SF400 DECarray

Owner's Manual

Order Number: EK–SF400–OM. C01

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Preface

This manual is intended for the user of the SF400 storage array. This manual provides the user with all the information needed to operate this array in a safe and effective manner. The information in this manual is organized as follows:

- Chapter 1 contains a product description and specifications for the storage array and storage enclosures.

- Chapter 2 contains operating instructions for the TF857 magazine tape loaders.

- Chapter 3 describes how to start up the storage enclosure and how to bring the disk ISE on line for normal operation.

- Appendix A contains a number of blank configuration sheets for your use when trying to configure different systems.

For troubleshooting, diagnostic, and other related information, refer to the *Tx857 Series Magazine Tape Subsystem Owner's Manual*.

Related Documentation

Table 1 lists documentation that supplements this guide.

Table 1   Related Documentation

Title	Order Number
DECarray SF400 Installation Guide	EK–SF400–IG
KFMSA Module Installation and User Manual	EK–KFMSA–IM
KFQSA Module Installation and User Manual	EK–KFQSA–IM
RFxx Series Integrated Storage Element User Guide	EK–RF7xD–UG
TF857 Magazine Tape ISE Service Manual	EK–TF857–SM
Tx857 Series Magazine Tape Subsystem Owner's Manual	EK–TF857–OM
DECarray Owner's Manual	EK–SF7xS–OM
System Expansion Installation Supplement	EK–431AB–IN
DSSI VAXcluster Installation and Troubleshooting Manual	EK–410AA–MG

1
Introduction

1.1 DECarray Overview

The SF400 DECarray is a storage cabinet designed to hold up to a total of 10 SF-series disk enclosures and TF-series tape loaders. The cabinet doors have modular panels that allow flexibility of storage device locations. All storage device operator control panels (OCP) project through the front door of the storage array to allow easy access. In addition, the SF400 DECarray cabinet provides optional dual ac power capability to provide redundant power.

The SF400 DECarray cabinet can be used with any CPU system that has Digital Storage System Interconnect (DSSI) capability. It can be installed in any location, relative to the CPU, allowed by the DSSI cabling length limits. The DSSI cables from the CPU connect directly to the storage devices in the cabinet. There is no DSSI panel in the SF400 DECarray cabinet.

_____ **Note** _____

The equipment described in this manual is listed by the Underwriters Laboratories Incorporated and bears the UL listing mark. The SF400 DECarray cabinet is also certified by the Canadian Standards Association and TUV Product Service GmbH, and bears both the CSA certification and TUV GS marks.

_____

Viewing the SF400 DECarray cabinet from the front, you will note that the SF-series storage enclosures and magazine tape integrated storage elements (ISEs) are arranged in the cabinet as shown in Figure 1–1. Figure 1–2 shows the rear view of the cabinet.

Introduction
1.1 DECarray Overview

Figure 1–1   DECarray Front View

CXO-3525A-TI_R

Figure 1–2 DECarray Rear View

POWER
CONTROLLER
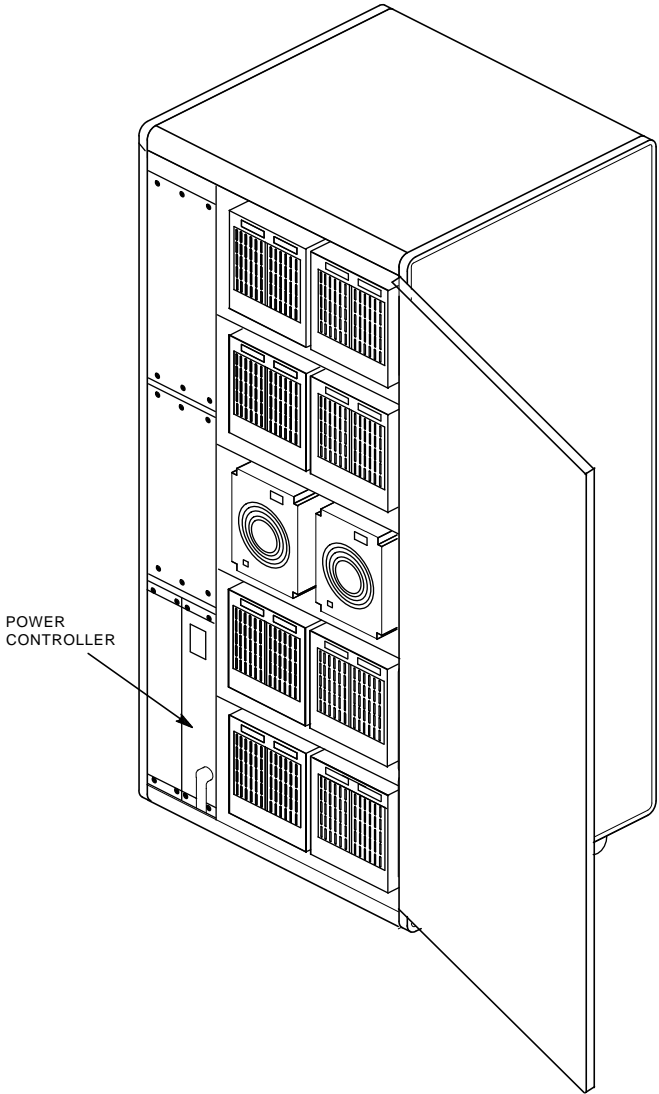
CXO-3526A-TI_R

Introduction
1.1 DECarray Overview

The DECarray cabinet has five levels, each with two storage enclosure
positions. The levels are numbered from the bottom up. As viewed from
the front, the odd-numbered positions are on the right, and even-numbered
positions are on the left. Table 1–1 lists these positions.

Table 1–1   DECarray Storage Positions

Level	Left Position	Right Position
1	2	1
2	4	3
3	6	5
4	8	7
5	10	9

Specifications for the SF400 DECarray cabinet are shown in Table 1–2.

Table 1–2 DECarray Specifications

Characteristic	Specification
Dimensions (nominal)	170.0 cm (66.93 inches) H, 80.0 cm (31.50 inches) W, 87.25 cm (34.35 inches) D
Weight	
Minimum configuration	228 kg (500 lb)
Maximum configuration	635 kg (1400 lb)
Agency compliance	FCC, UL, IEC, CSA, TUV, and VDE
Electrical rating	
SF400–XA	120/208 volts, 50/60 Hz, 3 phase Y, 24 amperes per phase
SF400–XD	380-415 volts, 50/60 Hz, 3 phase Y, 16 amperes per phase
Temperature	+10°C to +40°C (+50°F to +104°F) Reduce rating by 1.8°C for each 1000 meters altitude (1.0°F for each 1000 feet altitude)
Humidity	10 to 85 percent at maximum wet bulb temperature of +32°C (+90°F) and minimum dew point of +2°C (+36°F)
Recommended Environmental Limits[1]	
Operating environment	
Temperature	18°C to 24°C (64.4°F to 75.2°F) with an average rate of change of 3°C per hour maximum and a step change of 3°C or less
Relative humidity	40 to 60 percent (noncondensing) with a step change of 10 percent or less (noncondensing)
Altitude	Up to 2400 meters (8000 feet)
Air quality (maximum particle count)	Not to exceed 500,000 particles per cubic foot of air at a size of 0.5 micron or larger

[1]These limits are for optimum equipment performance and reliability.

Table 1–2 (Continued) DECarray Specifications

Characteristic	Specification
Recommended Environmental Limits[1]	
Air volume (at inlet)	50 cubic feet per minute (0.026 cubic meters per second)
Nonoperating environment	
Temperature	-40°C to +66°C (-40°F to +151°F)
Relative humidity	10 to 80 percent noncondensing
Altitude	4900 meters (16,000 feet)
Nominal airflow through enclosure	360 to 650 cubic feet per minute

[1]These limits are for optimum equipment performance and reliability.

Acoustic information is shown in Table 1–3.

Table 1–3 SF400 DECarray Acoustics Declaration

	Sound Power Level LWAd, B		Sound Pressure Level LpAm, dBA (Bystander Positions)	
Acoustics–declared values per ISO 9296 and ISO 7779:				
Product	**Idle**	**Operate**	**Idle**	**Operate**
SF400 with 10xSF35	7.3	7.3	56	56
SF400 with 10xSF73	7.1	7.1	54	54
Per device when installed in SF400				
SF35	6.3	6.3	46	46
SF73	6.1	6.1	44	44

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

1.2 Storage Enclosure Overview

The SF-series storage enclosures are available in two designs: the SF3x enclosure, which contains up to twelve half-height, 3 1/2-inch ISEs, and the SF7x enclosure, which contains up to four full-height, 5 1/4-inch ISEs.

Each disk ISE within an SF-series enclosure is independently controlled from the OCP on the front of the enclosure. A power supply in the enclosure provides the dc power for all disk ISEs installed in the enclosure. A blower fan provides air flow for cooling.

The SF3x storage enclosure holds up to twelve RF3x series ISEs (Figure 1–3). There are six slots in the front of the enclosure and six slots in the rear. Disk ISEs installed in these slots plug directly into a backplane, which is cabled to a connector tray on the top rear of the storage enclosure.

The SF3x enclosure can be configured in through-bus mode or split-bus mode. In through-bus mode, the six ISEs in the front of the SF3x enclosure are connected to a single DSSI bus, and the six ISEs in the rear of the SF3x enclosure are connected to a second DSSI bus. In split-bus mode, each end of the enclosure (front and rear) is further divided into left-side ISEs and right-side ISEs, each connected to a separate DSSI bus. Thus, in split-bus mode there are four DSSI buses, each with three drives connected to it.

The SF7x series storage enclosure holds either two or four RF7x series ISEs (Figure 1–4). The ISEs in the SF7x storage enclosure can also be configured in split-bus or through-bus mode. In through-bus mode, all four disk ISEs are connected to a single DSSI bus. In split-bus mode, the left-side ISEs are connected to one DSSI bus, while the right-side ISEs are connected to a second DSSI bus.

The SF-series storage enclosures have the following features:

- Both can operate in either through-bus or split-bus mode.

- Each disk ISE has its own set of switches and indicators on the OCP.

- The enclosure power supply provides operating power to all disk ISEs and other subassemblies in the enclosure.

- The drive dc power switches for the disk ISEs are on the front panel of the storage enclosure.

