SA7x/6000 Cabinet Series Upgrade Installation Guide

Order Number EK–SA7CK–IN–003

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Preface

This manual describes:

- How to unpack the SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, or the SA73–NK/PK options.

- Safety precautions for Digital Services engineers working with the VAX 6000-series processor cabinet.

- How to install SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, or SA73–NK/PK enclosures into an existing, installed VAX 6000-series processor cabinet

Intended Audience

All Digital Services engineers installing an SA7x enclosure into a VAX 6000-series processor cabinet should read this manual. Without the information in this manual, proper installation cannot be done.

Document Structure

This document is divided into the following chapters:

Chapter	Describes
1	The contents of the SA7x options and how to unpack them
2	Safety and ESD precautions for Digital Services engineers
3	How to install the SA70–CK kit, the SA7x upgrade kit, the SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, or SA73–NK/PK enclosures
4	SA7x controls and indicators
5	How to use the SA7x enclosure
6	How to install RA7x disk drives

Scope

General information about the VAX 6000-series processor cabinet and field acceptance procedures is not contained in this manual. Refer to documentation for the VAX 6000-series cabinets for that information.

Chapter 1

SA70–CK and Upgrade Kits

1.1 Introduction

This chapter a brief description and parts list of the SA7x options and related upgrade kits available as Embedded Storage in the VAX 6000 series processor cabinet. Unpacking instructions are also included.

Warning

Procedures described in the following chapters must be performed by qualified Digital Services engineers. Digital customers may access the SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, or SA73–NK/PK disk enclosure operator control panel (OCP) only through the access panel on the front door. Access to the options by opening the front or rear cabinet doors is prohibited.

The following table shows the SA7x Options available for installation as Embedded Storage in the VAX 6000 Series Cabinet:

Table 1–1: SA7x Options for VAX 6000 Embedded Storage

Option	Description
SA70-LK	SA70-HK Storage Enclosure with 560 MB (2 RA70) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA70-MK	SA70-JK Storage Enclosure with 1.12 GB (4 RA70) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA71-NK	SA71-CK Storage Enclosure with 700 MB (1 RA71) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA71-PK	SA71-JK Storage Enclosure with 2.8 GB (4 RA71) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA72-NK	SA72-CK Storage Enclosure with 1 GB (1 RA72) Disk Storage capacity and SA70 Cab Kit (70-27273-01)

Table 1–1 (Cont.): SA7x Options for VAX 6000 Embedded Storage

Option	Description
SA72-PK	SA72-JK Storage Enclosure with 4 GB (4 RA72) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA73-NK	SA73-CK Storage Enclosure with 2 GB (1 RA73) Disk Storage capacity and SA70 Cab Kit (70-27273-01)
SA73-PK	SA73-JK Storage Enclosure with 8 GB (4 RA73) Disk Storage capacity and SA70 Cab Kit (70-27273-01)

Upgrade kits for systems that do not already have front door access to the SA7x operator control panels will need to be installed. The following table shows the contents of the upgrade kits:

62X34–UA	62X34–UB
70–26931–01 — door with SA70 control panel access panel	70–26931–01 — door with SA70 control panel access panel
H405–E — unswitched power controller for 208V/60Hz systems	H405–F — unswitched power controller for 380/416V/50Hz systems
Appropriate logo slug — To be installed on door	Appropriate logo slug — To be installed on door
EK-62X34-CL — Cover Letter	EK-62X34-CL — Cover Letter

These variations allow a Digital Services engineer to install SA70 enclosures into an existing, installed VAX 6000-series processor cabinet.

Some systems require a KDB50–C or a KDM70 disk controller. A KDB50–C disk controller has four ports; the KDM70 has eight ports. Refer to the *KDB50 Disk Controller User Guide* (EK–KDB50–UG) or the *KDM70 Disk Controller User Guide* (EK–KDM70–UG) for disk controller installation instructions.

Note

The 70–27273–01 kit is referred to as the SA70–CK kit in this document.

1.2 SA70–CK Parts List

The SA70–CK kit contents are listed in Table 1–2. Be sure all contents of the kit are present before starting the installation procedure.

Table 1–2:   SA70–CK Kit Parts List

Part Number	Description	Quantity
70–25686–01	Rail chassis assembly	1
70–25687–01	Bracket rail assembly	1
74–36464–01	Bar, insert nut	1
90–00039–26	Screw, Mach flat phil	4
90–06078–01	Screw, Mach pan phil	2
90–06664–00	Washer, flat	4
90–07906–00	Washer, helical split steel	2
74–36160–01	Block wedge	2
74–35857–02	Bracket, chassis retaining	1
74–35857–01	Bracket, chassis retaining	1
74–35860–01	Bracket, chassis retainer	2
90–06637–00	Washer, lock internal steel	6
12–24007–02	Screw, shoulder hex	4
12–24007–01	Screw, shoulder hex	2
12–21368–02	Screw, sems pan	2
90–06074–02	Screw, flathead phil	2
17–01699–02	I/O cable assembly	1
17–00442–27	Power cable 3 ft.	1
74–39395–01	Shim	2
74–39405–01	BeCu spring clip	2
12–20580–08	BeCu spring clip	9
99–08213–01	Packaged add-on SA7x	1
99–07030–02	Packaged add-on SA7x	as required
74–36158–01	Medallion	1
I/O Cable Assembly Hardware		
90–07880–00	Cable tie	6

Table 1–2 (Cont.):   SA70–CK Kit Parts List

Part Number	Description	Quantity
90–08264–00	Cable mount	1
90–07087–00	5/8-inch cable clamp	2
90–00063–41	10–32 x 5/8-inch posidrive screw	2
90–06662–00	Washer, flat	2
EK–SA7CK–IN	*SA7x/6000 Installation Guide*	1

1.3 Unpacking the SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, and SA73–NK/PK Options

The SA7x options are shipped in a packaging box. The SA70–CK kit are shipped in a separate package. Cut the shipping straps, open the top container, and unpack the option, as shown in Figure 1–1.

Figure 1–1: Unpacking the SA70 Enclosure

CONTAINER

MANUALS AND
MOUNTING
HARDWARE

SA7x
ENCLOSURE

DESICCANT

SHIPPING
STRAPS
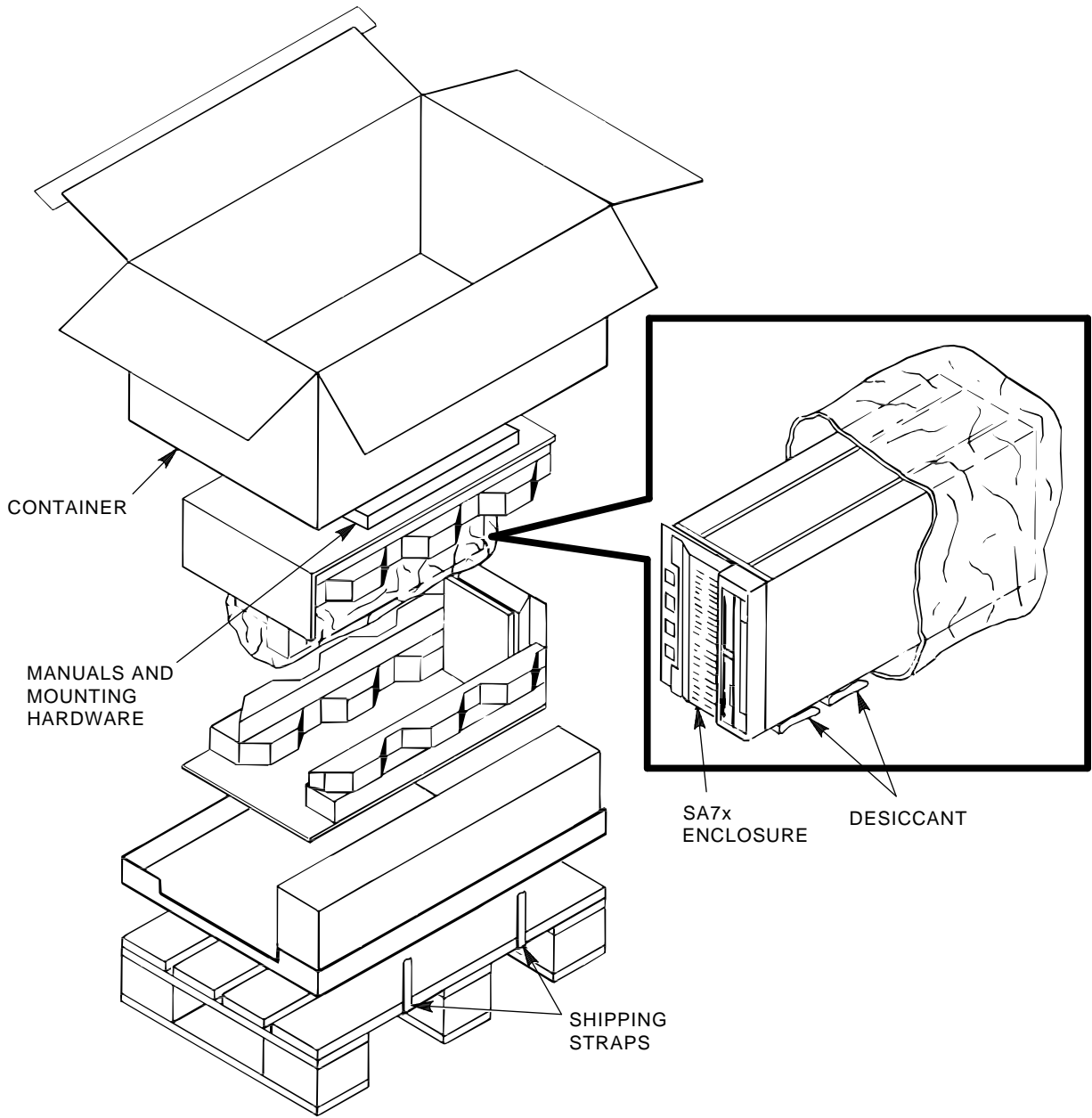
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Chapter 2

Safety Precautions

2.1 Introduction

This chapter discusses hazards and safety precautions that the Digital Services engineer should be aware of before installing SA70–CK kit, SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, and SA73–NK/PK options into the VAX 6000-series processor cabinet.

Warning

Only qualified Digital Services engineers should perform these procedures. Digital customers may access the SA70–LK/MK, SA71–NK/PK, SA72–NK/PK, or SA73-NK/PK operator control panel only through the VAX 6000 OCP access panel on the front door. Access to the options by opening the front or rear cabinet doors is prohibited.

2.2 Hazards and Safety Precautions

The front door of a VAX 6000-series processor cabinet is considered a safety barrier. High voltages, as well as the blower assembly, are accessible once the front door is opened. The cabinet door is locked and cannot be opened without a 5/32 hex key. Only Digital Services engineers can open the front door without violating Digital safety measures.

SA7x enclosure line voltage switches come preset in the 220V/50Hz position as a safety precaution. Ensure the line voltage switch is set to the proper position for the installation. Refer to Chapter 3.

2.3 ESD Precautions

Only Digital Services engineers with training in electrostatic discharge (ESD) procedures should install an SA7x enclosure or work with the processor cabinets.

Digital Services engineers must wear proper ESD protective ground straps connected to a good ground when accessing, installing, or repairing SA7x enclosures or VAX 6000-series processor cabinets. ESD kits, containing protective ground straps, are behind the front and rear doors of the processor cabinets. Use this ground strap when working with the processor cabinets. Use a separate ground strap connected to the SA7x enclosure when working with the SA7x enclosure.

Chapter 3

Installing the SA70–CK Kit

3.1 Introduction

This chapter describes the following:

- How to power down the VAX 6000-series processor cabinet

- How to install the SA7x (62X34-UA/UB) upgrade kits, which includes a front door with SA7x operator control panel (OCP) access, appropriate logo slug, and an H405 power controller.

