SF200 Storage Array Installation Guide

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Contents

About This Guide xi

1 Introduction
1.1 SF200 Storage Array Overview 1–1
1.2 SF72 Storage Enclosure Overview 1–4
1.3 Related Documentation 1–8

2 SF200 Storage Array Site Preparation

3 Unpacking and Placing an SF200 Storage Array with a VAX 6000 Series System
3.1 Unpacking 3–2
3.2 Removing the SF200 Storage Array from the Pallet 3–3
3.3 Placing the Array 3–8
3.4 Leveling the Array 3–10
3.5 Inspecting the Storage Array 3–11

4 Installing an SF200 Storage Array with a VAX 6000 Series System
4.1 Single-Host Overview 4–2
4.2 Dual-Host Overview 4–4
4.3 Single-Host Installation of an SF200 Storage Array 4–6
4.3.1 Inspecting the Storage Array (Single-Host) 4–7
4.3.2 Cabling the Storage Array (Single-Host) 4–15

4.3.3 Labeling the Cables (Single-Host) 4–19
4.3.3.1 Completing the System Configuration Sheet (Single-Host) 4–19
4.3.3.2 Filling Out the Labels (Single-Host) 4–20
4.3.3.3 Placing the Labels (Single-Host) 4–20
4.3.4 Powering Up the SF200 Storage Array (Single-Host) 4–24
4.3.5 Single-Host Final Verification 4–29
4.4 Dual-Host Installation of an SF200 Storage Array 4–30
4.4.1 Inspecting the Storage Array (Dual-Host) 4–31
4.4.2 Cabling the Storage Array (Dual-Host) 4–39
4.4.3 Labeling the Cables (Dual-Host) 4–42
4.4.3.1 Completing the System Configuration Sheet (Dual-Host) 4–42
4.4.3.2 Filling Out the Labels (Dual-Host) 4–43
4.4.3.3 Placing the Labels (Dual-Host) 4–44
4.4.4 Powering Up the SF200 Storage Array (Dual-Host) 4–47
4.4.5 Dual-Host Final Verification 4–52

5 Installing the SF72 Storage Enclosure in an SF200 Storage Array

5.1 Steps to Install 5–3
5.1.1 Unpacking the SF72 Storage Enclosure 5–4
5.1.2 Where to Install the SF72 Storage Enclosure 5–6
5.1.3 Checking the System Configuration Sheet 5–8
5.1.4 Installation Procedure 5–11
5.1.4.1 Preparing the SF200 Storage Array 5–12
5.1.4.2 Hardware Installation Procedures 5–13
5.2 Cabling the SF72 in Storage Array Position 5–32
5.2.1 Single-Host Configuration 5–35
5.2.1.1 Identifying DSSI Connectors on the System I/O Panel . 5–35
5.2.1.2 Cabling Position 1 5–37
5.2.1.3 Cabling Position 2 5–41
5.2.1.4 Cabling Position 4 or 7 5–47
5.2.1.5 Cabling Position 3 or 8 5–50

5.2.2 Dual-Host Configuration 5–52
5.2.2.1 Identifying DSSI Connectors on the System I/O Panel . 5–52
5.2.2.2 Cabling Position 1 5–54
5.2.2.3 Cabling Position 2 5–56
5.2.2.4 Cabling Position 3 5–61
5.2.2.5 Cabling Position 4 5–64
5.2.2.6 Cabling Position 7 5–67
5.2.2.7 Cabling Position 8 5–70
5.3 Powering Up the SF72 5–73
5.3.1 Updating the System Configuration Sheet 5–74
5.4 Labeling the DSSI Cables and OCP 5–74
5.4.1 Filling Out the Labels 5–74
5.4.2 Labeling the Cables 5–75
5.4.3 Labeling the OCP 5–76
5.5 Final Verification 5–77

6 Installing the Magazine Tape Subsystem in an SF200 Storage Array

6.1 Steps to Install 6–3
6.1.1 Unpacking the Magazine Tape Subsystem 6–3
6.1.2 Where to Install the Magazine Tape Subsystem 6–6
6.1.3 Completing the System Configuration Sheet 6–8
6.1.4 Installion Procedure 6–11
6.1.4.1 Preparing the SF200 Storage Array 6–12
6.1.4.2 Hardware Installation Procedures 6–14
6.2 Cabling the Subsystem in SF200 Storage Array Position 6–26
6.2.1 Single-Host Configuration 6–26
6.2.1.1 Cabling Position 5 6–27
6.2.1.2 Cabling Position 6 6–29
6.2.2 Dual-Host Configuration 6–35
6.2.2.1 Cabling Position 5 6–35
6.2.2.2 Cabling Position 6 6–37
6.3 Powering Up the Magazine Tape Subsystem 6–41
6.3.1 Updating the System Configuration Sheet 6–41
6.4 Labeling the DSSI Cables and Magazine Tape Subsystem . . . 6–42
6.4.1 Filling Out the Labels 6–42

6.4.2 Labeling the Cables 6–42
6.4.3 Labeling the Magazine Tape Subsystem 6–44
6.5 Final Verification 6–46

7 Installation Troubleshooting

7.1 Troubleshooting the SF72 Storage Enclosure 7–2
7.1.1 Removing an RF72 Disk ISE from an SF72 Storage Enclosure 7–6
7.1.2 Bringing the RF72 Disk ISE On-Line 7–15
7.2 Troubleshooting the Magazine Tape Subsystem 7–15

A SF200 Storage Array Cabling Diagrams

A.1 Single-Host Configuration A–3
A.2 Dual-Host Configuration A–24

B Installation Procedures for an SF72-UK Upgrade Kit

B.1 Introduction B–1
B.2 Securing the Array for the Upgrade B–3
B.3 Installing the RF72 Disk ISE Into an SF72-HK Storage Enclosure B–4
B.4 Powering Up the ISEs B–10
B.5 Bringing the New RF72 Disk ISEs On-Line B–11

C Converting a Single-Host Configuration to a Dual-Host Configuration

C.1 Securing the Array for Conversion C–4
C.2 Conversion Procedure C–5
C.2.1 Split-Bus to Through-Bus Conversion Procedure C–6
C.2.2 Single-Host to Dual-Host Cabling Conversion C–8
C.2.3 Labeling the Cables C–14
C.2.3.1 System Configuration Sheet C–14
C.2.3.2 Filling Out the Labels C–16
C.2.3.3 Placing the Labels C–16
C.2.4 Power up the SF200 Storage Array C–19

C.2.5 Bringing a Newly Converted Dual-Host Conversion On-Line C–21
C.2.6 Final Verification C–22

Glossary

Index

Figures

1–1 Front View of the SF200 Storage Array 1–2
1–2 SF72 Storage Enclosure 1–5
2–1 Single-Host System Configuration Sheet 2–2
2–2 Dual-Host System Configuration Sheet 2–3
2–3 NEMA Plugs 2–4
3–1 Shipping Bolts 3–4
3–2 Ramp Installation on Shipping Pallet 3–5
3–3 Storage Array Removal from the Pallet 3–7
3–4 Placing the SF200 Storage Array 3–9
3–5 Adjusting Leveler Feet 3–10
3–6 Verifying the SF72 OCP Seating 3–11
3–7 Verifying the 881 Power Controller 3–12
3–8 SF72 Storage Enclosure Power Connection and Voltage Selection 3–14
3–9 Magazine Tape Subsystem Power Connection and Voltage Selection 3–15
4–1 Verifying the SF72 DSSI ID Switch Settings 4–8
4–2 Seating the SF72 OCP 4–9
4–3 Verifying the 881 Power Controller 4–11
4–4 SF72 Power Cords and Voltage Selection 4–13
4–5 Magazine Tape Subsystem Power Cords and Voltage Selection 4–14
4–6 Removing Terminators and Connecting DSSI Cables at the System I/O Panel 4–17
4–7 Placing a Label on a DSSI Cable 4–21
4–8 Placing a Label on the OCP Door 4–22
4–9 Placing a Label on the Magazine Tape Subsystem 4–23

4–10 881 Circuit Breaker 4–24
4–11 Magazine Tape Subsystem AC Power Switch 4–25
4–12 SF72 Storage Enclosure AC Power Switch 4–26
4–13 Drive DC Power Switches 4–27
4–14 OCP Indicators and Controls 4–28
4–15 Verifying the SF72 DSSI ID Switch Settings 4–32
4–16 Seating the SF72 OCP 4–33
4–17 Verifying the 881 Power Controller 4–35
4–18 SF72 Power Cords and Voltage Selection 4–37
4–19 Magazine Tape Subsystem Power Cords and Voltage Selection 4–38
4–20 Removing Terminators and Connecting DSSI Cables at the System I/O Panel 4–41
4–21 Placing a Label on a DSSI Cable 4–44
4–22 Placing a Label on the OCP Door 4–45
4–23 Placing a Label on the Magazine Tape Subsystem 4–46
4–24 881 Circuit Breaker 4–47
4–25 Magazine Tape Subsystem AC Power Switch 4–48
4–26 SF72 Storage Enclosure AC Power Switch 4–49
4–27 Drive DC Power Switches 4–50
4–28 OCP Indicators and Controls 4–51
5–1 SF72 Enclosure Locations (Front View) 5–7
5–2 System Configuration Sheet (Single-Host) 5–9
5–3 System Configuration Sheet (Dual-Host) 5–10
5–4 Removing a Filler Panel 5–12
5–5 AC Power Cord Retainer 5–14
5–6 Installing the Slide Mount 5–16
5–7 Installing the Weldment Brackets 5–18
5–8 Chassis Retainers 5–19
5–9 Securing the SF72 to the Weldment Brackets 5–21
5–10 Changing an SF72 to Split-Bus Mode 5–23
5–11 Adjusting the OCP 5–24
5–12 DSSI ID Switch Settings 5–26
5–13 Installing the OCP on the SF72 Enclosure 5–28
5–14 Drive DC Power Switches 5–29
5–15 AC Power Switch, Voltage Selections, and Power Cord 5–31

5–16 Single-Host Bus Configurations 5–33
5–17 Dual-Host Bus Configurations 5–34
5–18 Installing the 42-Inch DSSI Cable for Position 1 5–40
5–19 Installing the 70- and 108-Inch DSSI Cables for Position 2 . . 5–42
5–20 Installing the 42-Inch DSSI Cable (Position 2) 5–44
5–21 Installing the 42-Inch DSSI Cable (Position 2) 5–46
5–22 Installing 70- and 108-Inch DSSI Cables for Position 4 and 7 5–49
5–23 Installing the 42-Inch DSSI Cable to Position 3 and 8 5–51
5–24 Installing the 42-Inch DSSI Cable (Position 1) 5–55
5–25 Installing the 70- and 108-Inch DSSI Cables for Position 2 . . 5–57
5–26 Installing the 42-Inch DSSI Cable for Position 2 5–60
5–27 Installing the 70-Inch DSSI Cables (Position 3) 5–62
5–28 Installing the 70- and 108-Inch DSSI Cables for Position 4 . . 5–65
5–29 Installing the 70- and 108-Inch DSSI Cables for Position 7 . . 5–68
5–30 Installing the 70- and 108-Inch DSSI Cables for Position 8 . . 5–71
5–31 Placing a Label on a DSSI Cable 5–75
5–32 Placing a Label on the OCP Door 5–76
6–1 Subsystem Locations 6–7
6–2 System Configuration Sheet (Single-Host) 6–9
6–3 System Configuration Sheet (Dual-Host) 6–10
6–4 Removing a Filler Panel 6–13
6–5 AC Power Cord Retainer 6–15
6–6 Installing the Slide Mount 6–18
6–7 Installing the Weldment Brackets 6–20
6–8 Chassis Retainers 6–22
6–9 Securing the Tube to the Weldment Brackets 6–23
6–10 AC Power Switch, Voltage Selections, and Power Cord 6–25
6–11 Installing the 42-Inch DSSI Cable (Position 5) 6–28
6–12 Installing the 42-Inch DSSI Cable (Position 6) 6–30
6–13 Installing the DSSI Cables 6–34
6–14 Installing the 42-Inch DSSI Cable (Position 6) 6–36
6–15 Installing the 42-Inch DSSI Cable (Position 6) 6–38
6–16 Installing the 42-Inch DSSI Cable (Position 6) 6–40
6–17 Placing a Label on a DSSI Cable 6–43
6–18 Placing a Label of on the Magazine Tape Subsystem 6–45
7–1 Powering Down the SF72 Storage Enclosure 7–7

7–2 SF72 Front Cover Removal 7–8
7–3 Disconnecting the Cables 7–9
7–4 RF72 Disk ISE Removal 7–10
7–5 RF72 Wedges and Skid Plate 7–11
7–6 RF72 Disk ISE Orientation 7–12
7–7 Cabling the RF72 Disk ISE 7–13
7–8 SF72 Front Cover Replacement 7–14
A–1 SF200-BA/BD and SF200-CA/CD Variants A–4
A–2 SF200-FA/FD Variants A–7
A–3 SF200-HA/HD Variants A–10
A–4 SF200-HA/HD Variants, with One SF72 . . . . . A–13
A–5 SF200-HA/HD Variants, with Two SF72s A–16
A–6 SF200-JA/JD Variants A–19
A–7 SF200-TA/TD Variants (Magazine Tape Subsystems Only) . . A–22
A–8 SF200-BE/BH and SF200-CE/CH Variants A–25
A–9 SF200-FE/FH Variants A–28
A–10 SF200-HE/HH Variants A–31
A–11 SF200-HE/HH Variants, with One SF72 . . . . . A–34
A–12 SF200-HE/HH Variants, with Two SF72s A–37
A–13 SF200-JE/JH Variants A–40
A–14 SF200-TA/TD Variants (Magazine Tape Subsystems Only) . . A–43
B–1 SF72 Front Cover Removal B–6
B–2 RF72 Disk ISE Orientation B–7
B–3 Cabling the RF72 Disk ISE B–8
B–4 SF72 Front Cover Replacement B–9
C–1 Example of a Single-Host System Configuration Sheet C–3
C–2 Changing an SF72 to Through-Bus Mode C–7
C–3 Possible Single-Host Bus Configurations C–9
C–4 Possible Dual-Host Bus Configurations C–10
C–5 How to Connect DSSI Cables on the SF200 I/O Panel C–13
C–6 Blank Dual-Host System Configuration Sheet C–15
C–7 Placing a Label on a DSSI Cable C–17
C–8 Placing a Label on the OCP Door C–18
C–9 OCP Indicators and Controls C–20

Tables

1–1 SF200 Storage Array Specifications 1–3
1–2 SF72 Storage Enclosure Specifications 1–7
1–3 Related Documentation 1–8
4–1 SF200 Storage Array Configurations (Single-Host) 4–3
4–2 SF200 Storage Array Configurations (Dual-Host) 4–5
4–3 SF72 DSSI ID Verification (Front View) 4–7
4–4 SF72 DSSI ID Verification (Front View) 4–31
5–1 SF72 Required Tool List 5–2
5–2 SF72 Kit Contents 5–5
5–3 DSSI ID Switch Settings (SF72 Only) 5–25
6–1 Magazine Tape Subsystem Required Tool List 6–2
6–2 Magazine Tape Subsystem Kit Contents 6–5
7–1 Troubleshooting Chart 7–3
A–1 Cabling Diagram Key A–1
A–2 Cabling Diagram List A–2
C–1 DSSI ID Switch Settings (SF72 only) C–7
C–2 Single-Host to Dual-Host Conversion C–11

About This Guide

This guide provides the steps to install either SF200 storage arrays or SF72 storage enclosures and magazine tape subsystems in the SF200 storage array cabinet. The guide is intended for Digital Customer Services and for personnel qualified to service the SF200 storage array. The information in this guide is organized as follows:

- **Chapter 1, Introduction,** contains a description of and specifications for the SF200 storage array subsystem and SF72 storage enclosure.
- **Chapter 2, SF200 Storage Array Site Preparation,** contains site preparation information for the SF200 storage array subsystem.
- **Chapter 3, Unpacking and Placing an SF200 Storage Array with a VAX 6000 Series System,** describes how to unpack the SF200 storage array and where to place it with a VAX 6000 series system.
- **Chapter 4, Installing an SF200 Storage Array with a VAX 6000 Series System,** describes how to install one or two SF200 storage arrays with a VAX 6000 series system in a single-host configuration, and one SF200 storage array with VAX 6000 series systems in a dual-host configuration.
- **Chapter 5, Installing the SF72 Storage Enclosure in an SF200 Storage Array ,** describes how to install SF72 storage enclosures in an SF200 storage array cabinet.
- **Chapter 6, Installing the Magazine Tape Subsystem in an SF200 Storage Array ,** describes how to install two magazine tape subsystems in an SF200 storage array cabinet.
- **Chapter 7, Installation Troubleshooting,** contains instructions for troubleshooting the installed SF200 storage arrays, and the SF72 storage enclosure and magazine tape subsystem upgrades.

1
Introduction

This chapter provides an overview of the SF200 storage array and the SF72 storage enclosure, with specifications. A related documents list provides references to supplemental information.

1.1 SF200 Storage Array Overview

The SF200 storage array is a storage rack cabinet designed to hold SF72 storage enclosures and magazine tape subsystems.

The SF200 storage array is intended to be installed on one or both sides of a host system. All operator control panels (OCPs) project through the front door of the storage array to allow easy access. The DSSI (Digital Storage System Interconnect) cables from the host cabinet input/output (I/O) panel connect to the DSSI I/O panel at the bottom rear of the storage array. The DSSI I/O panel supports as many as 16 individual DSSI buses. A fully configured single-host SF200 storage array uses four DSSI buses. A fully configured dual-host SF200 storage array uses six DSSI buses. The remaining unused DSSI buses are for future use.

Viewing the SF200 storage array from the front, note that the SF72 storage enclosures and magazine tape subsystems are arranged in the storage array as follows (Figure 1–1):

- Levels 1, 2, and 4 are reserved for SF72 storage enclosures only. SF72 storage enclosure upgrades are installed into these levels in the following order: position 1, 2, 3, 4, 7, and 8.
- Level 3 is reserved for magazine tape subsystems. Magazine tape subsystem upgrades are installed into this level in the following order: position 5 then 6.

NOTE

The position numbers are visible on the right and left chassis side rails when the front and rear doors of the storage array are open.

Specifications for the SF200 storage array are shown in Table 1–1.

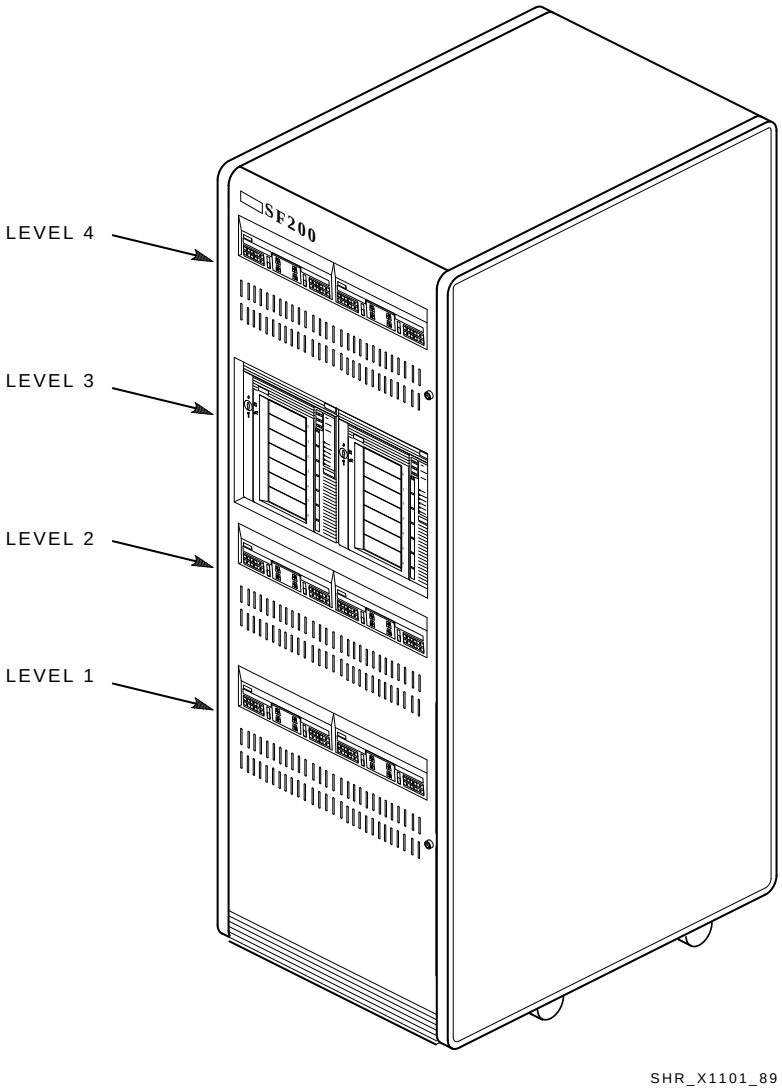

Figure 1–1 Front View of the SF200 Storage Array

Table 1–1 SF200 Storage Array Specifications

Characteristic	Specification
Number of disk ISEs	Minimum: 2, maximum: 24
Formatted storage capacity	Minimum: 2, maximum: 24 (in 2-GByte increments)
Dimensions (nominal)	152.4 cm (60.5 inches) H, 60.96 cm (24.0 inches) W, 76.2 cm (34.0 inches) D
Weight	
Minimum configuration[1]	179.62 kg (396 lb)
Maximum configuration[2]	442.25 kg (975 lb)
Agency compliance	FCC, UL, IEC, CSA, and VDE
Temperature	+10°C to +40°C (+50°F to +104°F). Derate 1.8°C for each 1000 meters altitude (1.0°F for each 1000 feet altitude)
Humidity	10% to 85% @ maximum wet bulb temperature of +32°C (+90°F) and minimum dew point of +2°C (+36°F)
Recommended Environmental Limits[3]	
Operating environment	
Temperature	18°C to 24°C (64.4°F to 75.2°F) with an average rate of change of 3°C/hour maximum and a step change of 3°C or less
Relative humidity	40% to 60% (noncondensing) with a step change of 10% 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
Air volume (at inlet)	50 cubic feet per minute (0.026 cubic meters per second)

[1]The minimum configuration is an SF200–Bx with one SF72–HK.

[2]The maximum configuration is an SF200–Jx that consists of six SF72–JK enclosures and two magazine tape subsystems.

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

Table 1–1 (Cont.) SF200 Storage Array Specifications

Characteristic	Specification
Recommended Environmental Limits[3]	
Nonoperating environment	
Temperature	–40°C to +66°C (–40°F to +151°F)
Relative humidity	10% to 80%, noncondensing
Altitude	4900 meters (16,000 feet)
SF200 acoustic noise	6.8 bels
Nominal airflow through enclosure	360 to 520 cubic feet/minute
Input power requirements (47 to 63 Hz normal operation)	6.00 A (per phase) @ 100 to 120 Vac (60 Hz), 3.00 A (per phase) @ 220 to 240 Vac (50 Hz)
Power requirements during disk ISE spinup	21.0 A @ 100 to 120 Vac (60 Hz), 10.5 A @ 220 to 240 Vac (50 Hz)

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

1.2 SF72 Storage Enclosure Overview

The SF72 is a storage enclosure (Figure 1–2) designed to be installed into an SF200 storage array or certain system cabinets. A single enclosure holds two or four RF72 disk integrated storage elements (ISEs). Each disk ISE is independently controlled by the SF72 OCP. The power supply in the enclosure provides the dc power and cooling for the disk ISEs.

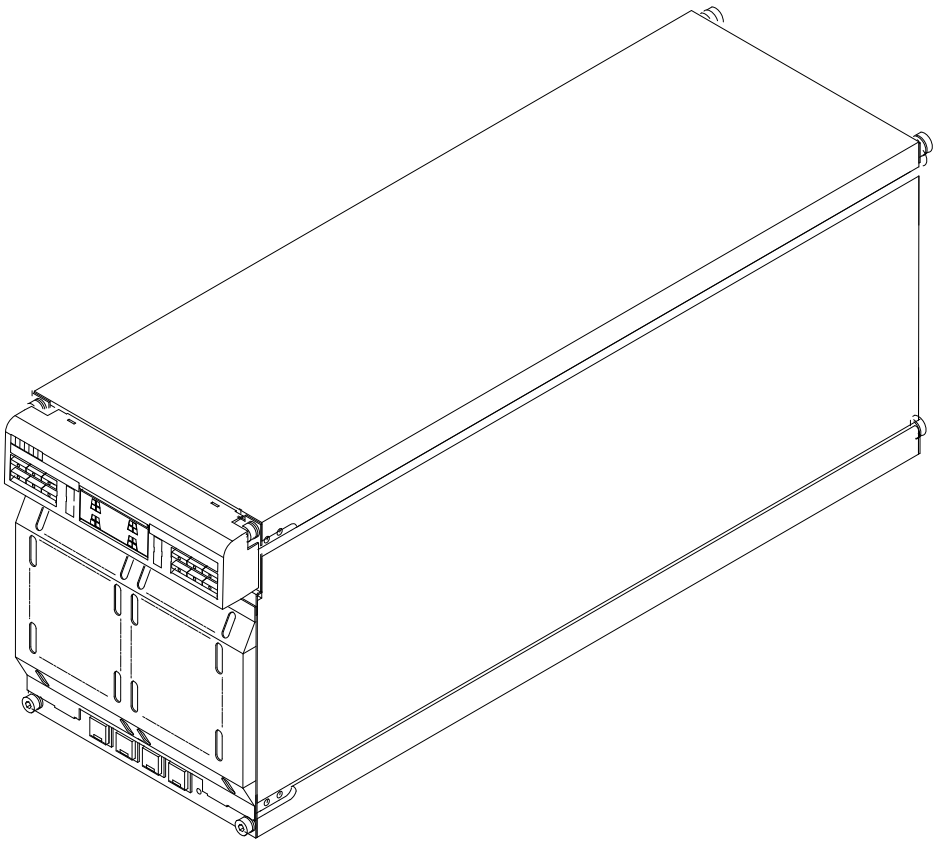

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Figure 1–2 SF72 Storage Enclosure

The SF72 storage enclosure has the following features:

- The SF72 storage enclosure can operate in one of two modes: through-bus or split-bus.
  - When in through-bus mode, all of the disk ISEs connect to a single common DSSI bus inside the SF72 enclosure. The DSSI bus is terminated by connecting to one of the following: a DSSI terminator (part number 12–31281–01), another SF72 storage enclosure operating in the split-bus mode (while in single-host configuration), or another host system (while in dual-host configuration).

    Host configurations are explained later in this guide. Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for a more detailed explanation.
  - When in split-bus mode, the disk ISEs on the left side of the enclosure connect to a different DSSI bus than the disk ISEs on the right side. Also, both DSSI buses terminate inside the SF72 on the transition termination module (TTM) behind the OCP. By connecting one SF72 enclosure (operating in through-bus mode) to an SF72 storage enclosure (operating in split-bus mode), two DSSI buses with six disk ISEs each are obtained. This mode of operation is used in single-host configurations only.
- Each RF72 disk ISE has its own set of switches and indicators on the OCP.
- The enclosure power supply provides operating power to the subassemblies of the enclosure. The rear panel of the power supply contains the ac power switch for the SF72.
- Two DSSI connectors are at the top rear of the enclosure. The DSSI bus runs to each disk ISE in the enclosure.
- The drive dc power switches for the disk ISEs are on the front panel of the SF72 enclosure. Each switch contains a symbol to indicate its associated disk ISE and an LED that lights when power is applied to that disk ISE.

Specifications for the SF72 storage enclosure are shown in Table 1–2.

Table 1–2 SF72 Storage Enclosure Specifications

Characteristic	Specification
Number of disk ISE positions	4 (RF72 disk ISEs)
Formatted storage capacity	
SF72–HK[1]	2 GBytes
SF72–JK[2]	4 GBytes
Dimensions (nominal)	26.7 cm (10.5 inches) H, 22.2 cm (8.75 inches) W, 71.1 cm (28.0 inches) D
Weight (nominal)	
SF72–HK[1]	34.93 kg (72 lb)
SF72–JK[2]	41.28 kg (91 lb)
Agency compliance	FCC, UL, IEC, CSA, and VDE
Temperature	+10°C to +40°C (+50°F to +104°F). Derate 1.8°C for each 1000 meters altitude (1.0°F for each 1000 feet altitude)
Humidity	10% to 85% @ maximum wet bulb temperature of +32°C (+90°F) and minimum dew point of +2°C (+36°F)
Recommended Environmental Limits[3]	
Operating environment	
Temperature	18°C to 24°C (64.4°F to 75.2°F) with an average rate of change of 3°C/hour maximum and a step change of 3°C or less
Relative humidity	40% to 60% (noncondensing) with a step change of 10% 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
Air volume (at inlet)	50 cubic feet per minute (0.026 cubic meters per second)

[1]The SF72–HK contains two RF72 disk ISEs.

[2]The SF72–JK contains four RF72 disk ISEs.

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

Table 1–2 (Cont.) SF72 Storage Enclosure Specifications

Characteristic	Specification
Recommended Environmental Limits[3]	
Nonoperating environment	
Temperature	–40°C to +66°C (–40°F to +151°F)
Relative humidity	10% to 80%, noncondensing
Altitude	4900 meters (16,000 feet)
SF72 enclosure acoustic noise	6.2 bels
Nominal airflow through enclosure	45 to 65 cubic feet/minute
Input power requirements (47 to 63 Hz normal operation)	2.70 A @ 100 to 120 Vac (60 Hz), 1.20 A @ 220 to 240 Vac (50 Hz)
Power requirements during disk ISE spinup	3.50 A @ 100 to 120 Vac (60 Hz), 3.25 A @ 220 to 240 Vac (50 Hz)

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

1.3 Related Documentation

Table 1–3 lists reference documentation that supplements this guide.

Table 1–3 Related Documentation

Title	Order Number
KFMSA Module Installation and User Manual	EK–KFMSA–IM
RF31/RF72 Integrated Storage Element User Guide	EK–RF72D–UG
TF837 Magazine Tape Subsystem Service Manual	EK–TF837–SM
SF72 Storage Enclosure and SF200 Storage Array Owner's Manual	EK–SF72S–OM

2
SF200 Storage Array Site Preparation

The SF200 storage array is intended for installation in a Class A computer room environment. It must be operated in an environment that meets the conditions specified in Table 1–1.

Before installing the SF200 storage array, make sure the following conditions are met:

- The SF200 storage array requires 3-phase ac power. Each phase draws up to 6 amperes in a fully configured array, and produces 6400 Btu of heat per hour.
- Adequate space is provided around the storage array for opening the front and rear doors, for accessing cables at the rear of the storage array, and for adequate airflow.
- The installation site floor can safely bear the weight of the storage array. (The SF200 storage array with power controller weighs 179.62 kilograms [396 pounds]; a fully configured storage array weighs 442.25 kilograms [975 pounds].)
- The system's configuration sheet has been correctly filled out and is up-to-date. Blank system configuration sheets can be found in Figures 2–1 and 2–2.
- An adequate number of KFMSA modules exist in the XMI backplane of the VAX 6000 series system to support all the disk ISEs in the SF200 storage array. Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for more details.
- The correct NEMA plug or plugs are available (Figure 2–3).