Introduction
1.2 Storage Enclosure Overview

Figure 1–3   SF3x Series Storage Enclosure

MA-0432-92.DG

Figure 1–4   SF7x Series Storage Enclosure
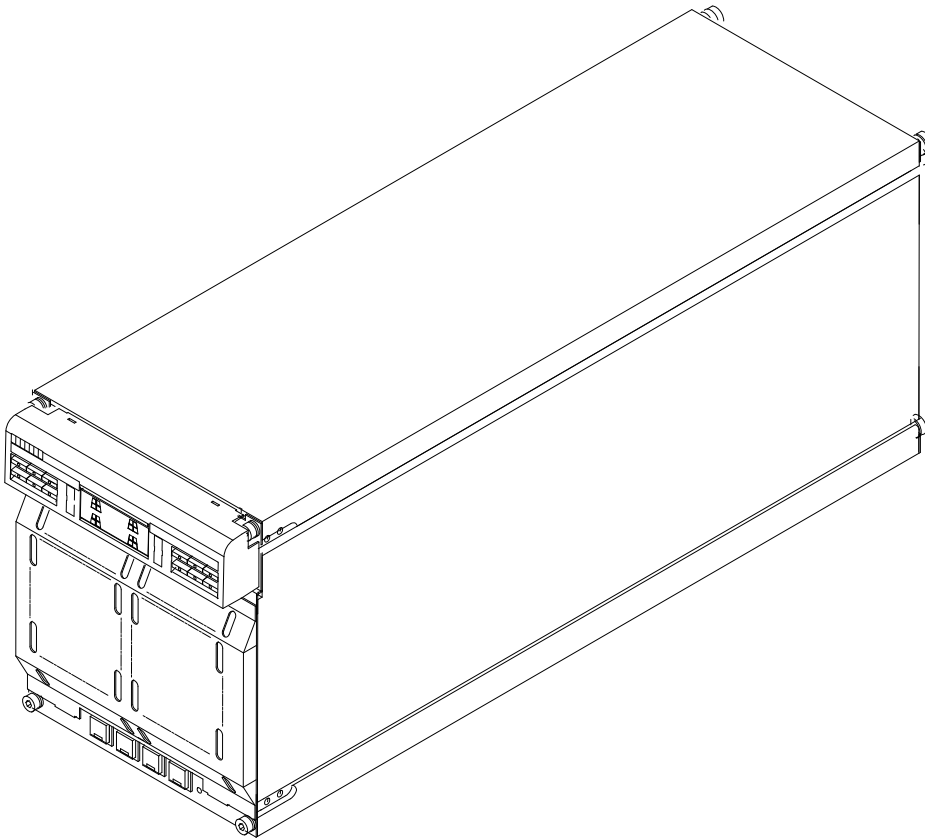
SHR_X1123C_89

Introduction
1.2 Storage Enclosure Overview

Power requirements are shown in Table 1–4.

Table 1–4 Storage Enclosure Power Requirements

Storage Enclosure	Specification
SF3x disk power requirements (steady state)	4.5 A at 100 to 120 Vac (60 Hz), 2.3 A at 220 to 240 Vac (50 Hz)
SF73 disk power requirements (steady state)	4.7 A at 100 to 120 Vac (60 Hz), 2.4 A at 220 to 240 Vac (50 Hz)
TF857 tape magazine power requirements (steady state)	1.1 A at 100 to 120 Vac (60 Hz), 0.5 A at 220 to 240 Vac (50 Hz)

2
TF8x7 Magazine Tape Subsystem

This chapter explains TF8x7 subsystem operation:

- Power-on process
- Mode Select key modes
- Operator control panel (OCP) indicator functions
- Slot Select, Load/Unload, and Eject button functions
- Magazine cartridge insertion and removal

2.1 Power-On Process

When the TF8x7 subsystem powers on, all of the indicators on the operator control panel (OCP) light, within 15 seconds. The power-on self-test, or POST, is initializing the subsystem. When POST completes successfully, all OCP indicators, including the Magazine Fault and Loader Fault indicators, turn off—except for Power On.

_____ **Note** _____

If the Magazine Fault or Loader Fault indicator remains on, POST has detected an error. See Chapter 4 of the *TF857 Series Magazine Tape Subsystem Owner's Manual* for error conditions.

_____

The elevator scans the magazine to determine which slots contain cartridges. If the subsystem has a magazine with a cartridge in slot zero, and no cartridge is in the drive, these indicators should be on:

Power On
Eject
Load/Unload
Slot Select
Slot 0

2.2 Mode Select Key

The Mode Select key (Figure 2–1) can lock the loader transfer assembly into the enclosure, as well as lock the receiver closed. It has four modes: OCP Disabled, Automatic, Manual, and Service. The OCP Disabled, Automatic, and Manual modes are for operational use; the Service mode is for head cleaning and servicing procedures.

2.2.1 Operating Modes

Use the following modes for operational use:

- **OCP Disabled mode**—When the magazine is inserted into the receiver and the receiver is closed, the loader transfer assembly scans the magazine. The first cartridge in the magazine automatically loads into the drive. Operations stop if you are copying data to tape and either the storage capacity of the last tape cartridge is exceeded, or no tape cartridge is in the next sequential slot in the magazine.

  To lock the TF8x7 subsystem into the enclosure and lock the receiver, set the Mode Select key to **OCP Disabled** mode. The OCP pushbuttons are disabled.

- **Automatic mode**—This mode is the default, or normal, mode of the TF8x7 subsystem. It automatically loads and unloads cartridges as necessary during backup procedures. Operations stop if you are copying data to tape and either the storage capacity of the last tape cartridge is exceeded, or no tape cartridge is in the next sequential slot in the magazine.

  To lock the TF8x7 subsystem into its normal operating position in the enclosure but leave the receiver unlocked, set the Mode Select key to **Automatic** mode. The receiver can be opened; all OCP pushbuttons are enabled.

- **Manual mode**—Automatic loading and unloading of cartridges does not occur in this mode; rather, you must press the Load/Unload button to move each cartridge. This mode is most useful for, but not restricted to, copying specific files to or from tape. To lock the TF8x7 subsystem into the enclosure, set the Mode Select key to **Manual** mode. The receiver is unlocked and can be opened; all OCP pushbuttons are on.

  _____ **Note** _____

  During Manual mode, the cartridge returns to the magazine, but the current Slot Select indicator does not advance forward to the next available cartridge.

  _____

Figure 2–1   TF8x7 Operator Control Panel

OPERATOR CONTROL PANEL

MODE SELECT KEY

OCP
DISABLED

AUTOMATIC
MODE

SERVICE
MODE

MANUAL
MODE

Eject

Load/Unload

Slot Select

BUTTON
AND
INDICATOR
AREA

0

Power On

OCP LABEL

CURRENT
SLOT
INDICATORS
0-6

Write
Protected

Tape In Use

1

Use
Cleaning Tape

Magazine
Fault

Loader Fault

2

DSSI NODE
ID LABEL
(TF857 ONLY)

3

4

5

6
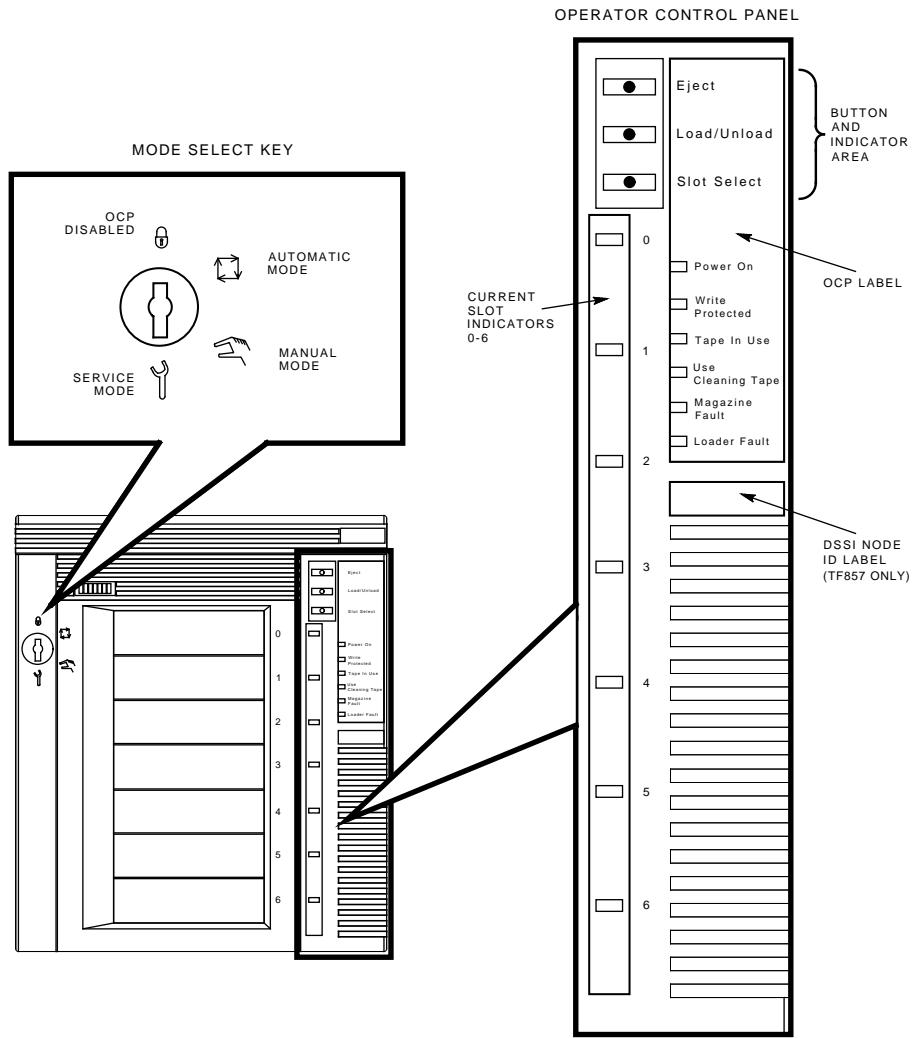
SHR_X1025E_91

2.2.2 Service Mode

Service mode is for performing head cleaning by manually loading the
CleaningTape III and for performing servicing procedures. See Chapter 5
of the *TF857 Series Magazine Tape Subsystem Owner's Manual* for information
on head cleaning.

To unlock the TF8x7 subsystem from its enclosure and remove it from its
normal operating position, set the Mode Select key to **Service** mode. The
receiver is unlocked and can be opened.

2.3 Operator Control Panel

The TF8x7 operator control panel (OCP) has 3 OCP pushbuttons and 16
indicators that are used with the Mode Select key (Table 2–1). See Section 2.2
for information on the Mode Select key and its functions. See Section 2.4 for
more details on button and indicator operations.

Table 2–1 TF8x7 Operator Control Panel

Button/Indicator	Color	Function
Eject button	–	Opens the receiver, allowing access to the magazine for removal and insertion of cartridges. Also can be used to unload the tape from the drive to the magazine.
Eject indicator	Green	Indicates a magazine fault, and that you can press the Eject button to unload cartridges from the drive to the magazine and to open the receiver.
Load/Unload button	–	Loads the currently selected cartridge into the tape drive. Unloads the cartridge currently in the tape drive. Resets the subsystem if there is a loader fault.
Load/Unload indicator	Green	Indicates that you can press the Load/Unload button.
Slot Select button	–	Increments the current slot indicator to the next slot.
Slot Select indicator	Green	Indicates that you can press the Slot Select button. Pressing this button moves the current slot indicator to the next slot.

Table 2–1   (Continued)   TF8x7 Operator Control Panel

Button/Indicator	Color	Function
Power On indicator	Green	Indicates the TF8x7 magazine tape subsystem is in a known good power state (ac and dc voltages are within tolerance).
Write Protected indicator	Orange	When on, indicates that the cartridge currently in the drive is write-protected by one of these methods: • Setting the Write Protect switch to write-protect • Using software write-protect qualifiers • Using a CompacTape or CompacTape II cartridge previously written by another drive When off, indicates that the current cartridge is write-enabled.
Tape In Use indicator	Yellow	Indicates tape drive activity as follows: • Slow blinking indicates tape is rewinding. • Rapid blinking indicates tape is reading or writing. • When on steadily, indicates that a cartridge is in the drive and the tape is not moving. • When off, indicates that no cartridge is in the drive.
Use Cleaning Tape indicator	Orange	Indicates that the read/write head needs cleaning.
Magazine Fault indicator	Red	Indicates a magazine failure.
Loader Fault indicator	Red	Indicates a loader transfer assembly error or drive error.

