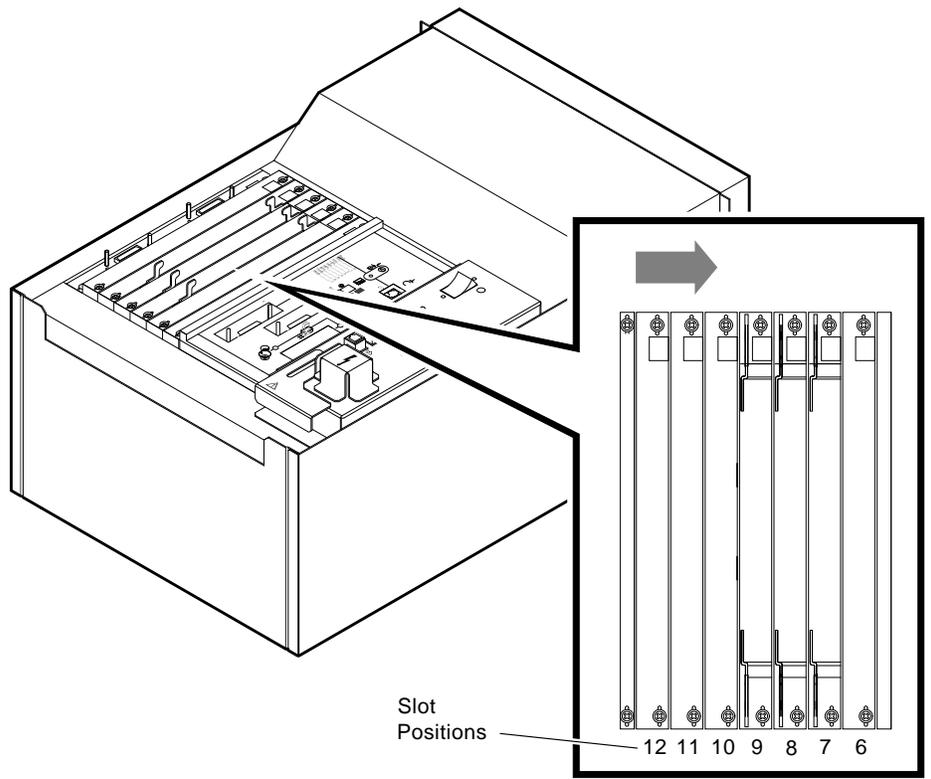
Slot
Positions
12 11 10 9 8 7 6

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The H3604 console module is to the right of slot 6 (Figure 2–2). DO NOT remove the DSSI cables that are connected to the front of this console module.

5. Open the H3604 console module by turning the ¼-turn screws.

6. Lift the hinged H3604 console panel from the right side. Note the position of the internal cables connected to the H3604 module. Carefully disconnect the following:

   • The flat cable connected to the CPU

   • The power cable connected to the backplane power card

7. Remove the H3604 console module door by sliding it towards the front of the system.

Figure 2–2   The H3604 Console
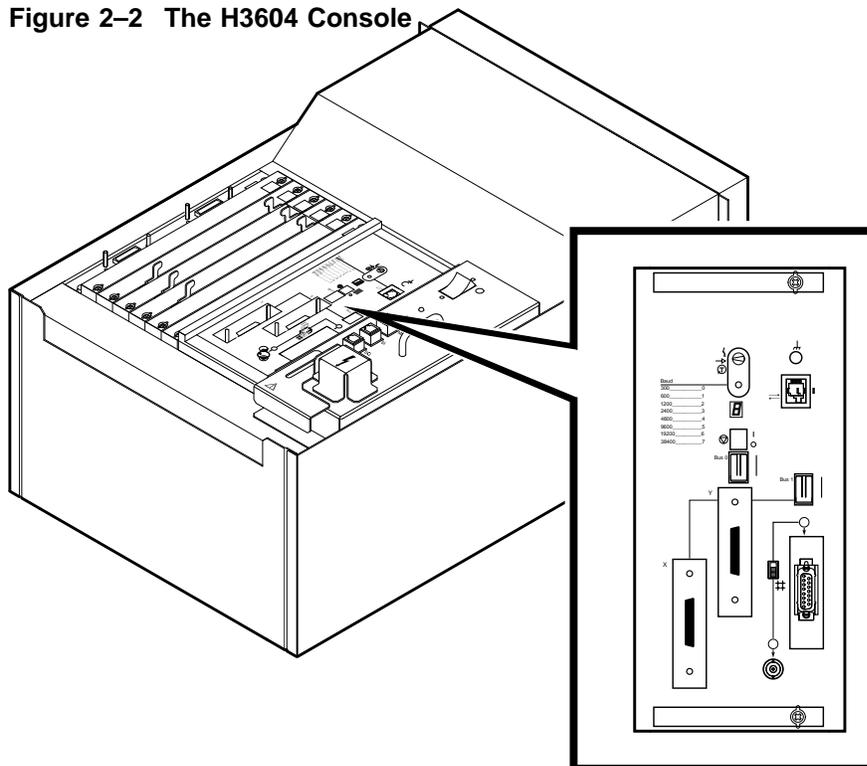
MLO-010863

8. Remove the memory modules.

9. Remove the CPU module.

10. Attach one "bus 2" label (36–26884–D4) to the Berg connector at the end of the DSSI cable assembly. Refer to Figure 2–3.

11. Attach the other "bus 2" label (36–26884–D4) to the front of the bulkhead assembly. Refer to Figure 2–3.

12. Attach one "bus 3" label (36–26884–D3) to the Berg connector at the end of the DSSI cable assembly. Refer to Figure 2–3.

13. Attach the other "bus 3" label (36–26884–D3) to the front of the bulkhead assembly. Refer to Figure 2–3.

Figure 2–3 Attaching the Bulkhead Labels
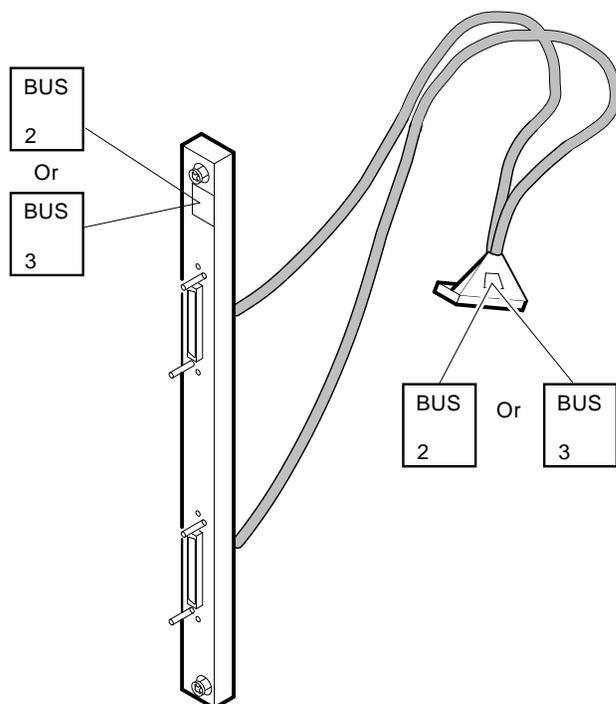
MLO-010192

14. Install the DSSI bus 2 bulkhead (70–22860–01). Figure 2–4 shows the position of the DSSI bulkheads inside the BA441 enclosure.

Configuration a   If you are not expanding the Q–bus to another enclosure, install the DSSI bus bulkheads in slots 12 and 11. See Figure 2–5.

Configuration b   If you are expanding the Q–bus to another enclosure, install the DSSI bus bulkheads in slots 11 and 10, and install the Q–bus expander module in slot 12 of this enclosure. Install another Q–bus expander in slot 1 of the other expander enclosure. See Figure 2–6.