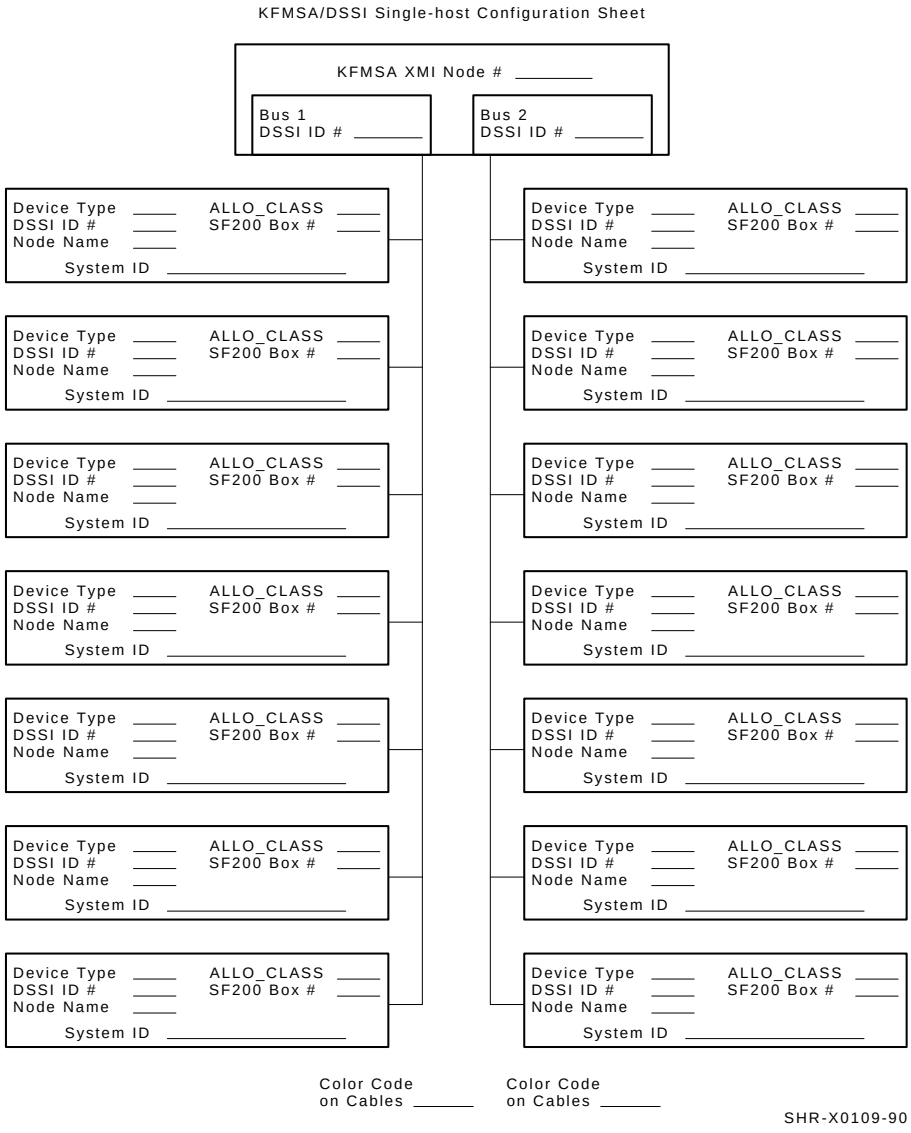


Figure 2–1 Single-Host System Configuration Sheet

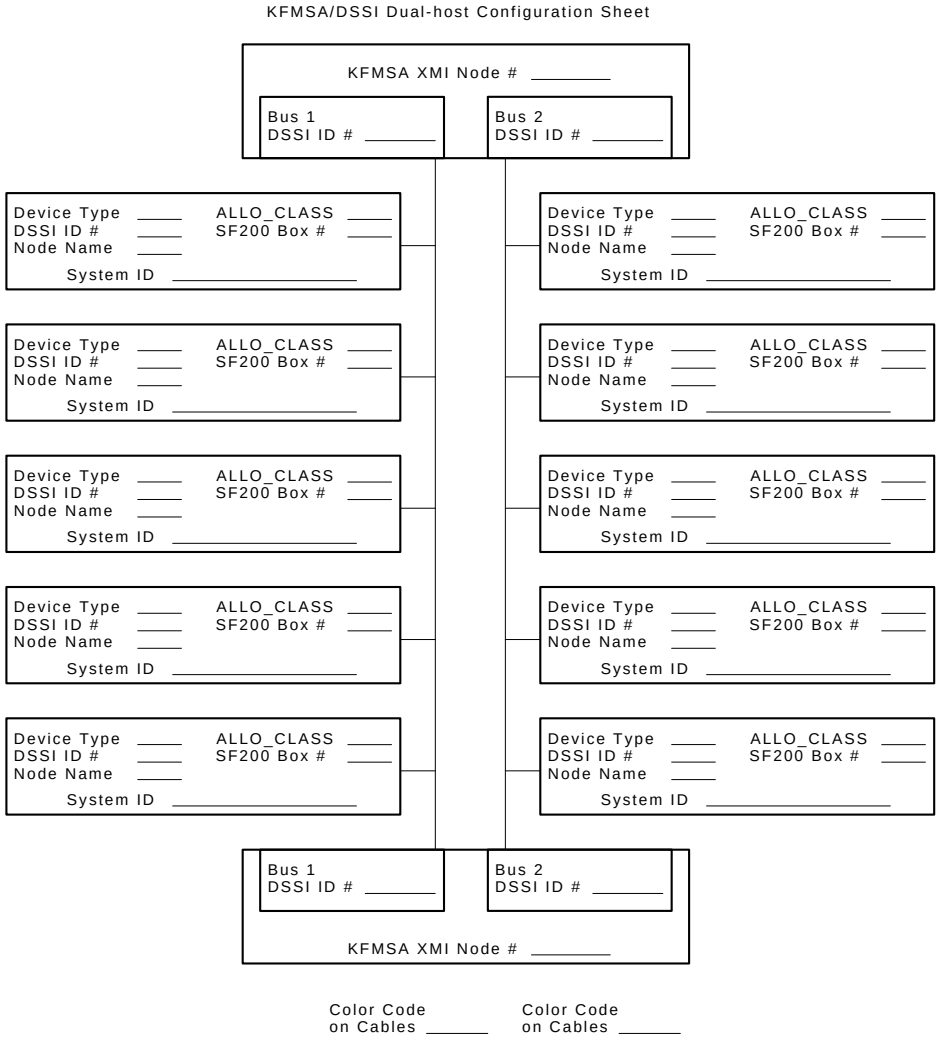


Figure 2–2 Dual-Host System Configuration Sheet

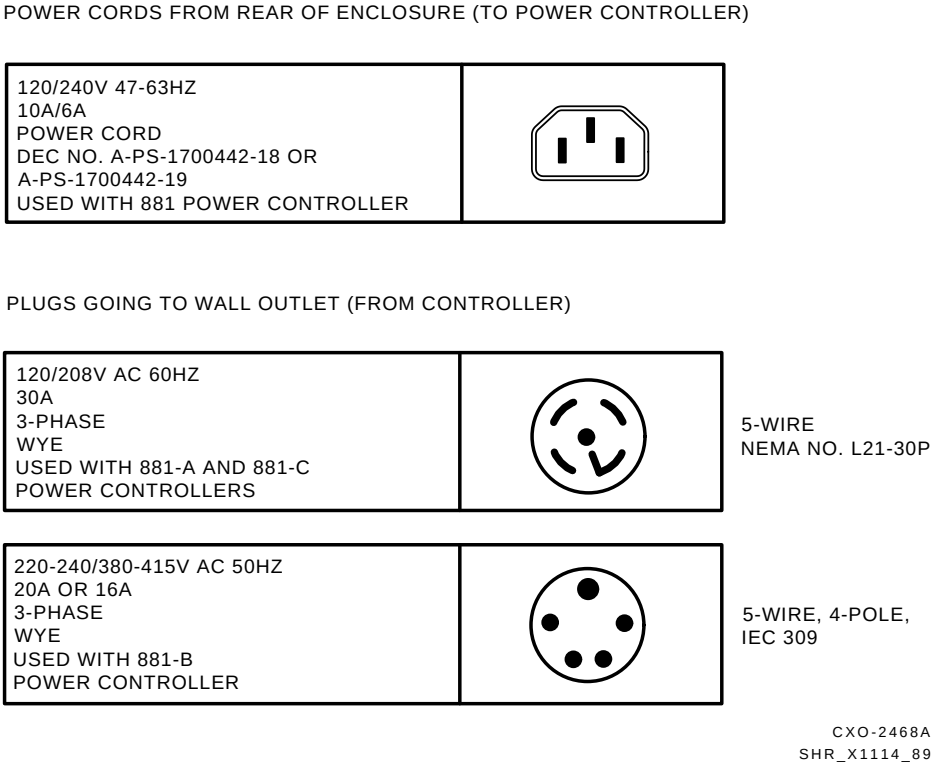


Figure 2–3 NEMA Plugs

3

Unpacking and Placing an SF200 Storage Array with a VAX 6000 Series System

Before unpacking and placing the SF200 storage array, ensure that the site is ready to receive the array. Refer to Chapter 2 for site preparation information and to Chapter 1 for array specifications.

This chapter describes the steps to:

- Correctly unpack the SF200 storage array (Section 3.1)
- Remove the SF200 storage array from the shipping pallet (Section 3.2)
- Place the SF200 storage array with an existing VAX 6000 series system (Section 3.3)
- Level the SF200 storage array (Section 3.4)
- Inspect the SF200 storage array before installation (Section 3.5)

3.1 Unpacking

The SF200 storage array is packed in a cardboard carton attached to a wooden shipping pallet and sealed in a barrier bag with desiccant for environmental protection.

NOTE
Before beginning to unpack the equipment, inspect the shipping carton for signs of external damage. Report any damage to the local carrier and either Digital Customer Services or the sales office.

REMEMBER
Retain the shipping container and all packing materials.

CAUTION
Failure to stabilize the equipment thermally may damage the drive media or associated electronics when the unit is powered up.

Remove the outer shipping carton, but leave the sealed moisture barrier with desiccant in place for at least 24 hours (thermal stabilization time). Thermal stabilization begins when the equipment is placed in the room where it is to be installed.

WARNING
Adhere to electrostatic discharge (ESD) procedures at all times. Use the ESD straps available with every array. The straps are inside the front and rear doors.

Once the array is unpacked, examine the front and rear doors, the right and left side panels, and undercarriage for any apparent damage. Report any damage.

3.2 Removing the SF200 Storage Array from the Pallet

This section provides the procedure for removing the storage array from the pallet and leveling the array. For personal safety, adhere to the following *WARNING* before starting the procedure:

WARNING

Serious personal injury may result if correct safety conditions are not met. During the unpacking procedure, personnel should wear safety glasses. Inspect the ramps, ramp side rails, and metal hardware for the following defects:

- **Cracks more than 25 percent of the ramp depth, either across or lengthwise on the ramp**
- **Knots or knotholes going through the thickness of the ramp and greater than 50 percent of the ramp width**
- **Loose, missing, or broken ramp side rails**
- **Loose, missing, or bent metal hardware**

If any of these defects exist, DO NOT USE THAT RAMP. Investigate alternate means of removing the array or order a new ramp. The part number for the left ramp is 99–07689–01; the part number for the right ramp is 99–07689–02.

Use the following procedure to remove the array from the shipping pallet (Figure 3–2):

1. Remove the two unloading ramps.
2. Remove the cardboard carton and packing material.
3. Examine the equipment for physical damage.
4. Remove the shipping bolts (Figure 3–1).

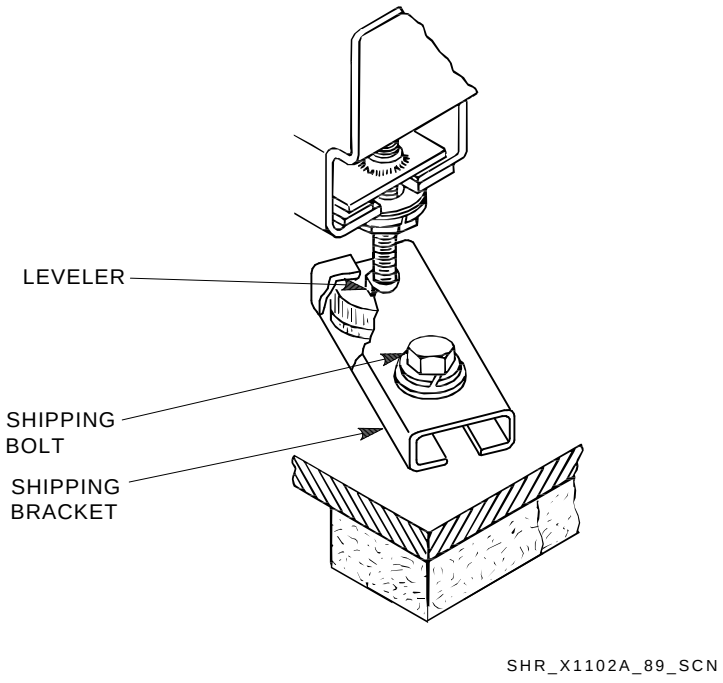


Figure 3–1 Shipping Bolts

5. Remove the shipping brackets from the cabinet levelers.
6. Extend the ramp to its full length, and insert the steel dowel as shown in Figure 3–2.

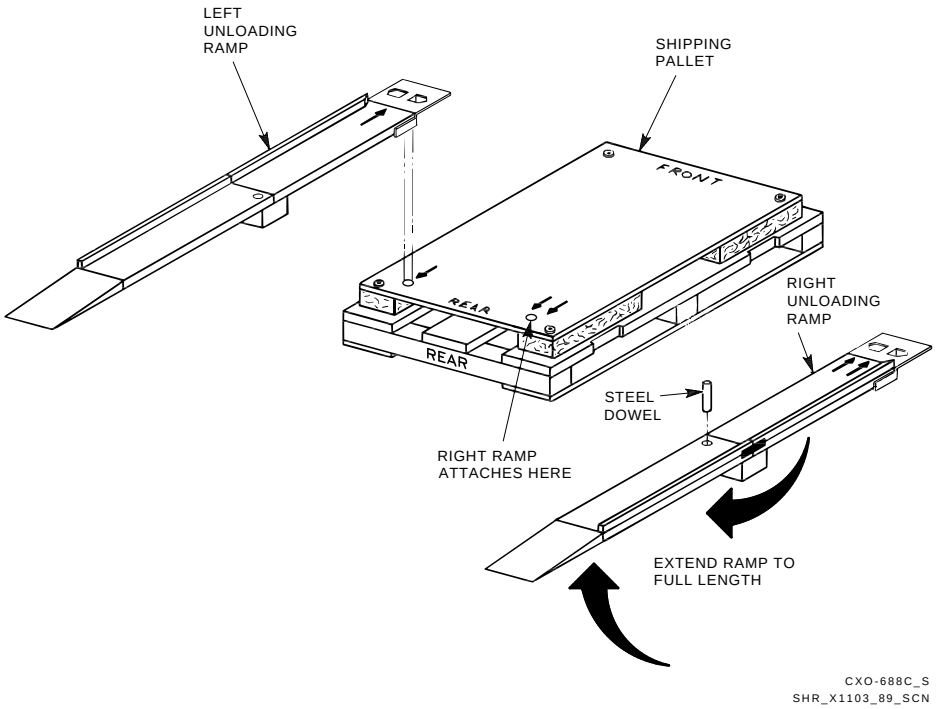
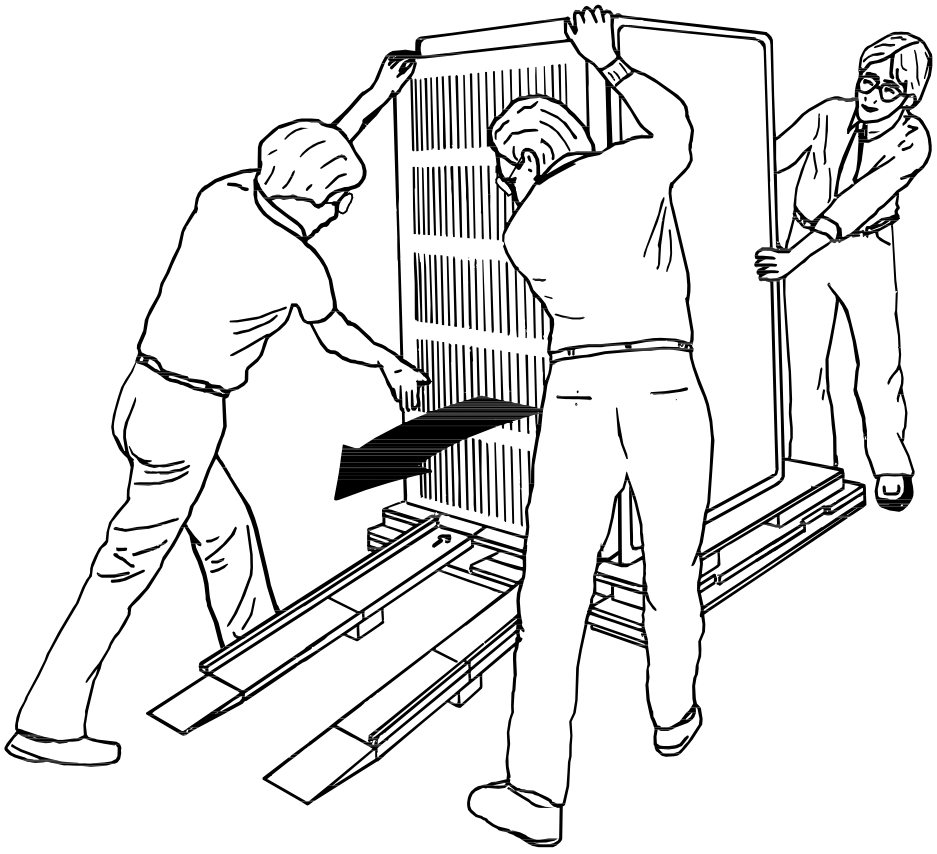


Figure 3–2 Ramp Installation on Shipping Pallet

7. Position the unloading ramps on the pallet by fitting the grooved end of each ramp over the metal mating strip on the pallet.
8. Screw the cabinet levelers all the way up until the storage array cabinet rests on its rollers on the pallet.
9. Loosen the locking nuts on all four leveler feet.
10. Carefully roll the array down the ramps. Three people are required to unload the storage array from the shipping pallet (Figure 3–3).

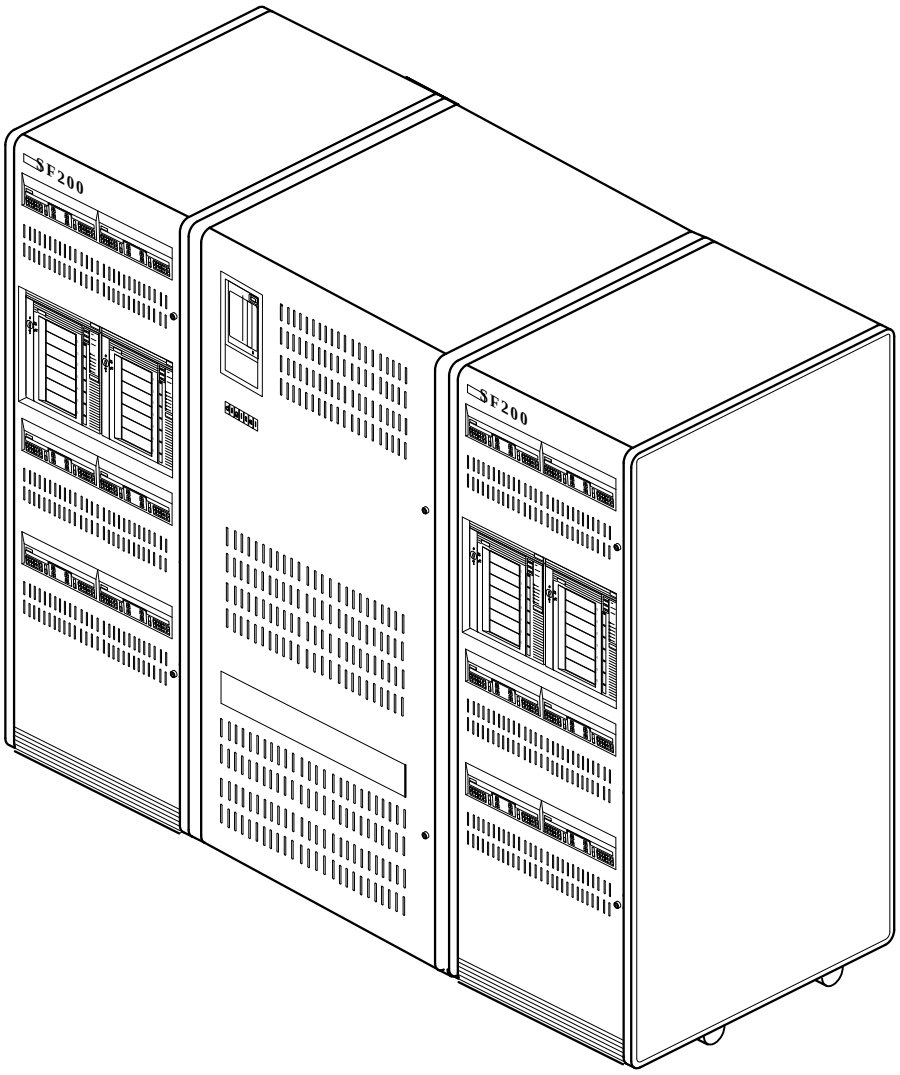


CXO-924A_S
SHR_X1104_89_SCN

Figure 3–3 Storage Array Removal from the Pallet

3.3 Placing the Array

Move the array to its final position, a distance not to exceed 0.9 meter (3 feet) from any host system cabinet. Refer to Figure 3–4.



SHR-X0123-90

Figure 3–4 Placing the SF200 Storage Array

3.4 Leveling the Array

Once the array is in its final position:

1. Loosen the locknuts on all four leveler feet (Figure 3–5).
2. Turn each leveler hex nut clockwise until the leveler foot contacts the floor.
3. Adjust all four feet until the cabinet is level and the load is removed from all casters. Verify that the casters spin freely.
4. Tighten the locknuts on all four leveler feet (Figure 3–5).

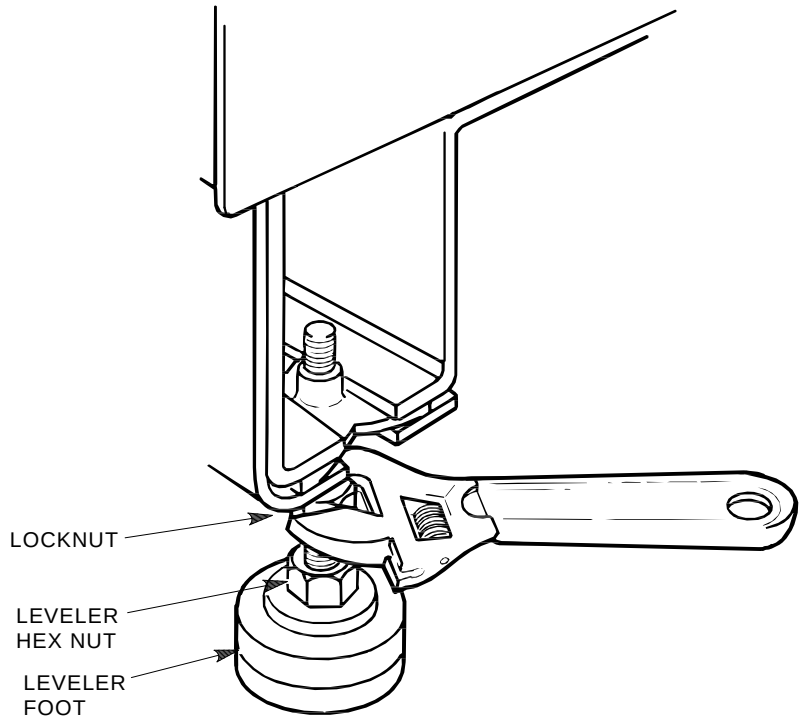


Figure 3–5 Adjusting Leveler Feet

3.5 Inspecting the Storage Array

Inspect the storage array first from the front, then from the rear.

1. Open the front and rear cabinet doors.
   a. Turn the two hex-Allen fasteners at the right edge of each door counterclockwise to unlock.
   b. For each door, grasp the door by its edge, and pull toward you.
2. At the front of the SF200 storage array, verify that all operator control panels are correctly seated on each SF72 storage enclosure installed in the cabinet (Figure 3–6).

WARNING
Adhere to electrostatic discharge (ESD) procedures at all times. Use the ESD straps available with every storage array. The straps are inside the front and rear doors.

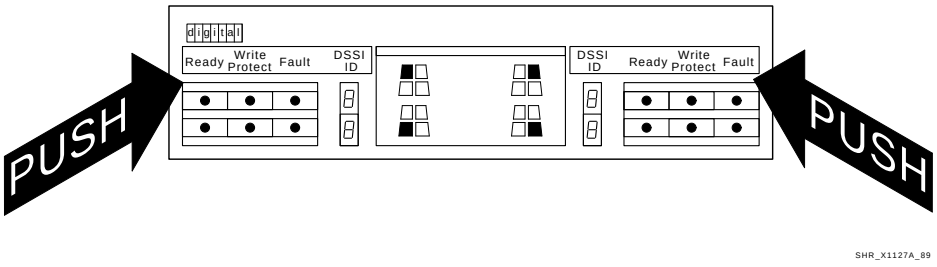


Figure 3–6 Verifying the SF72 OCP Seating

3. At the rear of the SF200 storage array, verify that the correct variation of the 881 power controller exists to meet the power supplied to the installation site.

881–A	120 Vac, 60 Hz
881–D	240 Vac, 50 Hz

4. Ensure that all ac power cords going to the 881 from devices installed in the storage array are correctly seated in the 881 power controller.
5. Ensure that the ac breaker is off (Figure 3–7).
6. Ensure that the bus switch of the 881 is in the on (down) position (Figure 3–7).

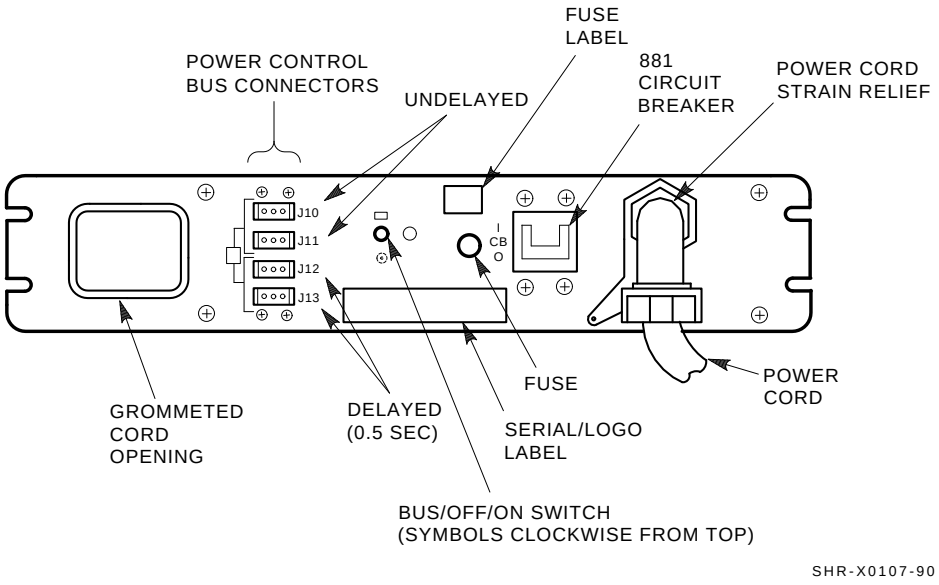


Figure 3–7 Verifying the 881 Power Controller

7. Check the ac power cords for each SF72 enclosure and magazine tape subsystem installed. Make sure that each is correctly seated (Figures 3–8 and 3–9).
8. Ensure that the voltage selection switches for each SF72 storage enclosure and magazine tape subsystem are in the correct position for the power supplied by the installation site (Figures 3–8 and 3–9).
9. Loosen the shipping screw on all magazine tape subsystems in the storage array. This screw is in the right rear upper corner.
10. Ensure that all DSSI cables internal to the storage array are firmly seated.
11. Close the cabinet doors; turn the hex-Allen fasteners one quarter turn clockwise to lock.

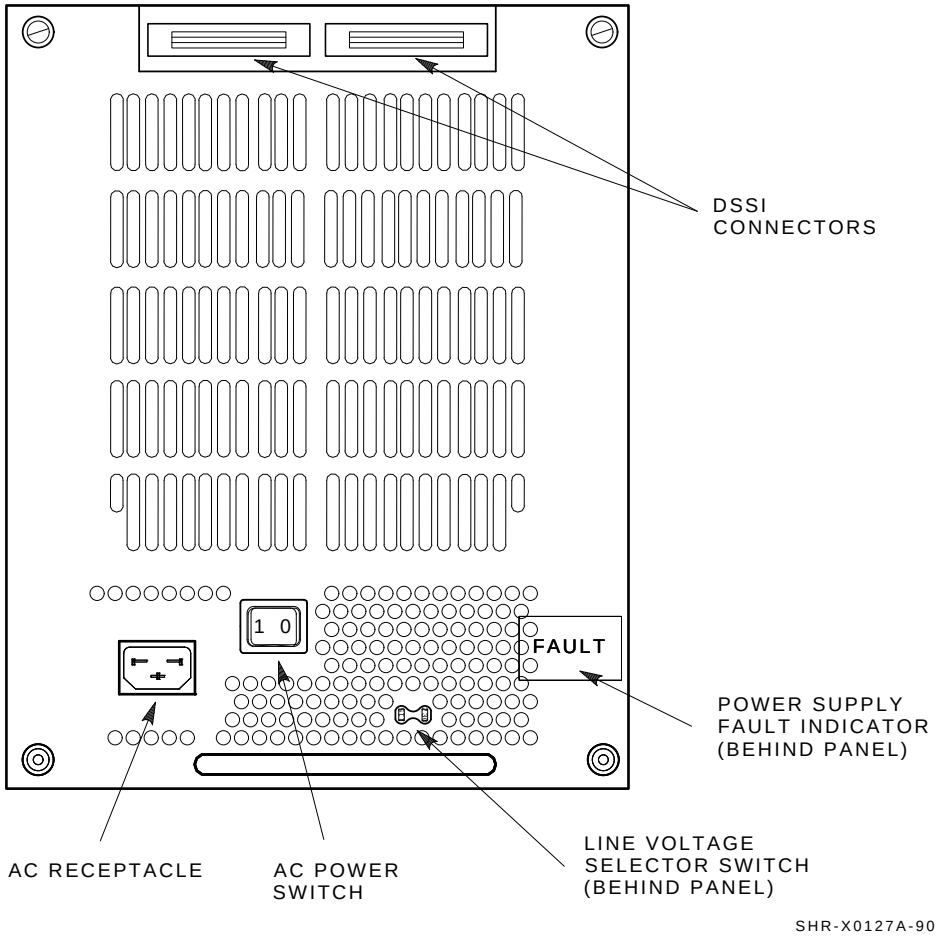


Figure 3–8 SF72 Storage Enclosure Power Connection and Voltage Selection

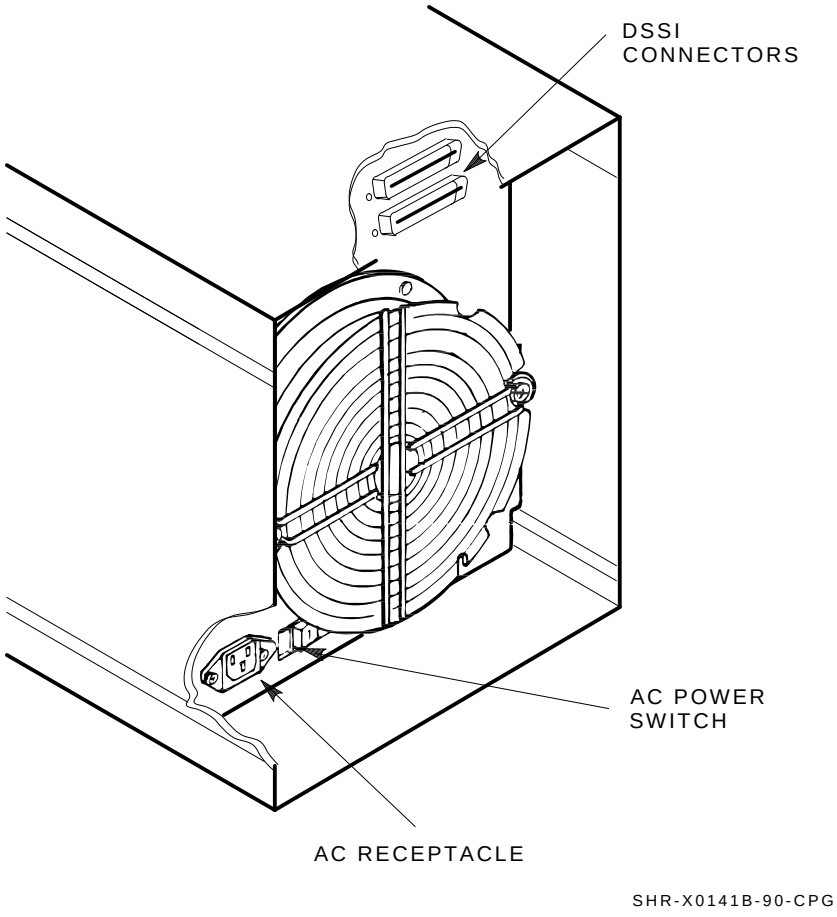


Figure 3–9 Magazine Tape Subsystem Power Connection and Voltage Selection

4

Installing an SF200 Storage Array with a VAX 6000 Series System

This chapter describes the steps to install the SF200 storage array correctly and safely with an existing VAX 6000 series system in two configurations:

- Single-host installation (Section 4.3)
- Dual-host installation (Section 4.4)

Perform the steps in the appropriate section only after you have completed all the steps in Chapter 3.

Ensure that all precautions for site preparation have been completed. Refer to Chapter 2.

Digital Customer Services or trained installing personnel must perform the step in the following *WARNING*:

WARNING

Hazardous voltages are in the storage array and in the components of the storage array.

When performing any operation involving the power source, turn off the power controls of all components and on the 881 power controller. Disconnect the power cable from the source outlet. Perform the operation, then reconnect the power cable to the source.

4.1 Single-Host Overview

As many as two SF200 storage arrays can be used with a VAX 6000 series system in a single-host configuration.

A single SF200 storage array requires one or two KFMSA modules (installed in the system's XMI backplane) to support the DSSI ISEs resident in the SF200 storage array.

A second storage array requires one or two additional KFMSA modules.

In a single-host configuration, one tape ISE and, or up to, six disk ISEs can be connected to one DSSI bus. For further information on single-host configurations, refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM).

Refer to Table 4–1 to confirm that the correct system configuration exists to support the installation of the array or arrays.

Table 4–1 SF200 Storage Array Configurations (Single-Host)

			You Will Need:				
			Additional				
	Systems			SF72s			
To Support: (GBytes)	KFMSA Module	Cable Kits[1]	SF200 Variants	HK	JK	TF Options AA/AB	SF200 Cable Kits[2]
2	1	1	BA/BD				1
4	1	1	CA/CD				1
6	1	1	CA/CD	1			2
8	1	1	FA/FD				2
10	1	1	FA/FD	1			2
12	1	1	HA/HD				2
14	2	2	HA/HD	1			3
16	2	2	HA/HD		1		3
18	2	2	HA/HD	1	1		4
20	2	2	HA/HD		2		4
22	2	2	HA/HD	1	2		4
24	2	2	JA/JD				4

[1]This cable kit part number is CK–KFMSA–LJ.

[2]This cable kit part number is CK–SF200–LM.

4.2 Dual-Host Overview

As many as two VAX 6000 series systems can be used with a single SF200 storage array.

A single SF200 storage array requires up to three KFMSA modules (installed in the system's XMI backplane) to support the DSSI ISEs resident in the SF200 storage array.

In a dual-host configuration, both systems must have up to three KFMSA modules installed in the system's XMI backplane to support dual-host configuration guidelines.

In a dual-host configuration, one tape ISE and, or up to, four disk ISEs can be connected to one DSSI bus. For further information on dual-host configurations, refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM).

Refer to Table 4–2 to confirm that the correct system configuration exists to support the installation of the array.

Table 4–2 SF200 Storage Array Configurations (Dual-Host)

			You Will Need:				
			Additional				
	Systems			SF72s			
To Support: (GBytes)	KFMSA Module	Cable Kits[1]	SF200 Variants	HK	JK	TF Options AA/AB	SF200 Cable Kits[2]
2	2	2	BE/BH				2
4	2	2	CE/CH				2
6	2	2	CE/CH	1			4
8	2	2	FE/FH				4
10	2	2	FE/FH	1			4
12	2	2	HE/HH				4
14	4	4	HE/HH	1			6
16	4	4	RE/HH		1		6
18	4	4	HE/HH	1	1		8
20	4	4	HE/HH		2		8
22	4	4	HE/HH	1	2		8
24	4	4	JE/JH				8

[1]This cable kit part number is CK–KFMSA–LJ.

[2]This cable kit part number is CK–SF200–LM.

4.3 Single-Host Installation of an SF200 Storage Array

This section provides the procedures for installing the SF200 storage array in a single-host configuration correctly and safely. Digital Customer Services or trained installing personnel must perform the procedures.

Ensure that all precautions for site preparation have been completed. Refer to Chapter 2.

The procedures provide the steps to:

- Inspect the SF200 storage array for correct configuration (Section 4.3.1)
- Cable the SF200 storage array with an existing VAX 6000 series system in the single-host configuration (Section 4.3.2)
- Power up the SF200 storage array after a successful installation (Section 4.3.4)
- Verify the SF200 storage array for correct operation (Section 4.3.5)

4.3.1 Inspecting the Storage Array (Single-Host)

This procedure describes the steps to inspect the SF200 storage array for correct configuration.

Inspect the storage array from the front, then from the rear.

1. Open the front and rear cabinet doors.
   a. Turn the two 3/16-inch hex-Allen fasteners at the right edge of the door counterclockwise to unlock.
   b. For each door, grasp the door by its edges, and pull toward you.
2. At the front of the SF200 storage array:
   a. Verify the correct setting for all the DSSI ID switches behind the door of the operator control panel (OCP) of every SF72 enclosure installed. Refer to Table 4–3 and Figure 4–1.
   b. The MSCP switch should be in the down or enabled position at all times unless you are instructed to change it to the up or disabled position.

Table 4–3 SF72 DSSI ID Verification (Front View)

Positions 1, 2, 4, and 7[1]	
Left Rear (LR)	001
Left Front (LF)	010
Right Front (RF)	011
Right Rear (RR)	100
Positions 3 and 8[1]	
Left Rear (LR)	101
Left Front (LF)	110
Right Front (RF)	110
Right Rear (RR)	101

[1]The switch settings for OCPs in these positions are 0 = down and 1 = up.