Table 2–1 (Continued) TF8x7 Operator Control Panel

Button/Indicator	Color	Function
Current slot indicators 0–6	Green	Identifies the current slot (see Slot Select button). Each current slot indicator blinks when its corresponding cartridge moves to or from the drive. Also used with the Magazine Fault or Loader Fault indicator to show the type of fault.

2.4 Slot Select, Load/Unload, and Eject Button Functions

The Slot Select, Load/Unload, and Eject buttons are OCP pushbuttons. They contain a green indicator, and they are operable only when their corresponding indicators are on.

_____ **Note** _____

The Load/Unload button has three functions: *load*, *unload*, and *reset*. If there is a loader fault and the Loader Fault indicator is on, press the Load/Unload button to reset the TF8x7 subsystem.

_____

2.4.1 Selecting a Cartridge

Use the **Slot Select** button to select a cartridge; press this button to advance the slot indicator light to the next available slot. After a successful initialization, the TF8x7 subsystem automatically selects slot 0 and the Slot Select button becomes active. The Load/Unload and Eject indicators remain on during the slot selection.

2.4.2 Loading the Cartridge

Press the **Load/Unload** button to load the cartridge into the drive. This action causes the Select Slot, Load/Unload, and Eject indicators to turn off, and the elevator to move to the selected slot, indicated by the light. The cartridge is then removed from the magazine and placed in the elevator. The elevator moves to the drive position and inserts the cartridge into the drive. The indicators remain off until the tape has loaded to the beginning of the tape (BOT). After the cartridge is loaded into the drive, the Eject and Load/Unload indicators turn on, and the corresponding buttons are enabled. The Slot Select indicator remains off.

2.4.3 Unloading the Cartridge

_____ **Caution** _____

Do not press the Load/Unload button until backup or other tape
operations are stopped at the terminal. Doing so can result in operation
failure and drive unavailability.

_____

When you press the Load/Unload button, the Select Slot, Load/Unload, and
Eject indicators turn off, and the cartridge unloads from the drive into the
magazine. However, automatic operation now stops and the Select Slot
operation does not increment. The indicators turn on once the cartridge is
returned to the magazine.

The Load/Unload indicator must be on before you press the button to load or
unload a cartridge. If the Loader Fault indicator is on, showing a malfunction,
press the Load/Unload button to reset the subsystem and try to clear the error.

2.4.4 Opening the Receiver

The Eject button opens the receiver for insertion or removal of the magazine.
It is disabled when the Mode Select key is in the OCP Disabled position. The
Eject button can also be used to _unload_ a tape from the drive.

_____ **Note** _____

When a cartridge is not in the drive, the Slot Select, Load/Unload, and
Eject indicators are on before any operation begins. Pressing the Eject
button causes all indicators to turn off. The elevator then returns to its
home position and the receiver opens.

When a cartridge is in the drive, the Eject and Load/Unload indicators
are on before the operation begins. When you press the Eject button,
both indicators turn off, and the cartridge unloads from the drive and
moves back into the magazine. The receiver then opens to allow access
to the magazine.

In both situations, once the receiver is closed again, a magazine scan
begins, and the indicators turn back on when the scan is complete.

_____

2.5 Magazine Cartridge Insertion and Removal

The front of the magazine has numbers (0 through 6) that indicate the number of the slot.

Note

Insert and remove all cartridges at the *front* of the magazine.

2.5.1 Inserting a Cartridge into the Front of the Magazine

To simplify cartridge insertion, place the magazine on its back and facing you. Each slot is numbered—to ensure that you are inserting the cartridge correctly in the front of the magazine. Usually, cartridges are inserted into consecutive slots.

To insert a cartridge into the magazine:

1. Grasp the cartridge with the CompacTape III label facing up and the Write Protect switch facing you (Figure 2–2).

2. Set the cartridge's Write Protect switch to the desired position. If you want to write on the tape, slide the switch to the right (orange indicator is not visible). If you want to write-protect the tape, slide the switch to the left (orange indicator is visible).

3. Insert the cartridge (Figure 2–3) by pushing it into the slot until you hear a click. A small metal tab holds the cartridge in place.

Figure 2–2   Write Protect Switch on a Cartridge
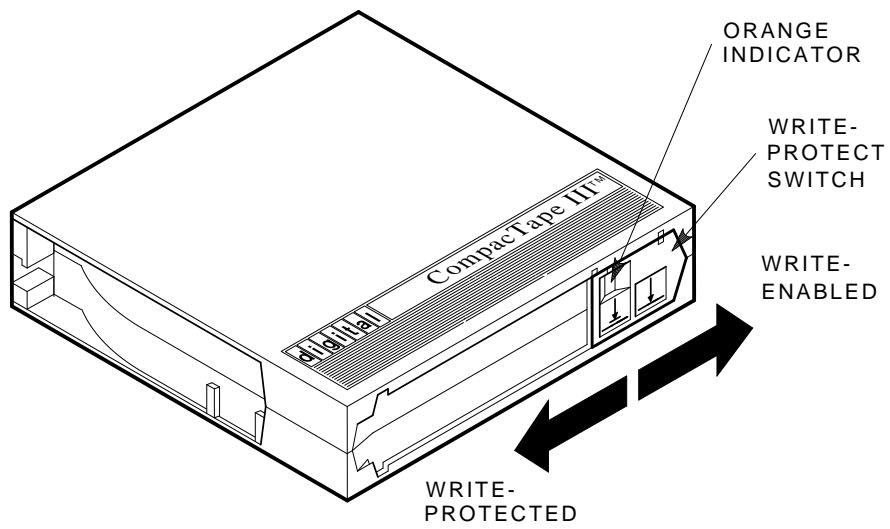
SHR_X1020C_89

Figure 2–3   Inserting a Cartridge into the Magazine
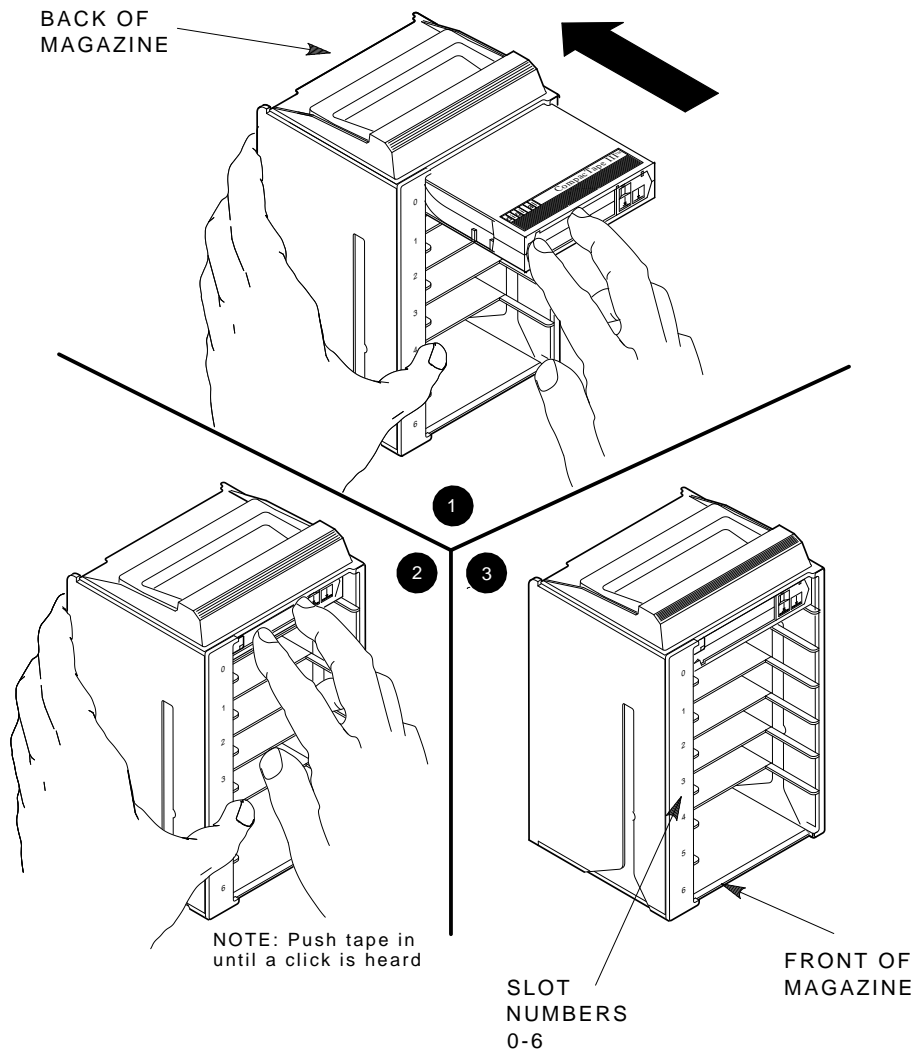
BACK OF
MAGAZINE

1

2   3

NOTE: Push tape in
until a click is heard

SLOT
NUMBERS
0-6

FRONT OF
MAGAZINE

SHR_X1021_89

2.5.2 Removing a Cartridge from the Magazine

To remove a cartridge from the magazine, press the cartridge (Figure 2–4) at the front of the magazine until you hear a click; then, release. The slot uses a spring-release action. When you press the cartridge in all the way, it pops out.

Caution

Never apply labels to the top or bottom of tape cartridges. Doing so can cause cartridge jams in the TF8x7 subsystem. Use the space on the front of the cartridge for labels. If a jam occurs, call your Digital Services representative.

2.5.3 Removing the Magazine from the Receiver

To remove the magazine from the receiver, first be sure that:

1. The Power On indicator is on (Figure 2–1).

2. The tape drive is unloaded.

3. The Eject indicator is on. (It must be on before you can press the Eject button.)

Then:

1. Press the Eject button (Figure 2–1) to open the receiver.

2. Grasp the receiver after it opens (Figure 2–5), and gently pull it forward to access the magazine.

3. Grasp the magazine's handle only to lift the magazine out of the receiver.

2.5.4 Installing the Magazine into the Receiver

To install the magazine into the receiver:

1. Slide the magazine down into the receiver (Figure 2–5) while holding the magazine by the handle. Because the magazine is slotted, you can install it only in the correct orientation.