_____ **Note** _____

A filler panel and a Q–bus grant card must be installed behind each DSSI bulkhead in configuration b.

_____

To route the DSSI bus bulkhead cables:

_____ **NOTE** _____

The easiest way to install the cable is by pulling the connector through while pushing the cable at the other end.

_____

- Route the bus 2 DSSI cable into the left-most cable routing slot of the card cage.

- Guide the cable across the bottom of the card cage until it reaches the slots for the CPU module. Push the connector through the bottom CPU slot. Refer to the first illustration in Figure 2–5.

- Route the bus 3 DSSI cable into the next (to the right) cable routing slot of the card cage.

- Guide the cable across the top of the card cage until it reaches the slots for the CPU module. Push the connector through the top CPU slot. Refer to the second illustration in Figure 2–5.

Figure 2–6 shows cabling of DSSI bus bulkheads in a Q–bus expansion situation.

Figure 2–4 Possible DSSI Bulkhead Configurations
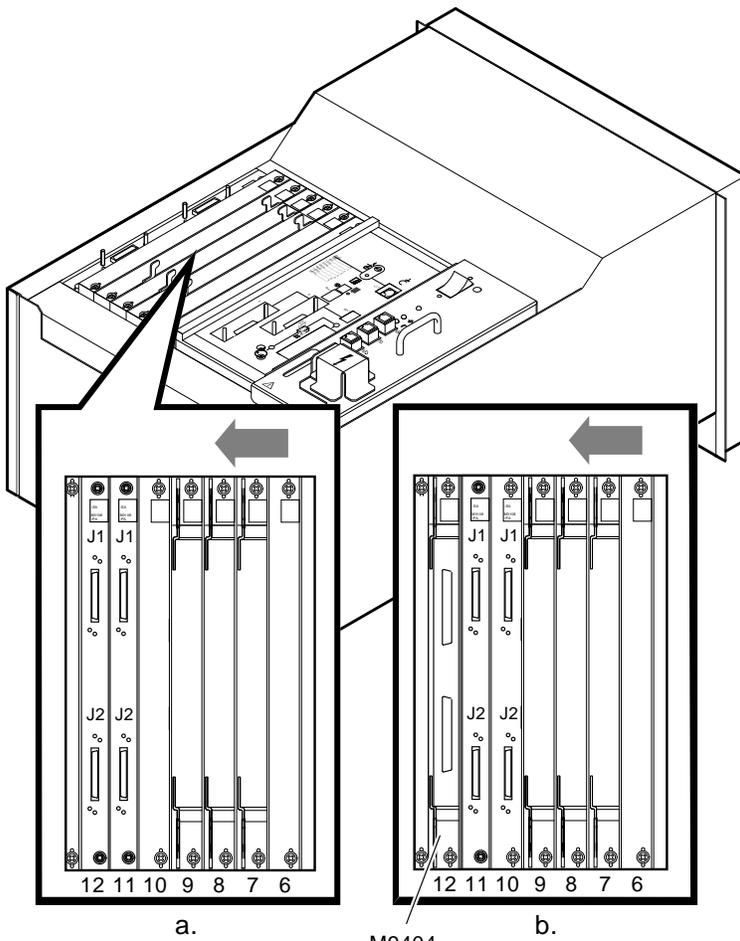
MLO-010864

Figure 2–5 DSSI Configuration "A" Cabling (Without Q–Bus Expansion)