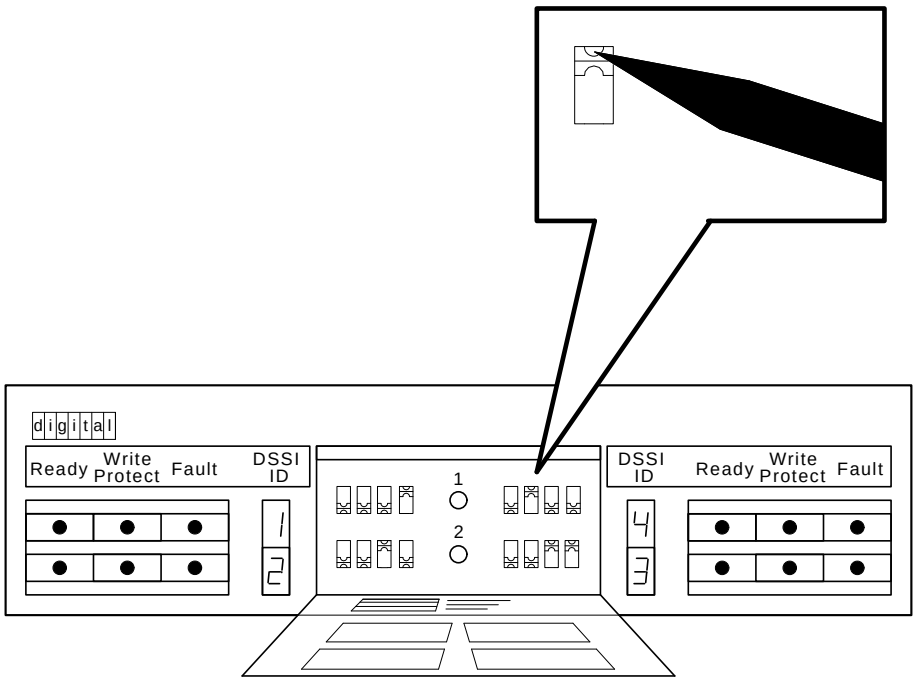


Figure 4–1 Verifying the SF72 DSSI ID Switch Settings

c. Ensure that all OCP buttons are in the out position.

d. Ensure that the OCP itself is correctly seated in the SF72 enclosure. To do so, place a thumb on either side of the OCP and press in (Figure 4–2).

e. Ensure that all drive dc power switches (lower half of the enclosure) are in the out position.

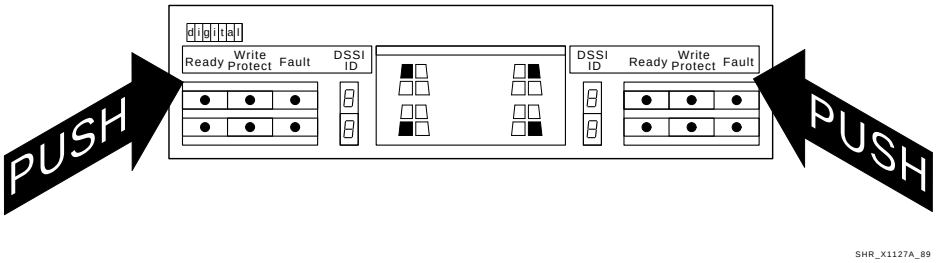


Figure 4–2 Seating the SF72 OCP

WARNING
Adhere to electrostatic discharge (ESD) procedures at all times. Use the ESD straps available with every storage array. The straps are inside the front and rear doors.

3. Ensure that the DSSI ID numbers of each magazine tape subsystem installed in the array are set to 0 and that the TMSCP switch is enabled (down). Refer to the magazine tape subsystem documentation for the procedure to access the DSSI controller module.
4. At the rear of the SF200 storage array:
   a. Verify that the correct variation of the 881 power controller exists to meet the power supplied to the installation site.

881–A	120 Vac, 60 Hz
881–B	240 Vac, 50 Hz

   b. Ensure that all ac power cords going to the 881 from devices installed in the storage array are correctly seated in the 881 power controller.
   c. Ensure that the ac breaker is off (Figure 4–3).
   d. Ensure that the bus switch of the 881 is in the on (down) position (Figure 4–3). Ensure that the BUS/OFF/ON switch is in the down position.

CAUTION
Make sure that all ac power switches on each SF72 storage enclosure and magazine tape subsystem are in the off position.

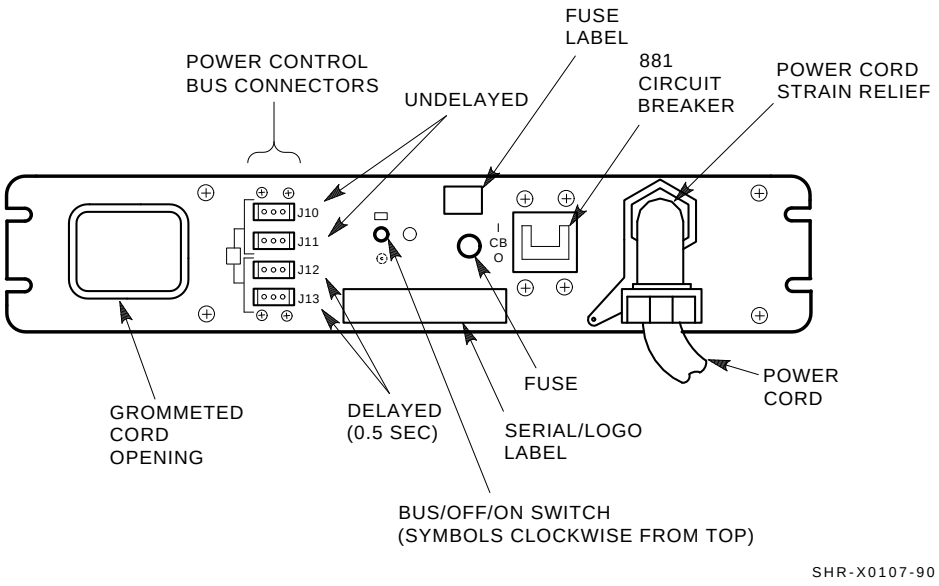


Figure 4–3 Verifying the 881 Power Controller

5. For each SF72 storage enclosure and magazine tape subsystem installed, check that the ac power cord is correctly seated (Figures 4–4 and 4–5).
6. Ensure that each SF72 storage enclosure and magazine tape subsystem has the correct voltage selected for the power supplied to the 881 power controller. Note that each has a voltage label for its factory setting.
7. Ensure that the voltage selection switches for each SF72 storage enclosure and magazine tape subsystem are in the correct position for the power supplied on the 881 power controller.
8. If the shipping screw on all magazine tape subsystems present has not been loosened, do so at this time. This screw is in the rear upper right corner of the subsystem. Loosen the screw; do not remove it.
9. Ensure that all DSSI connectors in the SF200 storage array are firmly seated.

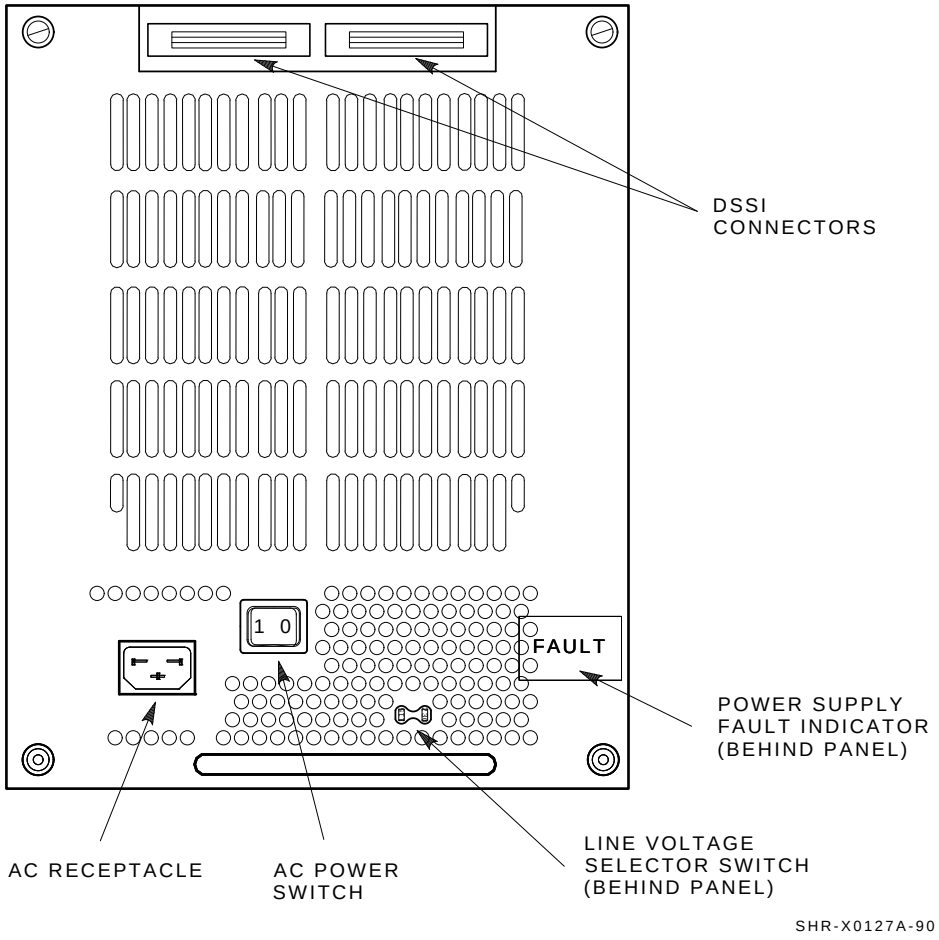


Figure 4–4 SF72 Power Cords and Voltage Selection

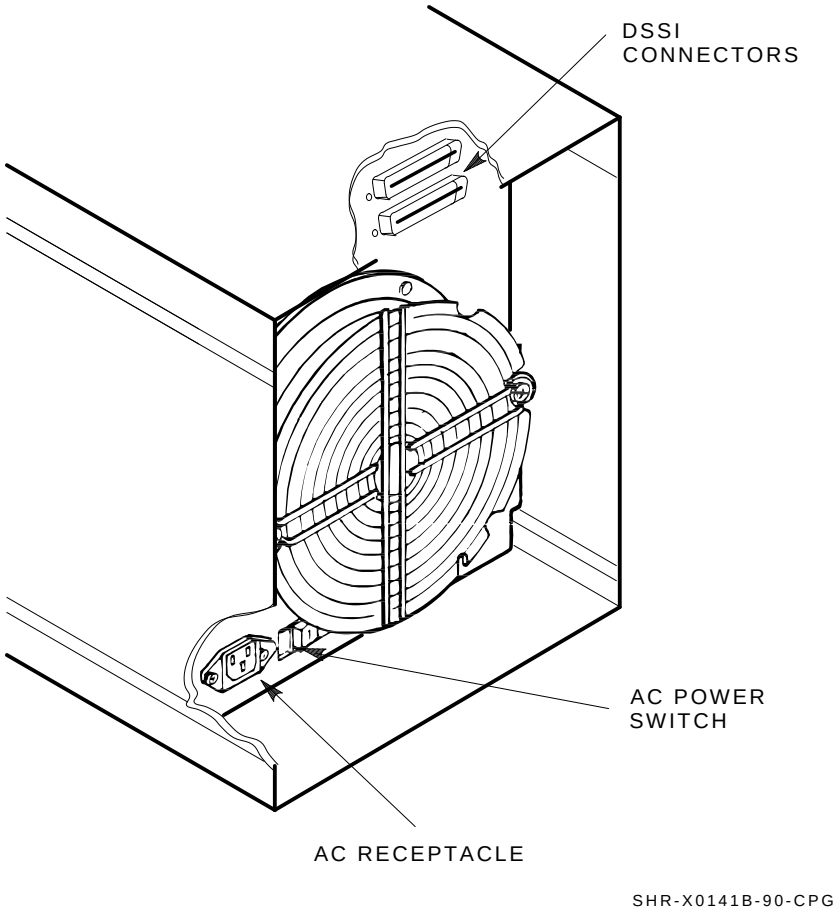


Figure 4–5 Magazine Tape Subsystem Power Cords and Voltage Selection

4.3.2 Cabling the Storage Array (Single-Host)

Start at the rear of the SF200 storage array cabinet.

1. Plug the main power cable of the storage array into its power receptacle.

   WARNING
   Hazardous voltages are in the storage array and in the components of the storage array.

   When performing any operation involving the power source, turn off the power controls of all components and on the 881 power controller. Disconnect the power cable from the source outlet. Perform the operation, then reconnect the power cable to the source.

2. Connect the 108-inch DSSI cable or cables (part number BC21Q–09) from the array DSSI I/O panel to the system I/O panel.

   a. At the system I/O panel, remove the terminator or terminators (part number 12–31281–01). See Figure 4–6. Store these terminators in the ESD pouch on the rear door of the storage array cabinet.

   b. To determine which of the two DSSI connectors on the system I/O panel to connect to:

      1. Open the system I/O panel by removing the six screws that secure it to the system chassis. Let the panel swing down to its rest position.

      2. Find the first KFMSA module installed in the system XMI backplane. It is the KFMSA module in the lowest numbered slot of the KFMSA modules installed.

      3. Follow the cabling from the backplane to the system I/O panel.

      4. While viewing the front of the I/O panel, note that the DSSI connector on the right is KFMSA DSSI bus 1 and on the left is bus 2.

      5. For port 1 and 3 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector of the system I/O panel.

      6. For port 2 and 4 on the SF200 I/O panel, connect the 108-inch DSSI cable to the left DSSI connector of the system I/O panel.

c. Install one end of the 108-inch DSSI cable (part number BC21Q–09) to one of the ports on I/O panel at the bottom rear of the system cabinet (Figure 4–6).

   1. Connect the DSSI cable from the DSSI port 1 (of the I/O panel) to the first DSSI connector of the first KFMSA bulkhead connector on the system I/O panel.
   2. Connect the DSSI cable from the DSSI port 2 (of the I/O panel) to the second DSSI connector of the first KFMSA bulkhead connector on the system I/O panel.
   3. Connect the DSSI cable from the DSSI port 3 (of the I/O panel) to the first DSSI connector of the second KFMSA bulkhead connector on the system I/O panel.
   4. Connect the DSSI cable from the DSSI port 4 (of the I/O panel) to the second DSSI connector of the second KFMSA bulkhead connector on the system I/O panel.

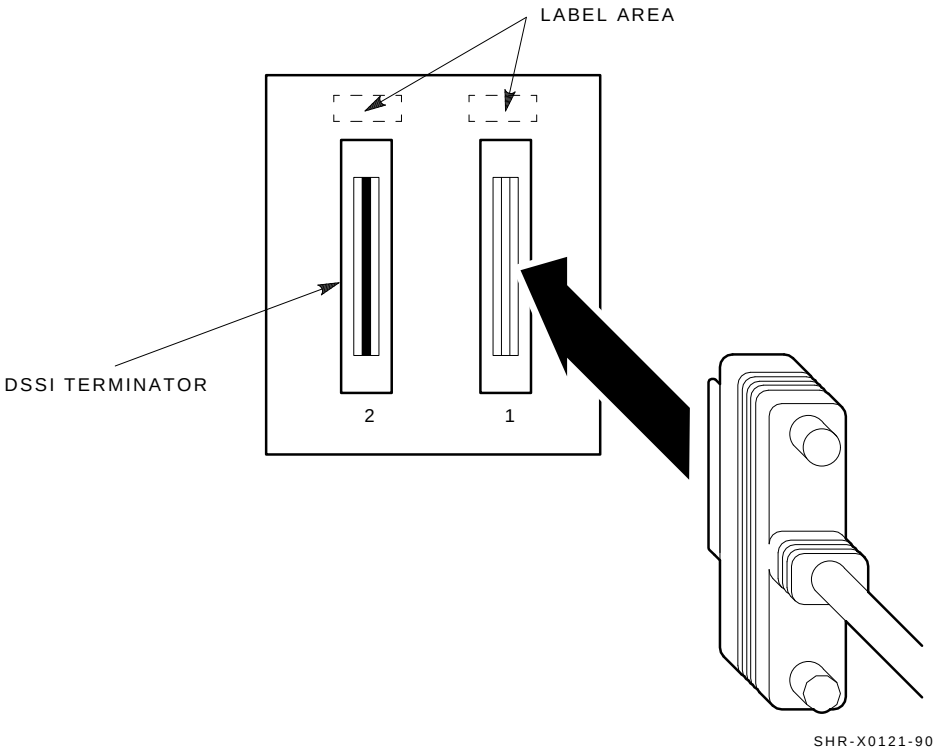


Figure 4–6 Removing Terminators and Connecting DSSI Cables at the System I/O Panel

3. Install the terminator or terminators (part number 12–31281–01) to their correct position on the SF72 enclosures, magazine tape subsystems, and system I/O panel.

   Note that the positions are numbered on the cabinet frame side rails on the front and the rear of the cabinet.

   - If the array has an SF72 storage enclosure in position 1 and a magazine tape subsystem in positions 5 and 6, then install a terminator (12–31281–01) in the bottom DSSI connector of the magazine tape subsystem in position 6.
   - If the array has two magazine tape subsystems in positions 5 and 6, then install a terminator (12–31281–01) in the bottom DSSI connector of both magazine tape subsystems.
   - If the array has an SF72 storage enclosure in position 1 only, then install a terminator (12–31281–01) in the leftmost DSSI connector of position 1 and the unused DSSI connector on the system I/O panel.
   - If the array has an SF72 storage enclosure in position 1 and 2, then install a terminator (12–31281–01) in the leftmost DSSI connectors of position 1 and 2.
   - If the array has an SF72 storage enclosure in position 1, 2, 3, 4, and 7, then install a terminator (12–31281–01) in the leftmost DSSI connectors of positions 4 and 7, and the unused DSSI connector on the system I/O panel.
   - If the array has an SF72 storage enclosure in position 1, 2, 3, 4, 7, and 8, then install a terminator (12–31281–01) in the leftmost DSSI connectors of position 4 and 7.

   All other configurations, with or without magazine tape subsystems, do not need terminators.

4.3.3 Labeling the Cables (Single-Host)

This section describes the steps to label correctly the cables for the VAX 6000 series system, the SF200 storage array, and its SF72 storage enclosures and magazine tape subsystems.

At this point, all steps in the previous sections must be complete.

Digital Customer Services or trained installing personnel must perform the steps that follow.

4.3.3.1 Completing the System Configuration Sheet (Single-Host)

At this time, you should be ready to fill out the system configuration sheet. Examples of these sheets are in Chapter 2 and in the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM). Refer to these examples when filling out the system's configuration sheet.

NOTE

Do not attempt to fill out and place the labels until you have completed the system configuration sheet.

The information from the system configuration sheet is used to fill out the labels correctly for all DSSI cables, enclosure OCPs, and subsystems.

You can also refer to the inside cover of the *SF Family Label Booklet* (part number 36–32882–01) for instructions on how to fill out the labels.

4.3.3.2 Filling Out the Labels (Single-Host)

There are two sizes of labels: the larger one for the DSSI cables, and the smaller one for the inside of the SF72 OCP door and the system I/O panel.

Refer to the inside cover of the *SF Family Label Booklet* (part number 36–32882–01) for instructions on what information to put on each of the two types of labels.

For the single-host configuration, use the following colored labels on the SF72 OCP door, the front panel of the magazine tape subsystem, and all DSSI cables.

Label Color	Port	Position
Blue	1	5, 1, 3
Red	2	6, 2, 3
Yellow	3	4, 8
Green	4	7, 8

Proceed once you have filled the cable and OCP labels according to the instructions on the inside cover of the *SF Family Label Booklet* (part number 36–32882–01).

4.3.3.3 Placing the Labels (Single-Host)

Now that the labels have all been filled out, place them on the DSSI cables and the SF72 OCP doors. Also place a label on the front of the magazine tape subsystem.

On the DSSI cable, place the label 2 inches behind the DSSI connector (Figure 4–7).

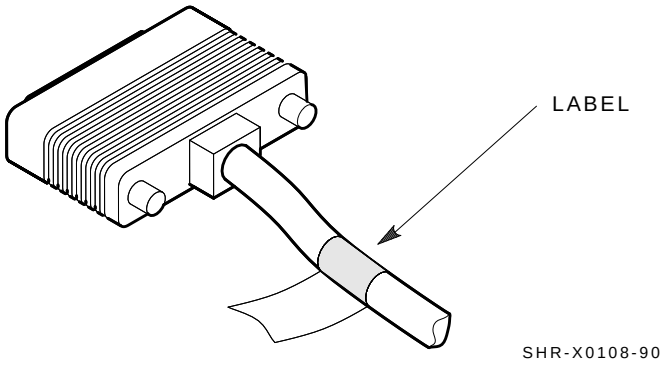


Figure 4–7 Placing a Label on a DSSI Cable

Place the SF72 OCP label as shown in Figure 4–8 and the magazine tape sybsystem label as shown in Figure 4–9.

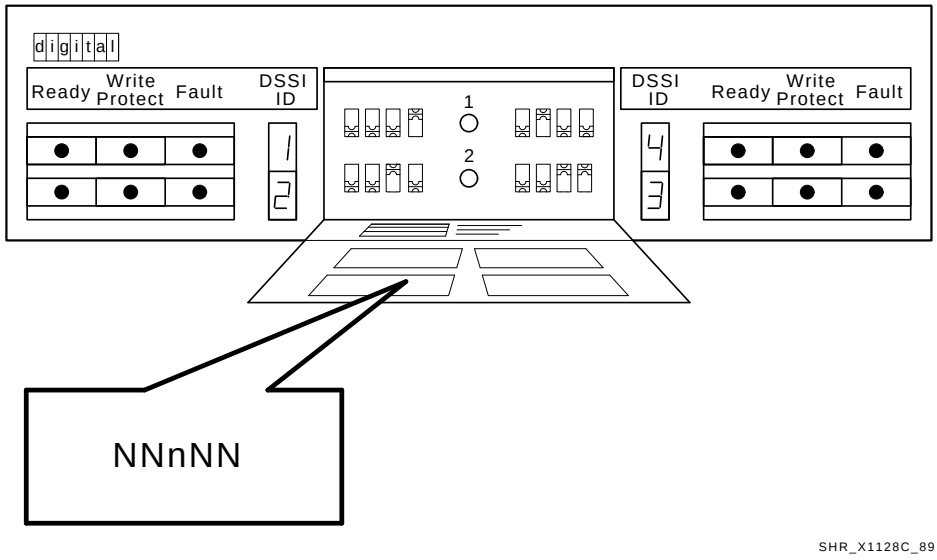


Figure 4–8 Placing a Label on the OCP Door

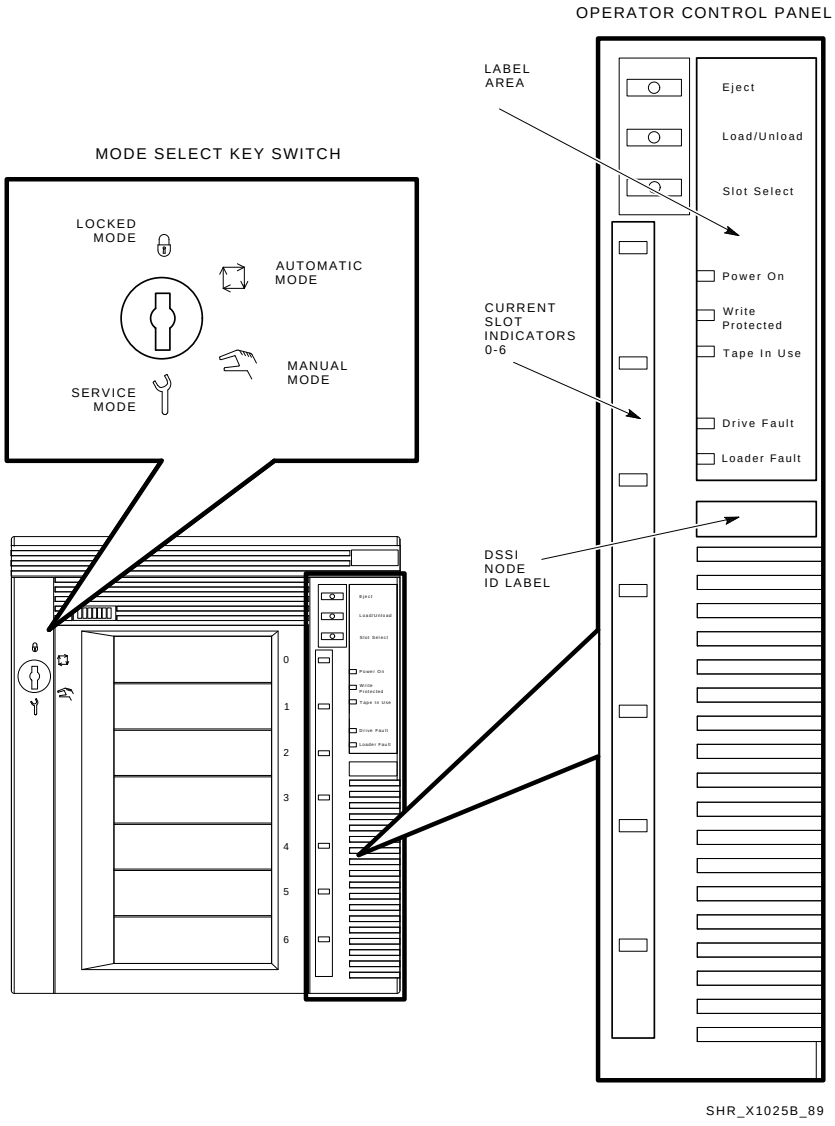


Figure 4–9 Placing a Label on the Magazine Tape Subsystem

4.3.4 Powering Up the SF200 Storage Array (Single-Host)

Now that the SF200 storage array has been installed and labeled, you are ready to apply power. Follow the steps in order.

CAUTION
Ensure that the ac power switch on each SF72 storage enclosure and magazine tape subsystem installed is in the off position.

1. At the rear of the storage array, turn the 881 power controller on (Figure 4–10). Ensure that the BUS/OFF/ON switch is in the down position.

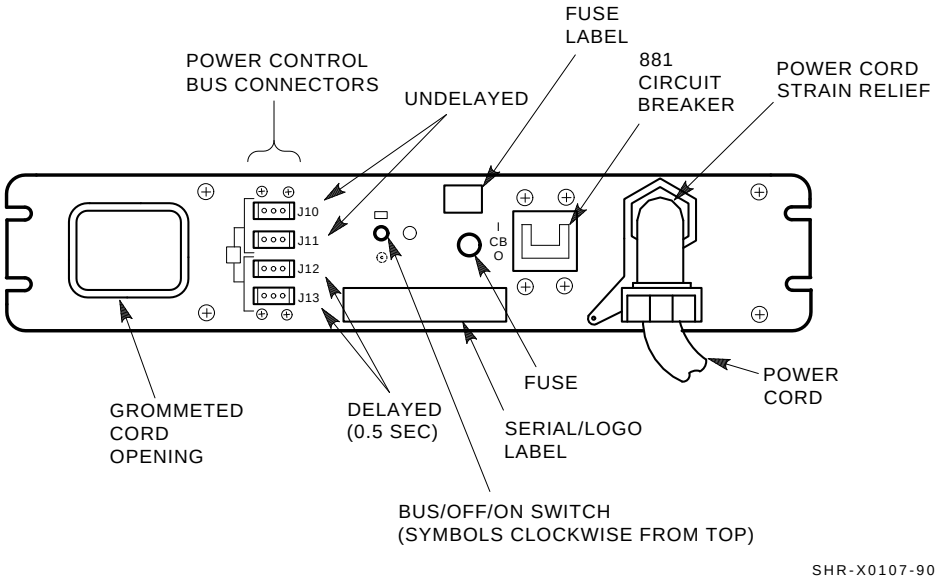


Figure 4–10 881 Circuit Breaker

2. At the rear of the storage array, turn on each magazine tape subsystem installed (if present). Power up position 5, then 6. See Figure 4–11. Observe the front panel. If a failure occurs, refer to Chapter 7.

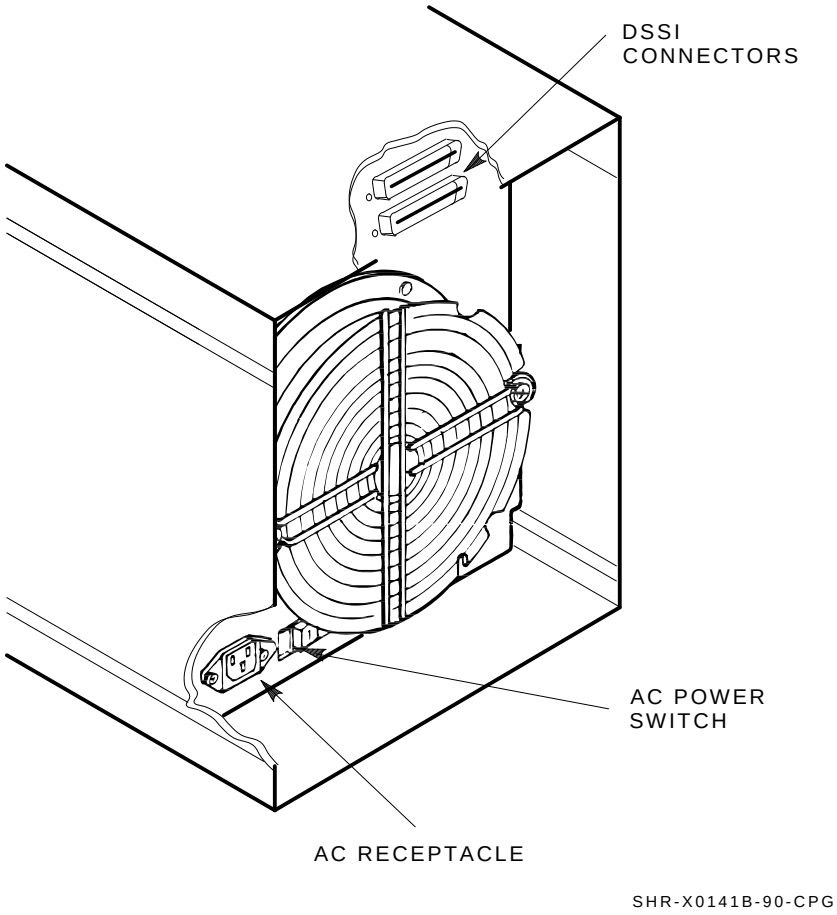


Figure 4–11 Magazine Tape Subsystem AC Power Switch

3. At the rear of the storage array, turn on each SF72 storage enclosure starting with position 1 and continuing in numerical order. See Figure 4–12.

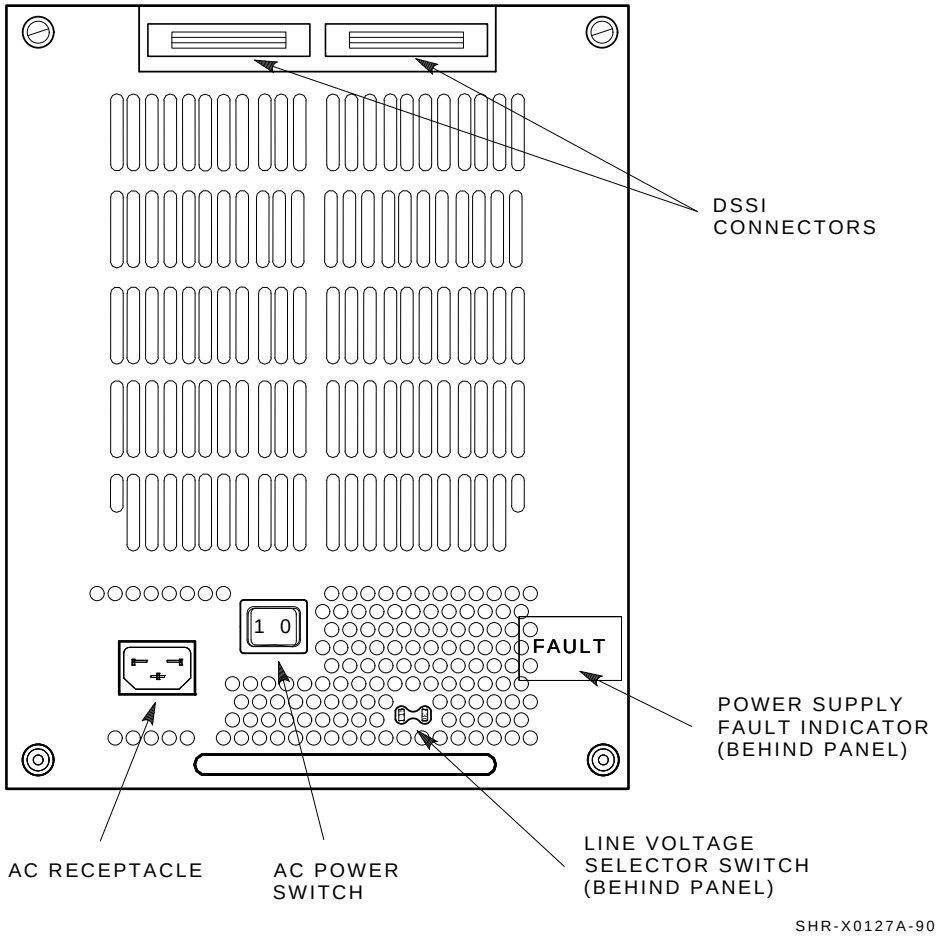


Figure 4–12 SF72 Storage Enclosure AC Power Switch

4. Press each drive dc power switch for each SF72 storage enclosure. Start with position 1 and continue in numerical order (Figure 4–13). If the Fault indicator lights for any disk ISE, refer to Chapter 7.