2. Push the receiver closed.

3. Observe that the receiver is fully closed in the TF8x7 subsystem before proceeding.

Figure 2–4   Removing a Cartridge from the Front of the Magazine
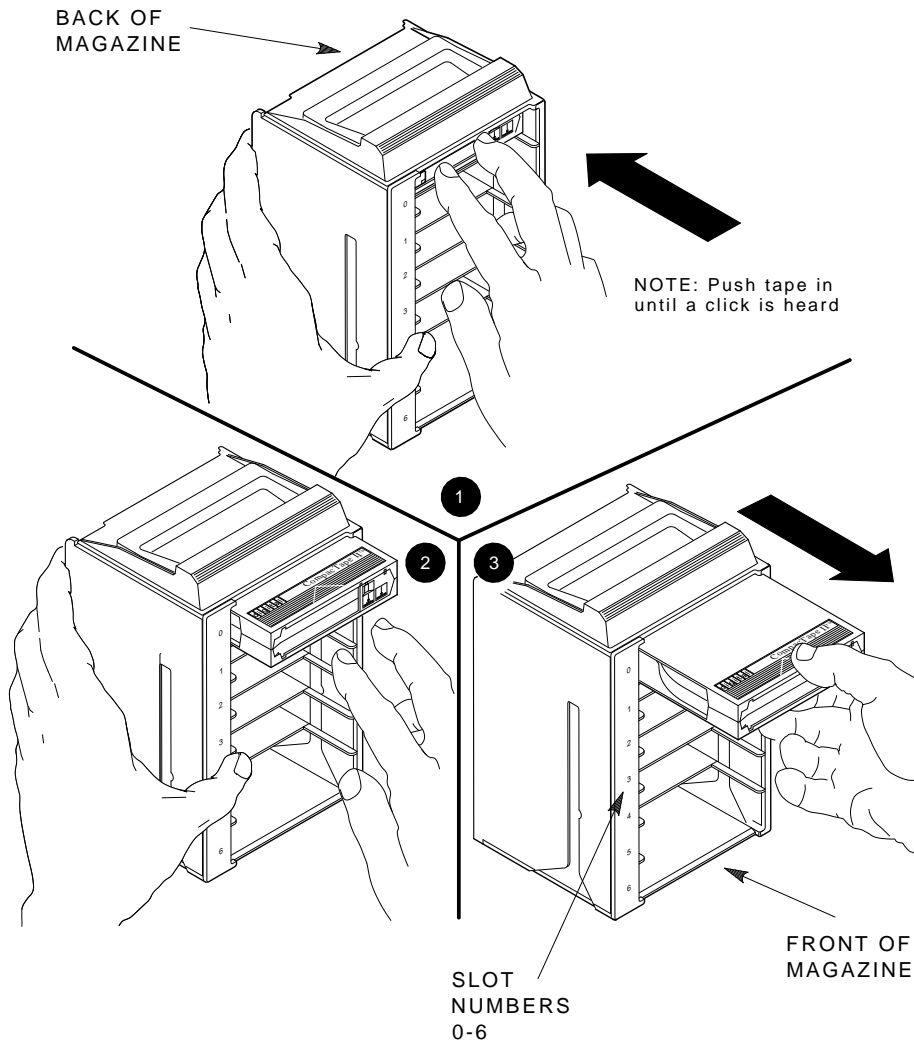
BACK OF
MAGAZINE

NOTE: Push tape in
until a click is heard

SLOT
NUMBERS
0-6

FRONT OF
MAGAZINE

SHR_X1022_89

Figure 2–5 Receiver Opened

FRONT
BEZEL

Eject

Load/Unload

Slot Select

Power On

Write Protect

Tape In Use

Use
Cleaning Tape

Drive Fault

Load Fault

SHR-X0046-90

3
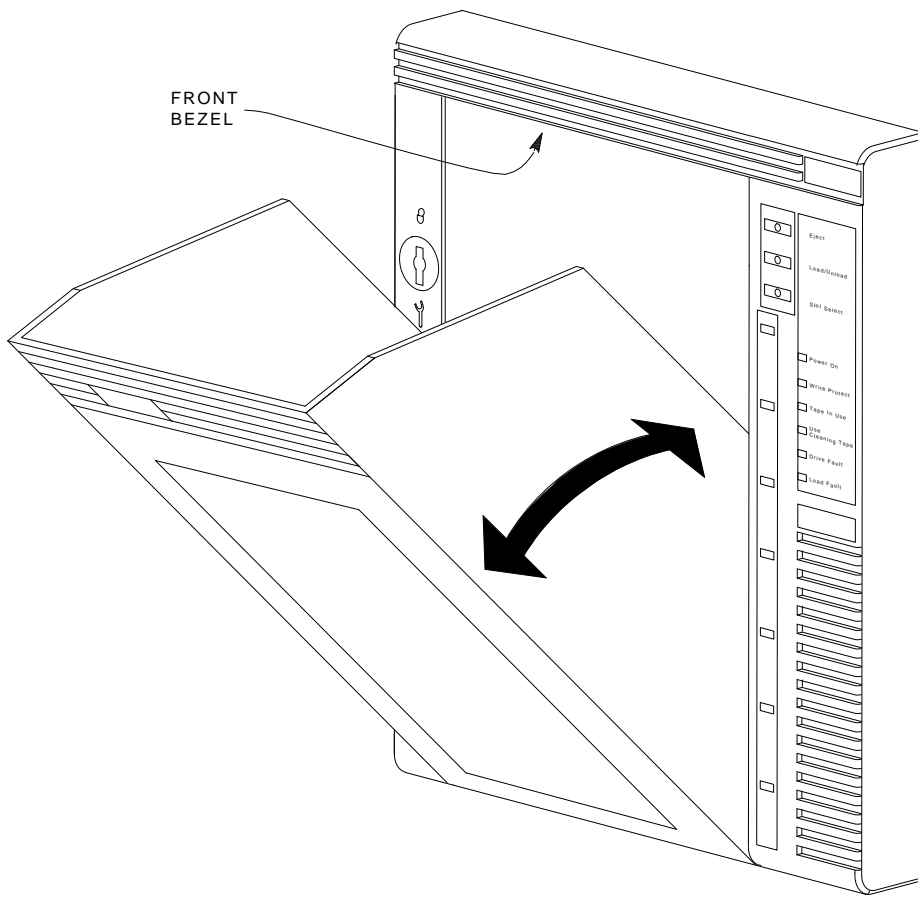
SF7x Series Storage Enclosure Operation

This chapter contains the following information:

- A description of the various bus modes and system configurations in which the storage enclosure functions
- A description of all front and rear panel controls and indicators
- Instructions on how to power up the storage enclosure
- Instructions on how to bring the storage enclosure on and off line

3.1 Storage Enclosure Configurations

The storage enclosure is available with either two or four RF7x (1- or 2-GB) disk ISEs installed. The two-ISE variant is referred to as **–HE**, and the four-ISE variant is referred to as **–JE**.

SF7x series storage enclosures residing in SF400 DECarray cabinets can be connected to a single system or to multiple systems in a DSSI VAXcluster system configuration.

Either of these variants operate in one of two bus modes. These modes are called through-bus and split-bus, and are described in the sections that follow.

3.1.1 Through-Bus Mode

In through-bus mode, all four disk ISEs in the storage enclosure operate on or are part of the same DSSI bus. The DSSI bus enters the enclosure from the rear, at the rightmost DSSI connector. The DSSI bus is then connected to the left rear disk ISE (facing the front of the enclosure), then the left front disk ISE, the right front disk ISE, then the right rear disk ISE, and finally out the leftmost (facing rear again) DSSI connector. At this point, the DSSI bus is either terminated (with a DSSI terminator, part number 12–31281–01) or connected to another storage enclosure (operating in split-bus mode in a single system or stripe set configuration).

Figure 3–1 shows a typical VAX 6000/7000 system and DECarray DSSI bus, with DSSI ID numbers.

Figure 3–1   Through-Bus Mode

SHR-X0110-90
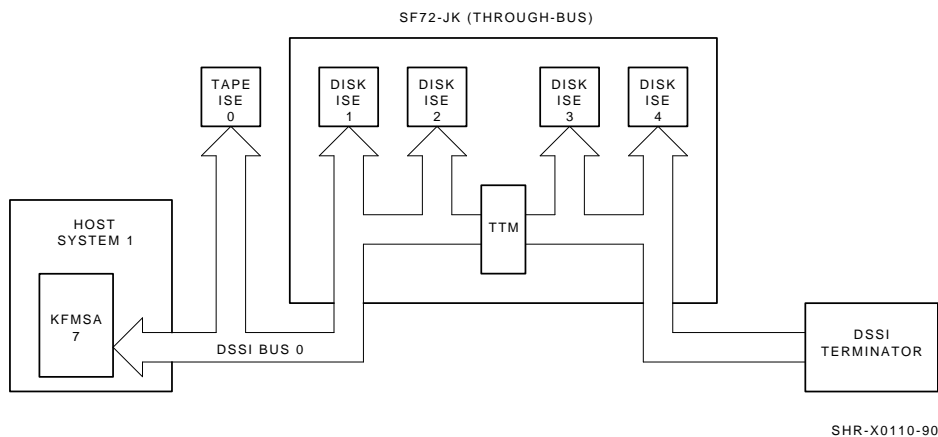
The –HE variant operates in through-bus mode, in a similar fashion, but only the rear two disk ISEs are used. An SF7x–UK upgrade kit consisting of two RF7x disk ISEs can be added at any time.

3.1.2 Split-Bus Mode

In split-bus mode, two disk ISEs in the storage enclosure operate on or are part of two separate DSSI buses. The DSSI bus enters the enclosure from the rear, at the leftmost or rightmost DSSI connector.

The DSSI bus for the left half of the enclosure is connected to the left rear disk ISE (facing the front of the enclosure), then the left front disk ISE, and finally terminated at the transition termination module (TTM) for the left half of the enclosure.

The DSSI bus for the right half of the enclosure is connected to the right rear disk ISE (facing the front of the enclosure), then the right front disk ISE, and finally terminated at the TTM for the right half of the enclosure.

Figure 3–2 shows a typical VAX 6000/7000 system and DECarray DSSI bus, with DSSI ID numbers.

_____ NOTE _____

Split-bus mode is not supported in DSSI VAXcluster system
configurations.

_____

Figure 3–2 Split-Bus Mode
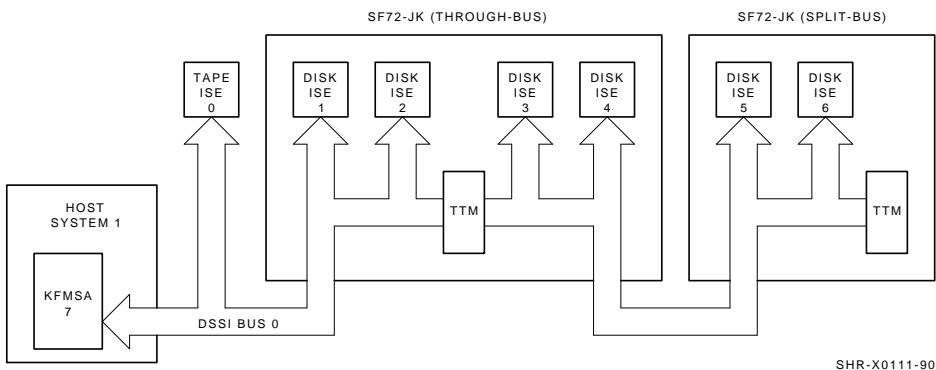
The –HE variant operates in split-bus mode, in a similar fashion, but only the
rear two disk ISEs are used. An SF7x–UK upgrade kit consisting of two RF7x
disk ISEs can be added to an –HE at any time.

3.2 Front Panel Controls, Labels, and Indicators

Figure 3–3 shows a front view of the storage enclosure. The operator control
panel (OCP) is on the top front of the enclosure. It can be accessed without
opening the cabinet's front door.

The drive dc power switches are on the lower front of the enclosure. These
switches are not accessible when the front door of the cabinet is closed.

Table 3–1 briefly describes the functions of the front panel controls and
indicators. Details are contained in the sections that follow.

3.2.1 Operator Control Panel (OCP)

The operator control panel (OCP) contains four identical sets of controls and
indicators, and two additional indicators behind the front door of the panel.
Unless a disk ISE is installed in the enclosure and power is applied to that disk
ISE, the controls and indicators are nonoperational. Table 3–1 summarizes the
controls and indicators discussed in the following sections.