Slot Positions

12 11

MLO-010866

Slot Positions

12 11
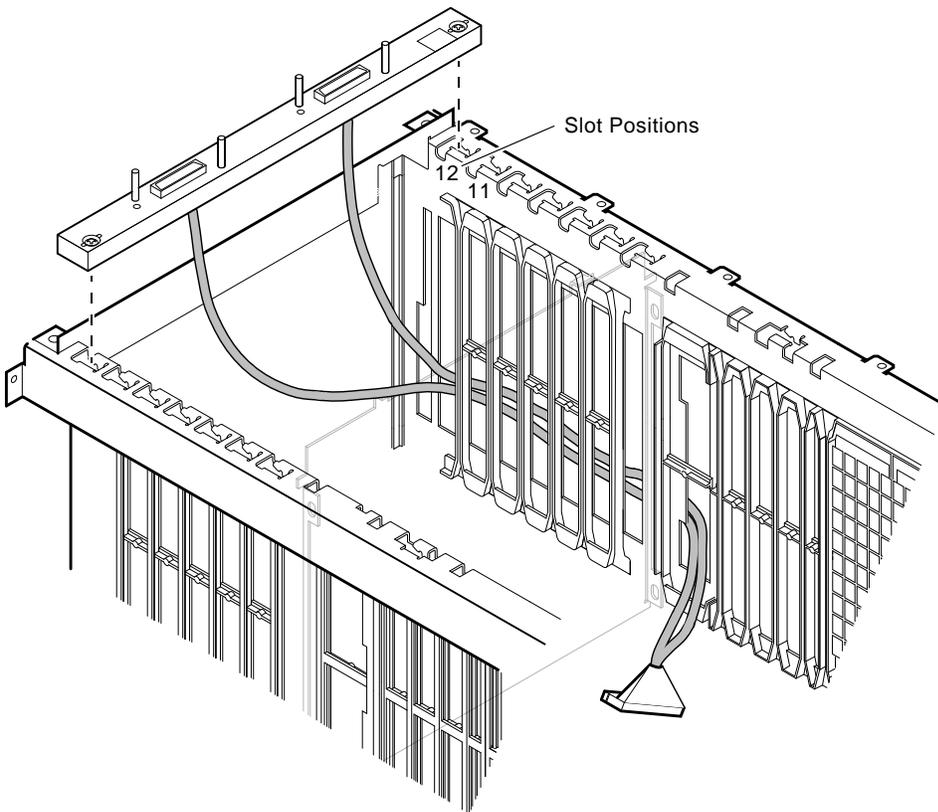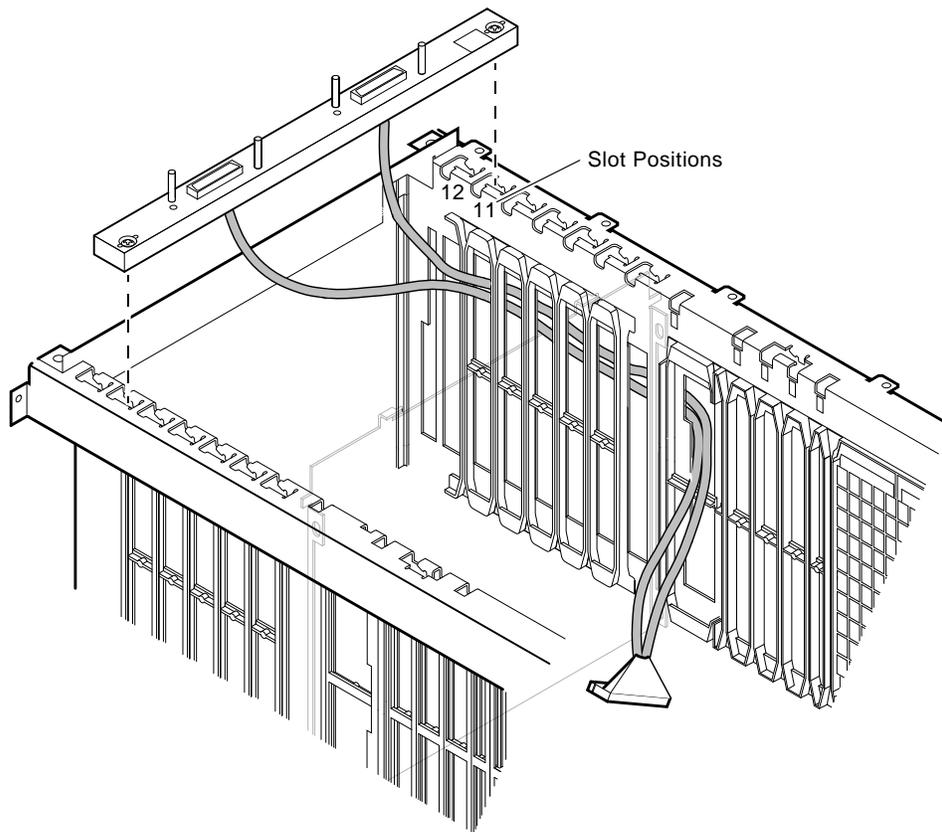
MLO-010865