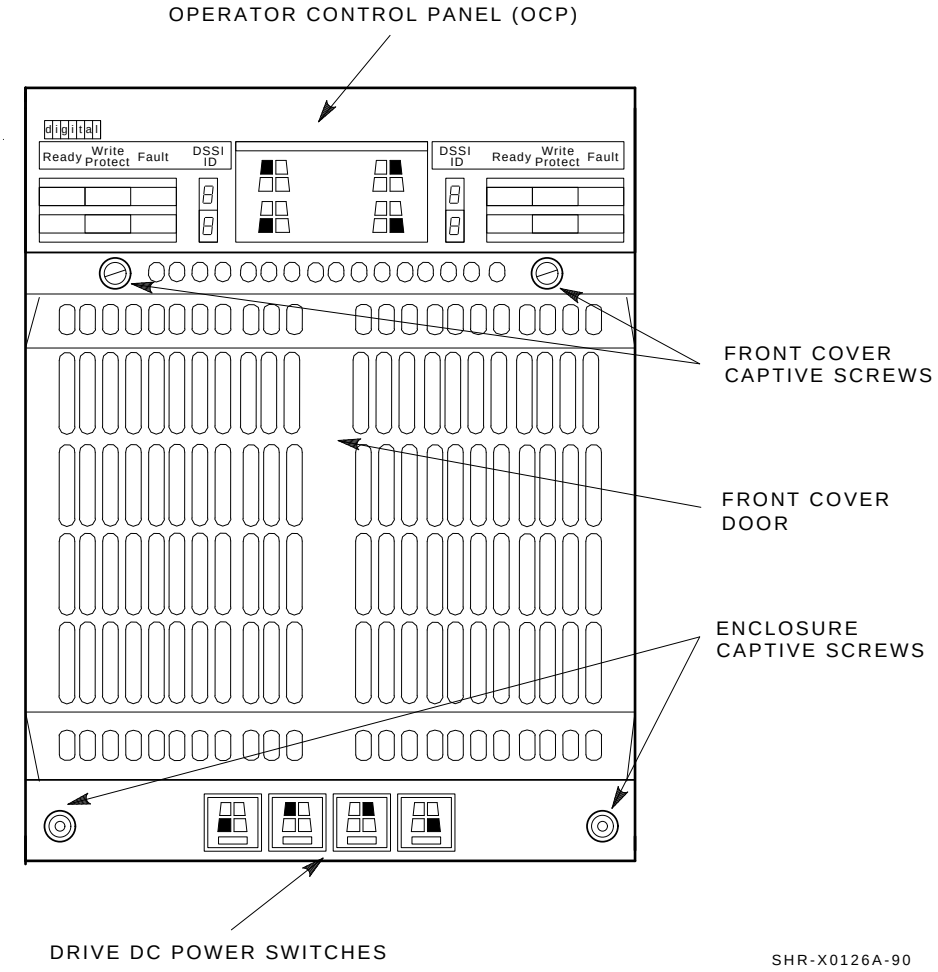


Figure 4–13 Drive DC Power Switches

5. Observe the OCP indicators (Figure 4–14).
   a. Check that the TERM PWR indicator (behind the door of the OCP) is on for all positions installed.
   b. Check that the SPLIT indicator (behind the door of the OCP) is on for positions 3 and 8 only. Refer to Chapter 1 for an explanation of split- and through-bus modes.
6. Press the Ready button on the OCP (Figure 4–14). The Ready indicator flickers, then lights steadily green once the ISE is on-line.

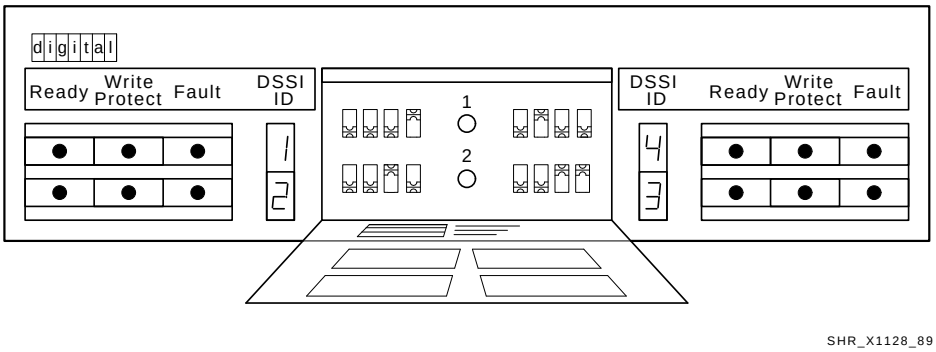


Figure 4–14 OCP Indicators and Controls

4.3.5 Single-Host Final Verification

Now that all the hardware installation, cabling and labeling, and the powering up steps are complete, you are ready to configure the DSSI subsystem and verify the correct operation of each ISE in the array with the host system.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) and the *TF837 Magazine Tape Subsystem Service Manual* (EK–TF837–SM) for detailed information and how to proceed with verifying the correct operation of each ISE that has been installed. In these manuals, you will find the procedure for establishing the communications between the ISEs, the adapter module, and the system. You will also find the step-by-step procedures for reconfiguring the system with its newly installed DSSI devices.

Refer to the manuals for the disk ISE and tape ISE for detailed information on the local programs in the ISEs.

Remember, each SF72 enclosure can contain two or four disk ISEs. Each magazine tape subsystem contains one tape ISE. A fully configured storage array contains 24 disk ISEs and 2 tape ISEs.

If at any time you detect a failure, refer to Chapter 7.

Once the verification is complete, close the cabinet doors; turn the hex-Allen fasteners one quarter turn clockwise to lock. The system is ready to be turned over to the system manager.

4.4 Dual-Host Installation of an SF200 Storage Array

This section provides the procedures for installing the SF200 storage array in a dual-host configuration correctly and safely. Digital Customer Services or trained installing personnel must perform the procedures.

Ensure that all precautions for site preparation have been completed. Refer to Chapter 2.

The following procedures provide the steps to:

- Inspect the SF200 storage array for correct configuration (Section 4.4.1)
- Cable the SF200 storage array with an existing VAX 6000 series system in the dual-host configuration (Section 4.4.2)
- Power up the SF200 storage array after a successful installation (Section 4.4.4)
- Verify the SF200 storage array for correct operation (Section 4.4.5)

4.4.1 Inspecting the Storage Array (Dual-Host)

This procedure describes the steps to inspect the SF200 storage array for correct configuration.

Inspection the storage array from the front, then from the rear.

1. Open the front and rear cabinet doors.
   a. Turn the two 3/16-inch hex-Allen fasteners at the right edge of the door one quarter turn counterclockwise to unlock.
   b. For each door, grasp the door by its edges, and pull toward you.
2. At the front of the SF200 storage array:
   a. Verify the correct setting for all the DSSI ID switches behind the door of the operator control panel (OCP) of every SF72 enclosure installed. Refer to Table 4–4 and Figure 4–15.
   b. The MSCP switch should be in the down or enabled position at all times unless you are instructed to change it to the up or disabled position.

Table 4–4 SF72 DSSI ID Verification (Front View)

Positions 1, 2, 3, 4, 7, and 8[1]	
Left Rear (LR)	001
Left Front (LF)	010
Right Front (RF)	011
Right Rear (RR)	100

[1]The switch settings for OCPs in these positions are 0 = down and 1 = up.

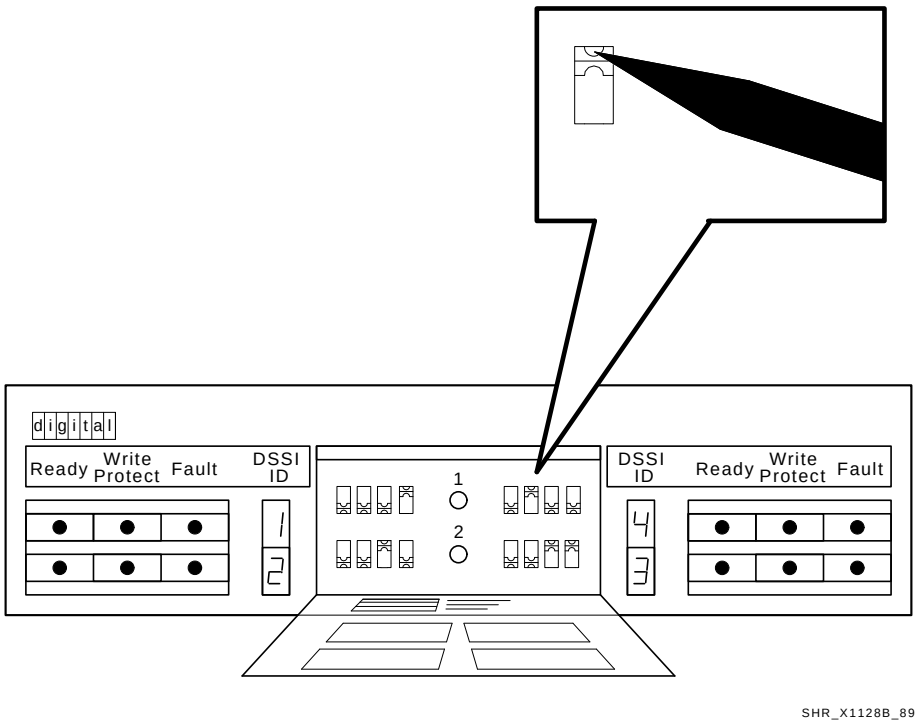


Figure 4–15 Verifying the SF72 DSSI ID Switch Settings

c. Ensure that all OCP buttons are in the out position.

d. Ensure that the OCP itself is correctly seated in the SF72 enclosure. To do so, place a thumb on either side of the OCP and press in (Figure 4–16).

e. Ensure that all drive dc power switches (lower half of the enclosure) are in the out position.

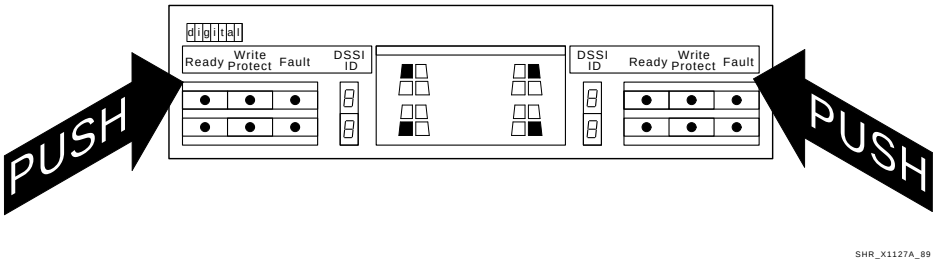


Figure 4–16 Seating the SF72 OCP

WARNING
Adhere to electrostatic discharge (ESD) procedures at all times. Use the ESD straps available with every storage array. The straps are inside the front and rear doors.

3. Ensure that the DSSI ID numbers of each magazine tape subsystem installed in the array are set to 0 and that the TMSCP switch is enabled (down). Refer to the magazine tape subsystem documentation for the procedure to access the DSSI controller module.
4. At the rear of the SF200 storage array:
   a. Verify that the correct variation of the 881 power controller exists to meet the power supplied to the installation site.

881–A	120 Vac, 60 Hz
881–B	240 Vac, 50 Hz

   b. Ensure that all ac power cords going to the 881 from devices installed in the storage array are correctly seated in the 881 power controller.
   c. Ensure that the ac breaker is off (Figure 4–17).
   d. Ensure that the bus switch of the 881 is in the on (down) position (Figure 4–17). Ensure that the BUS/OFF/ON switch is in the down position.

CAUTION
Make sure that all ac power switches on each SF72 storage enclosure and magazine tape subsystem are in the off position.

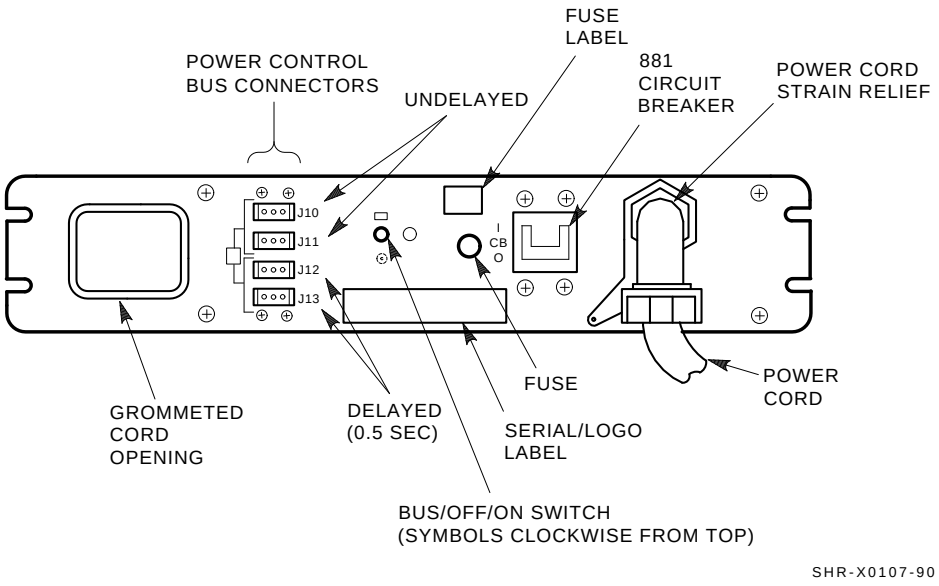


Figure 4–17 Verifying the 881 Power Controller

5. For each SF72 storage enclosure and magazine tape subsystem installed, check that the ac power cord is correctly seated. Refer to Figure 4–18 and Figure 4–19.
6. Ensure that each SF72 storage enclosure and magazine tape subsystem has the correct voltage selected for the power supplied to the 881 power controller. Note that each has a voltage label for its factory setting.
7. Ensure that the voltage selection switches for each SF72 storage enclosure and magazine tape subsystem are in the correct position for the power supplied on the 881 power controller.
8. If the shipping screw on all magazine tape subsystems present has not been loosened, do so at this time. This screw is in the rear upper right corner of the subsystem. Loosen the screw; do not remove it.
9. Ensure that all DSSI connectors in the SF200 storage array are firmly seated.

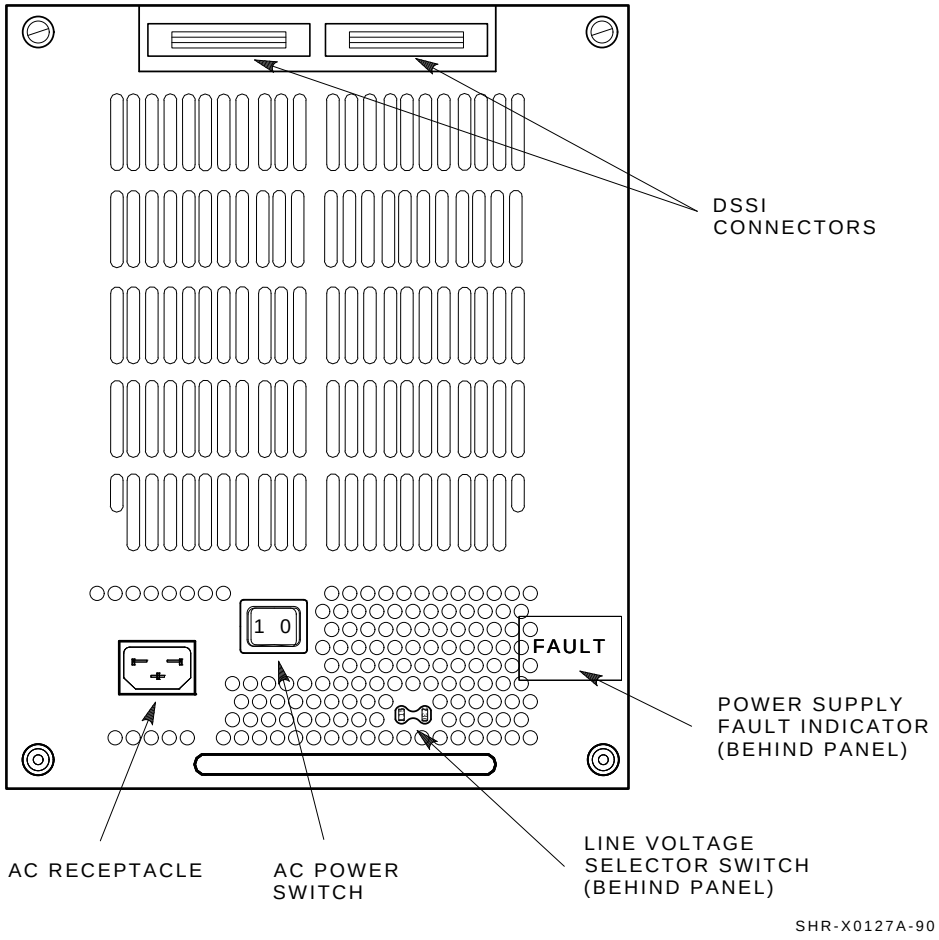


Figure 4–18 SF72 Power Cords and Voltage Selection

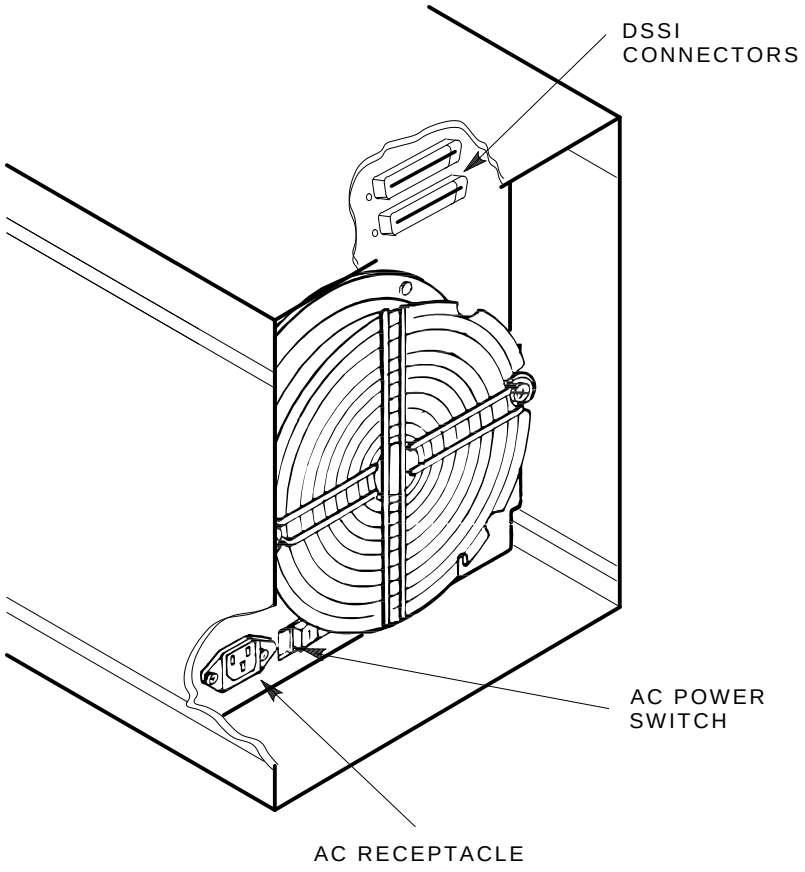


Figure 4–19 Magazine Tape Subsystem Power Cords and Voltage Selection

4.4.2 Cabling the Storage Array (Dual-Host)

Start at the rear of the SF200 storage array cabinet.

1. Plug the main power cable of the storage array into its power receptacle.

   WARNING
   Hazardous voltages are in the storage array and in the components of the storage array.

   When performing any operation involving the power source, turn off the power controls of all components and on the 881 power controller. Disconnect the power cable from the source outlet. Perform the operation, then reconnect the power cable to the source.

2. Connect the 108-inch DSSI cable or cables (part number BC21Q–09) from the array DSSI I/O panel to the system I/O panel.

   a. At the system I/O panel, remove the terminator or terminators (part number 12–31281–01). See Figure 4–20. Store these terminators in the ESD pouch on the rear door of the storage array cabinet.

   b. To determine which of the two DSSI connectors on the system I/O panel to connect to:

      - Open the system I/O panel by removing the six screws that secure it to the system chassis. Let the panel swing down to its rest position.
      - Find the first KFMSA module installed in the system XMI backplane. It is the KFMSA module in the lowest numbered slot of the KFMSA modules installed.
      - Follow the cabling from the backplane to the system I/O panel.
      - While viewing the front of the I/O panel, note that the DSSI connector on the right is KFMSA DSSI bus 1 and on the left is bus 2.
      - For port 1, 3, and 5 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector of the system I/O panel.
      - For port 2, 4, and 6 on the SF200 I/O panel, connect the 108-inch DSSI cable to the left DSSI connector of the system I/O panel.

c. Install one end of the 108-inch DSSI cable (part number BC21Q–09) to the I/O panel on the system cabinet (Figure 4–20).

- Connect the DSSI cable from the DSSI port 1 (of the I/O panel) to the first DSSI connector of the first KFMSA bulkhead connector on the system I/O panel.
- Connect the DSSI cable from the DSSI port 2 (of the I/O panel) to the second DSSI connector of the first KFMSA bulkhead connector on the system I/O panel.
- Connect the DSSI cable from the DSSI port 3 (of the I/O panel) to the first DSSI connector of the second KFMSA bulkhead connector on the system I/O panel.
- Connect the DSSI cable from the DSSI port 4 (of the I/O panel) to the second DSSI connector of the second KFMSA bulkhead connector on the system I/O panel.
- Connect the DSSI cable from the DSSI port 5 (of the I/O panel) to the first DSSI connector of the third KFMSA bulkhead connector on the system I/O panel.
- Connect the DSSI cable from the DSSI port 6 (of the I/O panel) to the second DSSI connector of the third KFMSA bulkhead connector on the system I/O panel.

Note that SF200 I/O panel DSSI ports 7, 8, 15, and 16 are not used.

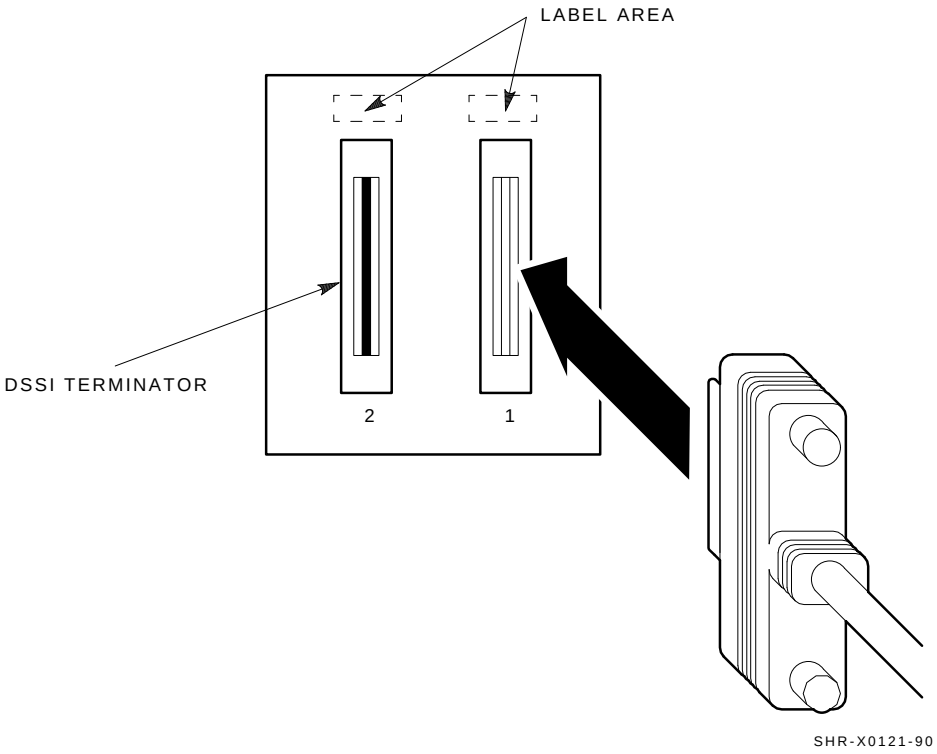


Figure 4–20 Removing Terminators and Connecting DSSI Cables at the System I/O Panel

4.4.3 Labeling the Cables (Dual-Host)

This section describes the steps to label correctly the cables for the VAX 6000 series system, the SF200 storage array, and its SF72 storage enclosures and magazine tape subsystems.

At this point, all steps in the previous sections must be complete.

Digital Customer Services or trained installing personnel must perform the steps that follow.

4.4.3.1 Completing the System Configuration Sheet (Dual-Host)

At this time, you should be ready to fill out the system configuration sheet. Examples of these sheets are in Chapter 2 and in the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM). Refer to these examples when filling out the system's configuration sheet.

NOTE

Do not attempt to fill out and place the labels until you have completed the system configuration sheet.

The information from the system configuration sheet is used to fill out the labels correctly for all DSSI cables, enclosure OCPs, and subsystems.

You can also refer to the inside cover of the *SF Family Label Booklet* (part number 36–32882–01) for instructions on how to fill out these labels.

4.4.3.2 Filling Out the Labels (Dual-Host)

There are two sizes of labels: the larger one for the DSSI cables, and the smaller one for the inside of the SF72 OCP door and the system I/O panel.

Refer to the inside cover of the *SF Family Label Booklet* (part number 36–32882–01) for the instructions on what information to put on each of the two types of labels.

For the dual-host configuration, the following colored labels are to be used on the SF72 OCP door, the front panel of the magazine tape subsystem, and all DSSI cables.

Label Color	Port/Position
Blue	Port 1, positions 5 and 1, port 9
Red	Port 2, positions 6 and 2, port 10
Yellow	Port 3, position 3, port 11
Green	Port 4, position 4, port 12
Blue with white strip	Port 5, position 7, port 13
Red with white strip	Port 6, position 8, port 14

Proceed once you have filled the cable and OCP labels according to the instructions on the inside cover of the *SF Family Label Booklet* (part number 36–32882–01).

4.4.3.3 Placing the Labels (Dual-Host)

Now that the labels have all been filled out, place the labels on the DSSI cables and the SF72 OCP doors. Also place a label on the front of the magazine tape subsystem.

On the DSSI cable, place the label 2 inches behind the DSSI connector (Figure 4–21).

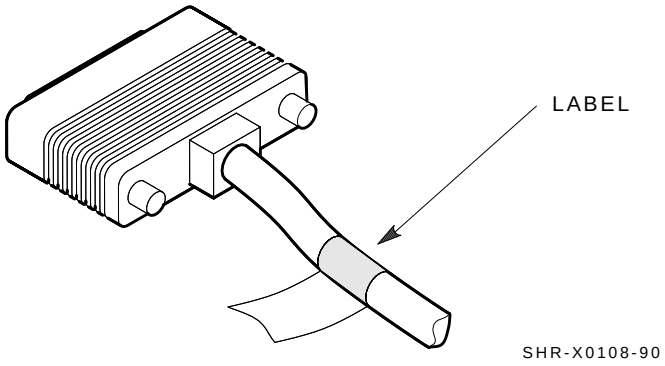


Figure 4–21 Placing a Label on a DSSI Cable

Place the SF72 OCP label as shown in Figure 4–22 and the magazine tape subsystem label as shown in Figure 4–23.

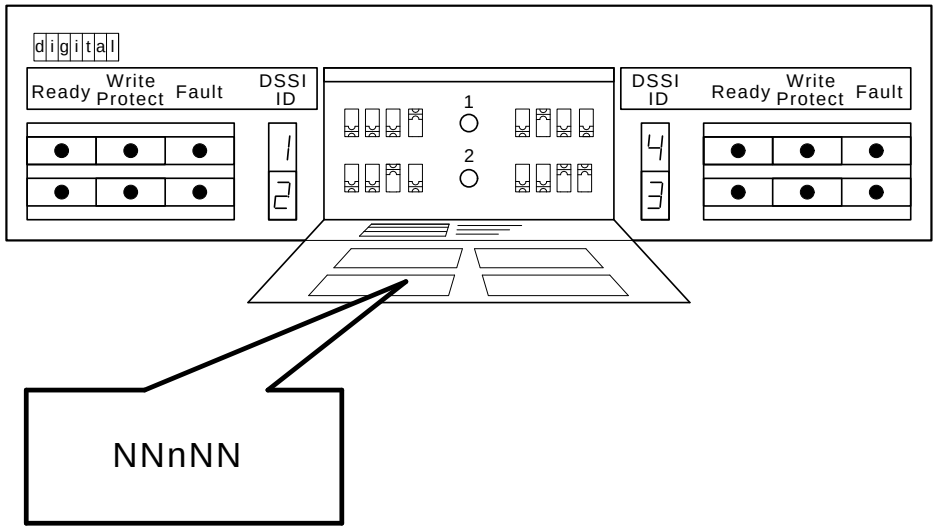


Figure 4–22 Placing a Label on the OCP Door

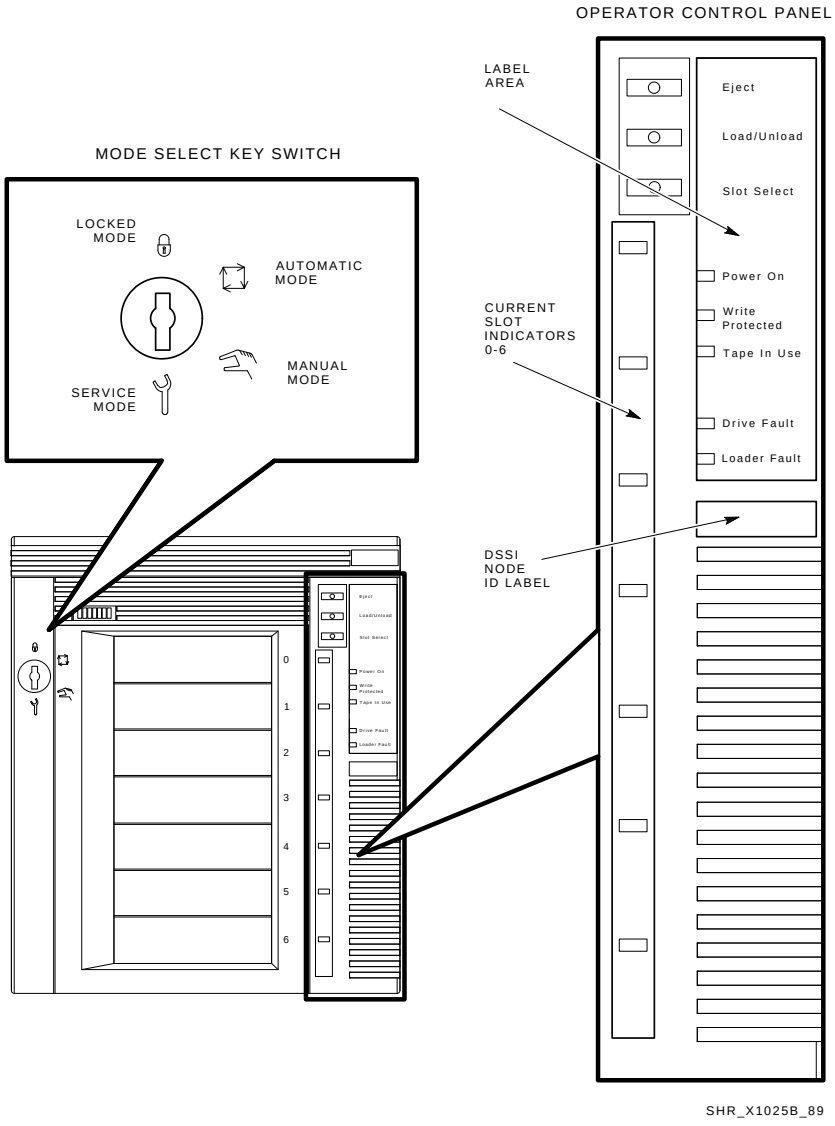


Figure 4–23 Placing a Label on the Magazine Tape Subsystem

4.4.4 Powering Up the SF200 Storage Array (Dual-Host)

Now that the SF200 storage array has been installed and labeled, you are ready to apply power. Follow the steps in order.

CAUTION
Ensure that the ac power switch on each SF72 storage enclosure and magazine tape subsystem installed is in the off position.

1. At the rear of the storage array, turn the 881 power controller on (Figure 4–24). Ensure that the BUS/OFF/ON switch is in the down position.

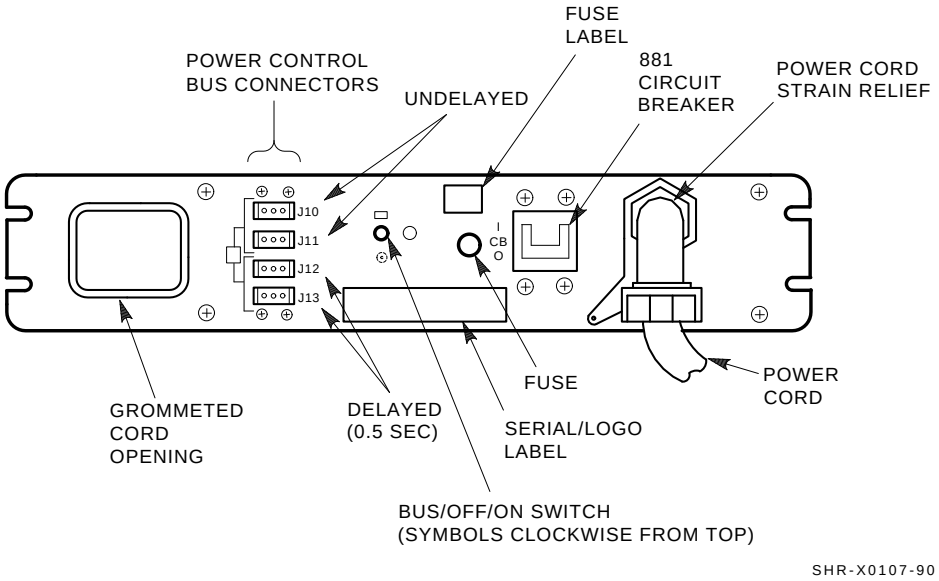


Figure 4–24 881 Circuit Breaker

2. At the rear of the storage array, turn on each magazine tape subsystem installed (if present). Power up position 5, then 6. See Figure 4–25. Observe the front panel. If a failure occurs, refer to Chapter 7.

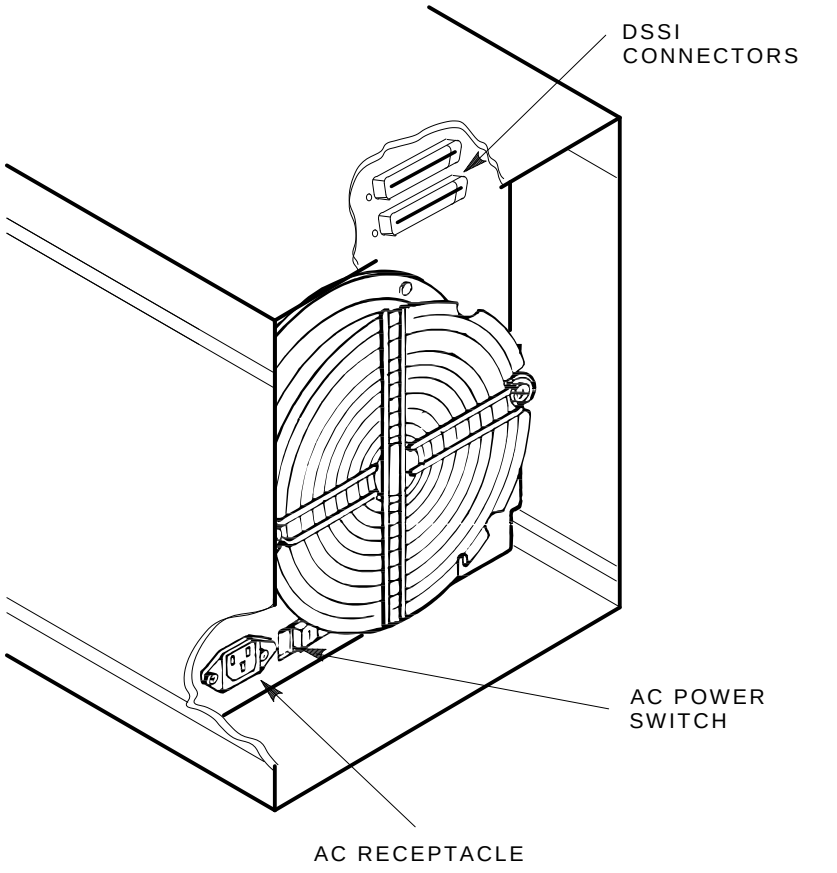


Figure 4–25 Magazine Tape Subsystem AC Power Switch

3. At the rear of the storage array, turn on each SF72 storage enclosure starting with position 1 and continuing in numerical order. See Figure 4–26.