- How to assemble and install the SA70–CK kit

- How to install SA7x enclosure options into the VAX 6000 cabinet

- How to route cables from the enclosure and cabinet

- How to power up the VAX 6000-series processor cabinet

Warning

These procedures must be performed by qualified Digital Services engineers only. Digital customers must not open the VAX 6000-series processor cabinet front door or access the enclosures, power supplies, controllers, or fans. All maintenance and repair actions must be performed by a qualified Digital Services engineer.

The front and rear views of a cabinet are shown in Figure 3–1 and Figure 3–2.

Figure 3–1: Front View of the VAX 6000-Series Processor Cabinet

FRONT DOOR
KEY PIN

FRONT DOOR
KEY PIN

GROUND
STRAP

OCP ACCESS
PANEL
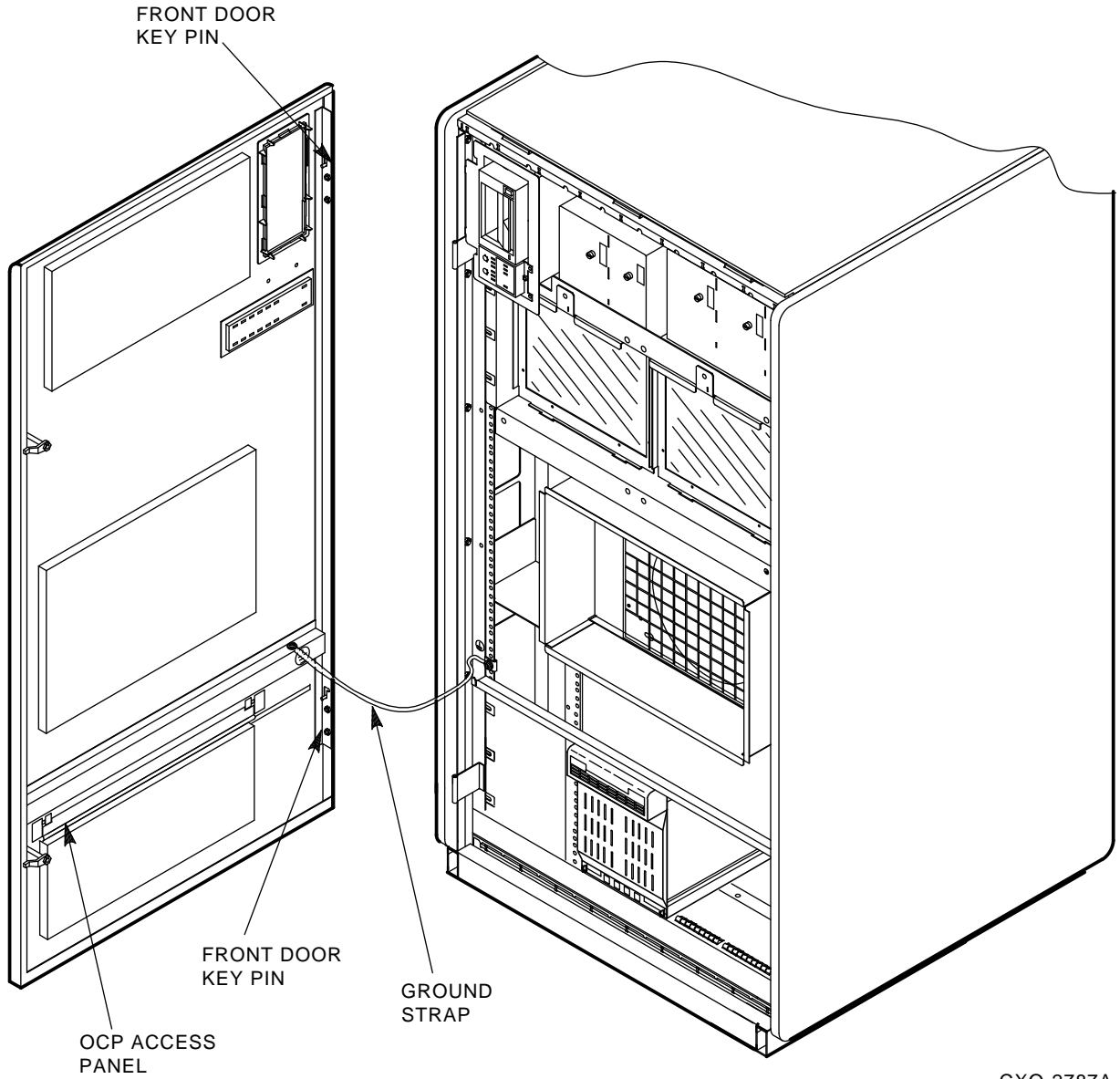
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3–2 Installing the SA70–CK Kit

Figure 3–2:   Rear View of the VAX 6000-Series Processor Cabinet

ESD
PACKET

ESD
GROUND
LUG

H405 POWER
CONTROLLER

POWER
CONTROLLER
SCREWS (6)
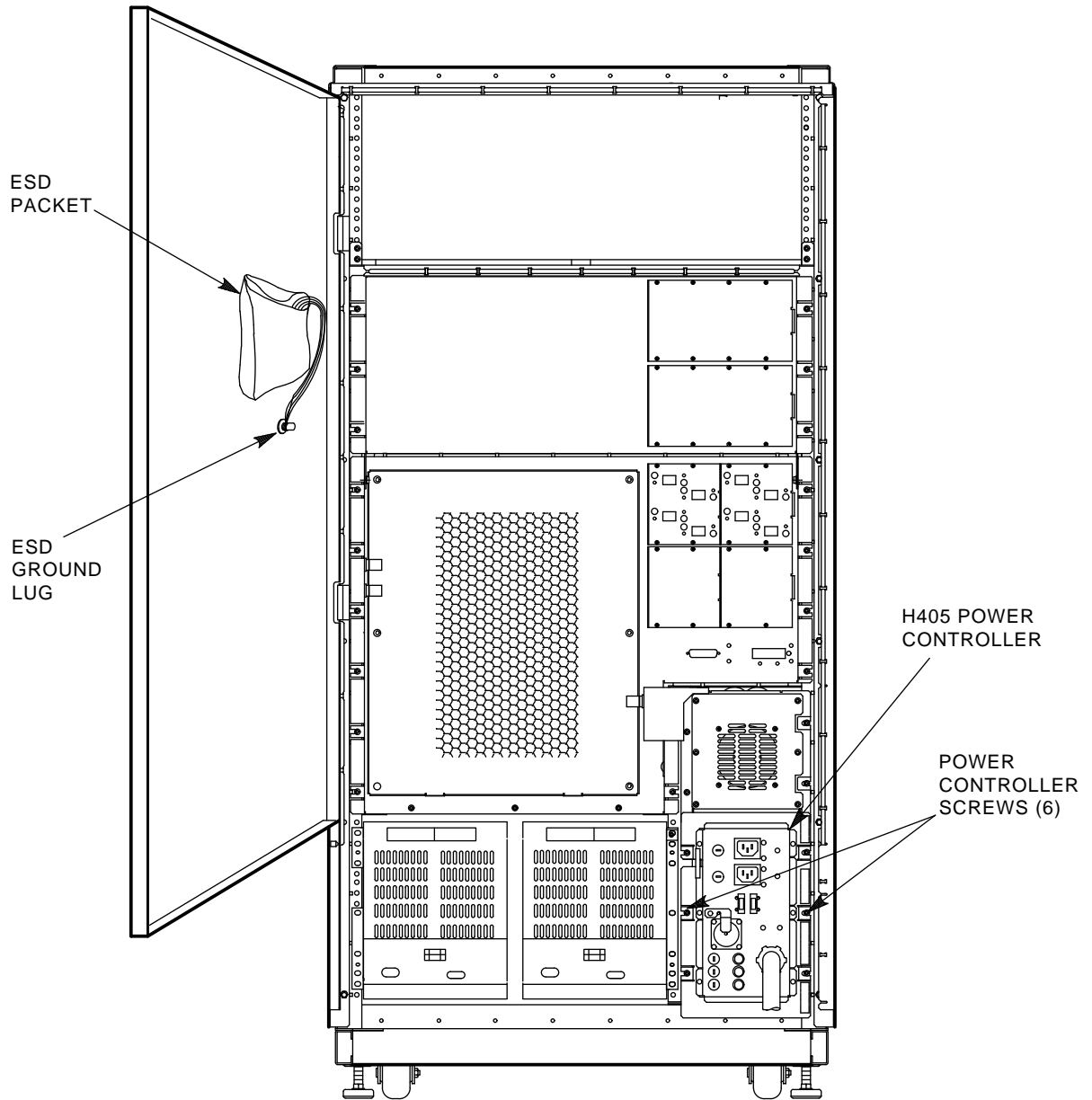
CXO-2788A

3.2 Powering Down the Cabinet

The VAX 6000-series processor cabinets use H405 power controllers. To remove power from the cabinet, use the following procedure:

1. Locate the cabinet control panel in the upper-left corner of the front door. The cabinet control panel is shown in Figure 3–3.

2. With the console key, turn the Standby/Enable/Secure control switch to 0.

3. Turn the Update/Halt/Auto Start control switch to Halt.

4. Go to the rear of the cabinet.

5. Locate the H405 power controller.

6. Remove power from the cabinet by pulling the power controller main circuit breaker T-handle located on the H405 power controller. Refer to Figure 3–3.

7. Unplug the cabinet power cord from the ac receptacle.

3.3 Installing H405–E or –F Power Controllers

Note

Replacing the H405–E/F VAX 6000 power controller may be necessary for VAX 6000 SA7x embedded storage installations. To determine if this procedure is necessary, carefully follow the instructions in this section.

Installing the SA7x embedded storage options may require replacing the H405–E/F VAX 6000 power controller.

Some VAX 6000 system cabinets may contain H405 power controllers with switched ac outlets. Replace any of these H405–E/F power controllers with the H405–E/F power controllers in the 62X34–UA/UB upgrade kits.

The H405–E/F power controller in the 62X34–UA/UB upgrade kit provides unswitched ac outlets with some electrical enhancements for proper operation of the SA7x options as embedded storage in the VAX 6000 cabinet.

3.3.1 Determining if H405–E/F Replacement Is Necessary

To determine of the H405–E/F replacement is necessary:

1. Perform an orderly system shutdown (Section 3.2).

2. Turn the upper key switch on the front control panel to the "0" position.

3. From the rear of the VAX 6000 system cabinet, locate the H405 power controller (lower-right corner) and remove power using the main circuit breaker. (See Figure 3–3.)