Figure 2–6   DSSI Configuration "B" Cabling (With Q–Bus Expansion)

Slot Positions

11
10

MLO-010867

Slot Positions

11

10
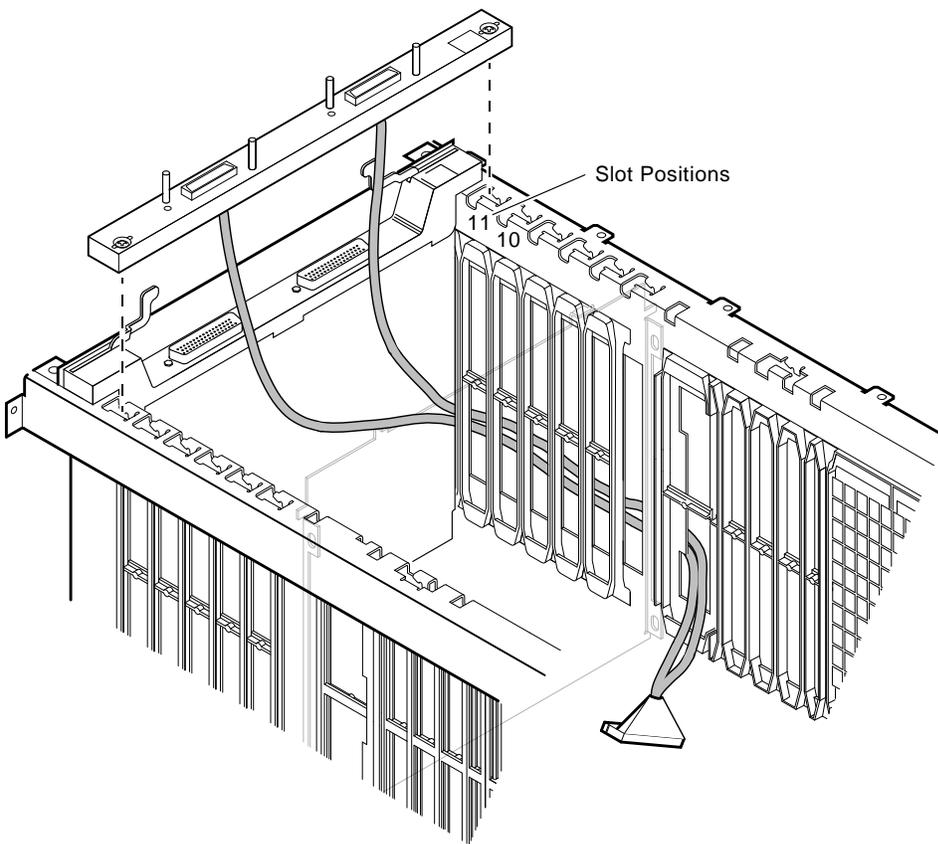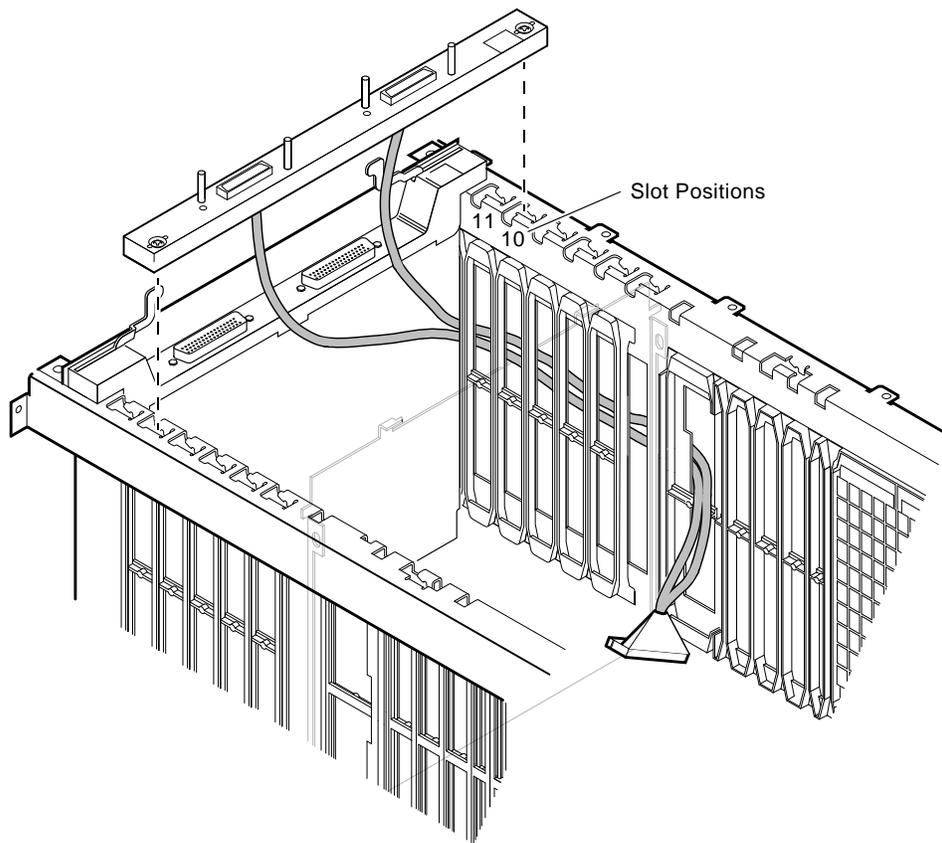
MLO-010868