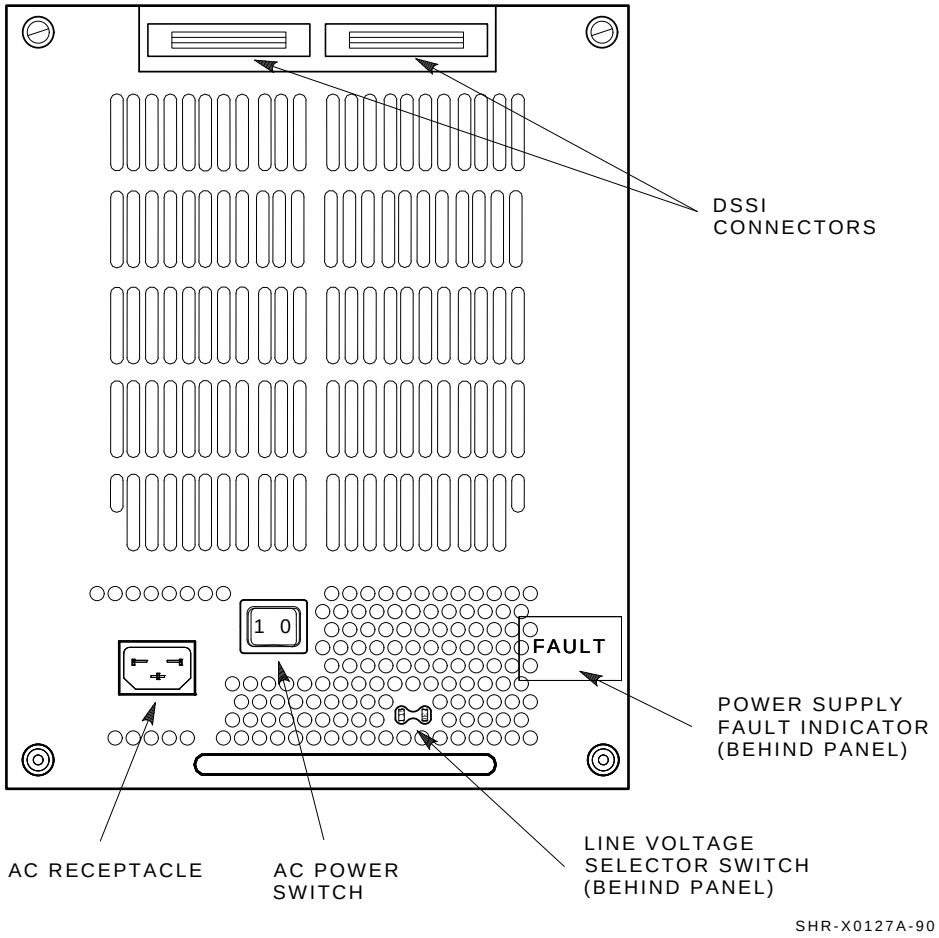


Figure 4–26 SF72 Storage Enclosure AC Power Switch

4. Press each drive dc power switch for each SF72 storage enclosure. Start with position 1 and continue in numerical order (Figure 4–27). If the Fault indicator lights for any disk ISE, refer to Chapter 7.

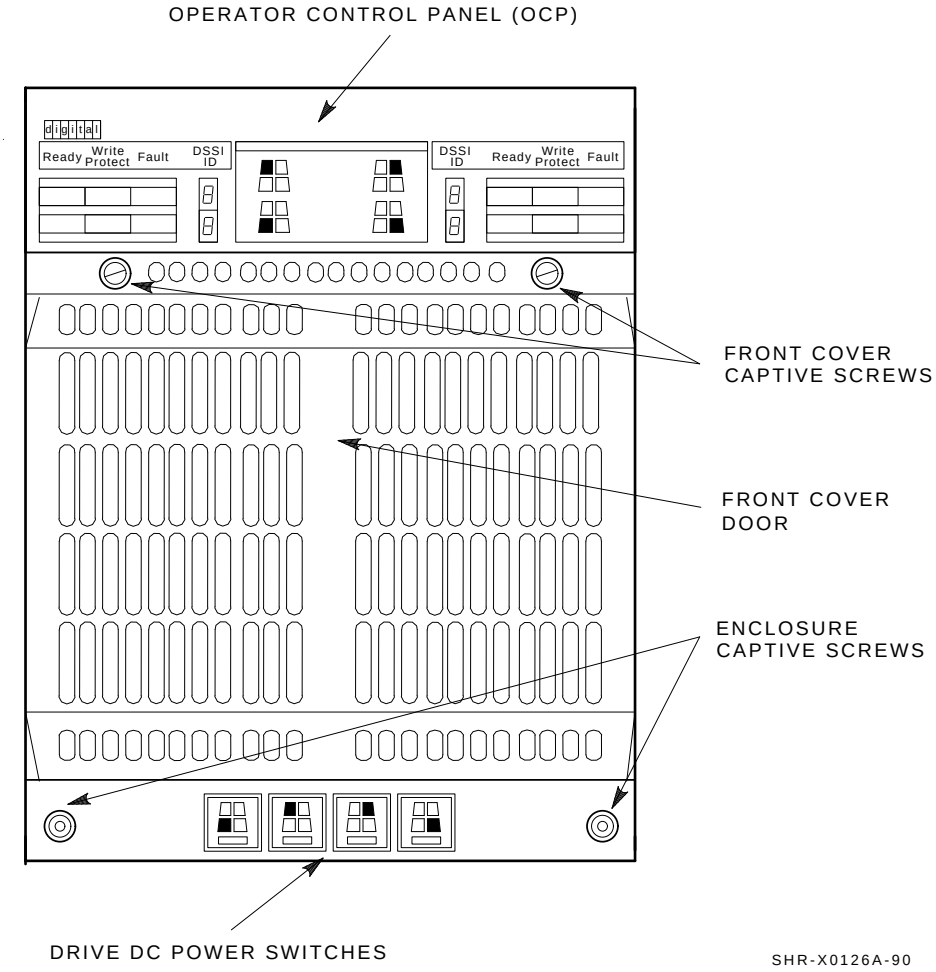


Figure 4–27 Drive DC Power Switches

5. Observe the OCP indicators (Figure 4–28).
   a. Check that the TERM PWR indicator (behind the door of the OCP) is on for all positions installed.
   b. Check that the SPLIT indicator (behind the door of the OCP) is off for all positions. Refer to Chapter 1 for an explanation of split- and through-bus modes.
6. Press the Ready button on the OCP (Figure 4–28). The Ready indicator flickers, then lights steadily green once the ISE is on-line.

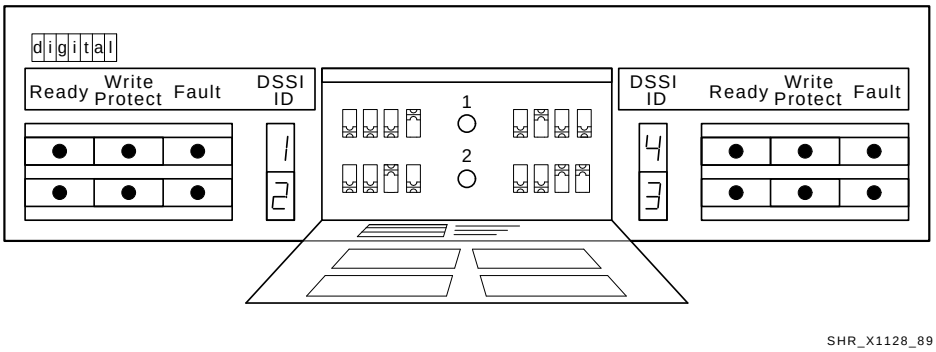


Figure 4–28 OCP Indicators and Controls

4.4.5 Dual-Host Final Verification

Now that all the hardware installation, cabling and labeling, and the powering up steps are complete, you are ready to configure the DSSI subsystem and verify the correct operation of each ISE in the array with the host system.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) and the *TF837 Magazine Tape Subsystem Service Manual* (EK–TF837–SM) for the detailed information and how to proceed with verifying the correct operation of each ISE that has been installed. In these manuals, you will find the procedure for establishing the communications between the ISEs, the adapter module, and the system. You will also find the step-by-step procedures for reconfiguring the system with its newly installed DSSI devices.

Refer to the manuals for the disk ISE and tape ISE for detailed information on the local programs in the ISEs.

Remember, each SF72 enclosure can contain two or four disk ISEs. Each magazine tape subsystem contains one tape ISE. A fully configured storage array contains 24 disk ISEs and 2 tape ISEs.

If at any time you detect a failure, refer to Chapter 7.

Once the verification is complete, close the cabinet doors; turn the hex-Allen fasteners one quarter turn clockwise to lock. The system is ready to be turned over to the system manager.

5
Installing the SF72 Storage Enclosure in an SF200 Storage Array

This chapter describes the steps to install the SF72 storage enclosure in an existing SF200 storage array:

- Steps to install (Section 5.1)
- Cabling the SF72 (Section 5.2)
  - Single-host configuration (Section 5.2.1)
  - Dual-host configuration (Section 5.2.2)
- Powering up the SF72 (Section 5.3)
- Labeling the DSSI cables and OCP (Section 5.4)
- Final verification (Section 5.5)

If you are attempting to install an SF72 in a cabinet other than an SF200 storage array cabinet, refer to the host system documentation.

Only Digital Customer Services and other installing personnel that have been trained in ESD procedures can use the procedures in this chapter.

Follow all the steps in this chapter to install an SF72 storage enclosure in an SF200 storage array. The steps apply for any position (1, 2, 3, 4, 7, or 8) in the storage array.

Table 5–1 lists the tools required to install the SF72 enclosure into the storage array.

Table 5–1 SF72 Required Tool List

Description	Part Number
Lifting device	FC–10117–AC
#0 Phillips screwdriver	29–10991–00
#1 Phillips screwdriver	29–11001–00
#2 Phillips screwdriver	29–11005–00
1/8-inch slot screwdriver	29–10802–00
5/16-inch slot screwdriver	29–10960–00
1/8-inch hex key	29–26115–00
3/16-inch hex key	29–26118–00
11/32-inch nutdriver	29–10674–00

Refer to Chapter 7 for tools or equipment recommended for use when troubleshooting after a successful installation.

5.1 Steps to Install

The following procedures assume that the existing SF200 storage array is correctly installed and configured.

The SF72 storage enclosure that you are installing may contain two or four RF72 disk ISEs. To determine if the SF72 contains two or four, simply look at the front of the enclosure. Open the front door of the SF200 storage array. If you can see two disk ISEs in the front of the SF72, then the enclosure contains four ISEs (SF72–JK variant). If you do not see two ISEs in the front of the enclosure, then that enclosure contains only two ISEs (SF72–HK variant). If you wish to verify an enclosure that is already installed in a cabinet or array, observe the number of 7-segment displays that are lit on the operator control panel (OCP). If the top two displays are lit, then the enclosure contains only two RF72 disk ISEs.

This section contains several major parts. The first part explains the steps to:

- Unpack, inspect for damage, and identify parts
- Determine where to install the SF72 enclosures
- Read and fill out the system configuration sheet

The next part explains the steps to install the SF72 enclosure itself:

- Prepare the array cabinet to receive an SF72 storage enclosure
- Install the supporting hardware and SF72, and set the DSSI ID switches
- Cable the SF72 storage enclosure to comply with the DSSI bus cabling conventions

The last part explains the steps to:

- Power up the SF72 enclosure, run the power-on self-test, and run the configuration programs
- Label all cables and operator control panels
- Verify the operation of the enclosure after a successful installation

Follow all the steps in each of these parts in the order they are presented and do not skip any steps.

When the array is to operate in a single-host configuration, remember that the enclosure in positions 1, 2, 4, and 7 operates in the through-bus mode. To ensure that the SF72 storage enclosure you are installing is in the through-bus mode after the installation is complete, observe the bottom indicator on the OCP. It should be off. Positions 3 and 8 operate in the split-bus mode and require you to reconfigure their transition termination module (TTM). That same indicator should be on once the enclosure is set for split-bus mode. The procedure to accomplish this is presented later in this chapter.

When the array is to operate in a dual-host configuration, remember that *all* enclosures operate in the through-bus mode.

5.1.1 Unpacking the SF72 Storage Enclosure

Unpack the SF72 shipping container. The enclosure is shipped in an environmental barrier bag with desiccant.

NOTE
After unpacking, retain the container and all packing materials.

At this time, examine the enclosure for physical damage. If you find *any* damage, do *not* attempt to install the enclosure. Notify your office immediately.

If there is no damage, then unpack all the boxes and bags, and identify all the parts by using Table 5–2.

Table 5–2 SF72 Kit Contents

Description	Quantity	Part Number
SF72 storage enclosure	1	SF72–HK (2-drive) SF72–JK (4-drive)
Slide mount assembly	1	–[1]
Weldment bracket (front top)	1	70–26052–01
Weldment bracket (front bottom)	1	70–26052–02
Shoulder screw, 10-32, 0.501	4	12–24007–01
Shoulder screw, 10-32, 0.438	6	12–24007–02
Lock washer, internal steel	10	90–06637–00
DSSI cable retainer	1	74–41302–01
Chassis retainer	2	74–35858–01
10-32 Phillips (SEMS)	4	12–21368–03
Machine screw, Phillips, 10-32, 0.500	2	90–06073–02
Machine screw, Phillips, 10-32, 1.5	2	90–06079–03
Lock washer, external steel	2	90–07651–00
AC power cord, 9-foot	1	17–00442–18
DSSI cables, 42-inch, box-to-box	1	BC21Q–3F
Owner's manual	1	EK–SF72S–OM
Installation guide	1	EK–SF200–IG
Label booklet	1	36–32882–01

[1]The slide mount assembly comes assembled and does not have a single part number.

5.1.2 Where to Install the SF72 Storage Enclosure

The SF72 storage enclosures install in numerical order (Figure 5–1). For your reference, the positions are numbered from 1 to 8 on the left and right chassis side rails. These numbers are visible only when the front or rear doors of the SF200 storage array are open,

SF72 storage enclosures occupy positions 1, 2, 3, 4, 7, and 8 only.

In split-bus mode, the following drives are part of the same DSSI bus (note that split-bus mode is supported in the single-host configuration):

1. Four drives in position 1 with the two left drives of position 3
2. Four drives in position 2 with the two right drives of position 3
3. Four drives in position 4 with the two left drives of position 8
4. Four drives in position 7 with the two right drives of position 8

All SF72 storage enclosures must be in through-bus mode when the SF200 storage array is in the dual-host configuration:

1. Four drives in position 1
2. Four drives in position 2
3. Four drives in position 3
4. Four drives in position 4
5. Four drives in position 7
6. Four drives in position 8

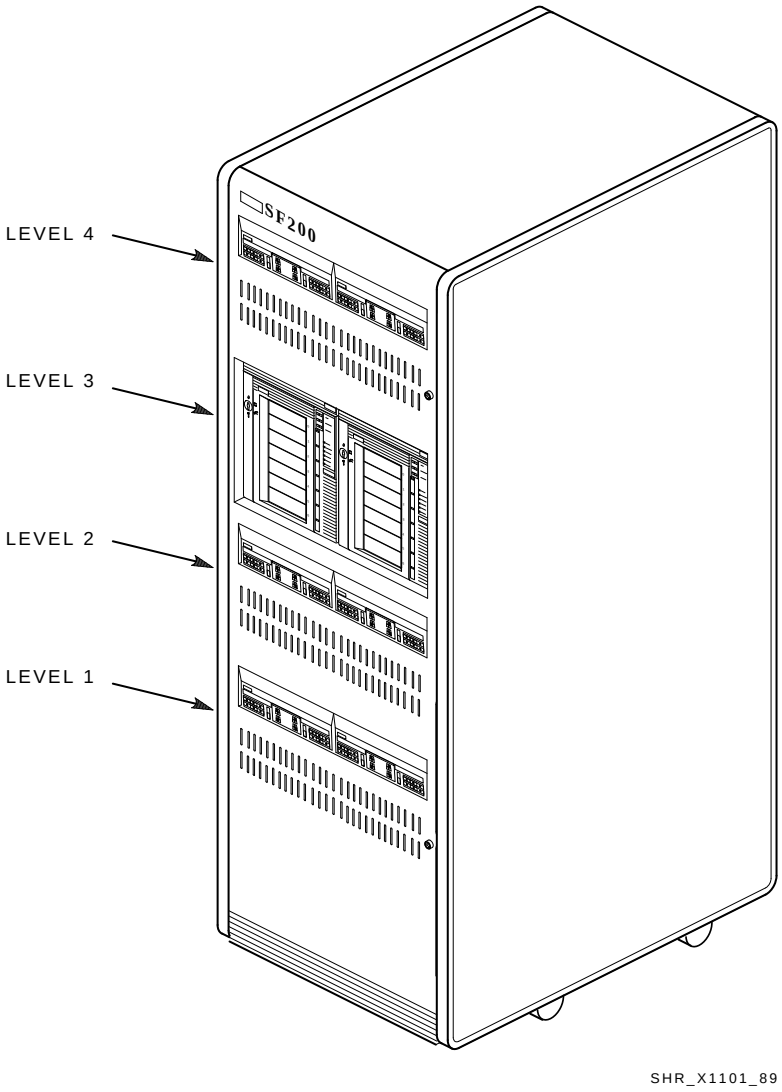


Figure 5–1 SF72 Enclosure Locations (Front View)

5.1.3 Checking the System Configuration Sheet

Locate the system configuration sheet. If you cannot locate this sheet or if the one that is available is either not filled out or filled out incorrectly, fill one out immediately.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for an explanation of this sheet and how to fill it out.

Figures 5–2 and 5–3 show an example of a system configuration sheet filled out for an SF200–Fx storage array with one magazine tape subsystem.

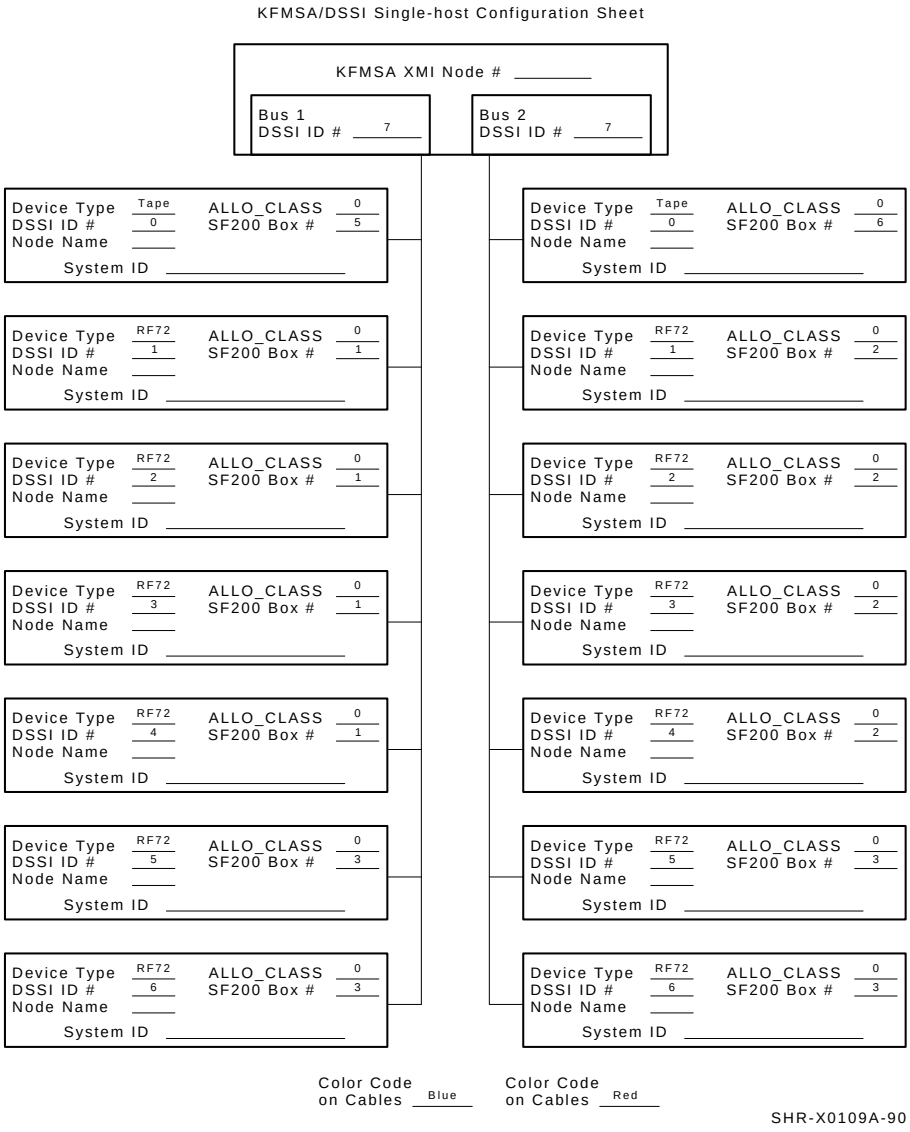


Figure 5–2 System Configuration Sheet (Single-Host)

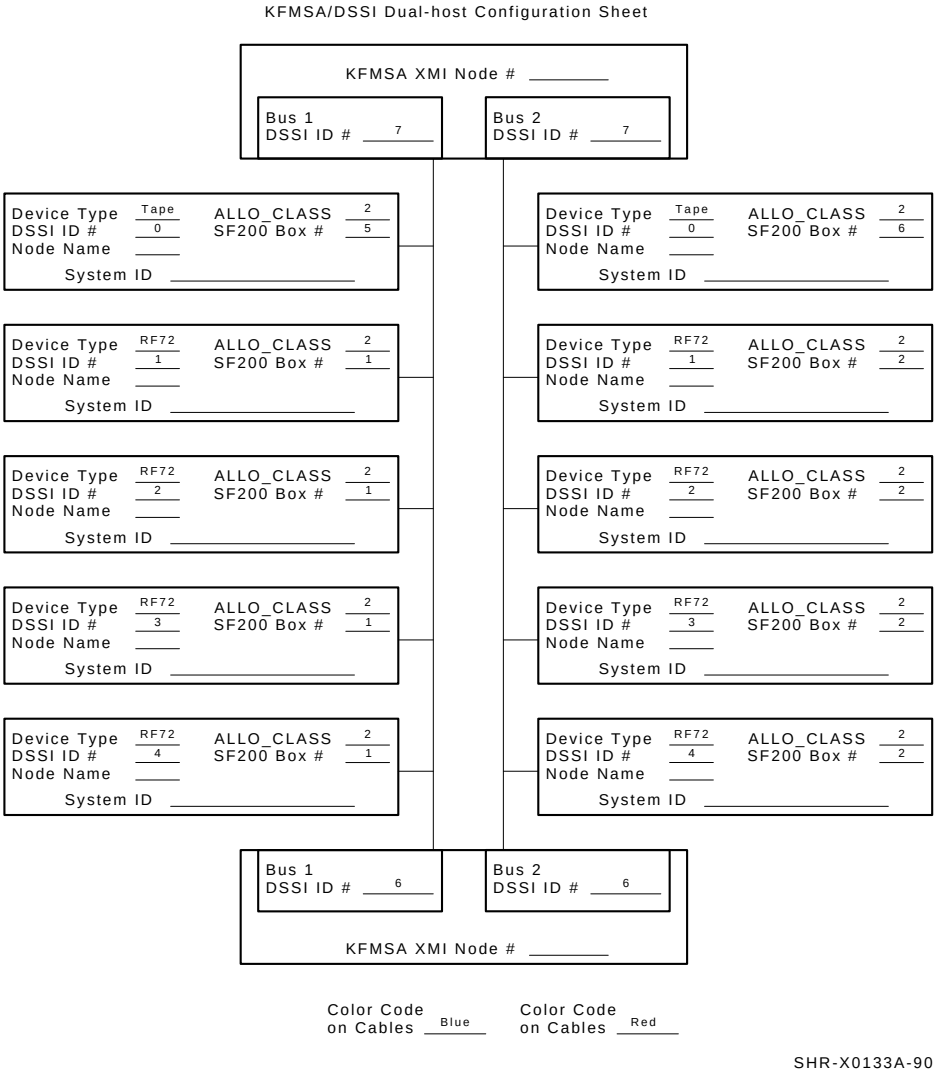


Figure 5–3 System Configuration Sheet (Dual-Host)

5.1.4 Installation Procedure

Before attempting any of the following steps, ensure that the SF72 enclosures installed in the array cabinet contain four disk ISEs.

To determine if the SF72 contains two or four drives, simply look at the front of the enclosure. If you can see two drives in the front of the SF72, then the enclosure contains four drives (SF72–JK variant). If you do not see two drives in the front of the enclosure, then that enclosure contains only two drives (SF72–HK variant). If you wish to verify an enclosure that is already installed and running in a cabinet or array cabinet, observe the number of 7-segment displays that are lit on the operator control panel (OCP). If the top two displays are lit, then the enclosure contains only two RF72 disk ISEs.

The procedure for installing the upgrade kit is in Appendix B.

This section describes the step-by-step procedures for installing an SF72 storage enclosure in SF200 storage array positions 1, 2, 3, 4, 7, or 8.

Be sure to:

- Follow each step in order, and do not skip any steps
- Leave sufficient room to perform the installation (approximately 1.5 meters to 1.8 meters [5 feet to 6 feet] front and rear of the array)

CAUTION
Observe all ESD precautions and procedures.

An antistatic wrist strap is inside the front and rear doors.

CAUTION
Do not attempt to pick up or support the SF72 by the handle in the rear of the enclosure. Doing so will injure the person attempting the installation or damage the power supply.

To maintain stability, only one SF72 storage enclosure or magazine tape subsystem should be extended on the slide mounts at a time.

5.1.4.1 Preparing the SF200 Storage Array

The following procedure describes how to prepare the array to receive the SF72 storage enclosure(s):

1. Place the SF72 to be installed to one side, in front of the array cabinet.
2. Open the front and rear doors of the storage array (Figure 5–4).
3. Remove the front door filler panel that corresponds to the position of the storage array you are installing (Figure 5–4).

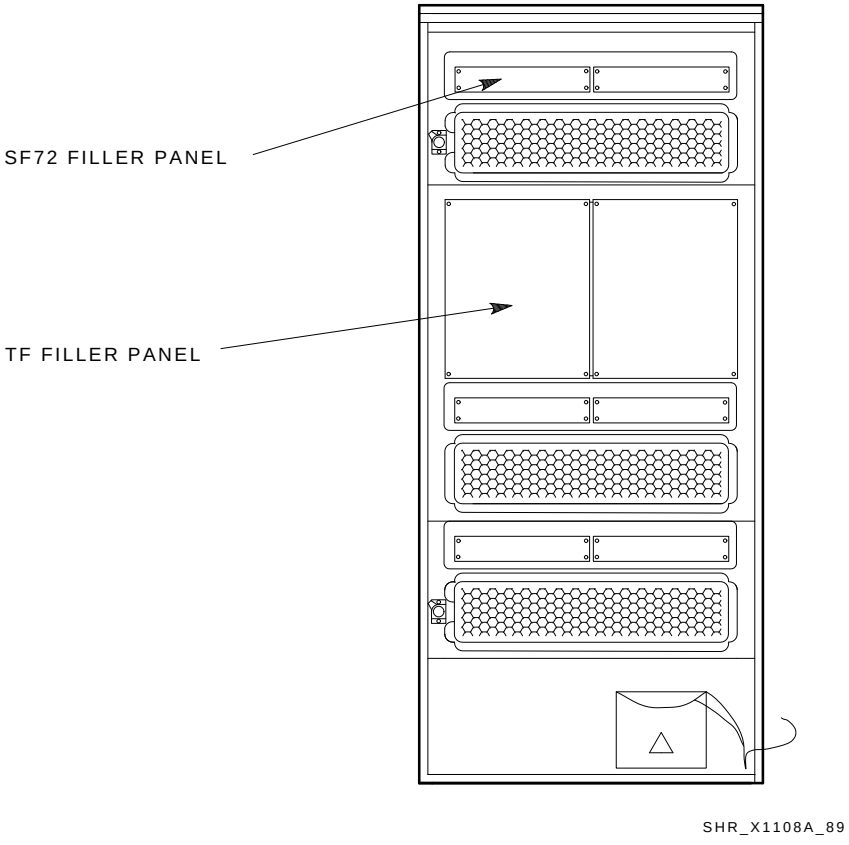


Figure 5–4 Removing a Filler Panel

5.1.4.2 Hardware Installation Procedures

Perform the following steps in full and in the order presented.

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

1. Install the ac power cord (Figure 5–5).
   a. Go to rear of cabinet. Open the DSSI I/O panel by loosening the two captive screws on the right.

      CAUTION
      Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

   b. Locate the ac power cord retainer bracket at the level that you are installing the SF72 storage enclosure.
   c. Loosen the lower screw of the ac retainer bracket. Remove the upper ac power cord retainer bracket screw and tilt the retainer 45 degrees. Then retighten the lower screw.
   d. Place the ac power cord in the retainer space with the shrouded male plug end inside the cabinet side rail.
   e. Leave approximately 0.6 meter (2 feet) of slack at the position location.
   f. Loosen the lower screw and put the retainer bracket back to its original position. Then reinsert the upper screw and tighten both the top and bottom screws.
   g. Connect the male end of the ac power cord to the first available outlet on the 881 power controller.

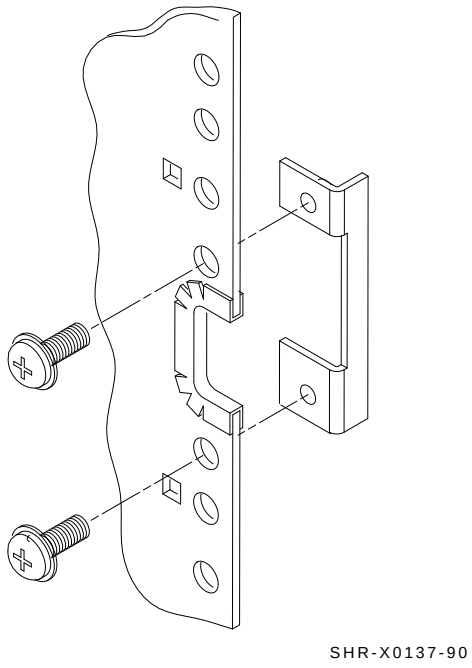


Figure 5–5 AC Power Cord Retainer

2. Install the slide mount and associated hardware (Figure 5–6).

   The slide mount has two parts. One part is called the “adjustable” end and the other is called the “slotted” end. The adjustable end has four screws that, when loosened, allow the slide mount to be placed in the cabinet and then extended to make a secure fit.

   When installing the slide mount in positions 1, 3, 5, and 7, install the slotted end in the front left cabinet frame rail. When installing the slide mount in positions 2, 4, 6, and 8, install the adjustable end in the front right cabinet frame rail. The number for each position is labeled on the right and left cabinet frame rail on the front and the rear of the cabinet.

   a. Loosen the four screws in the adjustable end of the slide mount.

   b. From the front of the cabinet, place the slide mount in the cabinet so that the stamped UP and arrow are visible.

   c. Align the guide pin with the X stamped in the cabinet frame rail.

   d. Install one 7/16-inch shoulder screw and washer (hand-tighten) in the center threaded hole of the slide mount.

   e. Install the opposite end of the slide mount into the rear cabinet side rail. Again, align the guide pins with the X on the rail.

   f. Install one 7/16-inch shoulder screw and washer (hand-tighten) in the center threaded hole of the slide mount.

   g. At the rear of the cabinet, install two 1/2-inch shoulder screws with washers and the DSSI cable retainer clip. Note that the DSSI cable retainer clip must always point away from the center of the cabinet.

      - Place a 1/2-inch shoulder screw with a washer through the upper hole of the DSSI cable retainer clip and install the screw (hand-tighten) in the top threaded hole in the slide mount.

      - Place the other 1/2-inch shoulder screw with a washer through the lower hole of the DSSI cable retainer clip and install the screw (hand-tighten) in the threaded hole in the slide mount.

h. While facing the rear of the cabinet, install two 7/16-inch shoulder screws with washers (hand-tighten) — one screw in the bottom threaded hole and the other in the threaded hole beneath the center rear shoulder screw (hand-tighten) previously installed.

i. While facing the front of the cabinet, install two 7/16-inch shoulder screws with washers (hand-tighten) — one screw in the bottom threaded hole and the other in the threaded hole beneath the center rear shoulder screw (hand-tighten) previously installed.

j. Tighten all shoulder screws.

k. Tighten the four slide mount screws.

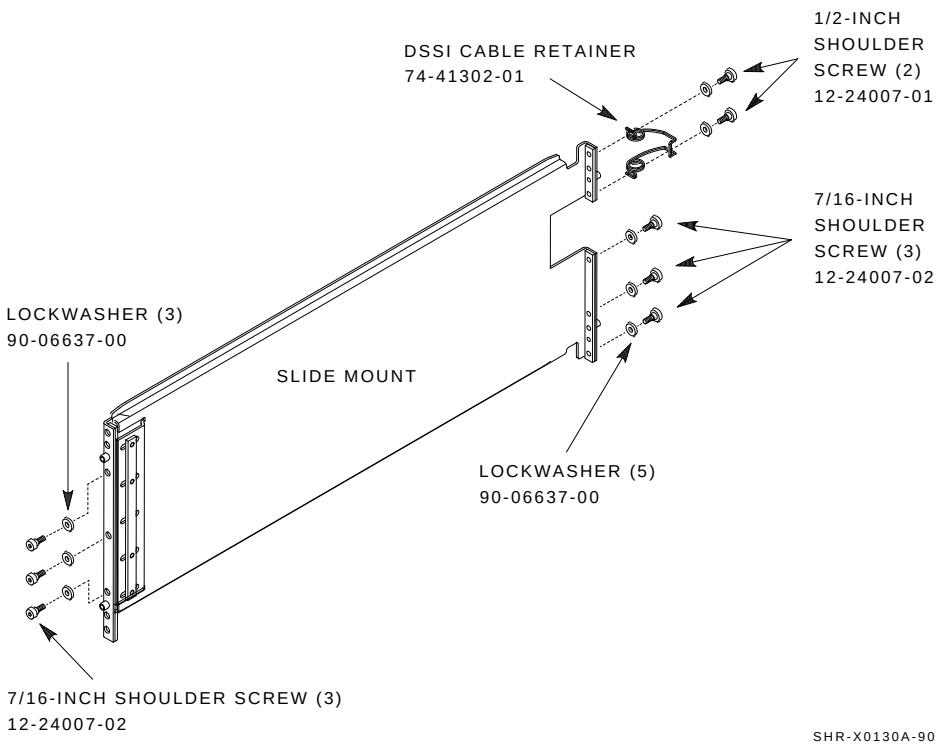


Figure 5–6 Installing the Slide Mount

l. From the front of the cabinet, install the upper and lower weldment brackets on the cabinet side rail using 1/2-inch shoulder screws and washers (Figure 5–7).