Figure 3–3   Front View of the Storage Enclosure

SHR-X0126A-90
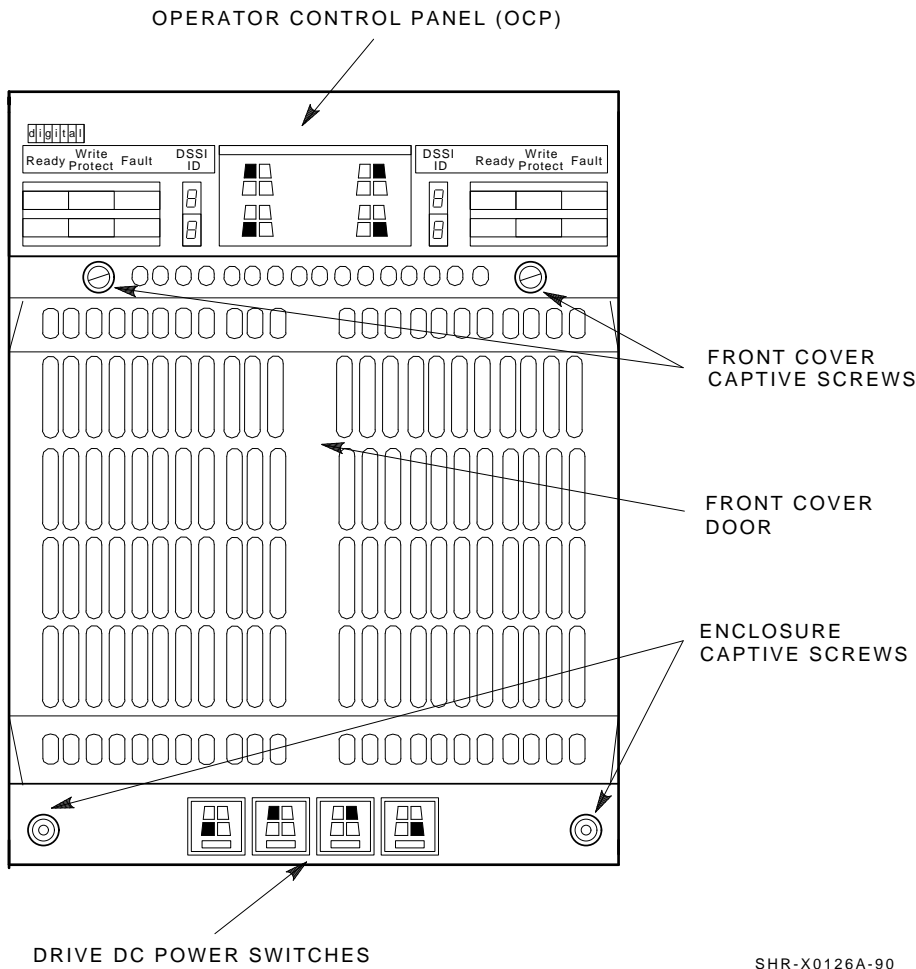
_____ **Note** _____

Figures may appear slightly different than actual SF7x storage
enclosures.

Table 3–1   Summary of Front Panel Control/Indicator Functions

Control/Indicator	Function
Operator Control Panel	
TERM PWR indicator	Indicates when termination power is being supplied
SPLIT indicator	Indicates when enclosure is in split-bus mode
MSCP enable switch	Enables or disables the disk ISE (leftmost bit)
DSSI ID select switch	Enables DSSI ID numbers (rightmost bits)
Seven-segment LED displays	Displays disk ISE DSSI ID number
Ready button	Brings disk ISE on line (Green LED lights when ready.)
Write Protect button	Places disk ISE in write-protect mode (yellow LED lights when disk ISE is write-protected.)
Fault button	Indicates a disk ISE fault (when red LED is lit). Press once to display fault code, twice to clear fault.
Lower Front	
Drive dc power switches	Applies power to disk ISEs; shows power status

The icons on the door of the OCP represent each disk ISE, as follows:

- The icon in the top left front represents the disk ISE in the left rear of the storage enclosure.

- The icon in the top right front represents the disk ISE in the right rear of the storage enclosure.

- The icon in the bottom left front represents the disk ISE in the left front of the storage enclosure.

- The icon in the bottom right front represents the disk ISE in the right front of the storage enclosure.

Colored labels on the inside of the door on the OCP help identify each of the DSSI buses. Typically, in a single system or stripe set configuration, colors represent the following buses:

- Blue represents DSSI bus 1 (single system and stripe set)

- Red represents DSSI bus 2 (single system and stripe set)

- Yellow represents DSSI bus 3 (single system)

- Green represents DSSI bus 4 (single system)

Typically, in a DSSI VAXcluster system configuration, colors represent the following buses:

- Blue represents DSSI bus 1

- Red represents DSSI bus 2

- Yellow represents DSSI bus 3

- Green represents DSSI bus 4

- Blue and/or white represents DSSI bus 5

- Red and/or white represents DSSI bus 6

Refer to the inside cover of the *SF Family Label Booklet* for further details.

The two indicators behind the OCP door are TERM PWR (termination power, top) and SPLIT (bus mode, bottom). The TERM PWR indicator lights green whenever the storage enclosure is connected to a DSSI bus. The SPLIT indicator lights green only when the enclosure is operating in split-bus mode, as described in Section 3.1.2.

Four switchpacks, one for each of the four disk ISEs, are located to the right and left of the two indicators behind the OCP door (Figure 3–4). The switch to the left is the MSCP enable switch and is in the down position when MSCP is enabled. The other switches are used to set the DSSI ID number, where the rightmost switch is the least significant. Typical switch settings are shown in Tables 3–2 and 3–3.

Figure 3–4   OCP Switchpacks
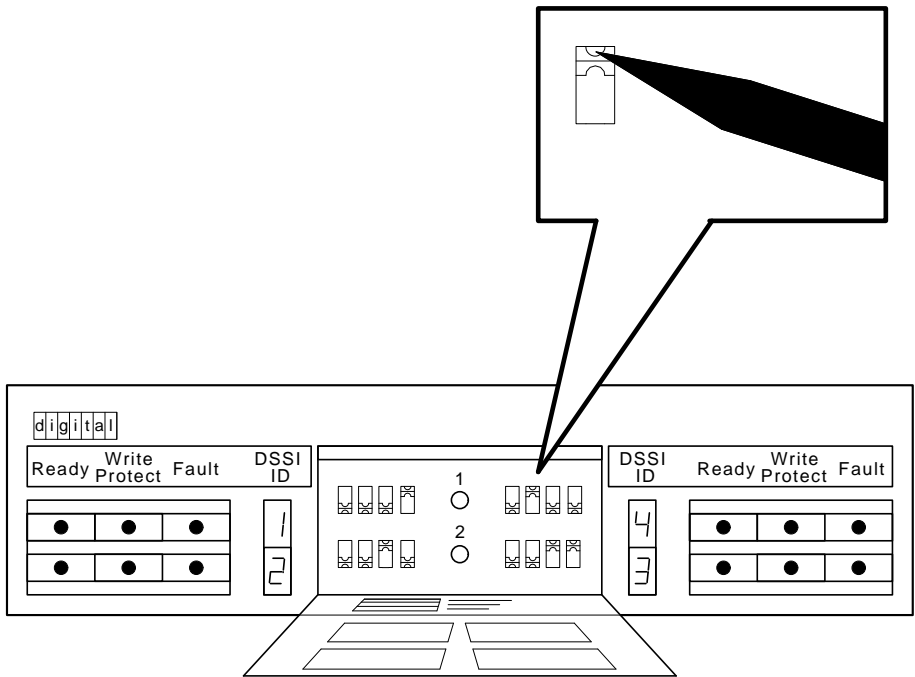
SHR_X1128B_89

Table 3–2   DSSI ID Switch Settings (Single System and Stripe Sets)

Disk ISE	DSSI ID	Setting[1]
Positions 1, 2, 4, and 7		
Left rear (LR)	1	0001
Left front (LF)	2	0010
Right front (RF)	3	0011
Right rear (RR)	4	0100
Positions 3 and 8		
Left rear (LR)	5	0101
Left front (LF)	6	0110
Right front (RF)	6	0110
Right rear (RR)	5	0101
Stripe Set (All Positions)		
Left rear (LR)	1	0000
Left front (LF)	2	0001
Right front (RF)	2	0001
Right rear (RR)	1	0000

[1]0 = down, 1 = up.

Table 3–3   DSSI ID Switch Settings (DSSI VAXcluster System)

Disk ISE	DSSI ID	Setting[1]
Positions 1, 2, 3, 4, 7, and 8		
Left rear (LR)	1	0001
Left front (LF)	2	0010
Right front (RF)	3	0011
Right rear (RR)	4	0100

[1]0 = down, 1 = up.

The four seven-segment LED displays on the front of the OCP display these DSSI ID numbers. If a display indicator is not lit, then that disk ISE position in the enclosure is not occupied by a disk ISE.

The three disk ISE controls and indicators are to the right or left side of the seven-segment LED displays. These controls, with their associated indicators, are as follows (Figure 3–5):

- **Ready**—The Ready button is a push-to-set switch with a green indicator. When pressed in, the Ready button causes the disk ISE to come on line. After the Ready button is pressed, it takes approximately 60 seconds for the disk ISE to come on line. The green indicator remains lit while the disk ISE is on line. However, this indicator may blink or go out entirely when the disk ISE is performing heavy seeks.

- **Write Protect**—The Write Protect button is a push-to-set switch with a yellow indicator. When the Write Protect button is engaged, the data on that disk ISE cannot be overwritten, nor can any new data be written to that disk ISE.

- **Fault**—The Fault button is a momentary switch with a red indicator. A disk ISE fault is indicated when the red indicator is lit. Press the Fault button once to display the disk ISE fault code, and a second time to clear the fault code and to clear the disk ISE fault.

Figure 3–5 Controls and Indicators
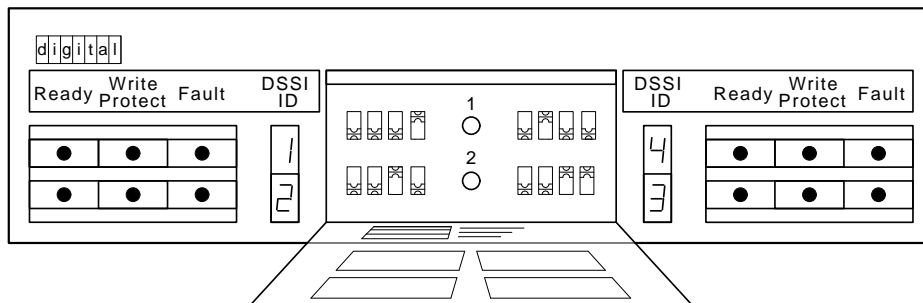
SHR_X1128_89

3.2.2 Drive DC Power Switches

Four drive dc power switches are on the lower front side of the storage enclosure. Each drive dc power switch is associated with a disk ISE position, as shown in Figure 3–3.

An indicator in each drive dc power switch illuminates to show that nominal power is being applied to the associated disk ISE. The switches are shown on the icon located on the front of the storage enclosure's chassis.

Setting a drive dc power switch connects power to the associated disk ISE and causes the disk ISE to spin up and run a self-test. After setting the drive dc power switch, you must press the Ready button on the OCP to bring the disk ISE on line.

3.3 Rear Panel Controls and Indicators

Figure 3–6 shows the rear panel of the storage enclosure. The DSSI connectors are on the top rear side of the enclosure. The ac power switch, line voltage selector switch, and power supply fault indicator are on the bottom rear of the enclosure, on the power supply chassis, as shown in Figure 3–6. These controls and indicators affect operation of the entire storage enclosure.