15. If you are using Q–bus expansion, do the following:

    a. Install a filler panel (74–33507–01) into slots 11 and 10.

    b. Install a Q–bus grant card (M9047) into the filler panel in slots 11 and 10.

16. Pull all the cables' slack into the CPU area. Arrange the four cables downward in the card cage area.

17. Secure each bulkhead to the card cage using its captive screws.

18. Install the DSSI bus daughter card (54–20569–01) on the CPU module.

    a. Remove the DSSI daughter card from its packaging.

    b. Open the ejector handles on the daughter card connectors.

    c. Turn the daughter card so the component side is facing down.

    d. Align the connector on the daughter card with the corresponding connector on the CPU module.

    e. Align the standoff holes on the daughter card with the standoff posts on the CPU module.

    f. Push the daughter card onto the CPU module until it locks in place.

    g. Check to ensure that the connectors are firmly seated. Refer to Figure 2–7.

Figure 2–7 Installing the DSSI Daughter Card

Standoffs

Connectors

DSSI
Module
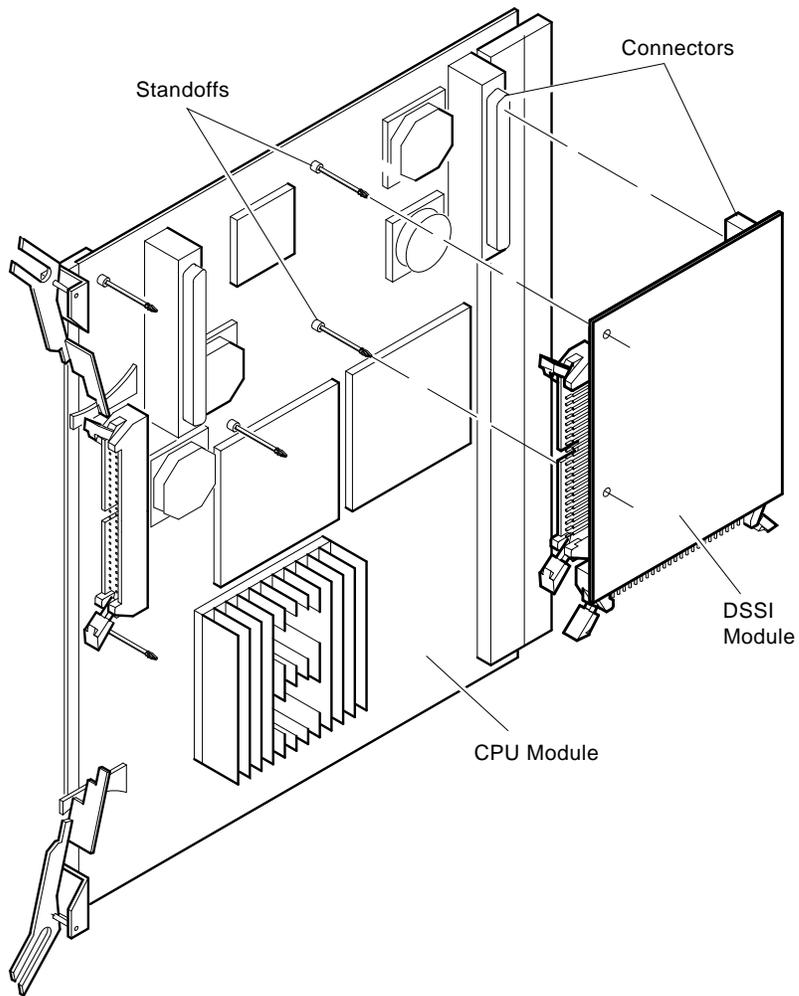
CPU Module

MLO-010198

19. Place the CPU module into its slot.

20. Connect the DSSI bus 2 and bus 3 cable connectors to the corresponding connectors on the DSSI daughter card. The connectors are keyed and marked "Bus 2" and "Bus 3" in the etch for proper assembly. Refer to Figure 2–8. Make sure the connectors lock in place.

Suggestion

Service loops should be created with the cable slack to allow the CPU module/DSSI daughter card to slide into and out of the slot easier. Loop the bus 3 cable toward the top of the unit touching the CPU board and loop the bus 2 cable toward the bottom of the unit touching the CPU board.