4. Unplug the system power cord from its receptacle.

5. Wait 2 minutes for all components to discharge.

Figure 3–3: Cabinet Control Panel and Power Controller

CONTROL PANEL

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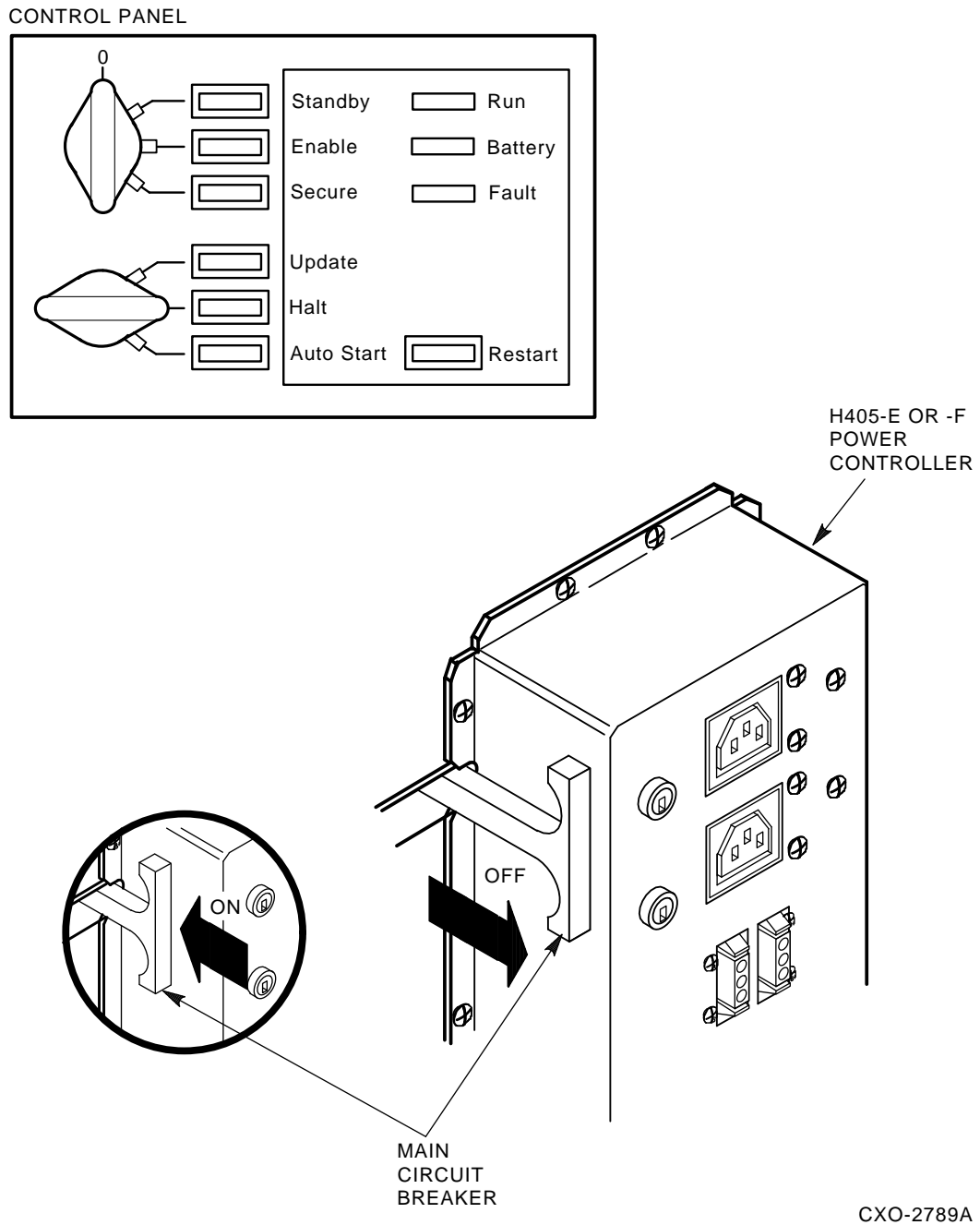
6. Locate the revision label on the side of the H405 power controller and check the revision.

If the H405–E/F revision level is:

a. Revision H07 or above for H405–E, Revision J07 or above for H405–F:

- The H405–E/F power controller contains unswitched ac outlets.

- Replacement of the H405–E/F is unnecessary.

b. Below revision H07 for H405–E; below revision J07 for H405–F:

- The H405–E/F power controller contains switched ac outlets.

- Continue this procedure to replace the H405–E/F.

7. Replace the H405–E/F power controller with the one in the 62X34–UA/UB upgrade kit.

3.3.1.1 H405–E/F VAX 6000 Power Controller Removal and Replacement

To remove and replace the H405–E/F VAX 6000 power controller, refer to the *VAX 6000 Platform Service Manual* (EK-600EA-MG).

3.4 Relocating the Rear ESD Packet

The rear ESD packet in the drive cavity of the VAX 6000-series processor cabinet must be removed to install enclosures. To remove and relocate the ESD packet, use the following procedure:

1. Open the rear door, using a 5/32 hex key.

2. Locate the rear ESD packet taped to the inside of the cabinet drive cavity. Some cabinets do not have this packet.

3. Remove the small Phillips screw that attaches the rear ESD ground strap to the cabinet and remove the tinneman nut.

4. Grasp and pull the rear ESD packet, removing it from the drive cavity.

5. Stick the rear ESD packet to the rear door as shown in Figure 3–2.

6. Secure the rear ESD ground strap to the rear door ground lug as shown in Figure 3–2.

Note

Some cabinets have the rear ESD packet already installed on the rear door.

3.5 Preparing the Cabinet for SA7x Installation

To ensure customer safety, install SA7x upgrade kits. The original VAX 6000-series cabinet doors must be removed and a new door with SA7x operator control panel access installed. The new door (70–26931–01) allows customers to access the SA7x operator control panel without opening cabinet front door. Refer to Figure 3–1.

To remove the original door:

1. Open the cabinet front door with a 5/32 hex key.

2. Remove the screw securing the front door ground strap to the cabinet frame.

3. Pull up on the top front door key pin, locking the key pin in the upper position.

4. Swing the top of the door away from the cabinet, lift the bottom of the door up and out of the bottom hinge, and set the door aside.

To install the new door:

1. Unpack the new door.

2. Set the packaging aside.

3. Ensure the top front door key pin is in the upper position.

4. Align the new front door with the bottom cabinet hinge.

5. Swing the new door into position and release the top front door key pin, locking the door into position.

6. Attach the ground strap to the cabinet frame using the screw previously removed.

7. Close and lock the door with the hex key, if desired.

To prepare the cabinet for SA7x installation, open the cabinet front door, using a 5/32 hex key. Use the procedures in the following sections.

3.6 Installing the Spring Clips

Nine BeCu spring clips, part number 12-20580-08, and two BeCu spring clips, part number 74-39405-01, must be installed.

3.6.1 Installing the 12-20580-08 BeCu Spring Clips

To install the 12-20580-80 BeCu spring clips into the VAX 6000 cabinet:

1. Locate the nine spring clips in the SA7x cab kit.

2. From the front of the VAX 6000 cabinet, locate the bottom front rail that has holes along it.

Note

Some VAX 6000 cabinets may have a braided FCC gasket installed on this rail. Remove this braided gasket and replace it with the supplied BeCu spring clips.

3. Remove gasket material, if necessary.

4. Locate the approximate center of the front rail.

5. Remove the adhesive backing strip from the spring clip to be installed.

6. Install the first spring clip so the middle of the clip aligns with the center of the front rail of the cabinet.

7. Install the remaining eight spring clips on both sides of the middle spring clip (four spring clips on each side).

3.6.2 Moving the ESD Strap

Use the following procedure to move and reattach the ESD strap:

1. Locate the front ESD packet, shown in Figure 3–4. The packet is adhered to a sheet metal transformer shield plate located left of the drive cavity. The packet contains the ESD ground strap, which is attached to the transformer shield plate in the top-right corner.

2. Move the front ESD ground strap from the top hole to the middle hole on the transformer shield plate. Attach the strap, using the middle hole screw, as shown in Figure 3–4. Discard the top and bottom screws. These holes are used for installation of the SA7x enclosure into the left drive position.

Figure 3–4: Relocating the Front ESD Strap

TOP ESD STRAP
MOUNTING HOLE

ESD
PACKET

MIDDLE ESD STRAP
MOUNTING HOLE

CABINET
FRONT
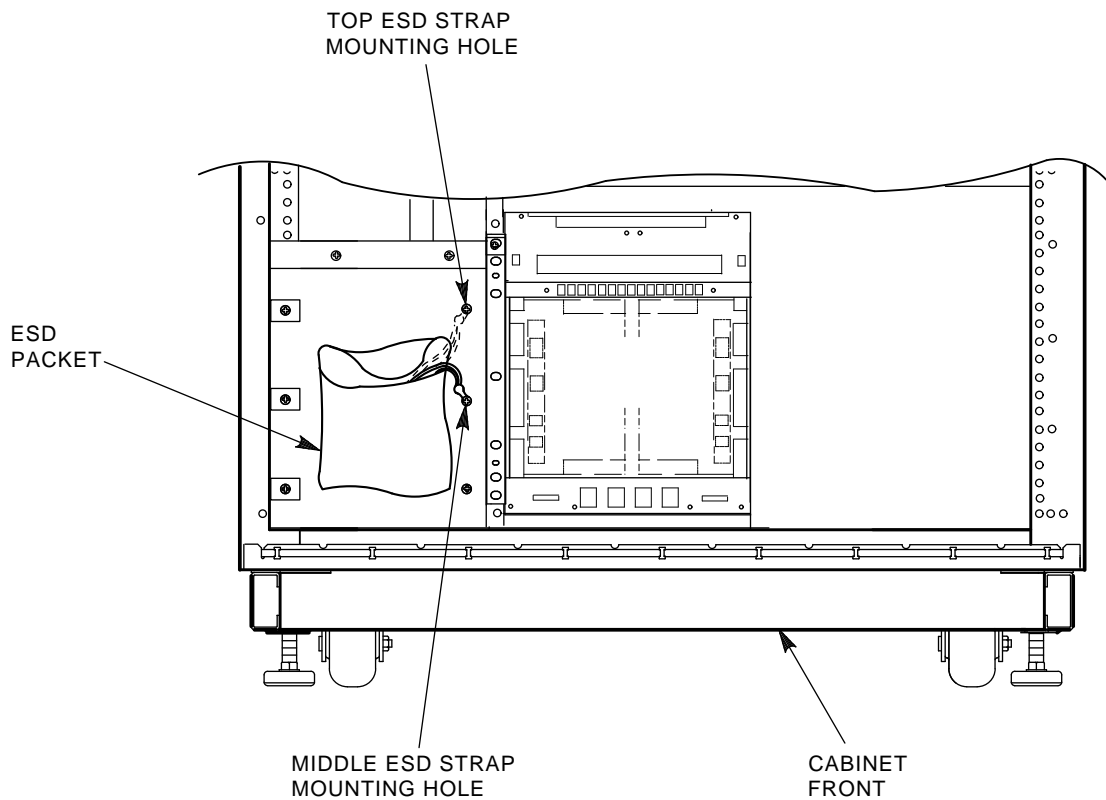
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3.6.3 Installing the 74-39405-01 BeCu Spring Clips

Use the following procedure to install beryllium copper (BeCu) spring clips:

1. Install one BeCu spring clip (74–39405–01) under the front edge of the BBU shielding tray. Refer to Figure 3–5.

2. Install the other spring clip on top of the front of the cabinet base. Refer to Figure 3–5.

   The spring clip hem faces the front of the unit so that the clips compress when an enclosure is installed.

3. Peel the adhesive strip off the back of the spring clips and adhere them 0.5 inches from the cabinet upright and 0.25 inches from the cabinet front.

3.6.4 Installing the Guide Rail Plate Assembly

Locate the preassembled guide rail plate assembly in the SA70–CK kit. This assembly consists of:

- Rail chassis assembly (70–25686–01)

- Bracket rail assembly (70–25687–01)

- Insert nut bar (74–36464–01)

- Four screws (90–00039–26)

To install the guttural plate assembly:

1. Slide the guide rail plate assembly into the cabinet on the appropriate side. The guide rail plate assembly mounts from the inside of the cabinet uprights.

   #### Note
   The guide rail plate assembly is marked with an up arrow for proper installation. Ensure the arrow on the rail sheet metal is pointing up when installed. The up arrow should be visible to the installer after the guide rail plate assembly is installed. Also, the bracket rail assembly (70–25687–01) will be in the front of the cabinet for SA7x installation into the right side of the cabinet. The bracket rail assembly will be in the rear of the cabinet for SA7x installation into the left side of the cabinet.

2. Go to the back of the cabinet. Count four holes up from the bottom of the cabinet upright.

   #### Note
   All references to holes refer to the cabinet upright mounting holes. Always start counting from the bottom of the cabinet upright.

3. Insert the bottom rear standoff of the guide rail plate assembly through hole 4.

4. Insert the top rear standoff of the guide rail plate assembly through hole 15. Standoffs through these holes hold the guide rail plate assembly in place.