   The center hole of the weldment bracket goes over the guide pin on the slide mount so the large end of the top weldment bracket points up and the large end of the bottom weldment bracket points down, regardless of whether you are installing the brackets on the front right or left cabinet frame rails.

NOTE
Do NOT tighten the screws at this time.

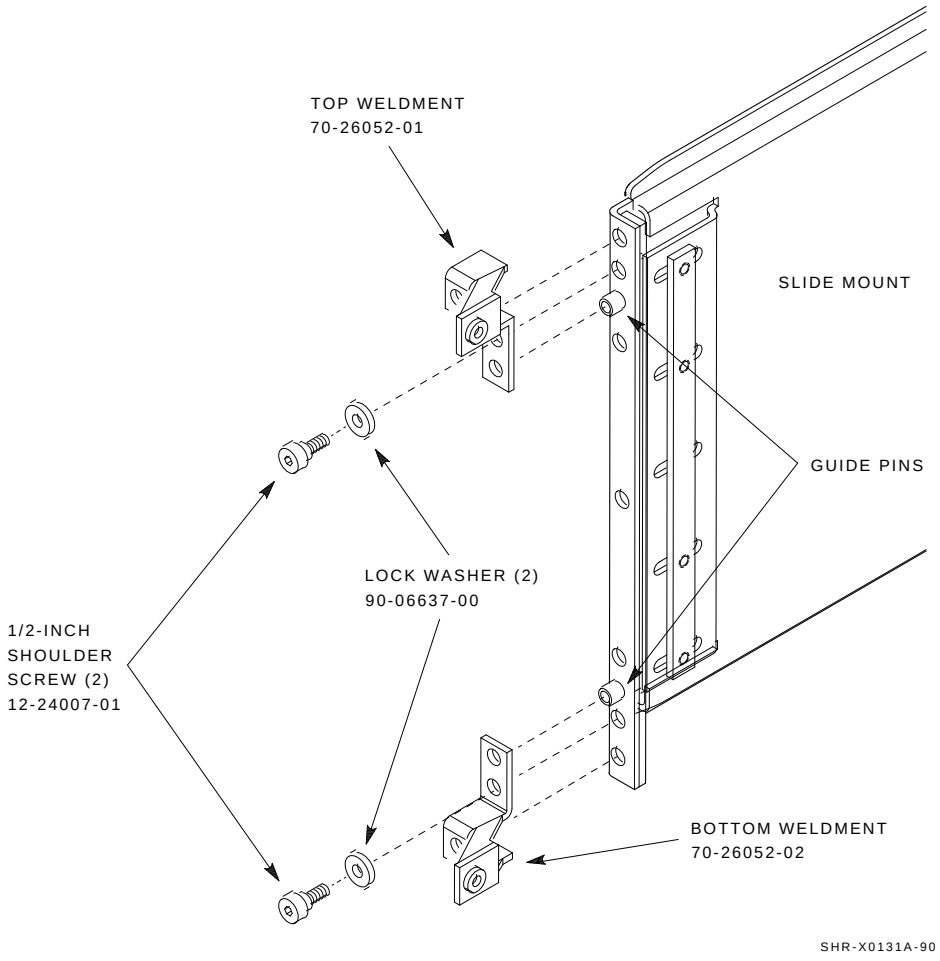


Figure 5–7 Installing the Weldment Brackets

3. Install the SF72.
   a. Install both chassis retainers on the front, right or left side, of the SF72 extrusion tube (top and bottom, Figure 5–8).

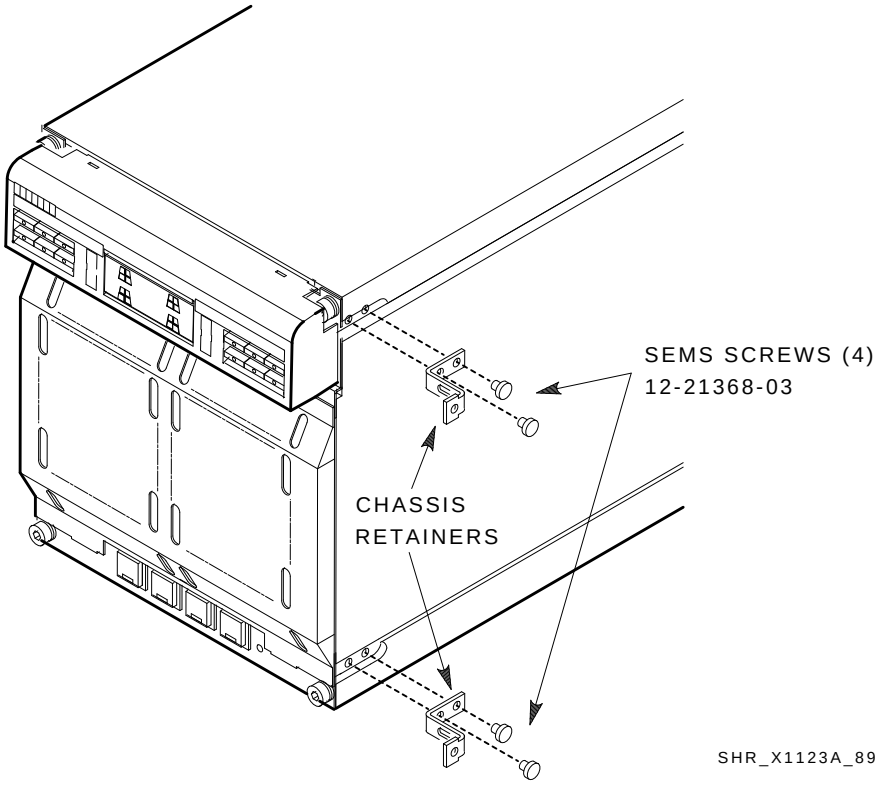


Figure 5–8 Chassis Retainers

b. At the front of the cabinet, hoist the SF72 assembly by using the lifting device or three people to lift the SF72 storage enclosure up and onto the slide mount. Push the assembly halfway into the cabinet.

c. From the rear of the storage array, pull the SF72 assembly all the way onto the slide mount until the chassis retainers contact the weldment brackets.

d. Install and tighten the two outer weldment bracket screws, then install and tighten the two inner weldment bracket screws (Figure 5–9).

e. Tighten the upper and lower weldment 1/2-inch shoulder screws and washers.

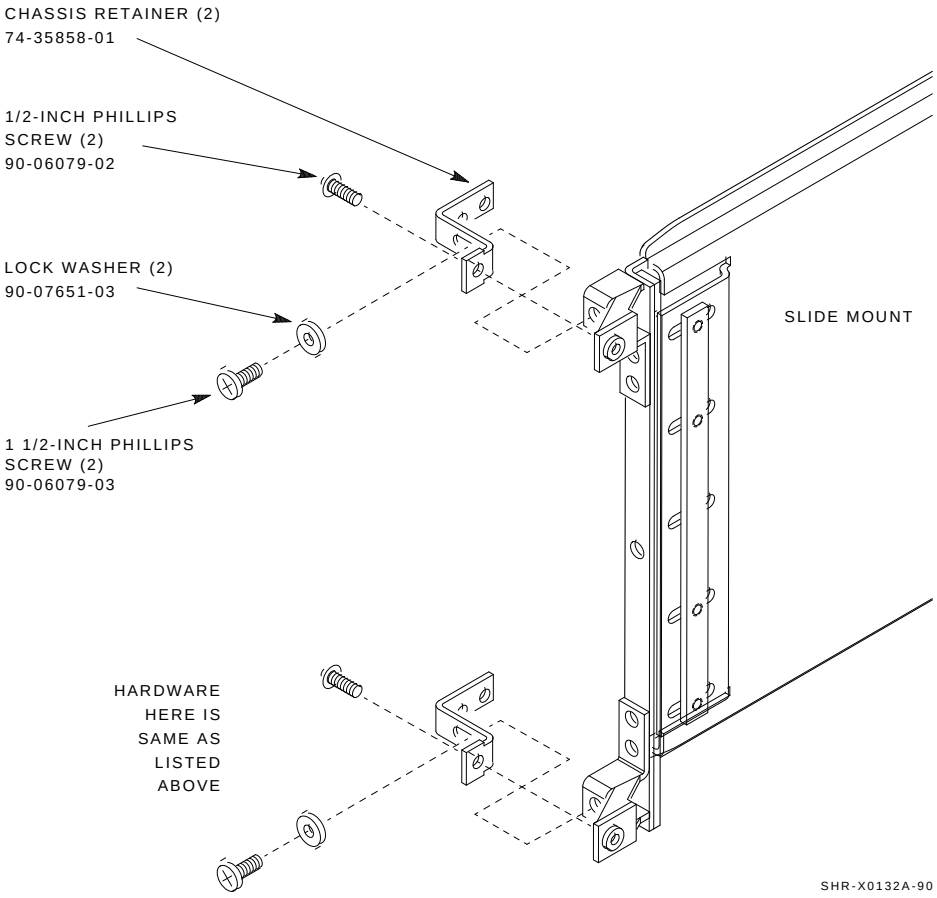


Figure 5–9 Securing the SF72 to the Weldment Brackets

4. Do the following if you are installing an SF72 in position 3 or 8 (single-host only):

   CAUTION
   To maintain stability, extend only one SF72 storage enclosure or magazine tape subsystem on the slide mounts at a time.

   a. Loosen the four captive slide assembly screws. Slide the inner assembly out until the drawer locks in the service position.

   b. Push the inner assemply forward from the rear.

      NOTE
      Do NOT completely remove the SF72 inner drawer assembly from the extrusion tube and extend only one at a time.

   c. Reconfigure the TTM for split-bus mode by first moving the small black jumper to the split-bus terminals, then moving cable connectors to the right pair of sockets.

   d. Push the SF72 inner drawer back in, replace the front cover door, and tighten the four front door screws. To prevent pinching any cables, be sure that all cables are dressed correctly.

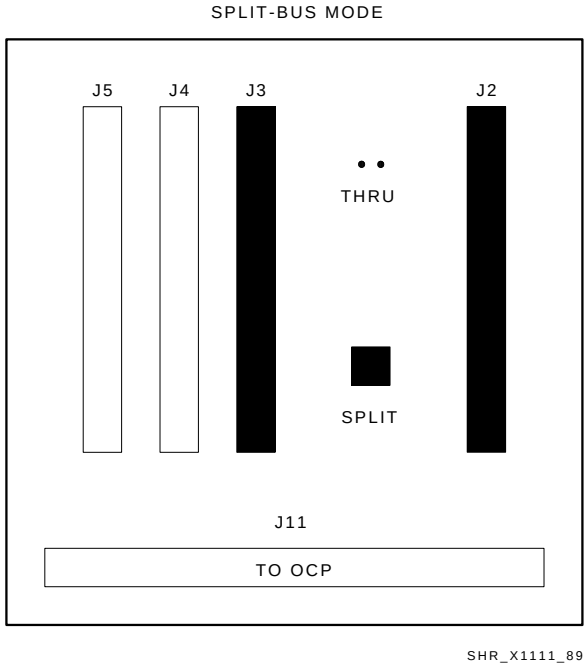


Figure 5–10 Changing an SF72 to Split-Bus Mode

5. Position the OCP.

   a. Adjust the SF72 OCP mount (Figure 5–11) to the **LEFT** for positions 1, 3, and 7, and to the **RIGHT** for positions 2, 4, and 8.

   b. Check that this and all other OCPs and magazine tape subsystem fronts project through the front door of the storage array correctly. It maybe necessary to adjust cabinet door mounting at the door hinges.

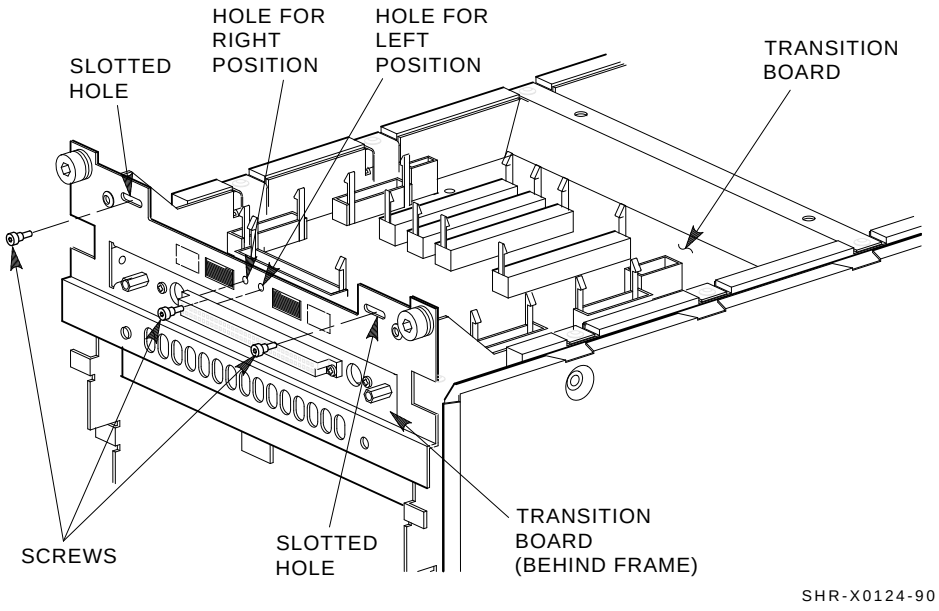


Figure 5–11 Adjusting the OCP

6. Check the DSSI ID switches on the OCP.

   Open the door on the front of the OCP. Ensure that the DSSI ID switches (the three rightmost switches) are set according to Figure 5–12. If they are not, then use a pointed instrument to set the switches to their correct configuration. Refer to Table 5–3.

   NOTE
   The leftmost switch (MSCP) should in the down or enabled position at all times, unless you are instructed to change it to the up or disabled position.

Table 5–3 DSSI ID Switch Settings (SF72 Only)

Positions 1, 2, 4, and 7[1]	
Left Rear (LR)	001
Left Front (LF)	010
Right Front (RF)	011
Right Rear (RR)	100
Positions 3 and 8 (Single-Host Only)[1]	
Left Rear (LR)	101
Left Front (LF)	110
Right Front (RF)	110
Right Rear (RR)	101

[1]The switch settings for OCPs in these positions are 0 = down and 1 = up.

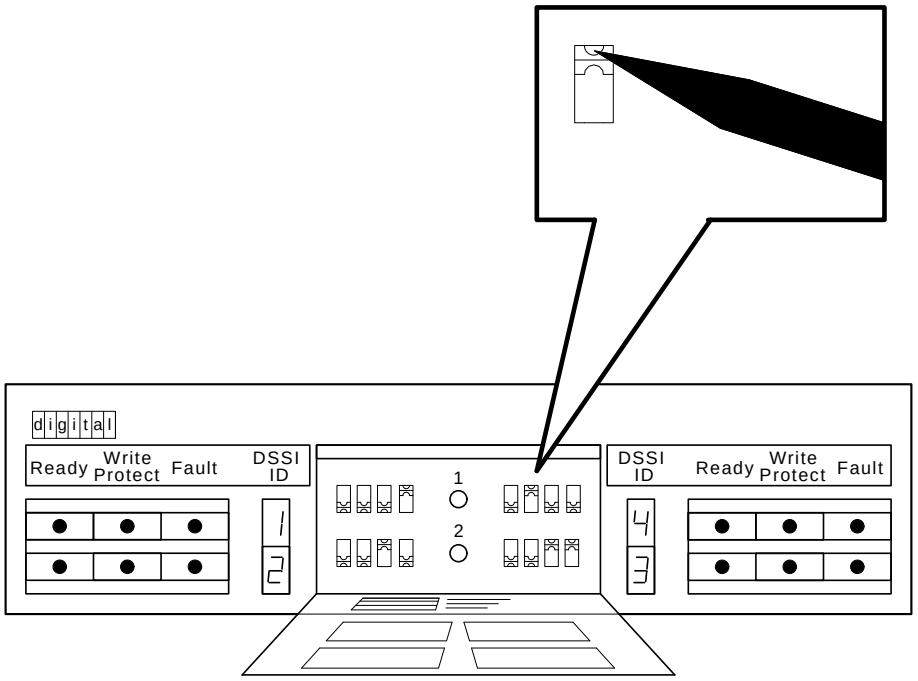


Figure 5–12 DSSI ID Switch Settings

CAUTION
Observe all ESD precautions and procedures.

An antistatic wrist strap is inside the front and rear doors.

7. Install the OCP (Figure 5–13).

NOTE
Ensure that the power if off to the enclosure.

Make sure that ALL the buttons are in the out position.

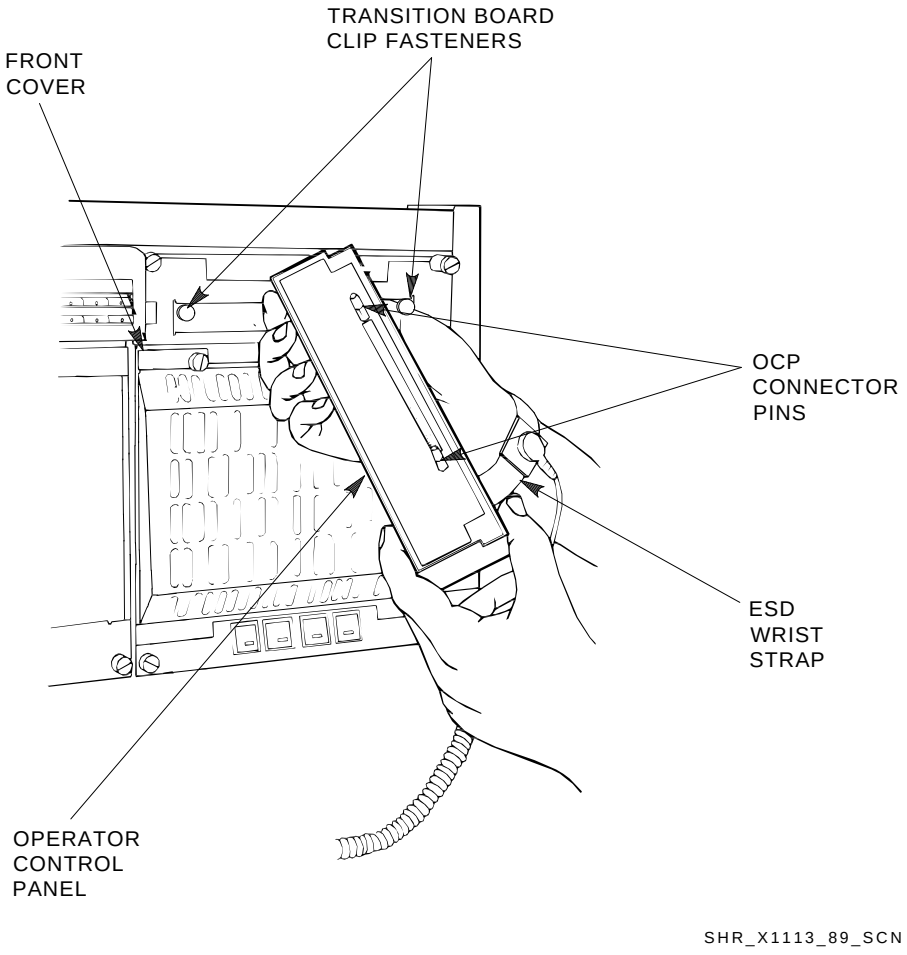


Figure 5–13 Installing the OCP on the SF72 Enclosure

8. At the front of the SF72 enclosure, make sure that all four (4) drive dc power switches are out (Figure 5–14).

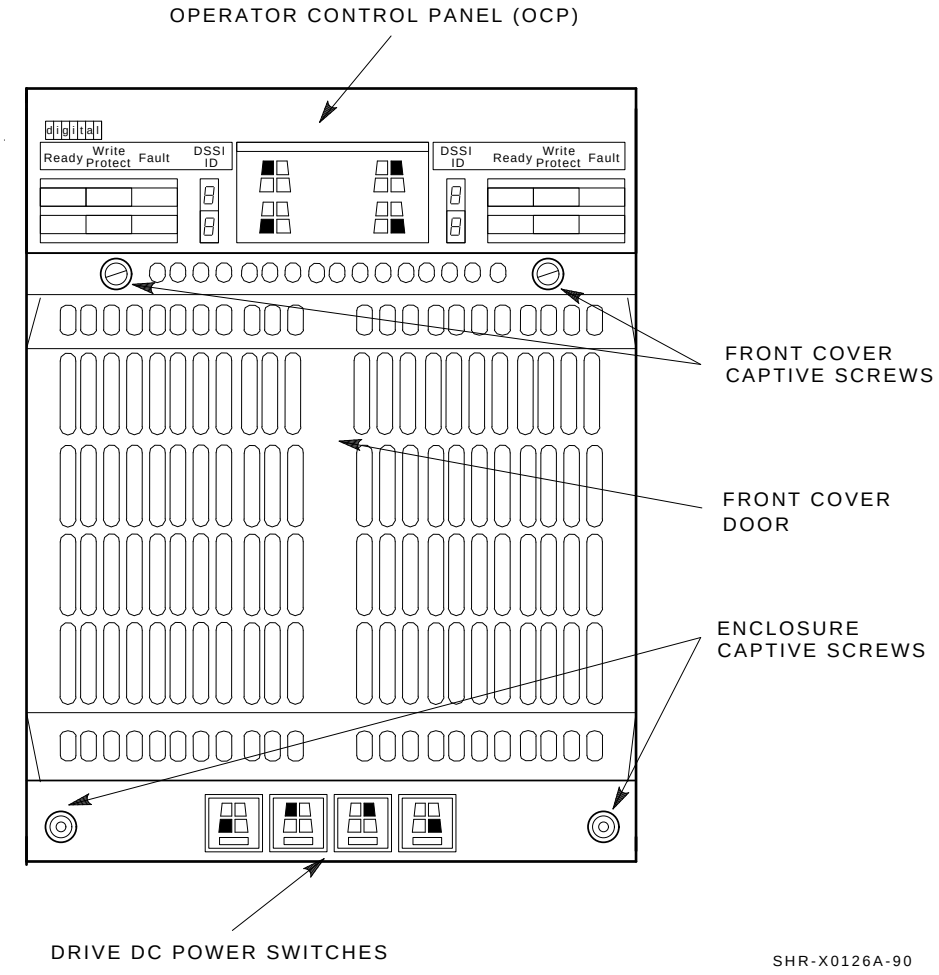


Figure 5–14 Drive DC Power Switches

9. At the rear of the SF72 enclosure, make sure that the ac power switch is in off or in the 0 position (Figure 5–15).
10. Also check the select line voltage. Set it to the correct setting for your application.
11. At this time, connect the ac power cord to the SF72 enclosure.

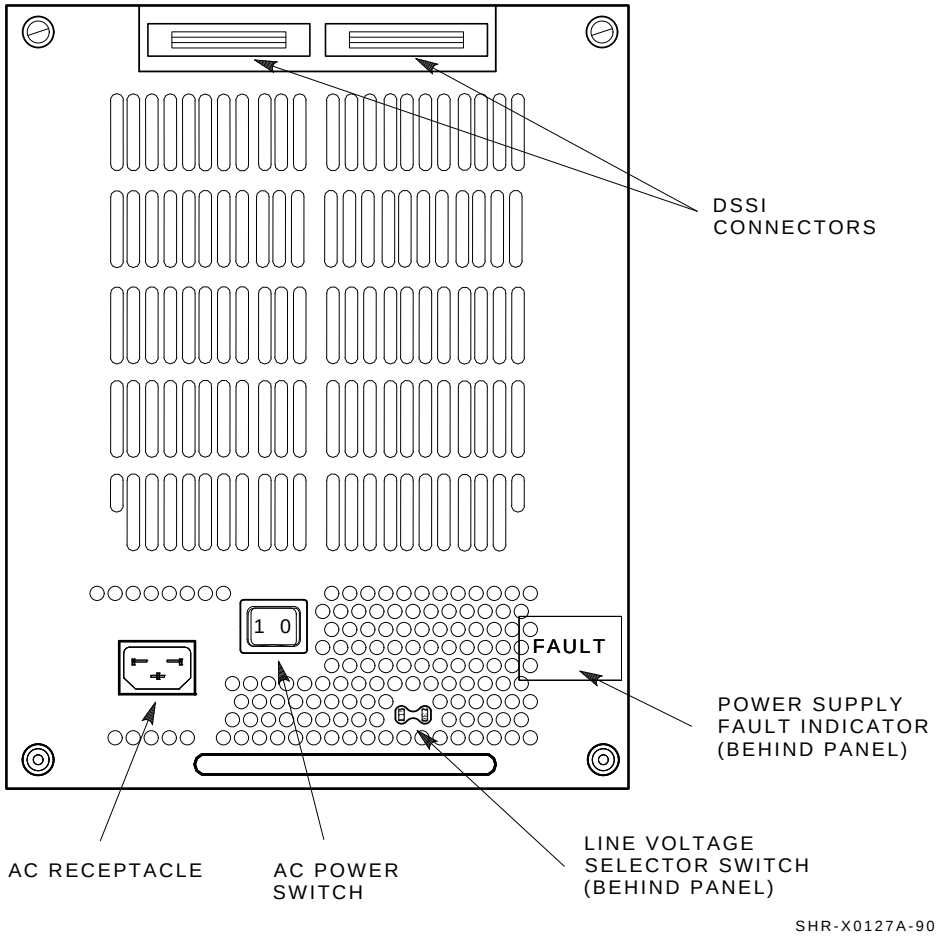


Figure 5–15 AC Power Switch, Voltage Selections, and Power Cord

5.2 Cabling the SF72 in Storage Array Position

This section describes the step-by-step procedure to cable the SF72 storage enclosure that you just installed to the existing DSSI bus configuration of the SF200 storage array.

Refer to Section 5.2.1 for instructions on how to cable the SF72 storage enclosure in an SF200 storage array configured for single-host. Refer to Section 5.2.2 for instructions on how to cable the SF72 storage enclosure in an SF200 storage array configured for dual-host.

Once the cabling of the SF200 storage array is complete, each bus must be connected to match one of the following eight buses. Figure 5–16 shows the five possible single-host configurations, and Figure 5–17 shows the three possible dual-host configurations.

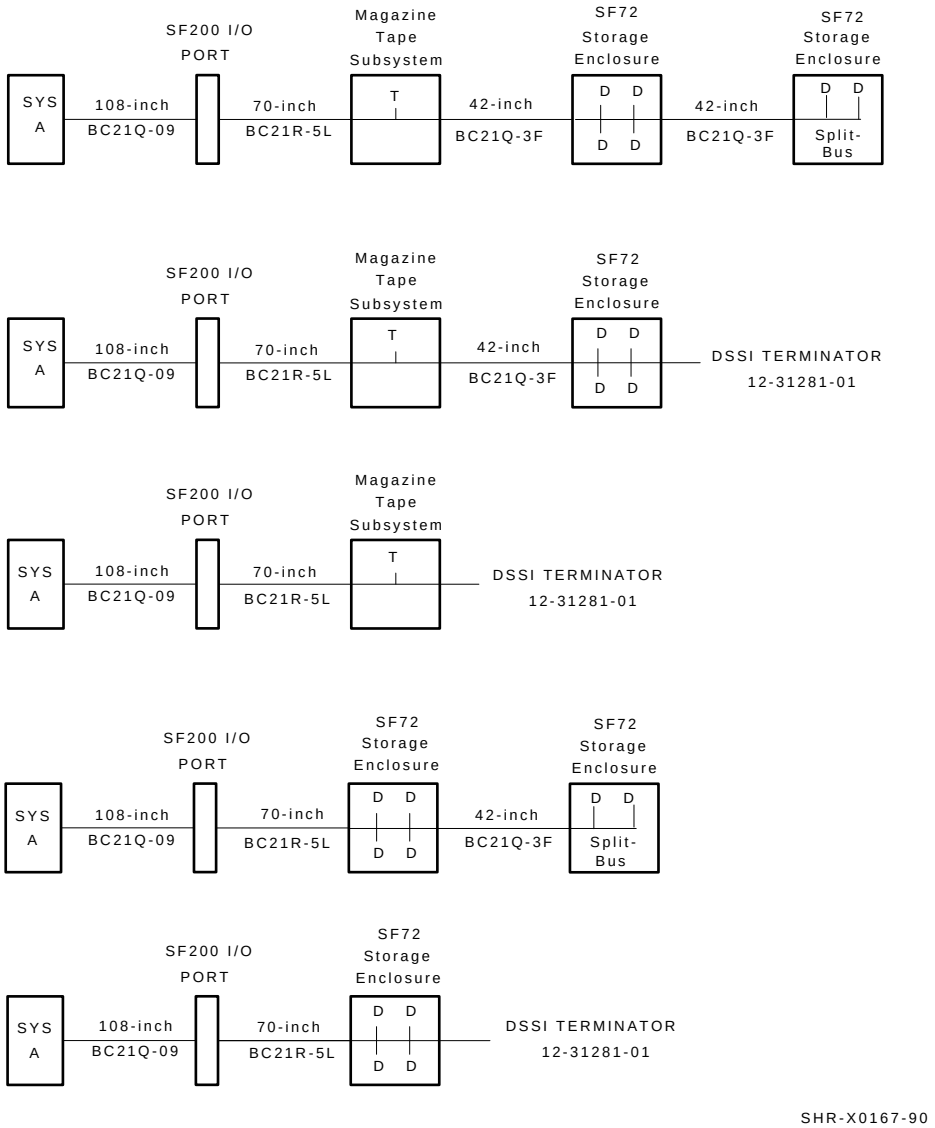


Figure 5–16 Single-Host Bus Configurations

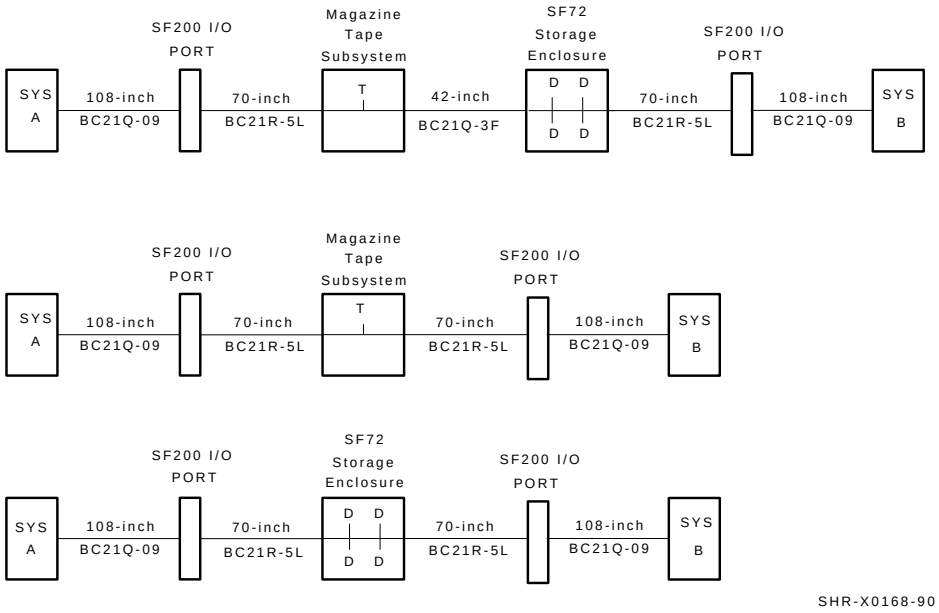


Figure 5–17 Dual-Host Bus Configurations

5.2.1 Single-Host Configuration

Use the following procedures for cabling an SF72 storage enclosure in an existing SF200 storage array configured for single-host.

The following procedures assume that all devices installed previous to a new installation of an SF72 storage enclosure are cabled in the single-host configuration.

5.2.1.1 Identifying DSSI Connectors on the System I/O Panel

The following procedure explains how to locate and identify the DSSI connections on the VAX 6000 system I/O panel.

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the systems that the SF200 storage array is connected to.

NOTE
This procedure assumes that no SF72 storage enclosures are installed internally in the system cabinet. If SF72 storage enclosures are in the system cabinet, then one of the KFMSA modules in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array. DO NOT COUNT this KFMSA module in the following steps.

1. Open the system I/O panel on the system by removing the six screws that secure the I/O panel to the system chassis. Let the panel swing down to its rest position.
2. Find the first KFMSA module installed in the XMI backplane of the system. It will be the KFMSA module in the lowest numbered slot of the XMI backplane.
3. Follow the cabling from the backplane to the system I/O panel.
4. While viewing the front of the I/O panel, note that the DSSI connector on the left is KFMSA DSSI bus 2 and the DSSI connector on the right is KFMSA DSSI bus 1. These connectors should be labeled BLUE for bus 1 and RED for bus 2.
5. Find the next KFMSA module installed in the XMI backplane of the system. It will be the next KFMSA module after the KFMSA module in the lowest numbered slot of the XMI backplane.
6. Follow the cabling from the backplane to the system I/O panel.

7. While viewing the front of the I/O panel, note that the DSSI connector on the left is KFMSA DSSI bus 2 and the DSSI connector on the right is KFMSA DSSI bus 1. These connectors should be labeled YELLOW for bus 1 and GREEN for bus 2.

If these connectors are not labeled, label them now with the small colored labels in the *SF Family Label Booklet* (part number 36–32882–01).

For the single-host configuration, use the BLUE, RED, YELLOW, and GREEN labels only.

5.2.1.2 Cabling Position 1

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

The following steps are for cabling position 1 with a magazine tape subsystem in position 5:

CAUTION
Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

1. Tighten the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 5.
2. Remove the DSSI terminator from the bottom DSSI connector on the rear of the magazine tape subsystem in position 5.
3. Install a 42-inch DSSI cable (part number BC21Q–3F) in the bottom DSSI connector on the rear of the magazine tape subsystem in position 5 (Figure 5–18).
4. Loosen the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 5.
5. Pull the inner assembly of the magazine tape subsystem out to the head-cleaning position (first mechanical stop).

6. Route this DSSI cable under the cable retainers on the right side of the cabinet. Cabling the magazine tape subsystem with the inner assembly pulled out to the head-cleaning position ensures that the correct cable slack will be provided when the inner assembly is pushed back into the extrusion tube.
7. Push the inner assembly of the magazine tape subsystem back into the extrusion tube.
8. Connect the 42-inch DSSI cable from the bottom DSSI connector on the rear of the magazine tape subsystem in position 5 to the rightmost DSSI connector on the rear of the SF72 storage enclosure in position 1.

NOTE

Perform the next step if this is the only SF72 storage enclosure to be installed on this particular DSSI bus. If not, then proceed to the cabling instructions for the next SF72 storage enclosure that has been installed.

9. Install a DSSI terminator in the leftmost DSSI connector at the rear of the SF72.

CAUTION

Do not apply power to the SF72 storage enclosure at this time.