Table 3–4 summarizes the functions of the rear panel controls and indicators. Details are provided in the section that follows.

Table 3–4   Summary of Rear Panel Control/Indicator Functions

Control/Indicator	Function
Power Supply Chassis	
AC power switch	Applies line voltage to dc power supply
Line voltage selector switch	Selects between 120 Vac (60 Hz) and 240 Vac (50 Hz) line voltage
Power supply fault indicator	Illuminates for fault or overtemperature in enclosure

Figure 3–6   Rear Panel of the Storage Enclosure

DSSI
CONNECTORS

1   0

FAULT

POWER SUPPLY
FAULT INDICATOR
(BEHIND PANEL)

LINE VOLTAGE
SELECTOR SWITCH
(BEHIND PANEL)

AC RECEPTACLE   AC POWER
SWITCH
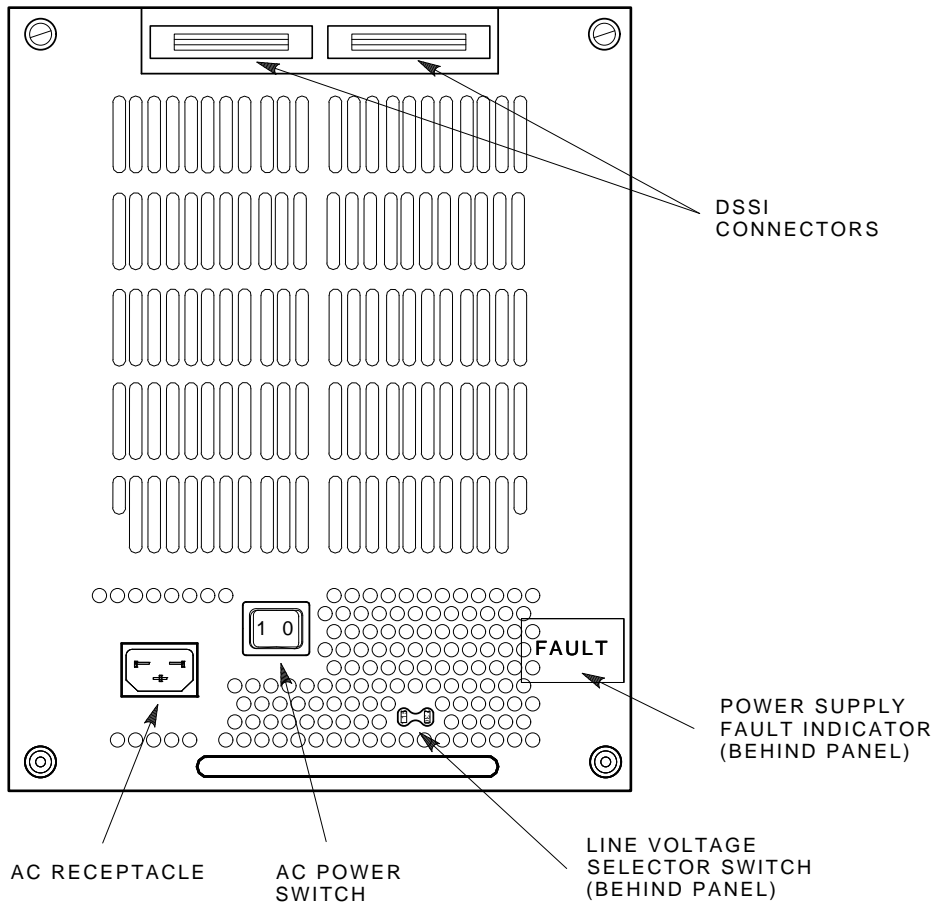
SHR-X0127A-90

_____ **WARNING** _____

Hazardous voltages are present inside the equipment cabinet and the
storage enclosure. Installation and service must be performed only by
qualified Digital Multivendor Customer Services engineers.

The ac power switch for the storage enclosure is in the center of the rear panel. Setting the ac power switch in the on (1) position applies power to the storage enclosure. Setting the switch in the off (0) position removes power from the enclosure.

As you face the rear panel, the line voltage selector switch is located to the right of the ac power switch. It is visible through a hole in the rear panel. The Digital Multivendor Customer Services engineer sets this switch to the available line voltage during installation. The number "120" represents 120 Vac at 60 Hz, and the number "240" represents 240 Vac at 50 Hz.

CAUTION

The storage enclosure power supply is universal for both 120 Vac and 240 Vac. The supply is factory-set to 240 Vac and must be reset to 120 Vac for some installations. Selecting 120 Vac and using 240 Vac will damage the power supply.

The power supply fault indicator is behind the panel in the lower right corner of the storage enclosure. When the fault indicator is lit, a green light is visible through the holes in the rear panel. The storage enclosure automatically shuts down when the dc power supply detects a fault or overtemperature condition.

3.4 Applying Power to the Enclosure

This section describes the procedure for powering up a storage enclosure. Perform *all* steps in the order in which they are presented.

Note

Do not change the DSSI ID setting while the power is on.

Apply power to the enclosure as follows:

1. Verify that the drive dc power switches and all disk ISE control buttons on the front of the enclosure are in the off (0) position.

2. Set the ac power switch to the on (1) position to apply ac power to the dc power supply.

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

_____ **Note** _____

It is possible to have airflow through the enclosure and not have output voltage. This indicates that the line voltage selector switch, located behind the rear panel of the enclosure, is in the wrong position.

Set the ac power switch to off (0) and reset the line voltage selector switch.

_____

4. Verify that the termination power indicator is on.

5. If the storage enclosure is in the split-bus mode, verify that the bus mode indicator is on.

6. Turn the drive dc power switch on. Verify that the green indicator is lit.

3.5 Placing a Disk ISE On Line

After power is applied to the storage enclosure, use the following procedure to place a disk ISE on line. Perform *all* steps in the order in which they are presented.

1. Press the Ready button on the OCP to bring the ISE on line.

    a. The Ready indicator flickers while the disk ISE is spinning up. If you power up a disk ISE with the Ready button for that disk ISE in the on (in) position, you must press the Ready button to put it in its off (out) position momentarily, then press the button in to bring the disk ISE on line correctly.

    b. All other indicators remain off.

    c. When the disk ISE has completed spinup, the Ready indicator illuminates, indicating that the disk ISE is ready for read/write operation.

    d. The Fault indicator illuminates if the disk ISE detects a fault.

2. Press the Write Protect button on the OCP, as required, to turn on write-protect mode. To deselect write-protect mode, press this button a second time.

Repeat this entire procedure for each disk ISE being placed on line.

_____ **Note** _____

The Ready indicator remains lit during normal operation, though it
may flicker during heavy seeks.

The Write Protect indicator is lit when the disk ISE is write-protected,
and off when the disk ISE is write-enabled.

_____

3.6 Taking a Disk ISE Off Line

To take a disk ISE off line, press the Ready button (out position) and wait until
the LED goes out.

4

SF3x Series Storage Enclosure

This chapter contains the following information:

- An overview of the SF3x storage enclosure
- A description of all front and rear panel controls and indicators
- Instructions on how to power up the storage enclosure
- Instructions on how to bring the storage enclosure on and off line

4.1 SF3x Overview

The SF3x storage enclosure comes with either six or twelve half-height, 3 1/2-inch form factor disk ISEs. They are arranged on two DSSI buses, one for the front six ISEs and one for the rear six ISEs. These can be further divided into four DSSI buses, each with three ISEs by configuring the storage enclosure in split-bus mode, as described in the next section.

Ease ISE slides into a slot in the enclosure, where it plugs directly into a backplane. There is one backplane for the front six ISEs and one backplane for the rear six ISEs. The location of an ISE within the backplane determines its DSSI node ID, as follows:

DSSI node ID 1—Upper left slot
DSSI node ID 2—Upper right slot
DSSI node ID 3—Middle left slot
DSSI node ID 4—Middle right slot
DSSI node ID 5—Lower left slot
DSSI node ID 6—Lower right slot

SF3x series storage enclosures can be connected to a single system, or they can be connected to multiple systems in a DSSI VAXcluster configuration. It can operate in one of two bus modes, through-bus or split-bus mode. These nodes are described in the sections that follow.

4.1.1 Through-Bus Mode

In through-bus mode, all six ISEs in each half of the storage enclosure are connected to the same DSSI bus. The DSSI bus enters through the left DSSI connector on the top of the backplane, connects to ISEs 1, 3, and 5 on the left side of the enclosure, then goes through ISEs 6, 4, and 2, and finally out the right DSSI connector (Figure 4–1).

At this point, the DSSI bus is either terminated (with a DSSI terminator, part number 12–31281-01), connected to a magazine tape ISE, or connected to the DECarray I/O panel.

Figure 4–1 Through-Bus Mode
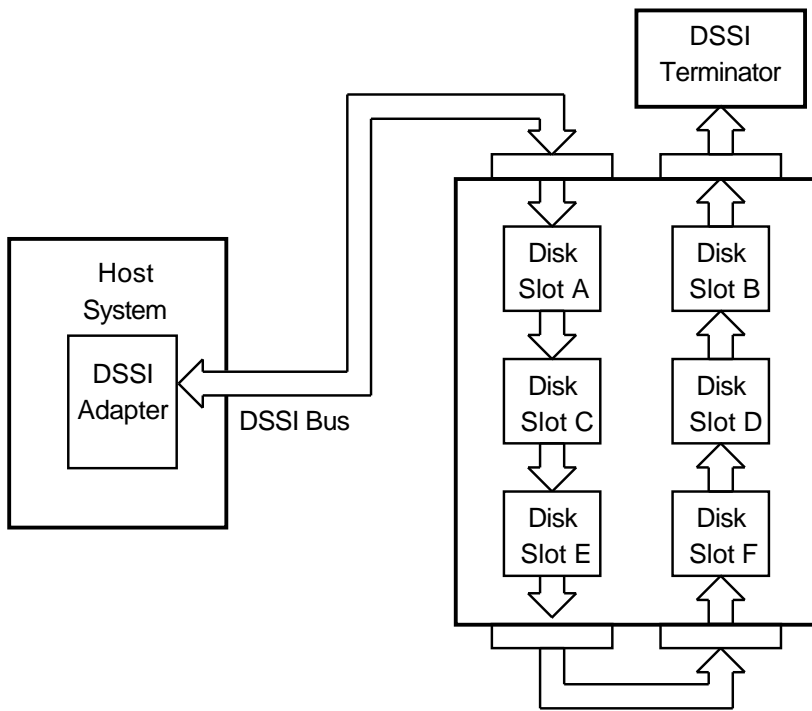
MKV−010000437−01−92−RAGS

4.1.2 Split-Bus Mode

Each set of six ISEs (front and rear) can be further separated by putting the left ISEs (DSSI nodes 1, 3, and 5) and right ISEs (DSSI nodes 2, 4, and 6) on separate DSSI buses. This configuration leaves each enclosure with four distinct DSSI buses, each with three disk ISEs (Figure 4–2).

This configuration is most often used when the DECarray is configured in stripe sets.