Figure 2–8   Connecting the DSSI Cables to the Daughter Card

Bus 3

Bus 2
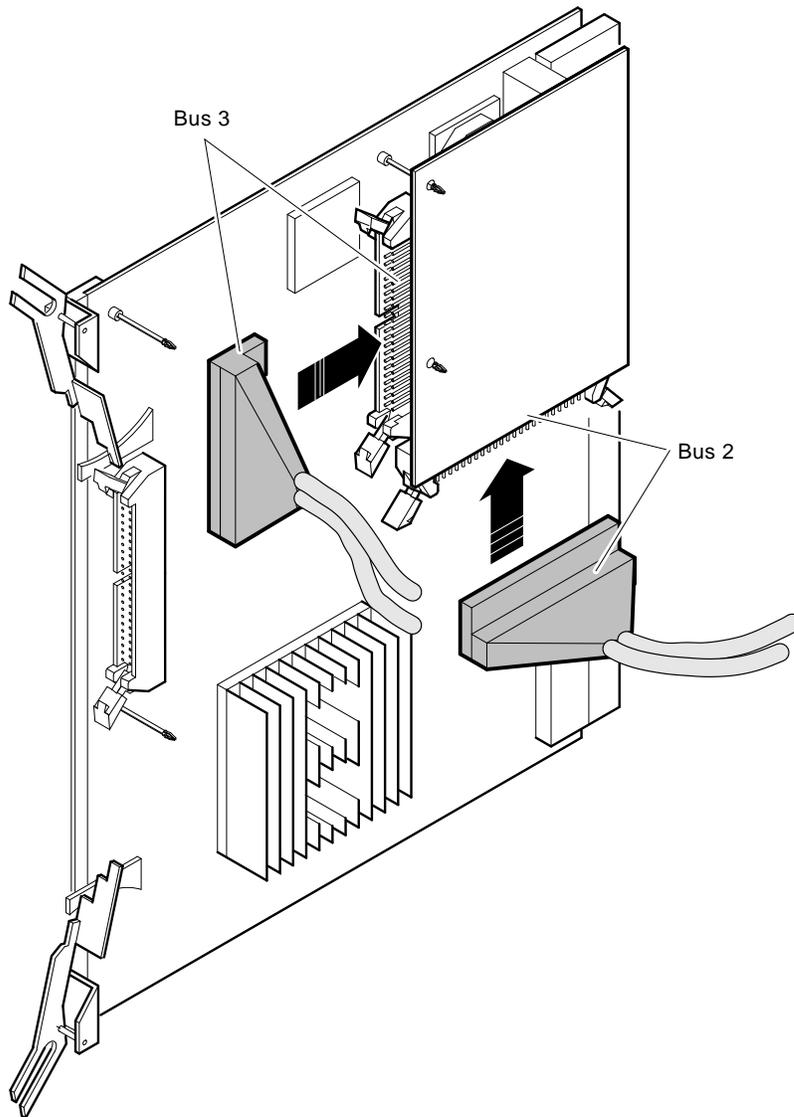
MLO-010199

21. Push the CPU module into its slot and lock it in place.

22. Reinstall the memory modules into their original slots starting from left to right. Refer to the Suggestion above to get the DSSI cables out of the way. It may be necessary to manually move the DSSI cables while installing the first memory module.

23. Reinstall the Q–bus options or blank panels.

24. Reconnect the internal cables to the H3604 console module. Close and lock the H3604 console module.

_____ **NOTE** _____

Ensure the H3604 console module backplane power card is fully inserted before installing the H3604 console module cover.

_____

25. Reconnect any cables belonging to the H3604 console module.

26. If you installed an expander unit, connect the expander cable at this time. Refer to the expander documentation.

27. Attach a DSSI terminator (12–29258–01) to any unused Bus 2 or Bus 3 bulkhead port.

28. Turn on the power to the system and expander boxes, if any. Have the customer perform a VMS boot to the system. Run diagnostics to verify system operation.

29. Check the power up procedure to determine which ID plugs are used.

    Until overridden by the SET DSSI_ID console command, DSSI bus 2 and 3 will assume the same IDs as Bus 0 and 1, respectively. You can change the DSSI ID by the SET DSSI_ID console command. Refer to the *VAX 4000 Model 500A/600A/700A Operation* manual to set and examine DSSI device parameters from console mode.

30. Have the customer reinstall the system backup information. This is optional.

How to Order Additional Documentation

Technical Support

If you need help deciding which documentation best meets your needs, call 800-DIGITAL (800-344-4825) and press 2 for technical assistance.

Electronic Orders

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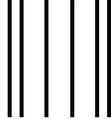
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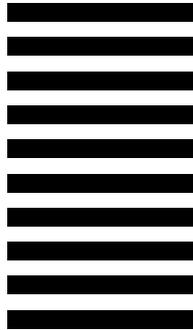
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