Figure 3–5: Installing BeCu Spring Clips

SPRING
CLIPS
LOCATION
(UNDER BBU TRAY)

CABINET
CENTER
DIVIDER

SPRING
CLIPS
LOCATION

CABINET
UPRIGHT

.50

.50

.25

CABINET
BASE

SPRING
CLIPS

CXO-2795A

3–10   Installing the SA70–CK Kit
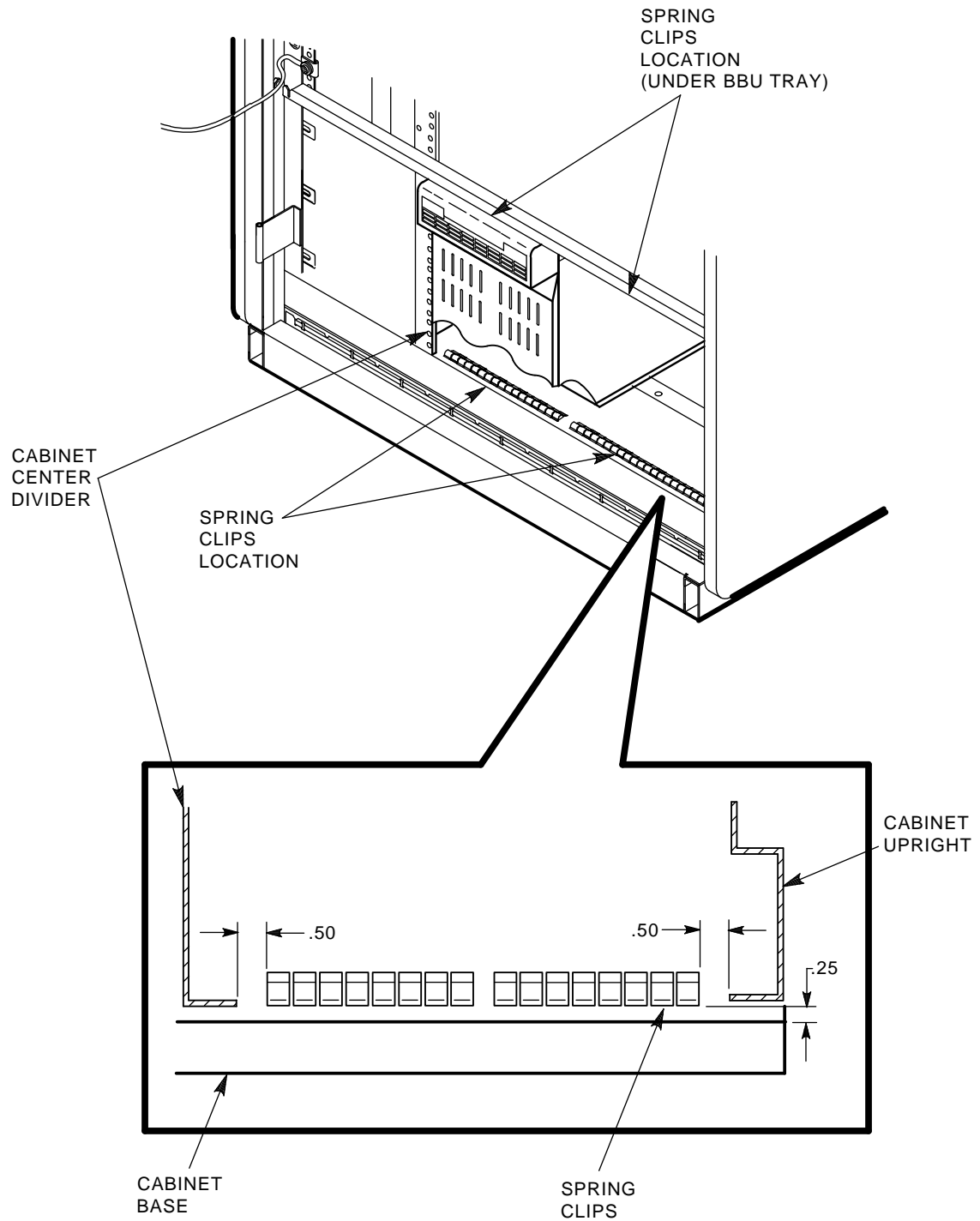
5. Go to the front of the cabinet. Install washer (90–06637–00) and shoulder screw (12–24007–02) into the front center hole of the guide rail plate assembly and through hole 9 of the cabinet upright. Refer to Figure 3–6.

6. Go to the back of the cabinet. Install three washers (90–06637–00) and three shoulder screws (12–24007–02) into the following rear holes of the guide rail plate assembly:

   • Hole 3 (hole below standoff)

   • Hole 9

   • Hole 16

   This secures the guide rail plate assembly to the cabinet for further hardware installation. Refer to Figure 3–6.

Figure 3–6: Installing the Guide Rail Plate Assembly
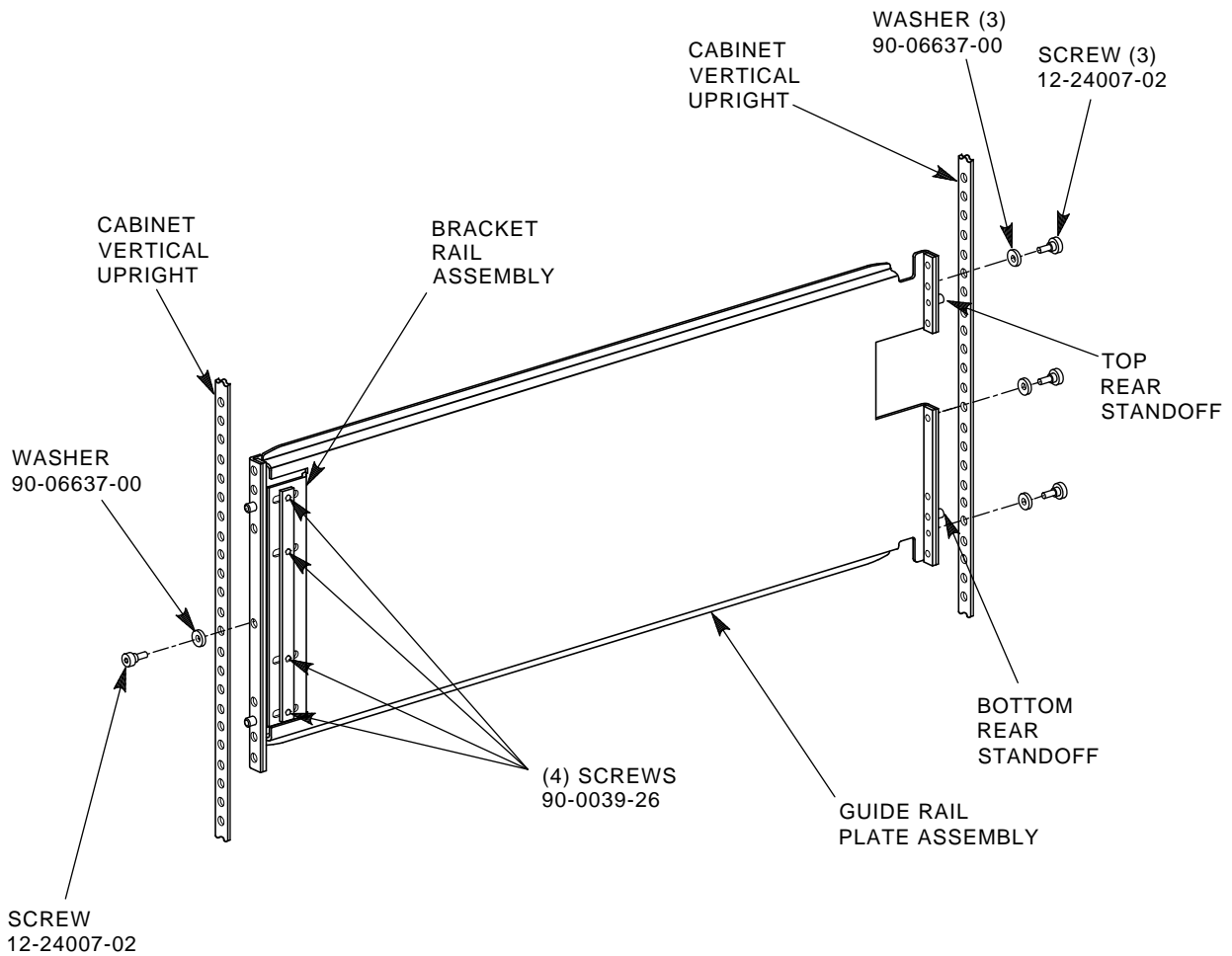
CXO-2792A

7. Install the top shim (74–39395–01) over the top front standoff of the guide rail plate assembly (hole 15). Place the bottom hole of the shim over the top front standoff. Refer to Figure 3–7.

8. Install the bottom shim (74–39395–01) over the bottom front standoff of the guide rail plate assembly (hole 4). Place the top hole of the shim over the bottom front standoff.

9. Install the top front chassis retaining bracket (74–35857–01) over the shim.

10. Install the washer (90–06637–00) and shoulder screw (12–24007–01) through the top hole of the top chassis retaining bracket and into the middle hole of the shim (hole 16 of the cabinet upright). The shoulder screw is torqued to 30-inch pounds.

11. Install the bottom front chassis retaining bracket (74–35857–02) over the bottom shim.

Figure 3–7: Chassis Retainer Brackets and Shim Orientation

WASHER
90-06637-00

TOP FRONT CHASSIS
RETAINING BRACKET
74-35857-01

TOP SHIM
74-39395-01

LONG
SHOULDER
SCREW
12-24007-01

TOP FRONT
STANDOFF

GUIDE RAIL
PLATE ASSEMBLY

BOTTOM FRONT CHASSIS
RETAINING BRACKET
74-35857-02

LONG
SHOULDER
SCREW
12-24007-01

BOTTOM FRONT
STANDOFF

WASHER
90-06637-00

BOTTOM SHIM
74-39395-01

CXO-2703A
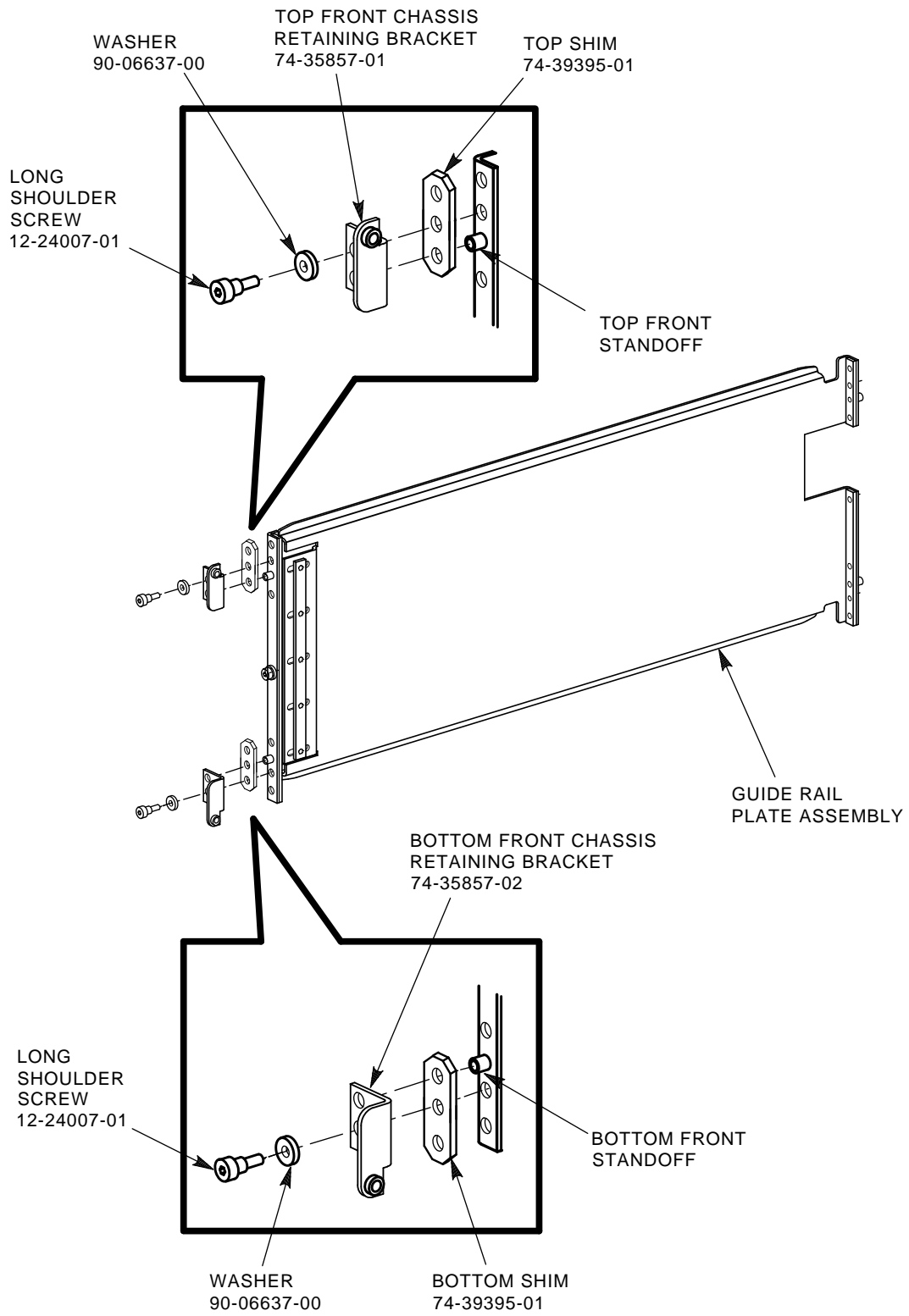
12. Install the washer (90–06637–00) and shoulder screw (12–24007–01) through the bottom hole of the chassis retaining bracket and into the middle hole of the shim (hole 3 of the cabinet upright). The shoulder screw is torqued to 30-inch pounds.