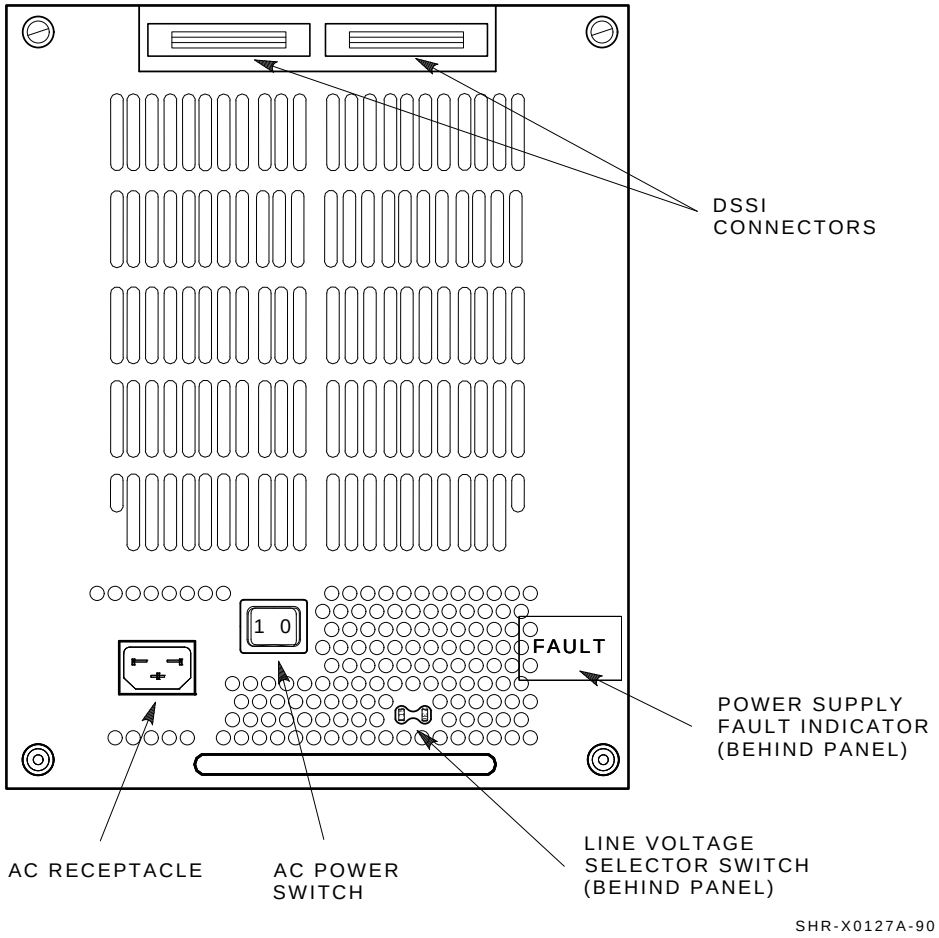


Figure 5–18 Installing the 42-Inch DSSI Cable for Position 1

5.2.1.3 Cabling Position 2

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

The SF72 storage enclosure installed in position 2 of the SF200 storage array has two possible cabling configurations. The difference depends on whether a magazine tape subsystem is installed in position 6 of the SF200 storage array.

The following steps are for cabling position 2 without a magazine tape subsystem in position 6:

1. At the rear of the SF200 storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank in port 2 of the I/O panel.
4. Install a 70-inch DSSI cable (part number BC21R–5L) in place of the panel blanks you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel (Figure 5–19).
5. Plug the other end of this cable into the rightmost DSSI connector at the rear of the SF72 storage enclosure in position 2 (Figure 5–20).
6. Route this DSSI cable under the cable retainers on the left side of the cabinet.
7. Plug a 108-inch DSSI cable (part number BC21Q–09) into the DSSI cable you just installed in port 2. Tighten the retainer screws with your fingers.

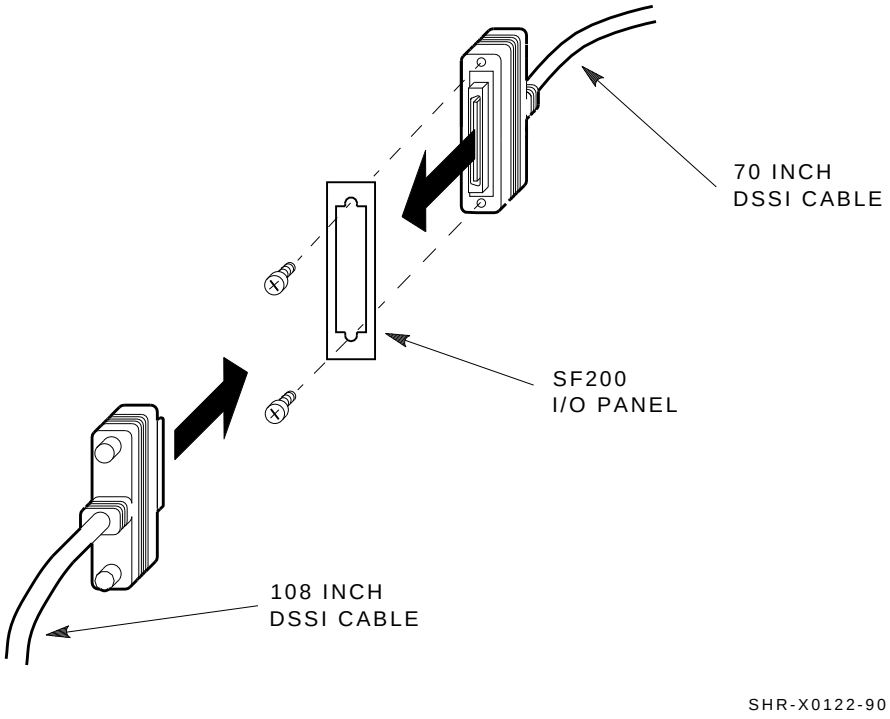


Figure 5–19 Installing the 70- and 108-Inch DSSI Cables for Position 2

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

8. Plug the other end of the 108-inch DSSI cable into the appropriate port on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

   a. Locate the DSSI connectors on the system I/O panel labeled BLUE and RED.

   b. From port 2 on the SF200 I/O panel, connect the 108-inch DSSI cable to the left DSSI connector (RED) of the first system I/O panel.

CAUTION

Do not apply power to the SF72 storage enclosure at this time.

NOTE

Perform the next step if this is the only SF72 storage enclosure to be installed on this particular DSSI bus. If not, then proceed to the cabling instructions for the next SF72 storage enclosure that has been installed.

9. Install a DSSI terminator in the leftmost DSSI connector at the rear of the SF72.

10. Replace the SF200 I/O panel to its original position and secure it by tightening the two right captive screws.

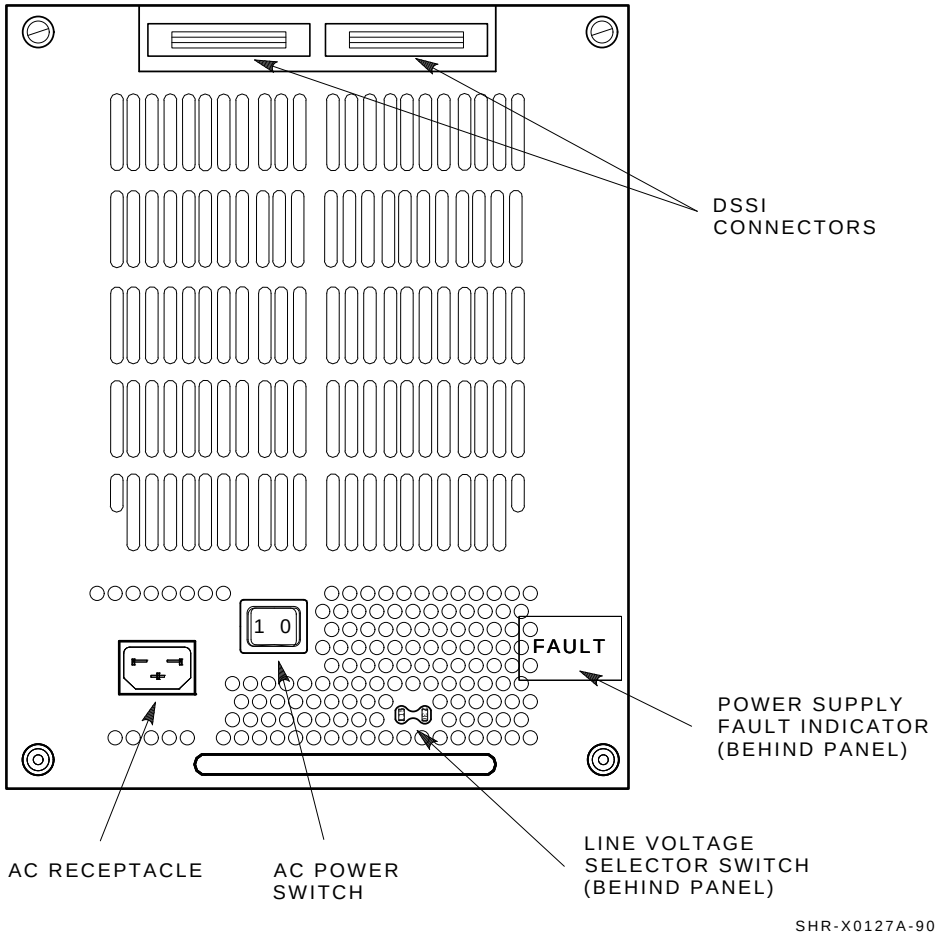


Figure 5–20 Installing the 42-Inch DSSI Cable (Position 2)

The following steps are for cabling position 2 with a magazine tape subsystem in position 6:

CAUTION

Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

1. Tighten the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 6.
2. Remove the DSSI terminator from the bottom DSSI connector on the rear of the magazine tape subsystem in position 6.
3. Install a 42-inch DSSI cable (part number BC21Q–3F) in the bottom DSSI connector on the rear of the magazine tape subsystem in position 6 (Figure 5–20).
4. Loosen the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 6.
5. Pull the inner assembly of the magazine tape subsystem out to the head-cleaning position (first mechanical stop).
6. Route this DSSI cable under the cable retainers on the left side of the cabinet. Cabling the magazine tape subsystem with the inner assembly pulled out to the head-cleaning position ensures that the correct cable slack will be provided when the inner assembly is pushed back into the extrusion tube.
7. Push the inner assembly of the magazine tape subsystem back into the extrusion tube.
8. Connect the 42-inch DSSI cable from the bottom DSSI connector on the rear of the magazine tape subsystem in position 6 to the rightmost DSSI connector on the rear of the SF72 storage enclosure in position 2.

NOTE

Perform the next step if this is the only SF72 storage enclosure to be installed on this particular DSSI bus. If not, then proceed to the cabling instructions for the next SF72 storage enclosure that has been installed.

9. Install a DSSI terminator in the leftmost DSSI connector at the rear of the SF72.

CAUTION
Do not apply power to the SF72 storage enclosure at this time.

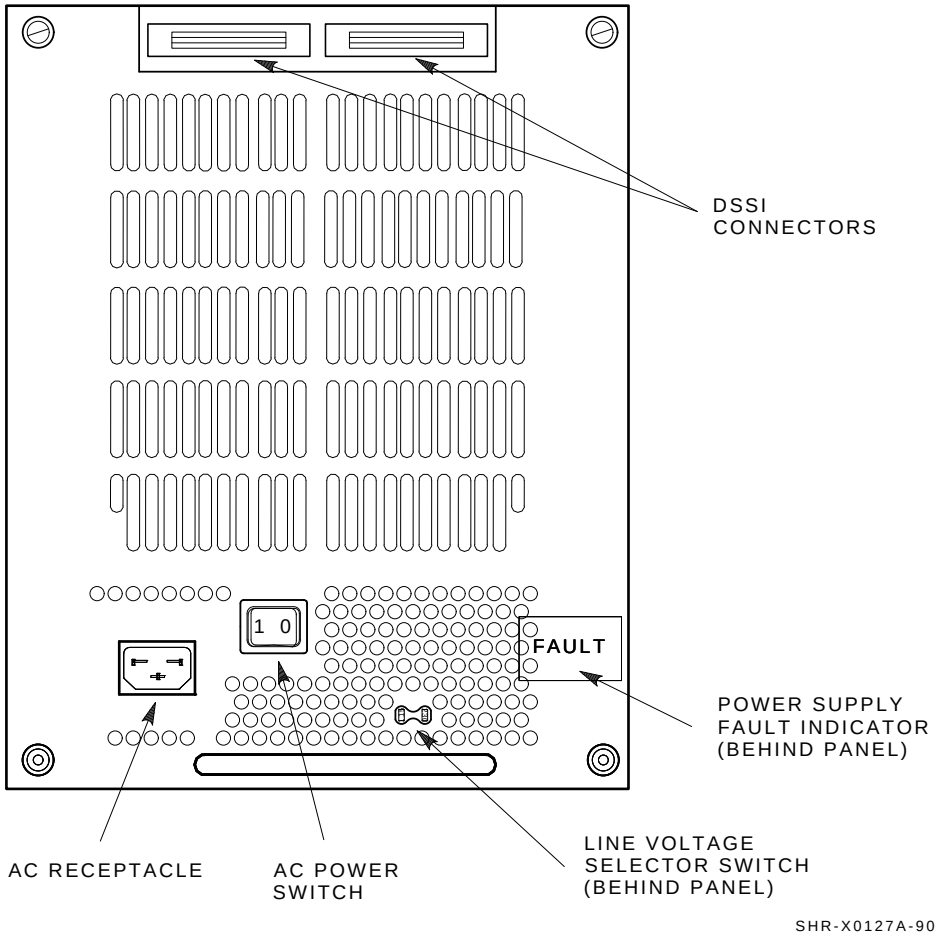


Figure 5–21 Installing the 42-Inch DSSI Cable (Position 2)

5.2.1.4 Cabling Position 4 or 7

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

The following steps are for cabling positions 4 and 7:

1. At the rear of the SF200 storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank in port 3 (for position 4) or port 4 (for position 7).
4. Install a 70-inch DSSI cable (part number BC21R–5L) in place of the panel blanks you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel (Figure 5–22).
5. Plug the other end of the 70-inch DSSI cable into the rightmost DSSI connector at the rear of the SF72 storage enclosure, in either position 4 or 7.
6. Route this DSSI cable under the cable retainers on the appropriate side of the cabinet, left side for position 4, and right side for position 7.
7. Plug a 108-inch DSSI cable (part number BC21Q–09) into the port you just installed in the previous steps (Figure 5–22). Tighten the retainer screws on the 108-inch DSSI cable with your fingers.

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

8. Plug the other end of the 108-inch DSSI cables into the appropriate port on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

   a. Locate the DSSI connectors on the system I/O panel labeled YELLOW and GREEN.

   b. For port 3 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (YELLOW) of the first system I/O panel.

   c. For port 4 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (GREEN) of the first system I/O panel.

CAUTION

Do not apply power to the SF72 storage enclosure at this time.

NOTE

Perform the next step if this is the only SF72 storage enclosure to be installed on this particular DSSI bus. If not, then proceed to the cabling instructions for the next SF72 storage enclosure that has been installed.

9. Install a DSSI terminator in the leftmost DSSI connector at the rear of the SF72 storage enclosure in position 4 or 7.

10. Replace the SF200 I/O panel to its original position and secure it by tightening the two right captive screws.

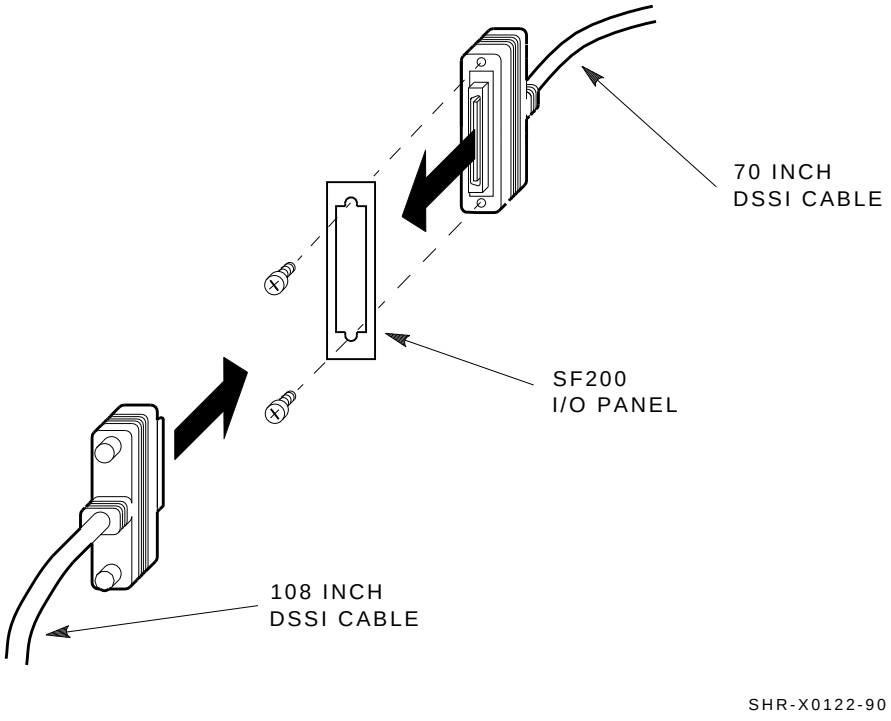


Figure 5–22 Installing 70- and 108-Inch DSSI Cables for Position 4 and 7

5.2.1.5 Cabling Position 3 or 8

WARNING
Before performing the following steps, perform an orderly shutdown of the system that the SF200 storage array is connected to.

The following steps describe cabling for positions 3 and 8. Note that positions 3 and 8 operate in split-bus mode for a single-host configuration.

1. Power down the SF72 storage enclosures in position 1 and 2 if you are installing in position 3. Power down the SF72 storage enclosures in position 4 and 7 if you are installing in position 8. To power down an enclosure, first press the Ready button for each ISE, then press each drive dc power switch (one at a time), and finally at the rear of the enclosure press the ac power switch to 0.
2. Install a 42-inch DSSI cable (part number BC21Q–3F) (Figure 5–23) to the rightmost DSSI connector on the rear of the SF72 storage enclosure in position 3 or 8.
3. Route this DSSI cable under the cable retainers on the right side of the cabinet for position 3. For position 8, route this cable above the SF72 storage enclosures in positions 7 and 8.
4. For position 3, connect this 42-inch DSSI cable to the leftmost DSSI connector at the rear of the SF72 in position 1. For position 8, connect this 42-inch DSSI cable to the leftmost DSSI connector at the rear of the SF72 in position 7.
5. Install a 42-inch DSSI cable (part number BC21Q–3F) (Figure 5–23) to the leftmost DSSI connector on the rear of the SF72 in position 3 or 8.
6. Route this DSSI cable under the cable retainers on the right side of the cabinet for position 3 and on the left side of the cabinet for position 8.
7. For position 3, connect this 42-inch DSSI cable to the leftmost DSSI connector at the rear of the SF72 in position 2. For position 8, connect this 42-inch DSSI cable to the leftmost DSSI connector at the rear of the SF72 in position 4.

WARNING
Do not apply power to the SF72 storage enclosure at this time.

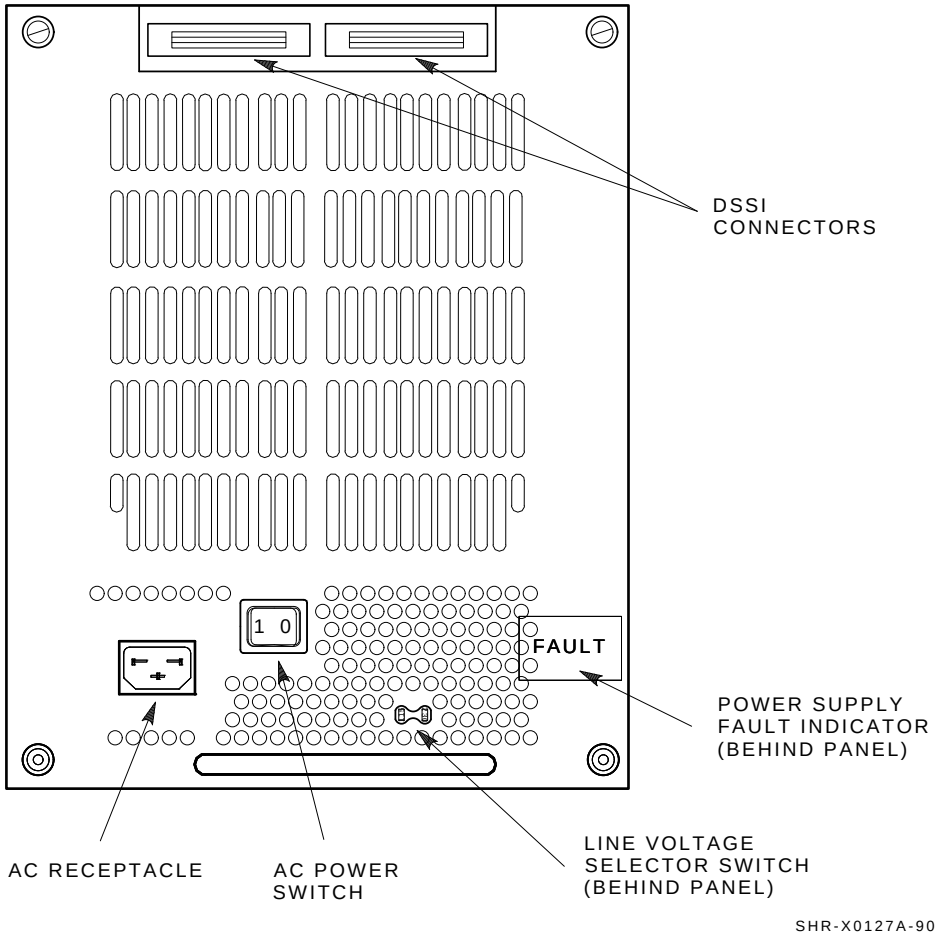


Figure 5–23 Installing the 42-Inch DSSI Cable to Position 3 and 8

5.2.2 Dual-Host Configuration

Use the following procedures for cabling an SF72 storage enclosure in an existing SF200 storage array configured for dual-host.

The following procedures assume that all devices installed previous to an new installation of an SF72 storage enclosure are cabled in the dual-host configuration.

5.2.2.1 Identifying DSSI Connectors on the System I/O Panel

The following procedure explains how to locate and identify the DSSI connections on the VAX 6000 system I/O panel.

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the systems that the storage array is connected to.

NOTE

This procedure assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array. DO NOT COUNT this KFMSA module in the following steps.

1. Open the system I/O panels on both systems by removing the six screws that secure the I/O panel to the system chassis. Let the panel swing down to its rest position.
2. Find the first KFMSA module installed in the XMI backplane of each system. It will be the KFMSA module in the lowest numbered slot of the XMI backplane.
3. Follow the cabling from the backplane to the system I/O panel.
4. While viewing the front of the I/O panel, note that the DSSI connector on the left is KFMSA DSSI bus 2 and the DSSI connector on the right is KFMSA DSSI bus 1. These connectors should be labeled BLUE for bus 1 and RED for bus 2.
5. Find the next KFMSA module installed in the XMI backplane of each system. It will be the next KFMSA module after the KFMSA module in the lowest numbered slot of the XMI backplane.

6. Follow the cabling from the backplane to the system I/O panel.
7. While viewing the front of the I/O panel, note that the DSSI connector on the left is KFMSA DSSI bus 2 and the DSSI connector on the right is KFMSA DSSI bus 1. These connectors should be labeled YELLOW for bus 1 and GREEN for bus 2.
8. Find the next KFMSA module installed in the XMI backplane of each system. It will be the next KFMSA module after the KFMSA module in the previous steps.
9. Follow the cabling from the backplane to the system I/O panel.
10. While viewing the front of the I/O panel, note that the DSSI connector on the left is KFMSA DSSI bus 2 and the DSSI connector on the right is KFMSA DSSI bus 1. These connectors should be labeled BLUE/WHITE for bus 1 and RED/WHITE for bus 2.

If these connectors are not labeled, label them now with the small colored labels in the *SF Family Label Booklet* (part number 36–32882–01).

5.2.2.2 Cabling Position 1

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the systems that the storage array is connected to.

The following steps are for cabling position 1 with a magazine tape subsystem in position 5:

CAUTION
Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

1. Tighten the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 5.
2. Disconnect the 70-inch DSSI cable (part number BC21R–5L) from the bottom DSSI connector of the magazine tape subsystem in position 5.
3. Reconnect this 70-inch DSSI cable to the leftmost DSSI connector on the rear of the SF72 in position 1 (Figure 5–24).
4. Install a 42-inch DSSI cable (part number BC21Q–3F) in the bottom DSSI connector of the magazine tape subsystem in position 5.
5. Loosen the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 5.
6. Pull the inner assembly of the magazine tape subsystem in position 5 out to its head-cleaning position. Cabling the magazine tape subsystem with the inner assembly pulled out to the head-cleaning position ensures that the correct cable slack will be provided when the inner assembly is pushed back into the extrusion tube.
7. Connect the 42-inch DSSI cable from the bottom DSSI connector of the magazine tape subsystem in position 5 to the rightmost DSSI connector of the SF72 in position 1 (Figure 5–24).
8. Route this DSSI cable under the cable retainers on the right side of the cabinet.
9. Push the magazine tape subsystem in position 5 back into the extrusion tube.

CAUTION
Do not apply power to the SF72 enclosure at this time.

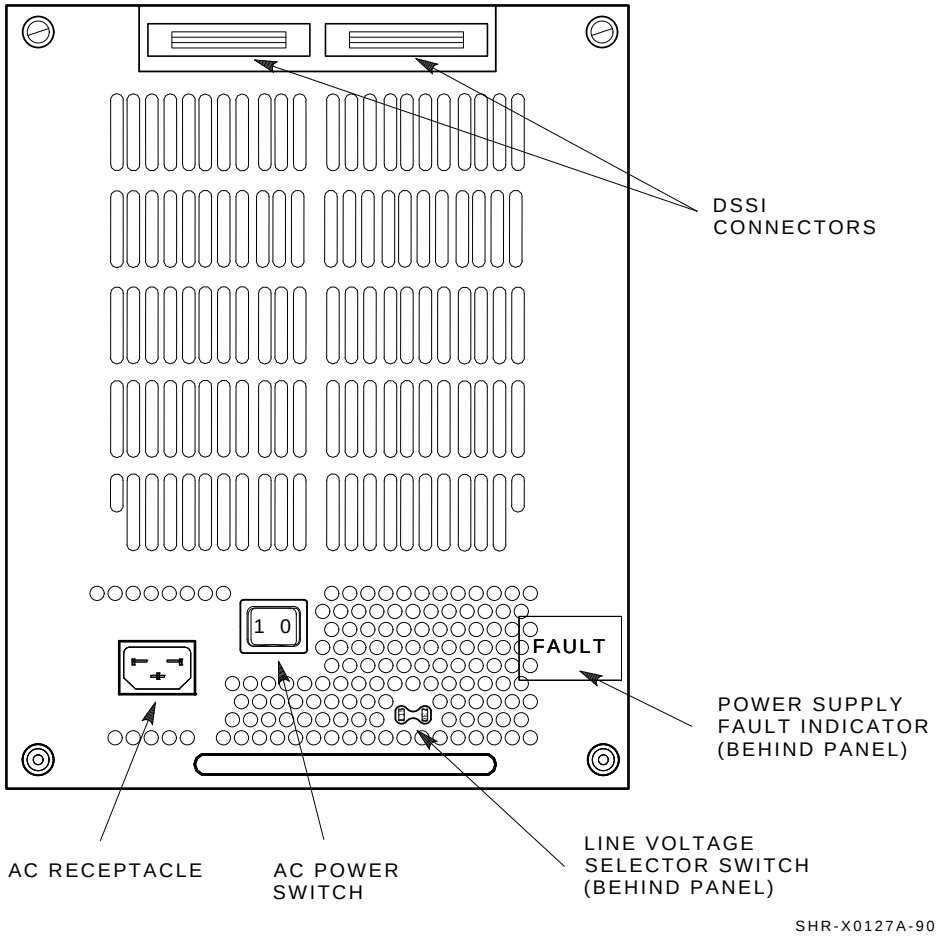


Figure 5–24 Installing the 42-Inch DSSI Cable (Position 1)

5.2.2.3 Cabling Position 2

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

The SF72 storage enclosure installed in position 2 of the storage array has two possible cabling configurations. The difference depends on whether a magazine tape subsystem is installed in position 6 of the SF200 storage array.

The following steps are for cabling position 2 without a magazine tape subsystem in position 6:

1. At the rear of the storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION
   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank in port 2 and port 10.
4. Install two 70-inch DSSI cables (part number BC21R–5L) in place of the panel blanks you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel.
5. Plug the other end of the 70-inch DSSI cable from port 2 into the rightmost DSSI connector at the rear of the SF72.
6. Route this DSSI cable under the cable retainers on the right side of the cabinet.
7. Plug the other end of the 70-inch DSSI cable from port 10 into the leftmost DSSI connector at the rear of the SF72 (Figure 5–25).
8. Route this DSSI cable under the cable retainers on the left side of the cabinet.
9. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 2 and 10 (Figure 5–25). Tighten the retainer screws with your fingers.

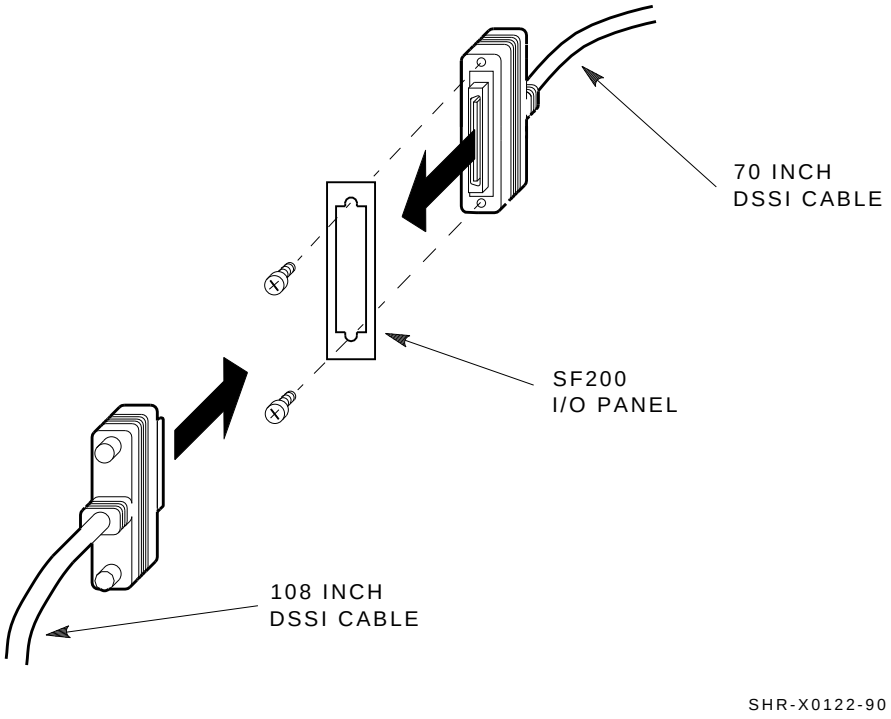


Figure 5–25 Installing the 70- and 108-Inch DSSI Cables for Position 2

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

10. Plug the other end of the 108-inch DSSI cables into the appropriate ports on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

    a. Locate the DSSI connectors on the system I/O panel labeled BLUE and RED.

    b. From port 2 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (RED) of the first system I/O panel.

    c. From port 10 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (RED) of the second system I/O panel.

CAUTION

Do not apply power to the SF72 enclosure at this time.

The following steps are for cabling position 2 with a magazine tape subsystem in position 6:

CAUTION
Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

1. Tighten the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 6.
2. Disconnect the 70-inch DSSI cable (part number BC21R–5L) from the bottom DSSI connector of the magazine tape subsystem in position 6.
3. Reconnect this 70-inch DSSI cable to the leftmost DSSI connector on the rear of the SF72 in position 2 (Figure 5–26).
4. Install a 42-inch DSSI cable (part number BC21Q–3F) in the bottom DSSI connector of the magazine tape subsystem in position 6.
5. Loosen the shipping screw in the rear, upper right corner, of the magazine tape subsystem in position 6.
6. Pull the inner assembly of the magazine tape subsystem in position 6 out to its head-cleaning position. Cabling the magazine tape subsystem with the inner assembly pulled out to the head-cleaning position ensures that the correct cable slack will be provided when the inner assembly is pushed back into the extrusion tube.
7. Connect the 42-inch DSSI cable from the bottom DSSI connector of the magazine tape subsystem in position 6 to the rightmost DSSI connector of the SF72 in position 2 (Figure 5–26).
8. Route this DSSI cable under the cable retainers on the right side of the cabinet.
9. Push the magazine tape subsystem in position 6 back into the extrusion tube.

CAUTION
Do not apply power to the SF72 enclosure at this time.

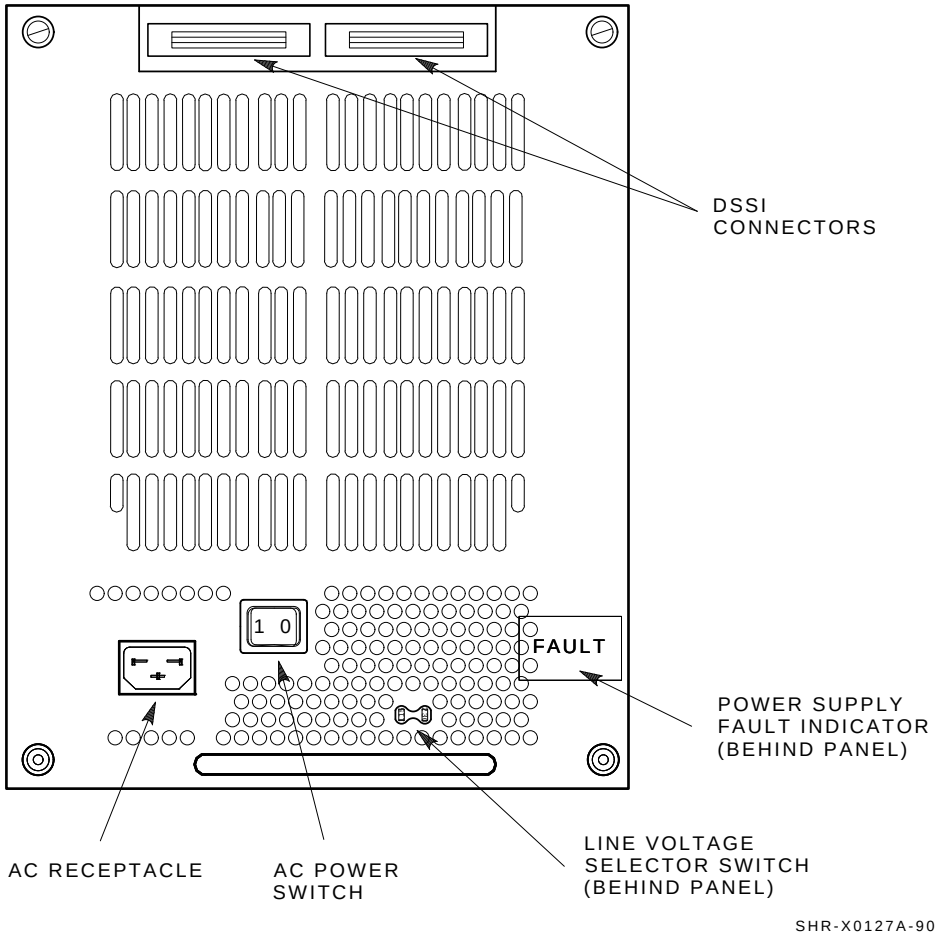


Figure 5–26 Installing the 42-Inch DSSI Cable for Position 2

5.2.2.4 Cabling Position 3

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

The following steps are for cabling position 3:

1. At the rear of the storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION
   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank of port 3.
4. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–27) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the rightmost DSSI connector at the rear of the SF72 in position 3.
5. Remove the two Phillips screws that hold the panel blank of port 11.
6. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–27) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the leftmost DSSI connector at the rear of the SF72 in position 3.
7. For the cable to port 3, route the DSSI cable under the cable retainer on the right side. For the cable to port 11, route the DSSI cable under the cable retainer on the left side.
8. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 3 and 11. Tighten the retainer screws on the 108-inch DSSI cables with your fingers.