Figure 4–2 Split-Bus Mode
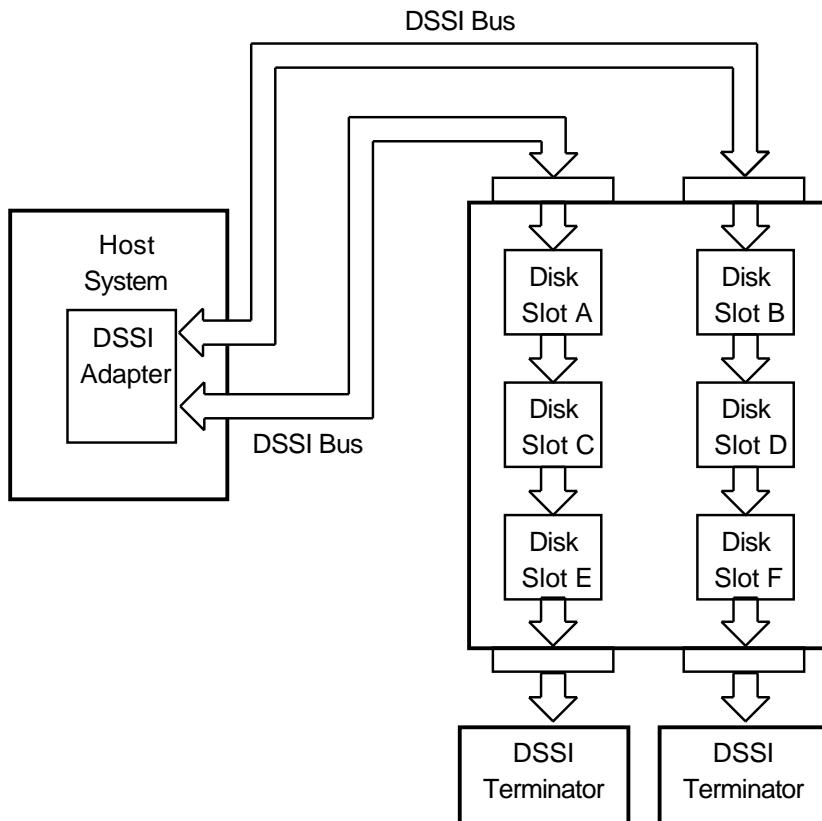
MKV–010000437–02–92–RAGS

4.2 Front Panel Controls, Labels, and Indicators

Figure 4–3 shows a front view of the storage enclosure. The operator control panel (OCP) is on the top front of the enclosure. It can be accessed without opening the cabinet front door.

The dc power switches for each ISE are on the bottom front of the enclosure. These switches are not accessible with the front door of the cabinet is closed.

—————————————— **Note** ——————————————

Figures may appear slightly different than actual SF3x storage enclosures.

———

Figure 4–3   Front View of the SF3x Storage Enclosure

MKV–010000437–03–92–rags

4.2.1 Operator Control Panel

The OCP contains two identical sets of controls and indicators, one set for the front ISEs and one set for the rear. Each set consists of switches and LEDs for six ISEs, one for each slot in that side of the storage enclosure. Unless a disk ISE is installed and power is applied to a given slot, the corresponding controls and indicators are nonoperational.
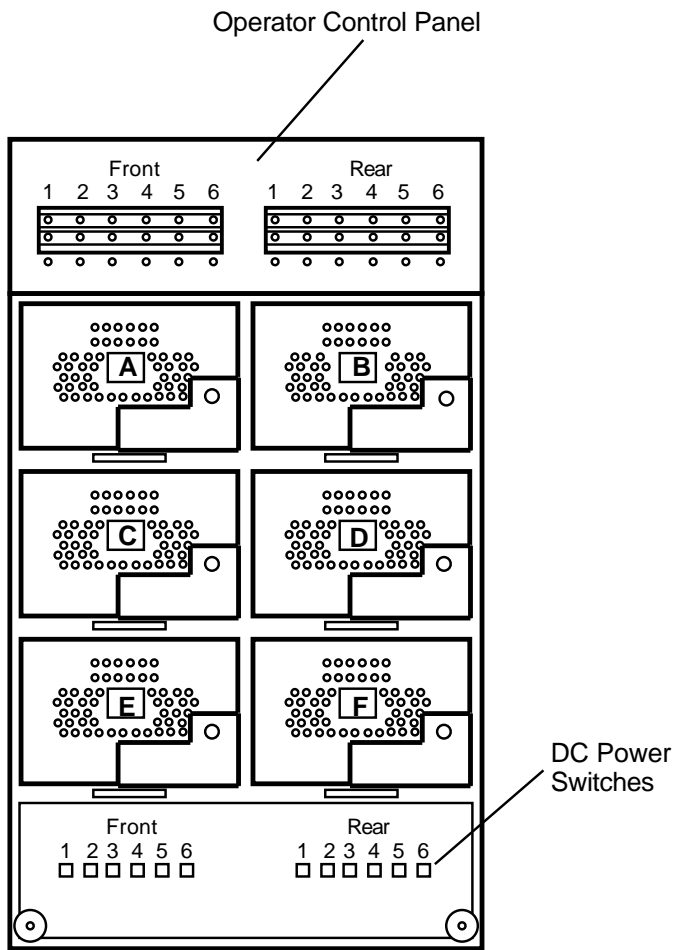
Table 4–1 summarizes the function of the controls and indicators provided for each ISE in the storage enclosure.

Table 4–1   Operator Control Panel Functions

Control/Indicator	Function
Ready switch	The Ready switch is a push-to-set switch with a green indicator. When pressed in, the Ready switch causes the disk ISE to come on line. After the Ready switch is pressed, it takes approximately 60 seconds for the disk ISE to come on line. The green indicator remains lit while the disk ISE is on line. However, this indicator may flicker or go out entirely when the disk ISE is performing heavy seeks.
Write Protect switch	The Write Protect switch is a push-to-set switch with an amber indicator. When the Write Protect switch is engaged, the data on that disk ISE cannot be overwritten, nor can any new data be written to that disk ISE.
MSCP switch/Fault indicator	The MSCP/Fault switch is a recessed switch with a multicolor indicator. During normal operation, this LED is unlit. If the MSCP switch is pressed and MSCP is disabled, this LET is lit green. If the system detects a fault in the ISE, this LED is lit red. If a fault is detected while MSCP is disabled, this LED is lit amber.

4.2.2 DC Power Switches

Power switches for each ISE in the enclosure are on the lower front side of the storage enclosure. The left six switches are for the front six ISEs and the right six switches are for the rear six ISEs. Each power switch is associated with a disk ISE position, as shown in Figure 4–3.

An indicator in each drive dc power switch illuminates to show that nominal power is being applied to the associated disk ISE.

Pressing a dc power switch connects power to the associated disk ISE and causes the disk ISE to spin up and run a self-test. After setting the drive dc power switch, you must press the Ready button on the OCP to bring the disk ISE on line.

When power is initially applied to the storage enclosure, the power is initially applied to the rear six ISEs first, then after a 15-second delay, power is applied to the front six ISEs.

4.3 Rear Panel Controls and Indicators

Figure 4–4 shows the rear panel of the storage enclosure. The DSSI connectors are on the top rear side of the enclosure. The ac power switch, line voltage selector switch, and power supply fault indicator are on the bottom rear of the enclosure, on the power chassis, as shown in Figure 4–4. These controls and indicators affect operation of the entire storage enclosure.

Table 4–2 summarizes the functions of the rear panel controls and indicators. Details are provided in the paragraphs that follow.

Table 4–2 Summary of Rear Panel Control/Indicator Functions

Control/Indicator	Function
Power Supply Chassis	
AC power switch	Applies line voltage to dc power supply.
Line voltage selector switch	Selects between 120 Vac (60 Hz) and 240 Vac (50 Hz) line voltage.
Power supply fault indicator	Illuminates for fault or overtemperature in enclosure.

Figure 4–4 Rear Panel of the Storage Enclosure
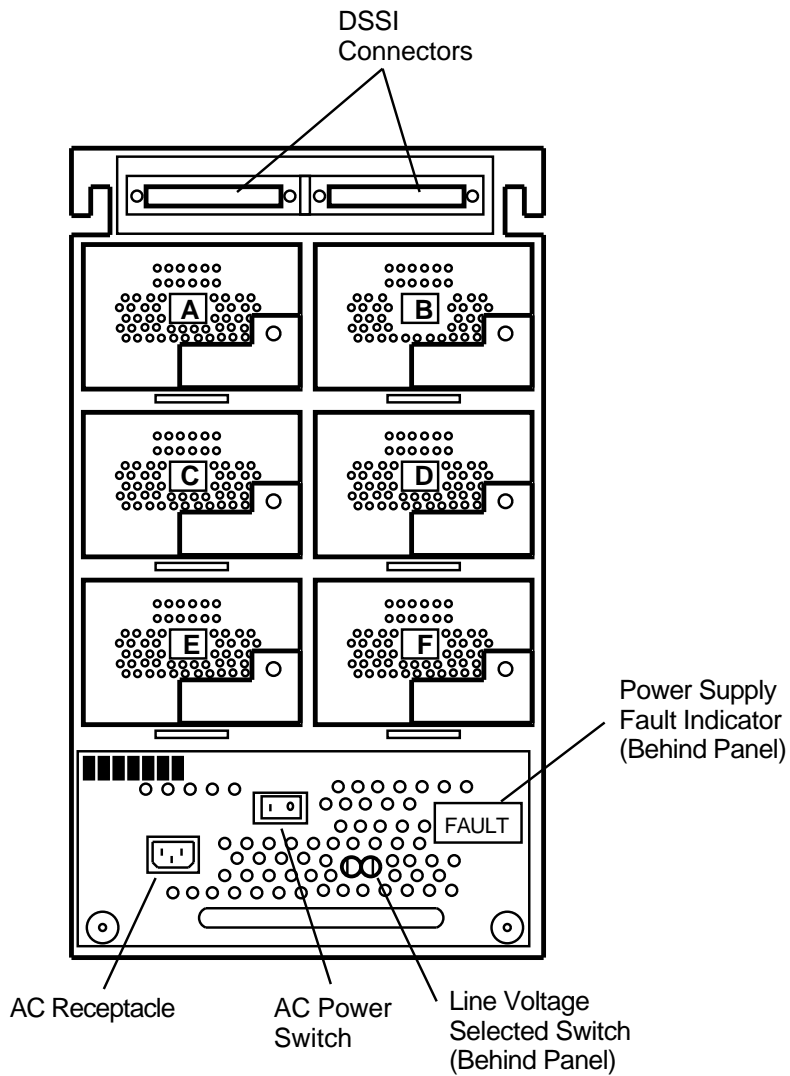
DSSI
Connectors

A

B

C

D

E

F

Power Supply
Fault Indicator
(Behind Panel)

FAULT

AC Receptacle

AC Power
Switch

Line Voltage
Selected Switch
(Behind Panel)

MKV−010000437−04−92−rags

---------------------------- **Warning** ----------------------------

Hazardous voltages are present inside the equipment cabinet and the storage enclosure. Installation and service must be performed only by qualified Digital Services engineers.

The ac power switch for the storage enclosure is in the center of the rear panel. Setting the ac power switch in the position labeled "1" applies power to the storage enclosure. Setting the switch in the position labeled "0" removes power from the enclosure.

As you face the rear panel, the line voltage selector switch is located to the right of the ac power switch. It is visible through a hole in the rear panel. The Digital Services engineer sets this switch to the available line voltage during installation. The number "120" represents 120 Vac at 60 Hz, and the number "240" represents 240 Vac at 50 Hz.

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

The storage enclosure power supply is universal for both 120 Vac and 240 Vac. The supply is factory set to 240 Vac and must be reset to 120 Vac for some installations. Selecting 120 Vac and using 240 Vac will damage the power supply.