13. Torque the three rear screws on the rail-mounting assembly to 30-inch pounds.

14. Torque the four screws (90–00039–26) shown in Figure 3–6 holding the bracket rail assembly to the guide rail assembly to 30-inch pounds.

3.7 Installing the SA7x Enclosure into the Cabinet

Although the VAX 6000 series cabinet allows installation of the SA7x options into either the right or left side of the disk cavity, it is recommended that the first option be installed into the left side of the cavity (from the front of the cabinet). Use the following procedure to install the SA7x enclosure into the VAX 6000-series processor cabinet:

CAUTION

The SA7x enclosure power supply is universal for both 120 Vac at 60 Hz or 240 Vac at 50 Hz. The power supply is set to 240 Vac at 50 Hz at the factory and must be reset to 120 Vac at 60 Hz for some installations. Selecting 120 Vac at 60 Hz and using 240 Vac at 50 Hz will damage the supply.

Note

The chassis retainers and screws used in this procedure are in the SA7x enclosure add-on kit, not the SA70–CK installation kit.

1. Grasp the middle of the SA7x enclosure operator control panel and pull it out.

2. Attach the front top and bottom chassis retainers (74–35858–01) to the SA7x enclosure, using the four (two per chassis retainer) 10–32 x 3/8 sems screws (90–09228–10). Refer to Figure 3–8.

Figure 3–8: Front Clamping Assembly

SA7x
ENCLOSURE
CHASSIS

RAIL CHASSIS
ASSEMBLY

FLATHEAD
SCREW
90-06074-02

TOP
CHASSIS
RETAINING
BRACKET

TOP
SHIM

PAN-HEAD
SEMS SCREW
12-21368-02

SEMS SCREWS
90-09228-10

TOP CHASSIS
RETAINER
74-35858-01

FLAT
WASHER
90-06664-00

GUIDE
RAIL
ASSEMBLY

FLATHEAD
SCREW
90-06074-02

FLAT
WASHER
90-06664-00

CABINET
FRONT
VERTICAL
UPRIGHT

BOTTOM
CHASSIS
RETAINER
74-35858-01

SEMS SCREWS
90-09228-10

PAN-HEAD
SEMS SCREW
12-21368-02

BOTTOM
CHASSIS
RETAINING
BRACKET

BOTTOM
SHIM

CXO-2794B

3. Lift and move the SA7x enclosure into place using a Digital lifting device (FC–10117–AC).

> **WARNING**
>
> If a lifting device is not available, two people are needed to install the SA7x into the drive cavity. The SA7x weighs 40 kilograms (88 pounds) and must be handled with care.

4. Slide the SA7x enclosure into the cabinet on the guide rail.

5. Set the line voltage select switch, located at the rear of the SA7x enclosure, to the correct volt/amp setting.

3.7.1 Securing the SA7x Enclosure

Use the following procedure to secure the SA7x enclosure:

1. Secure the SA7x enclosure to the rail by installing 10–32 x 5/8-inch flathead Phillips screws (90–06074–02) through the top and bottom chassis retainers and into the top and bottom chassis retainer brackets, as shown in Figure 3–8. Ensure spacing between the SA7x operator control panel and shielding is even across the front. Tighten the screws accordingly.

2. Install the flat washer (90–06664–00) and 10–32 x 5/8-inch pan-head sems screws (12–21368–02) into holes 2 and 17, through the top and bottom chassis retainers, and into the guide rail plate assembly. Tighten the screws. Refer to Figure 3–8.

3.7.2 Installing the Rear Clamping Assembly

Install the rear clamping assembly as follows:

1. Slide the rear retainer chassis bracket (74–35860–01) into the SA7x enclosure chassis, as shown in Figure 3–9.

2. Insert the following parts, in order, through the retainer chassis bracket and into hole 17 of the cabinet upright:

    *   White nylon wedge block (74–36160–01)

    *   Flat washer (90–06664–00)

    *   Helical washer (90–07906–00)

    *   Pan-head Phillips screw (90–06078–01)

3. Tighten the pan-head screw to secure the rear of the enclosure to the cabinet upright.

4. Repeat these steps for the bottom rear clamping assembly, installing the assembly through hole 3 of the cabinet upright.

Figure 3–9: Rear Clamping Assembly
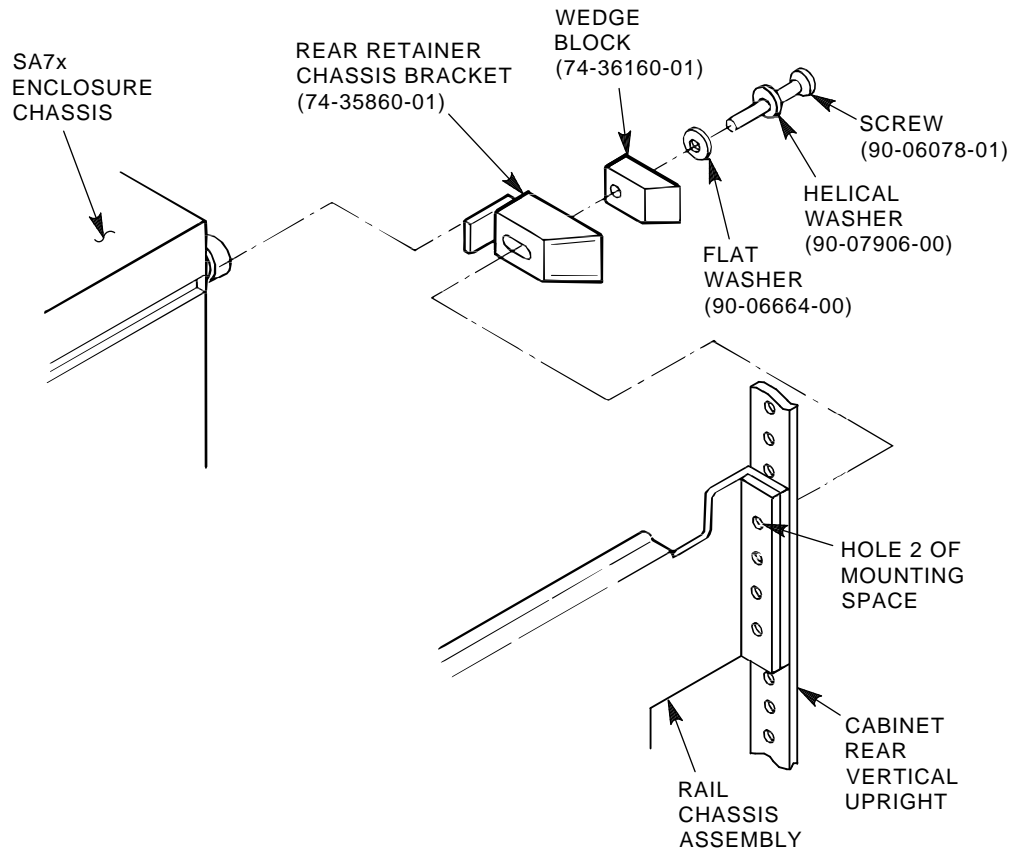
CXO-2807B_S

3.7.3 Installing the Digital Medallion

Install the Digital medallion (74–36158–01) over the operator control panel label, as shown in Figure 3–10.

3.7.4 Repositioning the SA7x Enclosure Operator Control Panel

The SA7x operator control panel mounts to the enclosure through a connector on transition board 1. Refer to Figure 3–11. A hole in the center of the transition board and holes in the corners allow you move the transition board and operator control panel to mount the enclosure in the left or right disk position of the cabinet.

**Figure 3–10: Installing the Digital Medallion**

DIGITAL
MEDALLION
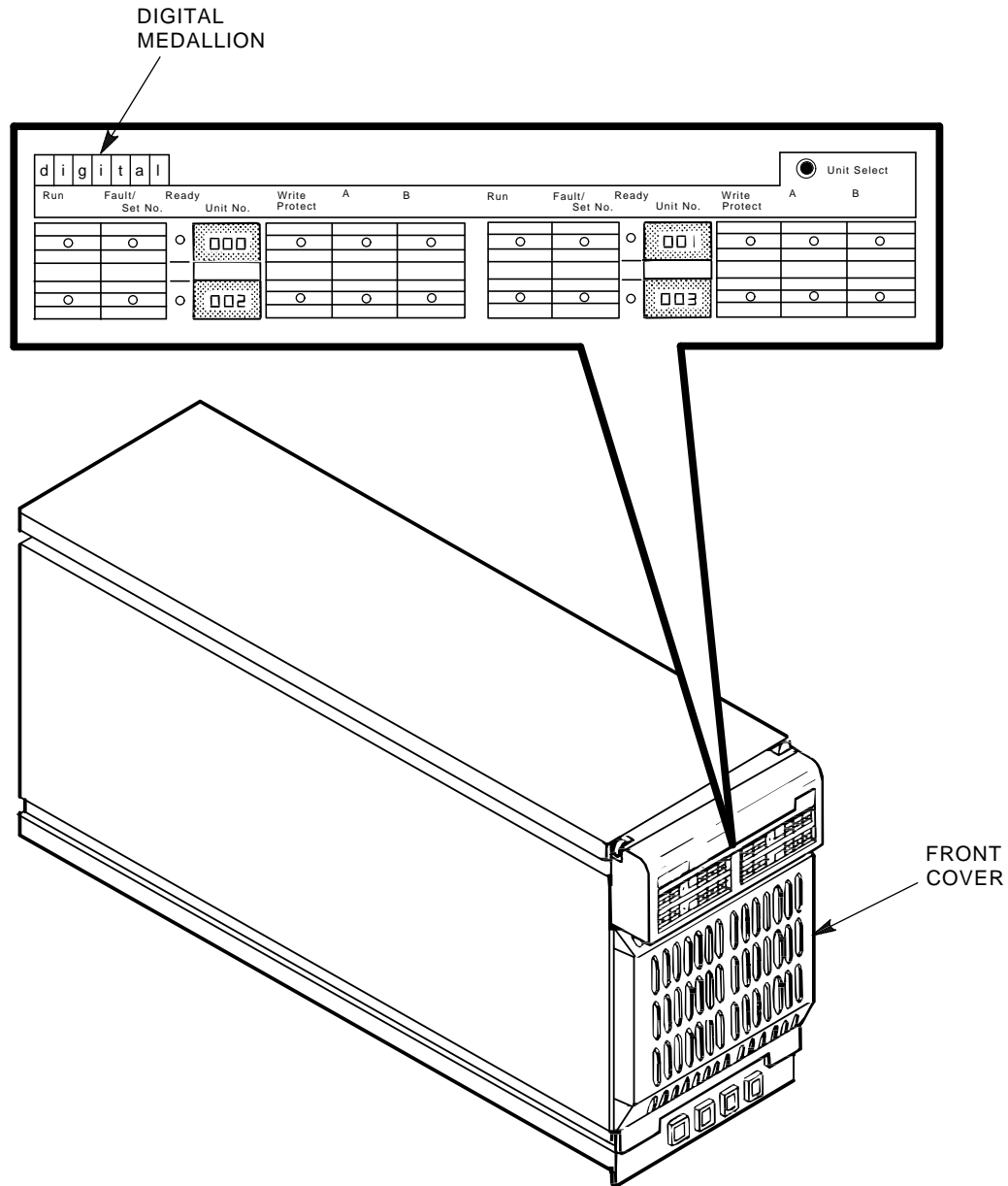
CXO-2796A

If the operator control panel for the SA7x enclosure is mounted in the right disk position, it must be repositioned to prevent mechanical interference with the cabinet. Refer to Figure 3–11 and use the following procedure to reposition the operator control panel:

1. Remove the SA7x operator control panel by grasping the center and pulling the operator control panel out.

Figure 3–11: Repositioning Transition Board 1
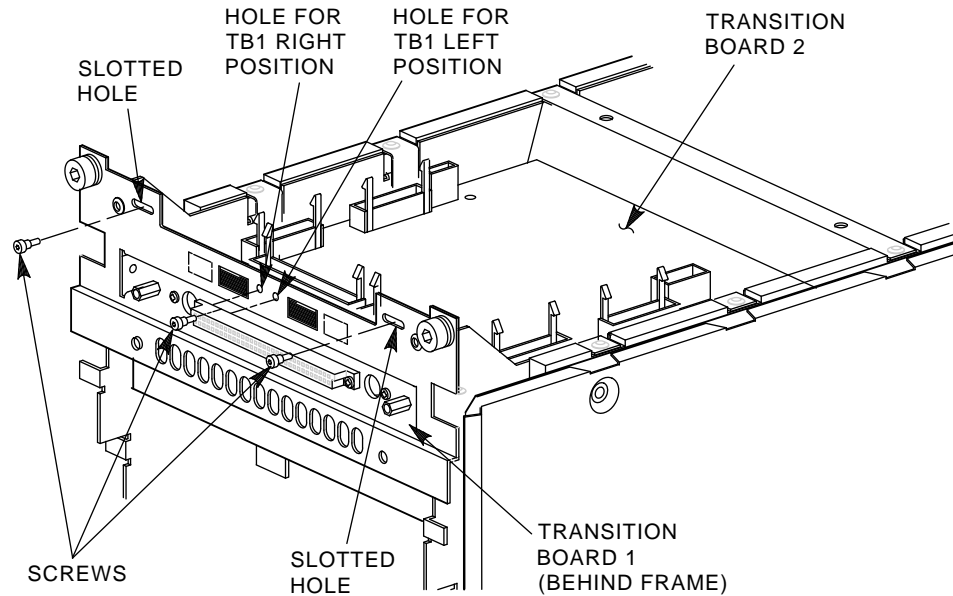
CXO-2797A

2. Remove the center screw from transition board 1.

3. Loosen the corner screws in the slotted holes of the board.

4. Slide transition board 1 to the left.

5. Install and tighten the center screw in the hole for TB1 left position as shown in Figure 3–11.

6. Tighten the corner screws in the slots.

7. Replace the SA7x enclosure operator control panel by lining up the connectors and pushing the operator control panel into the enclosure.

3.7.5 Routing the SA7x Enclosure Cables

Steps 1 through 9 of the following procedure details cable routing for the first SA7x enclosure installed in the left side of the cabinet. Step 10 of this procedure details the cabling of the second SA7x enclosure, installed in the right side of the cabinet. Route the SA7x enclosure cables as follows:

1. Plug the female end of the SA7x enclosure power cord (17–00442–27) into the SA7x enclosure.

2. Route the SA7x enclosure power cord through the clamp attached to the cable management guide as shown in Figure 3–12.

3. Plug the male end of the SA7x enclosure power cord into one of the H405–E/F power controller outputs. Refer to Figure 3–12.

4. Install the I/O cable tie mount (90–08264–00) as shown in Figure 3–12.

5. Attach the single end of the Port A I/O cable to Port A of the SA7x enclosure.

6. Route the first SA7x enclosure's Port A I/O cable (17–01699–02) under the SA7x enclosure, under the power controller, and up the side of the cabinet upright to the *top KDB50/KDM70 disk controller I/O bulkhead*. Refer to Figure 3–12.

7. Attach the hydra end of the Port A I/O cable to the controller I/O bulkhead, as shown in Figure 3–12. Ends RR and LR plug into the top connectors of the controller, and the RF and LF ends plug into the bottom connectors of the controller bulkhead. I/O cable reference labels on each hydra end of the I/O cable further define cabling procedures.

8. Secure the I/O cable to the cable tie mount with the cable tie wrap (90–07880–00).

9. Install the two 5/8-inch cable clamps (90–07087–00) as shown in Figure 3–12, securing the I/O cable to the cabinet upright.

Note

When installing cable clamps, remove existing 1/2-inch sems screws and replace with 5/8-inch screws (90–00063–41) and flat washers (90–06662-00).

10. To route a second SA7x I/O cable, tie off the second I/O cable to the first I/O cable at the five locations shown in Figure 3–13 with tie wraps (90–07880–00). Follow step 7 instructions to route the second SA7x I/O cable to the *bottom disk controller I/O bulkhead*. Plug in and route the second enclosure's power cord as per steps 1 and 2, using an available outlet on the H405 power controller.

3.8 Powering Up the Cabinet

To apply power to the cabinet after installation, use the following procedure:

1. Plug the cabinet power controller cord into an ac receptacle.

2. Push in the main circuit breaker T-handle located on the H405–E or –F power controller. Refer to Figure 3–14.

3. Locate the cabinet control panel in the upper-left corner of the front door, as shown in Figure 3–14.

4. Turn the Standby/Enable/Secure control switch to Enable.

Figure 3–12: Attaching a Single SDI Cable to the SA7x and KDB50/KDM70 I/O Bulkhead
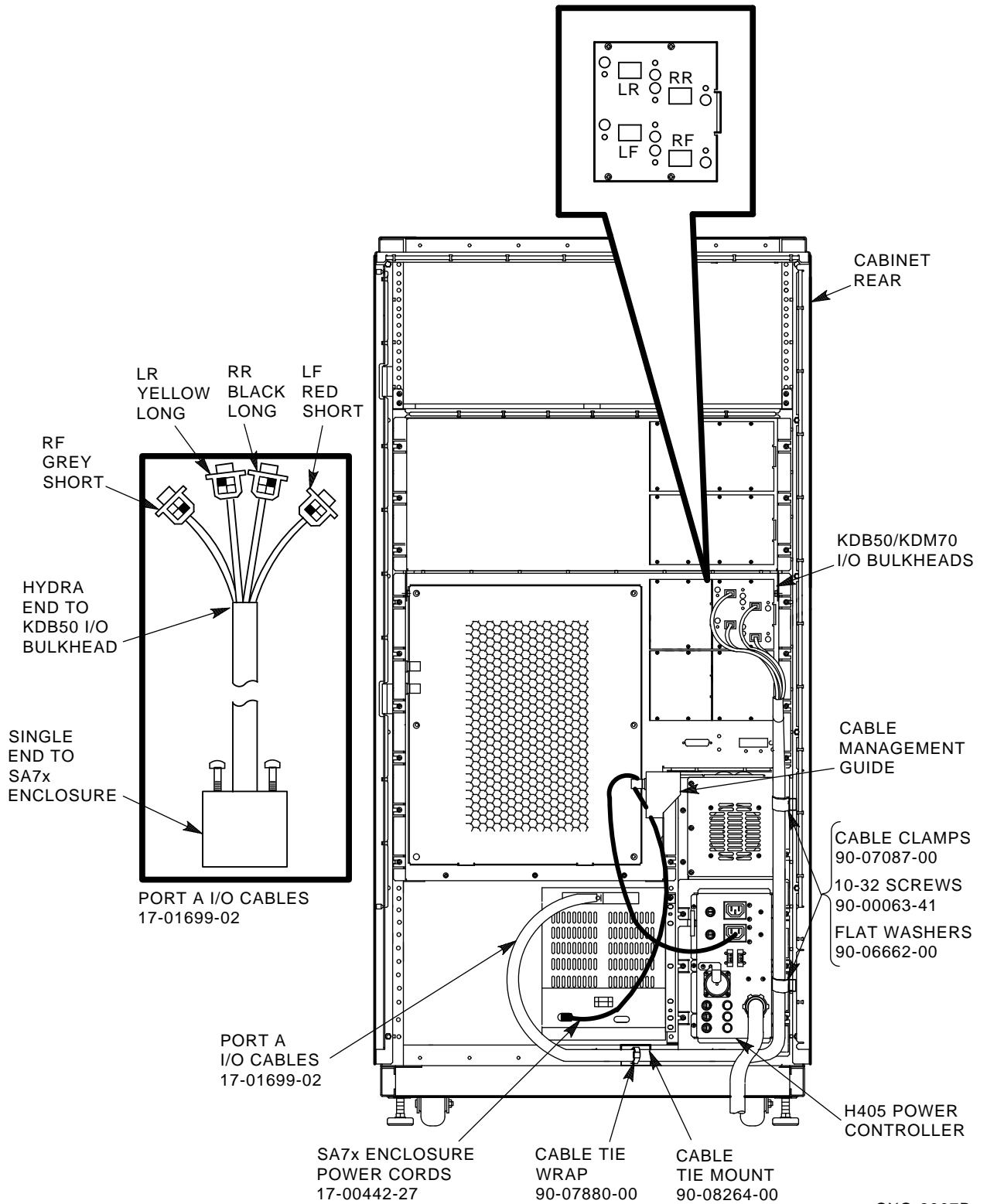

RR
LR
RF
LF

CABINET
REAR

LR
YELLOW
LONG

RR
BLACK
LONG

LF
RED
SHORT

RF
GREY
SHORT

HYDRA
END TO
KDB50 I/O
BULKHEAD

SINGLE
END TO
SA7x
ENCLOSURE

PORT A I/O CABLES
17-01699-02

KDB50/KDM70
I/O BULKHEADS

CABLE
MANAGEMENT
GUIDE

CABLE CLAMPS
90-07087-00

10-32 SCREWS
90-00063-41

FLAT WASHERS
90-06662-00

PORT A
I/O CABLES
17-01699-02

H405 POWER
CONTROLLER

SA7x ENCLOSURE
POWER CORDS
17-00442-27

CABLE TIE
WRAP
90-07880-00

CABLE
TIE MOUNT
90-08264-00

CXO-2907B

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Figure 3–13: Attaching a Second SDI Cable to the SA7x and KDB50/KDM70 I/O Bulkhead