The power supply fault indicator is behind the panel, in the lower right corner of the storage enclosure. When the fault indicator is lit, a green light is visible through the holes in the rear panel. The storage enclosure automatically shuts down when the dc power supply detects a fault or overtemperature condition.

4.4 Applying Power to the Enclosure

This section describes the correct procedure for powering up a storage enclosure. Perform *all* steps in the order in which they are presented.

Apply power to the enclosure as follows:

1. Verify that the drive dc power switches and all disk ISE control buttons on the front of the enclosure are in the off (0) position.

2. Set the ac power switch to the on (1) position to apply ac power to the dc power supply.

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

_____ **Note** _____

It is possible to have airflow through the enclosure and not have output voltage. This indicates that the line voltage selector switch, located behind the rear panel of the enclosure, is in the wrong position.

Set the ac power switch to off (0) and reset the line voltage selector switch.

_____

4. Verify that the green indicators on the dc power switches illuminate for the rear six ISEs (right six buttons on the front of the enclosure). Then, after 15 seconds, the dc power switches for the front six ISEs illuminate.

4.5 Placing a Disk On Line

After power is applied to the storage enclosure, use the following procedure to place a disk ISE on line. Perform *all* steps in the order in which they are presented.

1. Press the Ready button on the OCP to bring the ISE on line.

   a. The Ready indicator flickers while the disk ISE is spinning up. If you power up a disk ISE with the Ready button for that disk ISE in the on (in) position, you must press the Ready button to put it in its off (out) position momentarily, then press the button in to bring the disk ISE on line correctly.

   b. All other indicators remain off.

   c. When the disk ISE has completed spinup, the Ready indicator illuminates, indicating that the disk ISE is ready for read/write operation.

   d. The fault indicator illuminates if the disk ISE detects a fault.

2. Press the Write Protect button on the OCP, as required, to turn on write-protect mode. To deselect write-protect mode, press this button a second time.

Repeat this entire procedure for each disk ISE being placed on line.

_____ **Note** _____

The Ready indicator remains lit during normal operation, though it may flicker during heavy seeks.

The Write Protect indicator is lit when the disk ISE is write-protected, and off when the disk ISE is write-enabled.

_____

4.6 Taking a Disk Off Line

To take a disk ISE off line, press the Ready button (out position) and wait until the LED goes out.

A

DECarray Configuration Sheets

This appendix contains blank configuration sheets to help you plan your configuration.

Figures A–1, A–2, and A–3 are to be used with systems containing variants of the KFMSA adapter module. Figures A–4 and A–5 are to be used with systems containing either KFQSA adapter modules or embedded DSSI adapters.

DECarray Configuration Sheets

Figure A–1 Single System Configuration Sheet (Dual Port)

KFMSA/Single–System Configuration Sheet

[for VAX 6000 and 9000 systems]

KFMSA XMI Node # _____

Bus _____   Bus _____
DSSI ID #_____   DSSI ID #_____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Device Type _____ ALLO_CLASS _____	Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____	DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____	Node Name _____ UNITNUM _____
System ID _____	System ID _____

Color Code _____   Color Code _____

config_shr–x0109.rags

DECarray Configuration Sheets

Figure A–2 Two-Host DSSI VAXcluster System Configuration Sheet (Dual Port)

KFMSA/DSSI VAXcluster Configuration Sheet

[for VAX 6000 and 9000 systems]

KFMSA XMI Node # _____

| Bus _____ | Bus _____ |
| DSSI ID # _____ | DSSI ID # _____ |

Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____
System ID _____

Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____
System ID _____

Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____
System ID _____

Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____
System ID _____

Device Type _____ ALLO_CLASS _____
DSSI ID # _____ Array Pos. # _____
Node Name _____ UNITNUM _____
System ID _____

KFMSA XMI Node # _____

| Bus _____ | Bus _____ |
| DSSI ID # _____ | DSSI ID # _____ |

Color Code _____   Color Code _____

config_shr–x0133.rags

DECarray Configuration Sheets **A–3**

DECarray Configuration Sheets

Figure A–3 Three-Host DSSI VAXcluster System Configuration Sheet (Dual Port)

KFMSA/DSSI VAXcluster Configuration Sheet

[for VAX 6000 and 9000 systems]

```
KFMSA XMI Node # _____
   Bus _____      Bus _____
   DSSI ID #_____      DSSI ID #_____

KFMSA XMI Node # _____
   Bus _____      Bus _____
   DSSI ID #_____      DSSI ID #_____
```

```
Device Type _____  ALLO_CLASS _____       Device Type _____  ALLO_CLASS _____
DSSI ID # _____  Array Pos. # _____      DSSI ID # _____  Array Pos. # _____
Node Name _____   UNITNUM _____        Node Name _____   UNITNUM _____
        System ID _____                     System ID _____
```

```
Device Type _____  ALLO_CLASS _____       Device Type _____  ALLO_CLASS _____
DSSI ID # _____  Array Pos. # _____      DSSI ID # _____  Array Pos. # _____
Node Name _____   UNITNUM _____        Node Name _____   UNITNUM _____
        System ID _____                     System ID _____
```

```
Device Type _____  ALLO_CLASS _____       Device Type _____  ALLO_CLASS _____
DSSI ID # _____  Array Pos. # _____      DSSI ID # _____  Array Pos. # _____
Node Name _____   UNITNUM _____        Node Name _____   UNITNUM _____
        System ID _____                     System ID _____
```

```
Device Type _____  ALLO_CLASS _____       Device Type _____  ALLO_CLASS _____
DSSI ID # _____  Array Pos. # _____      DSSI ID # _____  Array Pos. # _____
Node Name _____   UNITNUM _____        Node Name _____   UNITNUM _____
        System ID _____                     System ID _____
```

```
Device Type _____  ALLO_CLASS _____       Device Type _____  ALLO_CLASS _____
DSSI ID # _____  Array Pos. # _____      DSSI ID # _____  Array Pos. # _____
Node Name _____   UNITNUM _____        Node Name _____   UNITNUM _____
        System ID _____                     System ID _____
```

```
KFMSA XMI Node # _____
   Bus _____      Bus _____
   DSSI ID #_____      DSSI ID #_____
```

Color Code _____   Color Code _____

config_shr–x0133b.rags

DECarray Configuration Sheets

Figure A–4   Single System Configuration Sheet (Single Port)

DSSI Single–System Configuration Sheet

[for MicroVAX II, MicroVAX/VAXserver 3xxx (Q–bus), and VAX 4000 systems]

```
┌─────────────────────────────────────────┐
│           DSSI ADAPTER                    │
│   ┌───────────────────────────┐           │
│   │ Bus _____   │           │
│   │ DSSI ID #_____   │           │
│   └───────────────────────────┘           │
└─────────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   Array Pos. #__ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
                    │
   ┌─────────────────────────────────────┐
   │ Device Type _____  ALLO_CLASS ___ │
   │ DSSI ID # _____   SF200 Box # __ │
   │ Node Name _____    UNITNUM _____ │
   │      System ID _____  │
   └─────────────────────────────────────┘
```

Color Code _____

`config_single.rags`

DECarray Configuration Sheets

Figure A–5 DSSI VAXcluster System Configuration Sheet (Single Port)

DSSI VAXcluster Configuration Sheet

[for MicroVAX II, MicroVAX/VAXserver 3xxx (Q–bus), and VAX 4000 systems]

Glossary

adapter

A module that connects one or more device controllers to the system bus and hides many of the system bus requirements from the controller. The KFQSA module is a Q-bus-to-DSSI bus adapter. The KFMSA module is an XMI-to-DSSI bus adapter.

allocation class

A numerical value assigned to the ISE to indicate which system(s) on a cluster it will be served by.

block

The smallest data unit addressable on a disk, also called a sector. In DSSI ISEs, a block contains 512 bytes of customer data, EDC, ECC, flags, and the block's address header.

DECarray

A storage array that houses up to six storage enclosures and up to two magazine tapes (such as the TF857 storage array).

device name

A unique name given to each device by the VMS operating system. The device name generally includes either the allocation class and MSCP unit number assigned to the device (if the allocation class is not zero), or the node name and MSCP unit number (if the allocation class is zero).

DRVTST

A local program resident on the ISE. It is a comprehensive hardware test used to verify ISE operation.

DSSI

Digital Storage System Interconnect. A DSA-based storage interconnect used by the KFMSA adapter and the RF- and TF-series integrated storage elements to transfer data and to communicate with each other.

DSSI VAXcluster system

Storage configuration where DSSI ISEs are shared between two DSSI adapters and systems.

DUP

Diagnostic and utility protocol. A SYSAP-level protocol by which a computer directs a storage device controller to run internal diagnostics or utility functions. DUP is implemented as a class driver on the system side and a corresponding class server on the storage controller side.

EEPROM

Electrically-erasable programmable read only memory. Used by the KFMSA adapter to store configuration, manufacturing, and error information in a nonvolatile location.

embedded adapter

An adapter that connects one or more device controllers to the system bus (such as a VAX 4000 system) and hides many of the system bus requirements from the controller. Refer to the system documentation for further information.

ISE

Integrated storage element. All DSSI storage devices are ISEs.

KFMSA

XMI bus to DSSI bus adapter.

KFQSA

Q-bus to DSSI bus adapter.

magazine tape

A DSSI tape ISE with tape loader, such as a TF857 storage array.

MDM

MicroVAX Diagnostic Monitor. Diagnostic tool for isolating problems in systems running MicroVMS software.

MSCP

Mass Storage Control Protocol. An application layer protocol used by the system to perform disk I/O operations and I/O control functions.

node name

A six-character (maximum) value that is assigned to each DSSI ISE. The node name of each ISE must be unique across the system topology.

OCP

Operator control panel. An enclosure interface that allows remote control of DSSI node ID selection and ISE operating status.

PARAMS

A local program resident on the ISE. PARAMS is used to view and modify current device parameter settings on an ISE.

Q-bus

The system bus for the MicroVAX II, MicroVAX/VAXserver 3xxx, and VAX 4000 series systems.

RF73

A 2-GB formatted capacity DSSI disk ISE.

RLL

Run length limited. The format used in the DSSI ISE to record data.

SF7x

A DSSI storage enclosure that houses either two or four RF-series disk ISEs.

single system

Storage configuration where DSSI ISEs are connected to only one DSSI adapter and system.

split-bus

A mode of operation where the ISEs in the right side of a storage enclosure are connected to a different DSSI bus than those on the left side. In this mode, the DSSI buses are terminated by the TTM.

stripe set

A set of disk drives operating in concert as a single virtual disk to provide increased I/O performance. In a DSSI bus application, all SF7x storage enclosures are in split-bus mode and each half of each enclosure is connected to its own dedicated DSSI adapter port.

through-bus

A mode of operation where all the ISEs in a storage enclosure are connected to the same DSSI bus. In this mode, the DSSI bus is terminated using an external terminator.

TMSCP

Tape Mass Storage Control Protocol. Application layer protocol that is used by the system to perform tape I/O operations and I/O control functions.

TTM

Transition termination module. A PC board that connects the storage enclosure OCP and RF-series disk ISE, and also provides DSSI bus termination when in split-bus mode.

unit number

Also called the MSCP/TMSCP unit number. Default value is the ISE's DSSI node ID. A unique value can be selected using PARAMS.

VAX Diagnostic Supervisor

A diagnostic environment that allows access to DSSI tests and programs in VAX 6000 and 9000 series systems.

virtual circuit

A logical point-to-point link between nodes.

XMI

Extended Memory Interconnect. The system bus for the VAX 6000 and 9000 series systems.

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