KDB50/KDM70
I/O BULKHEADS

RR
LR

RF
LF

LR
RR

LF
RF

CABINET
REAR

LR
YELLOW
LONG

RR
BLACK
LONG

LF
RED
SHORT

RF
GREY
SHORT

HYDRA
END TO
KDB50 I/O
BULKHEAD

SINGLE
END TO
SA7x
ENCLOSURE

PORT A I/O CABLES
17-01699-02

KDB50/KDM70
I/O BULKHEADS

CABLE
MANAGEMENT
GUIDE

CABLE TIE
WRAPS
90-07880-00

H405 POWER
CONTROLLER

PORT A
I/O CABLES
17-01699-02

CABLE TIE
WRAPS
90-07880-00

SA7x ENCLOSURE
POWER CORDS
17-00442-27

CABLE TIE
WRAP
90-07880-00

CABLE
TIE MOUNT
90-08264-00

3–22   Installing the SA70–CK Kit

CXO-2798B

Figure 3–14: Cabinet Control Panel and Power Controller

CXO-2789A
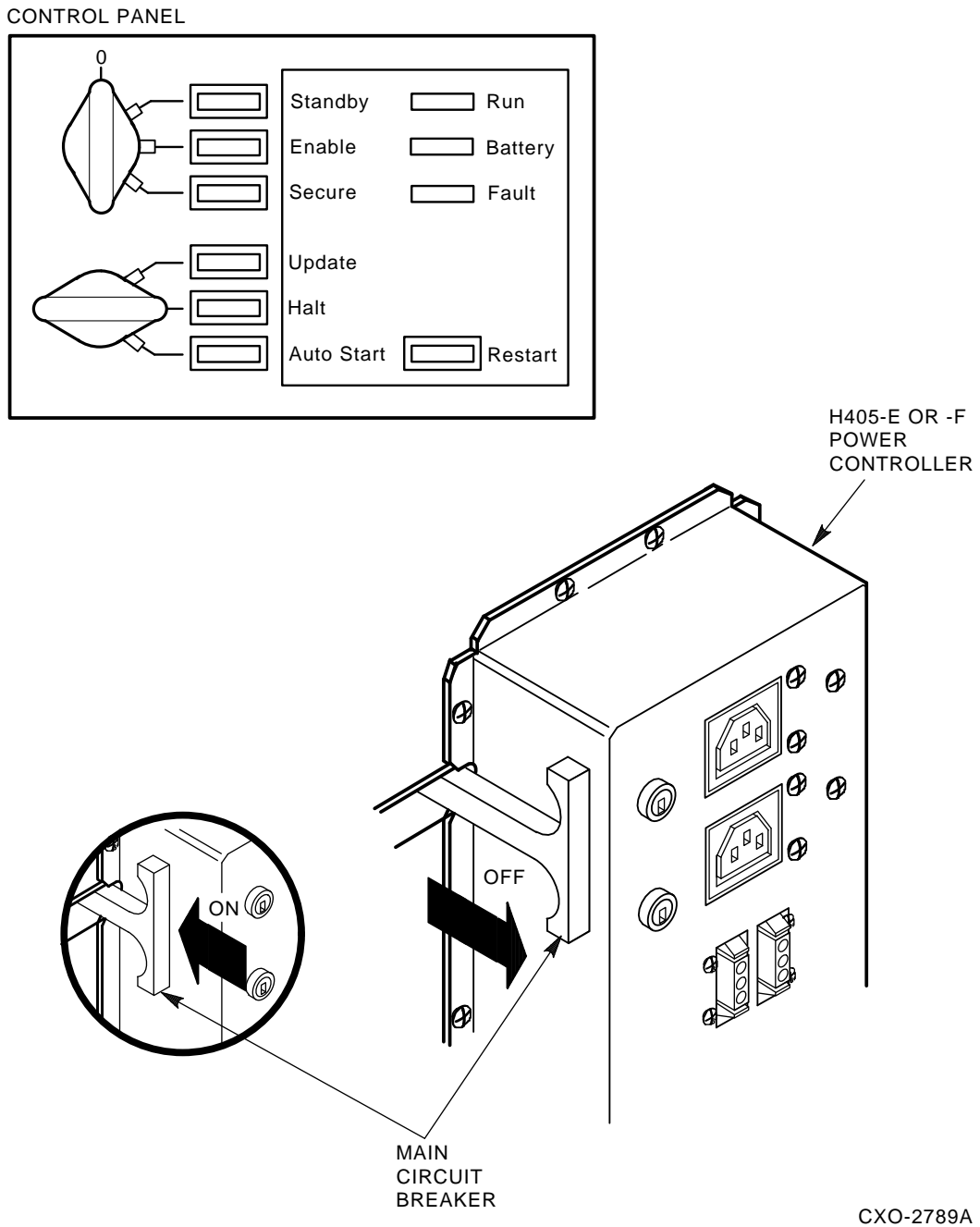
5. Turn the Update/Halt/Auto Start control switch to Auto Start.

Chapter 4

SA7x Controls and Indicators

This chapter describes the controls and indicators on the front and rear panels of the SA7x enclosure.
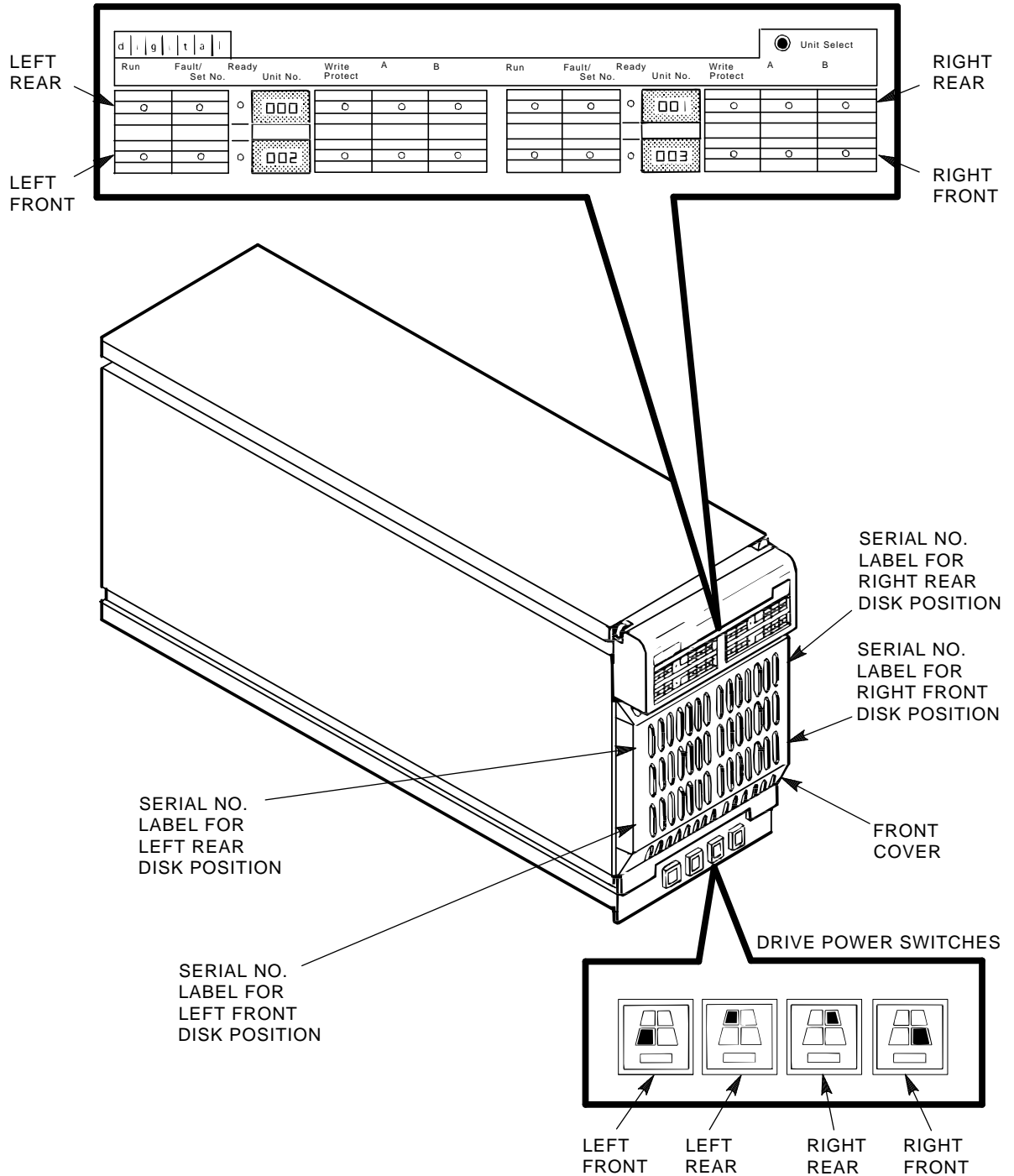
4.1 SA7x Front Panel Controls and Indicators

Figure 4–1 shows the front panel of the SA7x enclosure. The operator control panel (OCP), located along the top edge of the enclosure, contains the unit select switch and four identical sets of controls and indicators. Each set of controls and indicators is dedicated to one of the four disk drive positions in the enclosure.

The controls and indicators for a disk drive position can be used when a disk drive is powered up. Unless a drive is installed in a disk drive position and powered up, the controls and indicators for that position do not operate.

Serial number labels, corresponding to the RA7x disks and their disk positions, must be adhered to the front cover of the SA7x enclosure. Refer to Figure 4–1 for the location of these serial number labels.

Figure 4–1: Front Panel View of the SA7x Enclosure

LEFT REAR

LEFT FRONT

RIGHT REAR

RIGHT FRONT

SERIAL NO. LABEL FOR RIGHT REAR DISK POSITION

SERIAL NO. LABEL FOR RIGHT FRONT DISK POSITION

SERIAL NO. LABEL FOR LEFT REAR DISK POSITION

FRONT COVER

SERIAL NO. LABEL FOR LEFT FRONT DISK POSITION

DRIVE POWER SWITCHES

LEFT FRONT   LEFT REAR   RIGHT REAR   RIGHT FRONT

CXO-2447A_S

4–2   SA7x Controls and Indicators

While a drive is powering up and spinning up, the controls and indicators have slightly modified meanings, as described in Section 5.2.

Each control set for a disk drive position contains indicators and buttons and indicators for:

Run	Fault conditions	Port A
Write protection	Unit number selection	Port B

You can set most switches by pushing them in. These switches hold the set position until released with another push. However, the **Fault/Set No.** switch is a momentary pushbutton. When pressed and held, it is set; when released, it is not set.

The following table explains the functions of the switches and indicators:

Table 4–1: Front Panel Controls and Indicators

| Pressing this Switch	Performs this Function	Illuminates this Indicator
Fault/Set No. switch during normal operation	Enables the lamp test	All control panel indicators.
Fault/Set No. switch after a drive fault	Disables the drive	All indicators in the drive's control set, including the **Fault/Set No.**. All indicators blink an error condition code.
		Note
		During a fault, the **Fault/Set No.** indicator illuminates.
Fault/Set No. switch twice after a drive fault	Clears the error code and commands the drive to attempt to clear the error and return on line	
Fault/Set No. switch and **Unit Select** switch	Sets the drive unit number, as described in Section 5.4	

Table 4–1 (Cont.):   Front Panel Controls and Indicators

Pressing this Switch	Performs this Function	Illuminates this Indicator
Run switch	Spins up the drive	The yellow **Run** indicator illuminates after the drive spindle reaches operating speed. Then, the green **Ready** indicator illuminates to show that the drive is ready for read/write operations.
		The **Ready** indicator remains on during normal operations but may blink or go out during heavy disk usage.
		If the **Ready** indicator does not light 60 seconds after the **Run** switch is pressed, a problem exists in the drive.
		The unit number for the disk drive is displayed next to the **Ready** indicator.
Write Protect switch	Disables writing to the drive	The yellow **Write Protect** indicator.
Port **A** and port **B** select switches	Enables ports **A** and **B**	Yellow indicators in each switch.
Drive power Switch	Applies power to the drive, causes the drive to run a self test	Green indicator.

4.2 SA7x Rear Panel Controls and Indicators

All rear panel controls and indicators are located on the power supply chassis, as shown in Figure 4–2.

Figure 4–2: Rear Panel View of the SA7x Enclosure
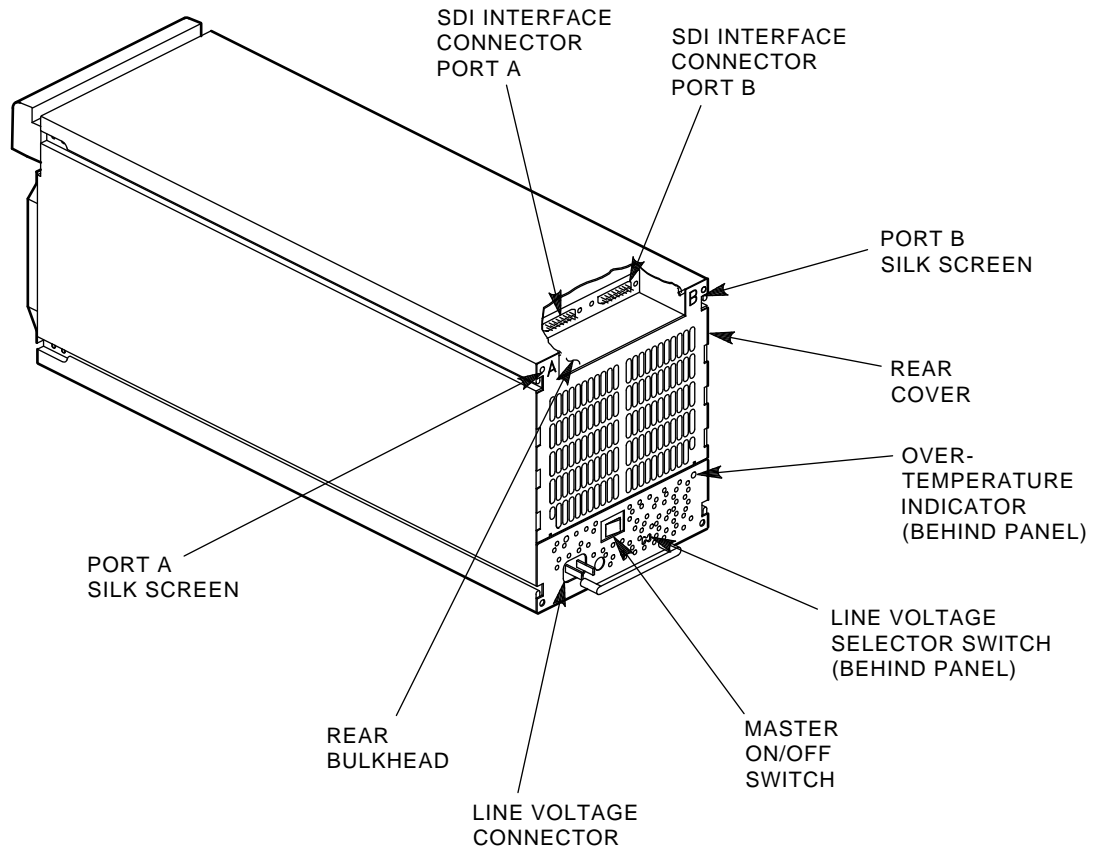
CXO-1868B

WARNING

Hazardous voltages exist in the equipment cabinet and the SA7x enclosure. Installation and service must be performed by qualified Digital Services engineers only. When performing any operation involving the source power, turn off the master on/off switch and disconnect the line cord from the enclosure rear panel and from the cabinet power controller, if possible. Perform the operation, then reconnect the cord.

4.2.1 Master On/Off Switch

The master on/off rocker switch for the SA7x enclosure is located in the center of the rear panel. Setting the switch to 1 applies power to the SA7x. Setting the switch to 0 removes power from the enclosure.

4.2.2 Line Voltage Select Switch

As you face the rear panel, the line voltage select switch is located to the right of the master on/off switch. It is visible through a hole in the rear panel. This switch is set to the available line voltage during installation. The selected voltage is shown on the switch element.

CAUTION

The SA7x enclosure power supply is universal for both 120 Vac at 60 Hz or 240 Vac at 50 Hz. The power supply is set to 240 Vac at 50 Hz at the factory and must be reset to 120 Vac at 60 Hz for some installations. Selecting 120 Vac at 60 Hz and using 240 Vac at 50 Hz will damage the supply.

4.2.3 Fault/Over-Temperature Indicator

A red Fault indicator is visible, when lit, through holes in the upper right-hand rear corner of the power supply. The enclosure automatically shuts down when it detects a fault or over-temperature condition. If the fault indicator illuminates, turn the master on/off switch to 0 and call Digital Services.

Chapter 5

Powering Up the SA7x Enclosure

This chapter explains how to use the SA7x enclosure and drives and how to set the unit number.

5.1 Powering Up the SA7x Enclosure

Apply power to the enclosure as follows:

1. Verify that the drive power switches on the front panel of the enclosure are set to off (switch button released).

2. Set the master on/off switch to 1.

3. Verify the power is on by checking that the fan starts and normal airflow exists through the enclosure.

Note

Air may flow through the enclosure without output voltage. This indicates the line voltage select switch is in the wrong position. Set the master on/off switch to 0 and set the line voltage select switch to the correct switch setting.

5.2 Placing a Drive On Line

After applying power to the SA7x enclosure, power up and bring each disk drive in the enclosure on line by performing the following steps:

1. Locate the drive power switches. Refer to Figure 4–1.

2. Press the drive power switch for the desired drive. If power to the drive is within specifications, the green switch element indicator illuminates.

Note

Setting a disk drive power switch does not spin up the associated drive.

The disk drive starts the drive's internal power-on diagnostics. All indicator lights illuminate for about 8 seconds. Then:

    a. If the drive completes the power-on diagnostics without detecting a fault, all indicators go out.

    b. If the **Fault/Set No.** indicator remains on, the drive has detected a fault. Press the **Fault/Set No.** switch to clear the fault.

3. Press the **Run** switch on the operator control panel to spin up the drive. Refer to Figure 4–1. The following sequence of indicator lights occurs during spin up:

    a. The **Run** indicator illuminates. If you power up the drive with the **Run** switch set, release and press the **Run** switch again or issue a MOUNT command from your system to initiate spin up. The **Run** indicator illuminates to show that spin up was initiated through either of these actions.

    b. All other indicators remain off.

    c. When the drive has spun up, the **Ready** indicator illuminates. The **Ready** indicator then flashes while the internal read/write and seek diagnostics run. When the diagnostics are complete, the **Ready** indicator remains on.

    d. The **Fault/Set No.** indicator illuminates if the drive detects a fault during spin up. Press the **Fault/Set No.** to clear the error.

4. Select Port **A**, Port **B**, and **Write Protect** switches, as required. These functions are disabled by pressing the switch a second time.

The **Ready** and **Run** indicators remain lit during normal operation, though the **Ready** indicator may flicker during heavy seeks. The **Write Protect** indicator is on if the drive is write protected, off if the drive is write enabled. The Port **A** and Port **B** indicators illuminate only while their respective ports are selected by the system controller.

5.3 Placing a Drive Off Line

To place a drive off line:

1. Press and release the Port **A** and **B** switches to disable both ports of the disk drive. Refer to Figure 4–1.

2. Wait for the port indicators to go out.

To place a drive off line for drive removal:

1. Press and release the Port **A** and **B** switches to disable both ports of the disk drive. Refer to Figure 4–1.

2. Wait for the port indicators to go out.

3. Press and release the appropriate **Run** switch on the operator control panel. Wait for the **Run** indicator to go out.

4. Set the drive power switch to Off. The switch element light goes out.

5.4 Setting the Unit Number

The unit number for any drive can be set at the operator control panel. This is the number by which the drive is known to the system. Once the number is in the drive, the system controller reads it according to the controller's protocol.

You must take a drive off line before changing its unit number. You do not need to take any other drives in the enclosure off line while setting a specific drive unit number, nor do you need to spin down the selected disk to change the unit number. When the operator control panel is in unit select mode, all drives not spun down continue to operate according to the settings of the operator control panel switches.

To set the unit number:

1. Dismount the disk, using the proper system commands.

2. Place the desired drive off line according to the procedures in Section 5.3. *Do not set the drive power switch to Off.*

3. Press the **Unit Select** switch with a pen or small screwdriver. The unit select numbers for all powered-on drives in the enclosure flash to indicate that the operator control panel is in unit select mode.

4. Press the **Fault/Set No.** switch once to increment the unit number by one.

    Press and hold the **Fault/Set No.** switch to rapidly increment the unit number for that drive. Set the unit number between 000 and 255.

    #### Note
    > You cannot decrement a drive number. Holding the **Fault/Set No.** switch increments to 255, then starts at 0 again.

5. Repeat that step for all drives for which you are changing numbers. If you do not press the **Fault/Set No.** switch, the number remains the same as before you entered the unit select mode.

6. After setting the unit numbers, restore the operator control panel to normal operation by pressing the **Unit Select** switch again.

7. Restore the off-line drive to its on-line status. Refer to Section 5.2.

8. Remount the disk drive, using the proper system commands.

After the SA7x enclosure powers up, passes internal diagnostics, and has the unit number set, run the SA7x/KDB50/KDM70 diagnostics to ensure the configuration is operational.

Chapter 6

Installing RA7x Disk Drives

This chapter describes how to install additional RA7x disk drives into SA7x enclosures that are not fully populated. These options include the SA70–LK, SA71–NK, SA72–NK, and SA73–NK. Other SA7x options described in this manual are fully configured (4 Disk Drives Installed) and cannot have additional RA7x drives installed.

6.1 Unpacking RA7x Disk Drives

The add-on RA7x disk drive arrives in its own packaging.

Warning

Take all possible ESD precautions when unpacking the RA7x disk drive. Wear a properly grounded ESD strap.

To unpack an RA7x disk drive:

1. Open the shipping carton.

2. Remove the RA7x disk drive wrapped in a protective wrapper.

3. Open the protective wrapper and remove the disk drive. Discard the desiccant bags.

4. Place the drive on the protective wrapper.

6.2 Powering Down the SA7x Enclosure

Before installing additional RA7x disk drives, remove all power to the enclosure, as explained in the following procedure:

1. Take each RA7x disk drive off line.

   a. Press and release both port switches on the operator control panel for the installed RA7xs.

   b. Press and release the appropriate **Run** switches. The switch indicators go out.

   c. Set the drive power switches to Off. This removes dc power to the installed RA7xs.

2. Set the master on/off switch to 0. This removes power to the enclosure.

6.3 Installing the RA7x Disk Drive

To install additional drives, remove the front cover. As you face the front of the enclosure, load the first add-on drive into the left position (position 3). Load the second add-on drive into the right position (position 4).

Refer to Figure 6–1 and use the following procedure to install the RA7x disk drive into an SA7x enclosure.

1. Ensure power has been removed from the enclosure. Refer to Section 6.2.

2. Remove the SA7x enclosure front cover. The front cover is attached to the enclosure with two captive half-turn screws. Loosen the screws and lift the front cover up and out.

3. RA7x add-on disk drives arrive at the customer site with the drive shoeplate installed for manufacturing purposes. The shoeplate needs to be reversed for enclosure applications. Remove four screws, two per side, from the drive shoeplate. Reverse the shoeplate and reinstall the four screws.

4. Orient the unpacked RA7x disk drive so that the drive shoeplate and enclosure shoeplate guide are on the same side.

5. Hold the connectors clear of the drive and slide the disk drive into the selected position in the enclosure.

6. Verify the shoe plate retaining clip has locked the drive in position.

7. Connect all cables to the disk drive. Connectors are keyed so that cables cannot be plugged in incorrectly.

8. Replace the enclosure front cover and tighten the captive screws.

Figure 6–1: Installing Add-On RA7x Disk Drives

SILK SCREEN OF
CONFIGURATION RULES

| LR 1 | RR 2 |
| LF 4 | RF 3 |

SHOE PLATE
RETAINING CLIP

SHOE PLATE

SHOE PLATE
RETAINING TAB
LOCATION

SHOE PLATE
GUIDE

20-PIN
OCP
CABLE

4-PIN DRIVE
POWER CABLE

INTERNAL
SDI CABLES

RA7x DISK DRIVE
REAR PANEL

CXO-3442A_S

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