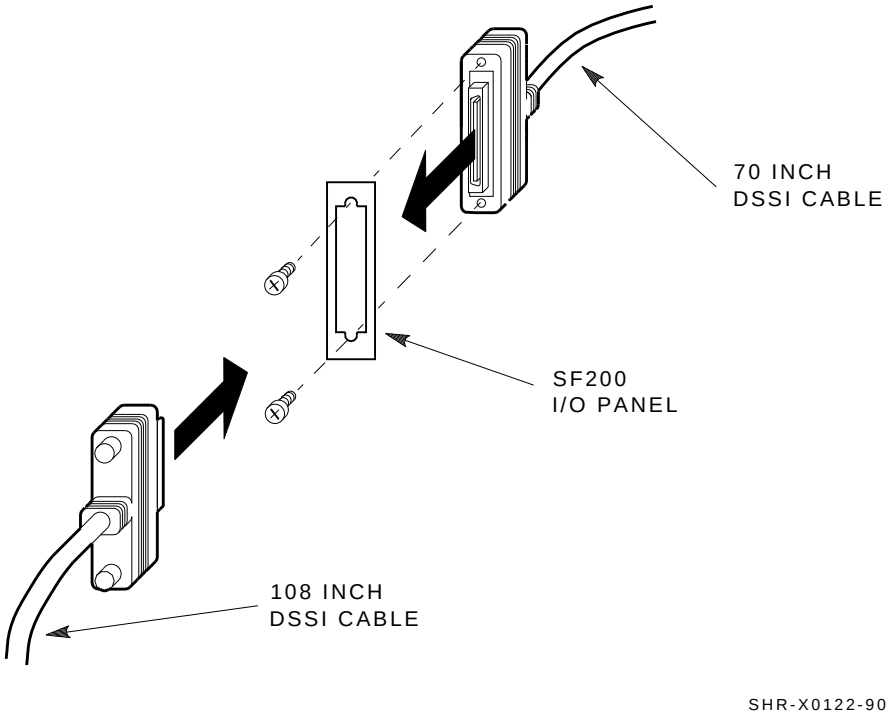


Figure 5–27 Installing the 70-Inch DSSI Cables (Position 3)

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

9. Plug the other end of the 108-inch DSSI cables into the appropriate ports on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

   a. Locate the DSSI connectors on the system I/O panel labeled YELLOW and GREEN.

   b. From port 3 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (YELLOW) of the first system I/O panel.

   c. From port 11 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (YELLOW) of the second system I/O panel.

CAUTION

Do not apply power to the SF72 enclosure at this time.

5.2.2.5 Cabling Position 4

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

The following steps are for cabling position 4:

1. At the rear of the storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION
   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank of port 4.
4. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–28) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the rightmost DSSI connector at the rear of the SF72 in position 4.
5. Remove the two Phillips screws that hold the panel blank of port 12.
6. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–28) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the leftmost DSSI connector at the rear of the SF72 in position 4.
7. For the cable to port 4, route the DSSI cable under the cable retainer on the right side. For the cable to port 12, route the DSSI cable under the cable retainer on the left side.
8. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 4 and 12. Tighten the retainer screws on the 108-inch DSSI cables with your fingers.

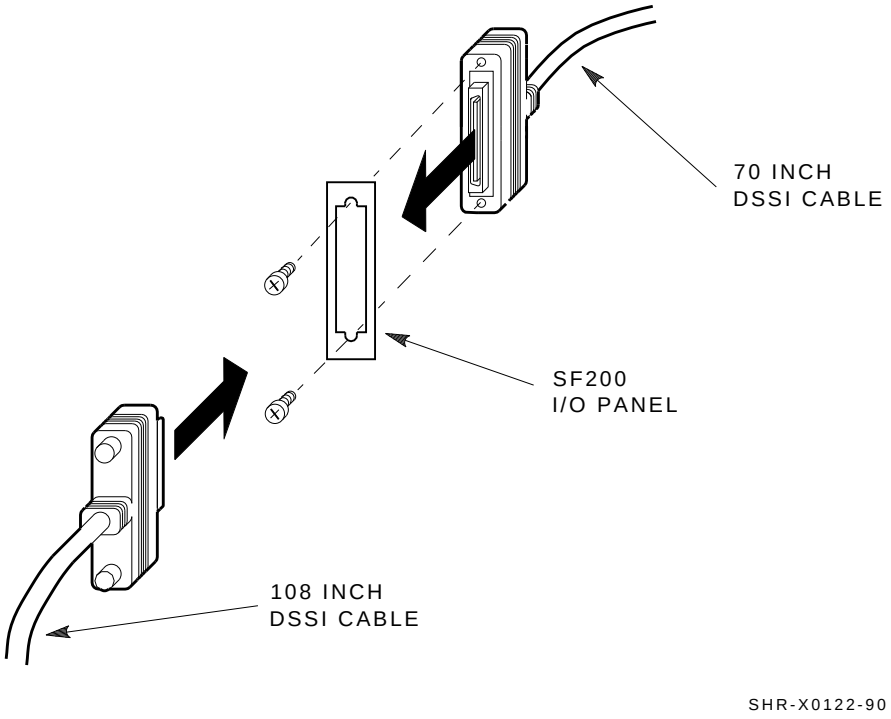


Figure 5–28 Installing the 70- and 108-Inch DSSI Cables for Position 4

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

9. Plug the other end of the 108-inch DSSI cables into the appropriate ports on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

   a. Locate the DSSI connectors on the system I/O panel labeled YELLOW and GREEN.

   b. From port 4 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (GREEN) of the first system I/O panel.

   c. From port 12 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (GREEN) of the second system I/O panel.

CAUTION

Do not apply power to the SF72 enclosure at this time.

5.2.2.6 Cabling Position 7

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

The following steps are for cabling position 7:

1. At the rear of the storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION
   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank of port 5.
4. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–29) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the rightmost DSSI connector at the rear of the SF72 in position 7.
5. Remove the two Phillips screws that hold the panel blank of port 13.
6. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–29) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the leftmost DSSI connector at the rear of the SF72 in position 7.
7. For the cable to port 5, route the DSSI cable under the cable retainer on the right side. For the cable to port 13, route the DSSI cable under the cable retainer on the left side.
8. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 5 and 13. Tighten the retainer screws on the 108-inch DSSI cables with your fingers.
9. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 4 and 12. Tighten the retainer screws on the 108-inch DSSI cables with your fingers.

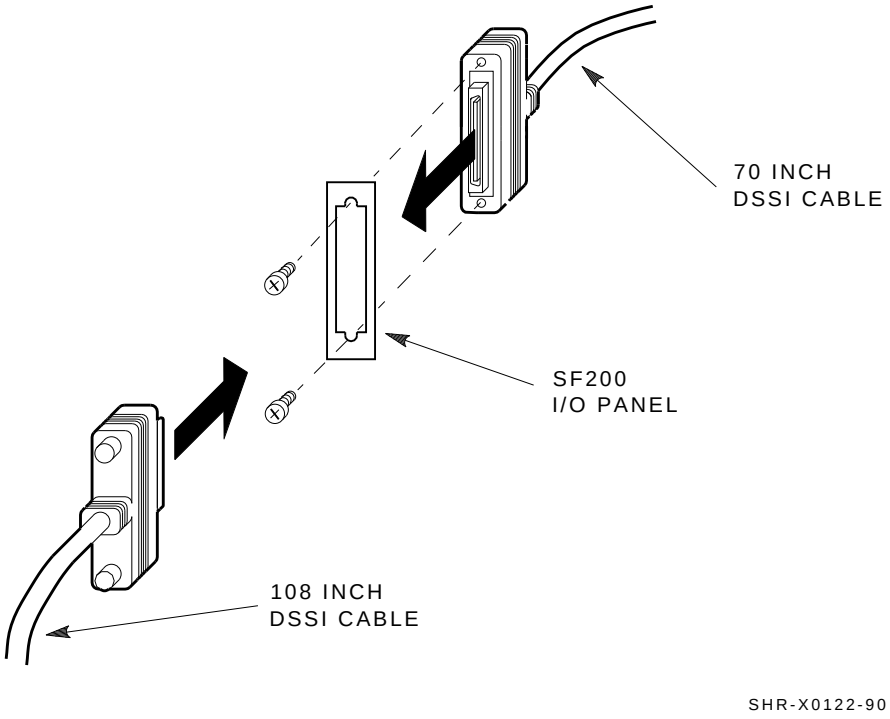


Figure 5–29 Installing the 70- and 108-Inch DSSI Cables for Position 7

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

10. Plug the other end of the 108-inch DSSI cables into the appropriate ports on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

    a. Locate the DSSI connectors on the system I/O panel labeled BLUE/WHITE and RED/WHITE.

    b. From port 5 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (BLUE/WHITE) of the first system I/O panel.

    c. From port 13 on the SF200 I/O panel connect, the 108-inch DSSI cable to the right DSSI connector (BLUE/WHITE) of the second system I/O panel.

CAUTION

Do not apply power to the SF72 enclosure at this time.

5.2.2.7 Cabling Position 8

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the storage array is connected to.

The following steps are for cabling position 8:

1. At the rear of the storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
2. Swing open and remove the panel from the cabinet frame.

   CAUTION
   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

3. Remove the two Phillips screws that hold the panel blank of port 6.
4. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–30) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the rightmost DSSI connector at the rear of the SF72 in position 8.
5. Remove the two Phillips screws that hold the panel blank of port 14.
6. Install a 70-inch DSSI cable (part number BC21R–5L) (Figure 5–30) in place of the panel blank you just removed in the previous step. Secure this cable to the I/O panel with the two Phillips screws removed from the blank panel. Plug the other end of this cable into the leftmost DSSI connector at the rear of the SF72 in position 8.
7. For the cable to port 6, route the DSSI cable under the cable retainer on the right side. For the cable to port 14, route the DSSI cable under the cable retainer on the left side.
8. Plug two 108-inch DSSI cables (part number BC21Q–09) into ports 6 and 14. Tighten the retainer screws on the 108-inch DSSI cables with your fingers.

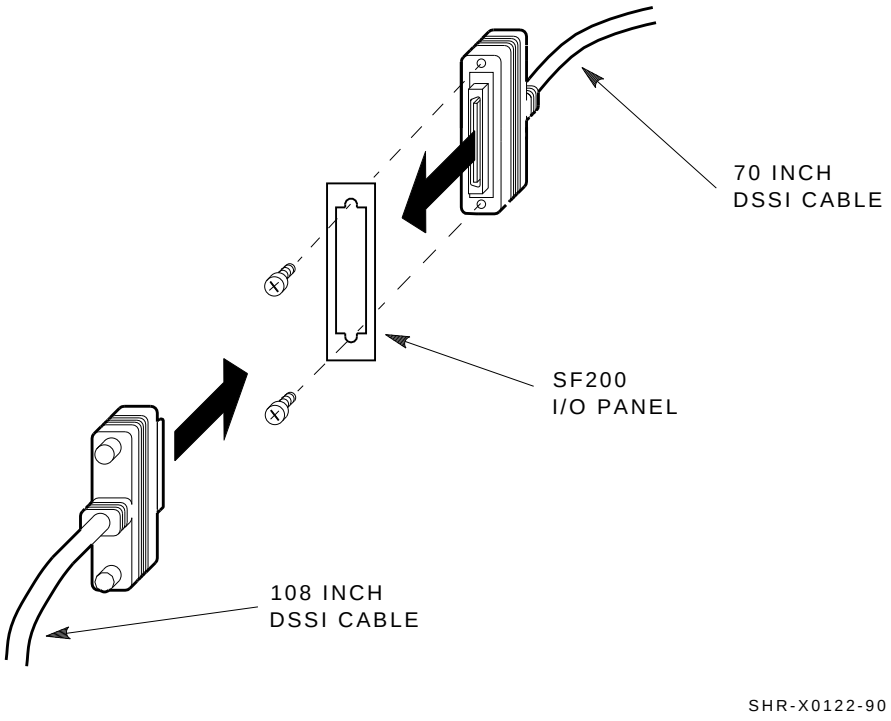


Figure 5–30 Installing the 70- and 108-Inch DSSI Cables for Position 8

NOTE

The following step assumes that no SF72 storage enclosures are installed internally in the system cabinet. If there are SF72 storage enclosures installed in the system cabinet, then one of the KFMSA modules installed in the system XMI backplane must be connected to those SF72 storage enclosures. DO NOT USE this KFMSA module or its DSSI connections to connect the system to the SF200 storage array.

9. Plug the other end of the 108-inch DSSI cables into the appropriate ports on the VAX 6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connectors on the system I/O panel to connect to:

   a. Locate the DSSI connectors on the system I/O panel labeled BLUE/WHITE and RED/WHITE.

   b. From port 6 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (RED/WHITE) of the first system I/O panel.

   c. From port 14 on the SF200 I/O panel, connect the 108-inch DSSI cable to the right DSSI connector (RED/WHITE) of the second system I/O panel.

CAUTION

Do not apply power to the SF72 enclosure at this time.

5.3 Powering Up the SF72

Follow these steps to apply power to a newly installed SF72 storage enclosure:

CAUTION
Ensure that the drive dc power switches on the front of the enclosure are in the out position.

1. Turn the ac power switch on the rear of the enclosure on or to the 1 position. If the green power supply fault LED is lit, refer to Chapter 7.
2. Press *each* of the four (4) drive dc power switches on the front of the SF72 enclosure, one at a time. If the green LED on the drive dc power switch does not light, refer to Chapter 7.
3. Observe the OCP indicators for each drive. If the Ready indicator is lit and no other LED comes on and stays on, the drive has passed the power-on self-test (POST). Should the Ready indicator not come on and the red Fault indicator come on, refer to Chapter 7.
4. Press each of the four (4) Ready buttons, one at a time. The Ready indicator should be on and stay on, with the Fault indicator remaining off. If a fault occurs, refer to Chapter 7.

Once these steps are done and the drive has passed POST, then — and only then — should you proceed to the next section.

5.3.1 Updating the System Configuration Sheet

Now that the enclosure has been successfully installed, power has been applied, and the drives have passed POST, you are ready to update the system configuration sheet to add the new ISEs.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for complete details on how to fill out a system configuration sheet.

5.4 Labeling the DSSI Cables and OCP

For a single-host configuration, use the following colored labels on the SF72 OCP door, magazine tape subsystem front panel, and all DSSI cables:

Label Colors	Connections
Blue	Port 1, positions 5, 1, 3
Red	Port 2, positions 6, 2, 3
Yellow	Port 3, positions 4, 8
Green	Port 4, positions 7, 8

For a dual-host configuration, use the following colored labels on the SF72 OCP door, magazine tape subsystem front panel, and all DSSI cables:

Label Colors	Connections
Blue	Port 1, positions 5 and 1, port 9
Red	Port 2, positions 6 and 2, port 10
Yellow	Port 3, position 3, port 11
Green	Port 4, position 4, port 12
Blue with white strip	Port 5, position 7, port 13
Red with white strip	Port 6, position 8, port 14

5.4.1 Filling Out the Labels

Follow the steps on the inside of the *SF Family Label Booklet* (part number 36-32882-01) to fill out the labels for the DSSI cables and SF72 operator control panels.

Proceed once you have filled the cable and OCP labels.

5.4.2 Labeling the Cables

For each cable you just installed, place a label 2 inches behind the connector as shown in Figure 5–31.

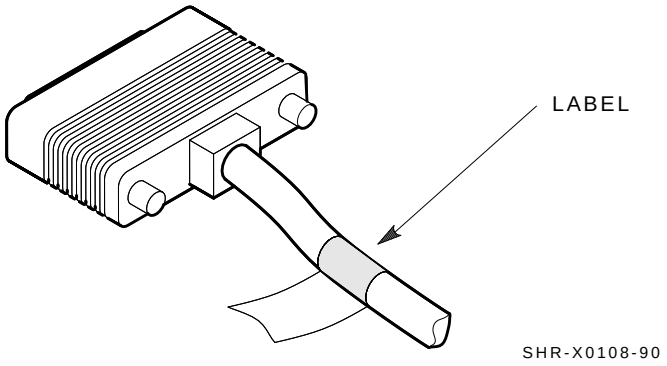


Figure 5–31 Placing a Label on a DSSI Cable

5.4.3 Labeling the OCP

For each OCP on each SF72 you installed, place a label as shown in Figure 5–32.

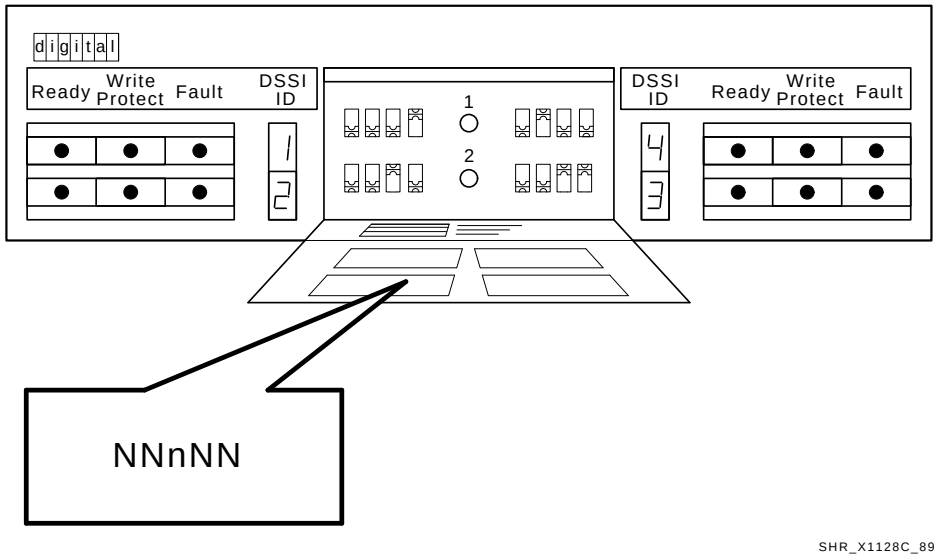


Figure 5–32 Placing a Label on the OCP Door

5.5 Final Verification

Now that all the hardware installation, cabling and labeling, and the powering up steps are complete, you are ready to configure the DSSI subsystem and verify the correct operation of each ISE in the array with the host system.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) and the *TF837 Magazine Tape Subsystem Service Manual* (EK–TF837–SM) for detailed information and how to proceed with verifying the correct operation of each ISE that has been installed. In these manuals, you will find the procedure for establishing the communications between the ISEs, the adapter module, and the system. You will also find the step-by-step procedures for reconfiguring the system with its newly installed DSSI devices.

Refer to the manuals for the disk ISE and tape ISE for detailed information on the local programs in the ISEs.

Remember, each SF72 enclosure can contain two or four disk ISEs. Each magazine tape subsystem contains one tape ISE. A fully configured storage array contains 24 disk ISEs and 2 tape ISEs.

If at any time you detect a failure, refer to Chapter 7.

Once the verification is complete, close the cabinet doors; turn the hex-Allen fasterners one quarter turn clockwise to lock. The system is ready to be turned over to the system manager.

6
Installing the Magazine Tape Subsystem in an SF200 Storage Array

This chapter describes the steps to install the magazine tape subsystem in an existing SF200 storage array:

- Steps to install (Section 6.1)
- Cabling the subsystem (Section 6.2)
  - Single-host configuration (Section 6.2.1)
  - Dual-host configuration (Section 6.2.2)
- Powering up the subsystem (Section 6.3)
- Labeling the subsystem (Section 6.4)
- Final verification (Section 6.5)

As many as two magazine tape subsystems can be installed in the SF200 storage array.

Only Digital Customer Services and other installing personnel that have been trained in ESD procedures can use the procedures in this chapter.

Follow all the steps in this chapter to install a magazine tape subsystem in an SF200 storage array.

Table 6–1 lists the tools required to install the magazine tape subsystem into the storage array.

Table 6–1 Magazine Tape Subsystem Required Tool List

Description	Part Number
#0 Phillips screwdriver	29–10991–00
#1 Phillips screwdriver	29–11001–00
#2 Phillips screwdriver	29–11005–00
1/8-inch slot screwdriver	29–10802–00
5/16-inch slot screwdriver	29–10960–00
1/8-inch hex key	29–26115–00
3/16-inch hex key	29–26118–00
11/32-inch nutdriver	29–10674–00

Refer to Chapter 7 for tools or equipment recommended for use when troubleshooting after a successful installation.

6.1 Steps to Install

The magazine tape subsystem that you are installing contains a tape ISE and the tape cartridge loader assemblies.

This section contains several major parts. The first part explains the steps necessary to:

- Unpack, inspect for damage, and identify parts
- Determine where to install the magazine tape subsystem
- Read and fill out the system configuration sheet

The next part explains the steps to install the magazine tape subsystem itself:

- Prepare the array cabinet to receive a magazine tape subsystem
- Install the supporting hardware and magazine tape subsystem, and set the DSSI ID switches
- Cable the magazine tape subsystem to comply with the DSSI bus cabling conventions

The last part explains the steps to:

- Power up the magazine tape subsystem, run the power-on self-test, and run the configuration programs
- Label all cables and operator control panels
- Verify the operation of the enclosure after a successful installation

Follow all the steps in each of these parts in the order they are presented and do not skip any steps.

Remember that the magazine tape subsystem installs in positions 5 and 6 *only*.

The first step is to unpack the shipping container. Refer to Section 6.1.1.

6.1.1 Unpacking the Magazine Tape Subsystem

The subsystem is shipped in an environmental barrier bag with desiccant, the container, and all packing materials.

NOTE
After unpacking, retain the container and all packing materials.

At this time, examine the subsystem for physical damage. If you find *any* damage, do *not* attempt to install the subsystem. Notify your office immediately.

If there is no damage, then unpack all the boxes and bags, and identify all the parts by using Table 6–2.

Table 6–2 Magazine Tape Subsystem Kit Contents

Description	Quantity	Part Number
Magazine tape subsystem	1	Subsystem specific
Hardware mounting assembly	1	subsystem specific
Slide mount assembly	1	–[1]
Weldment bracket (front top)	1	70–26052–01
Weldment bracket (front bottom)	1	70–26052–02
Shoulder screw, 10-32. 0.500	4	12–24007–01
Shoulder screw, 10-32, 0.438	6	12–24007–02
Lock washer, internal steel	10	90–06637–00
DSSI cable retainer	1	74–41302–01
Chassis retainer	2	74–35858–01
10-32 Phillips (SEMS)	4	12–21368–03
Machine screw, Phillips, 0.500	2	90–06073–02
Machine screw, Phillips, 1.5	2	90–06079–03
Lock washer, external steel	2	90–07651–00
AC power cord, 8-foot	1	17–00442–03
DSSI cables, 42-inch, box-to-box	1	BC21Q–3F
Owner's manual	1	EK–SF72S–OM
Installation guide	1	EK–SF200–IG
Subsystem owner's manual	1	Subsystem specific
Label Booklet	1	36–32882–01

[1]The slide mount assembly comes assembled and does not have a single part number.

6.1.2 Where to Install the Magazine Tape Subsystem

The third level of the SF200 storage array cabinet is reserved for magazine tape subsystems. The subsystems install in numerical order. Facing the front of the cabinet, note that position 5 is on the left and position 6 is on the right (Figure 6–1).

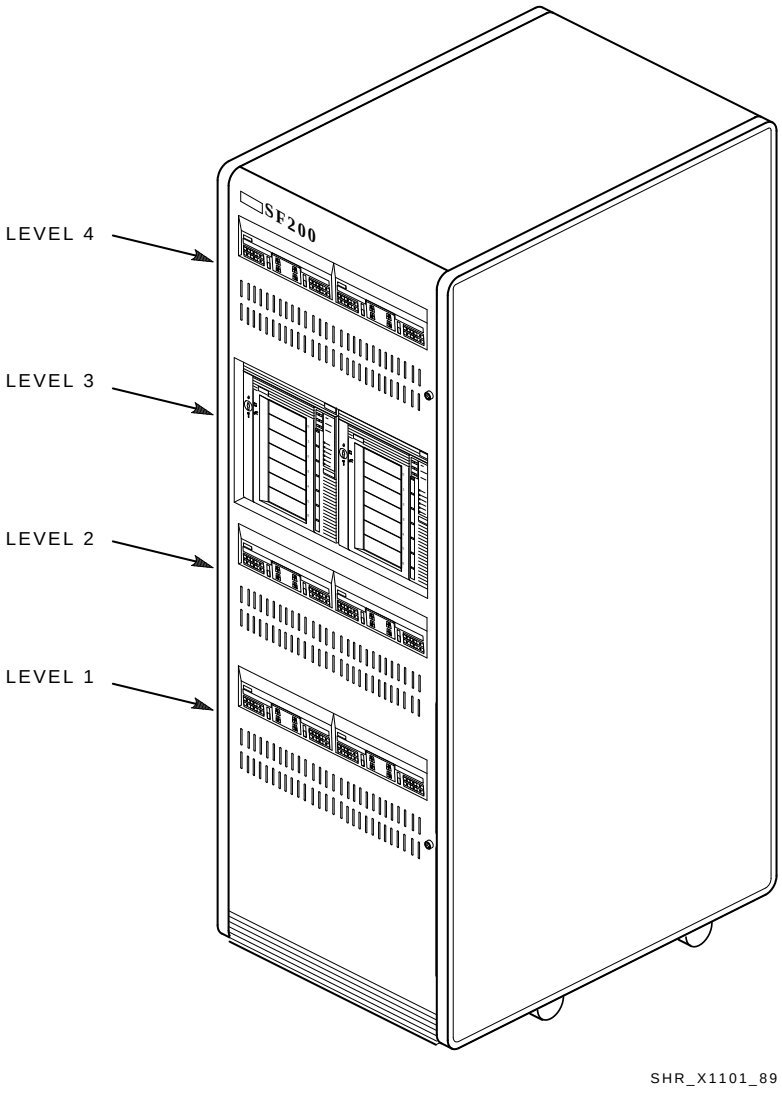


Figure 6–1 Subsystem Locations

6.1.3 Completing the System Configuration Sheet

Locate the system configuration sheet. Figure 6–2 and Figure 6–3 are examples of a filled out configuration sheet. If you cannot locate this sheet or if the one that is available is either not filled out or filled out incorrectly, fill one out immediately.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for an explanation of this sheet and how to fill it out.

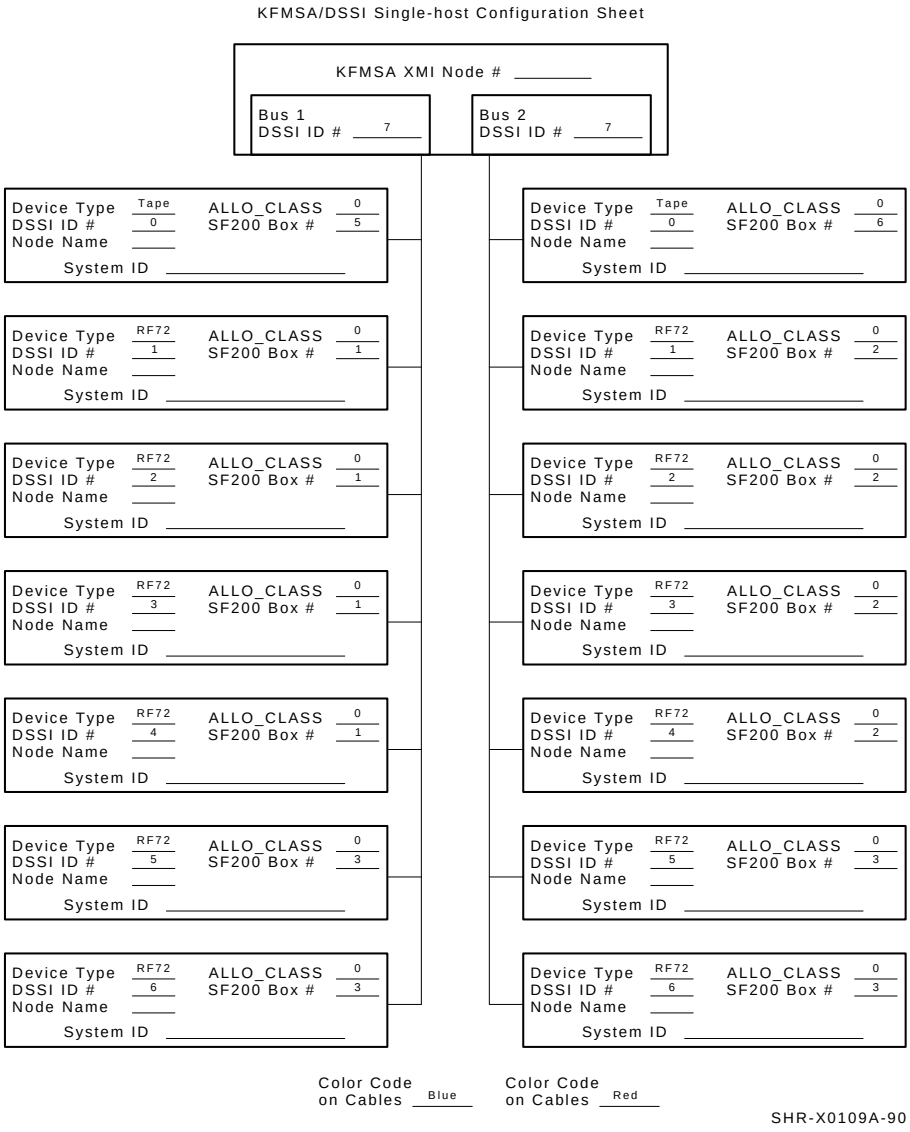


Figure 6–2 System Configuration Sheet (Single-Host)

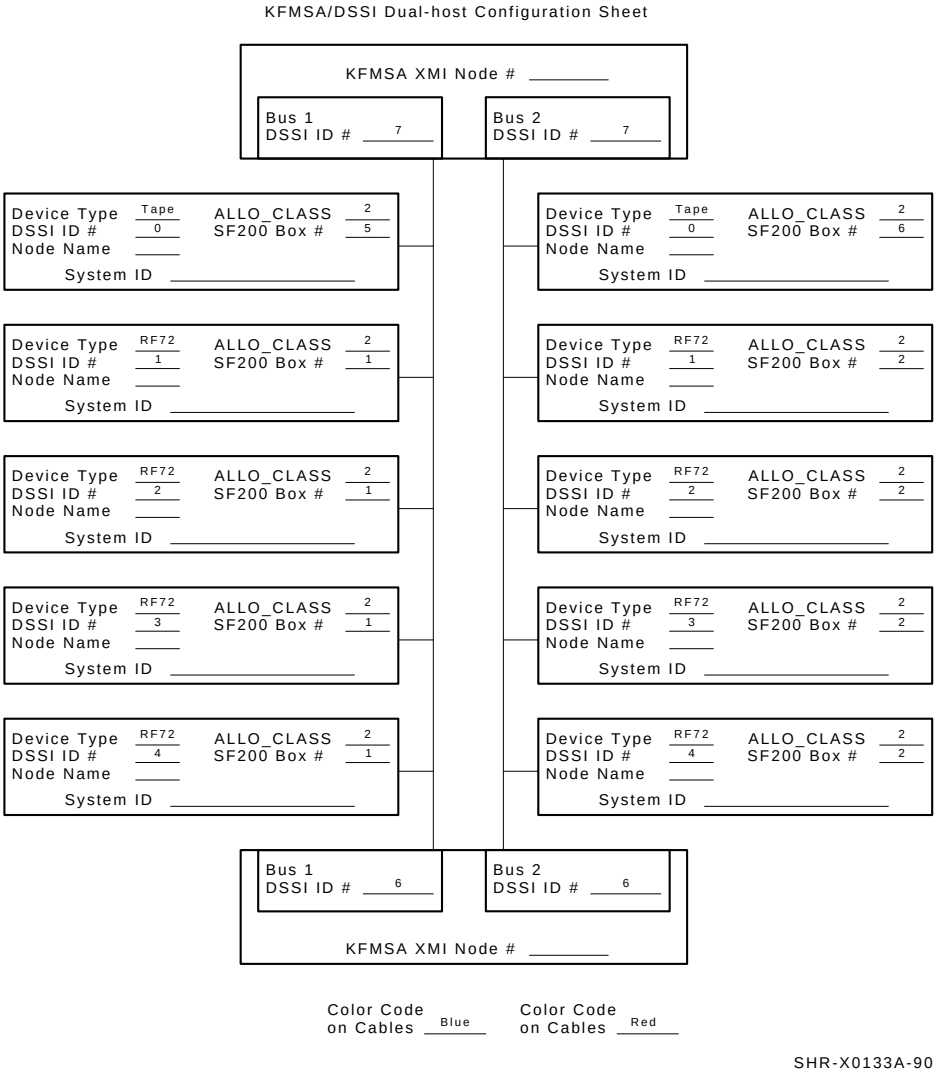


Figure 6–3 System Configuration Sheet (Dual-Host)

6.1.4 Installion Procedure

This section describes the step-by-step procedures for installing a magazine tape subsystem in an SF200 storage array.

Be sure to:

- Follow each step in order, and do not skip any steps
- Leave sufficient room to perform the installation (approximately 1.5 meters to 1.8 meters [5 feet to 6 feet] front and rear of the array)

CAUTION
Observe all ESD precautions and procedures.

An antistatic wrist strap is inside the front and rear doors.

CAUTION
Do not attempt to pick up or support the product by the rear of the enclosure. Doing so will injure the person attempting the installation or damage the power supply.

6.1.4.1 Preparing the SF200 Storage Array

The following procedure describes how to prepare the array to receive the magazine tape subsystem:

1. Place the magazine tape subsystem to be installed to one side, in front of the cabinet.
2. Open front and rear doors of the SF200 storage array (Figure 6–4).
3. Remove the front door filler panel that corresponds to the position of the SF200 storage array you are installing (Figure 6–4).

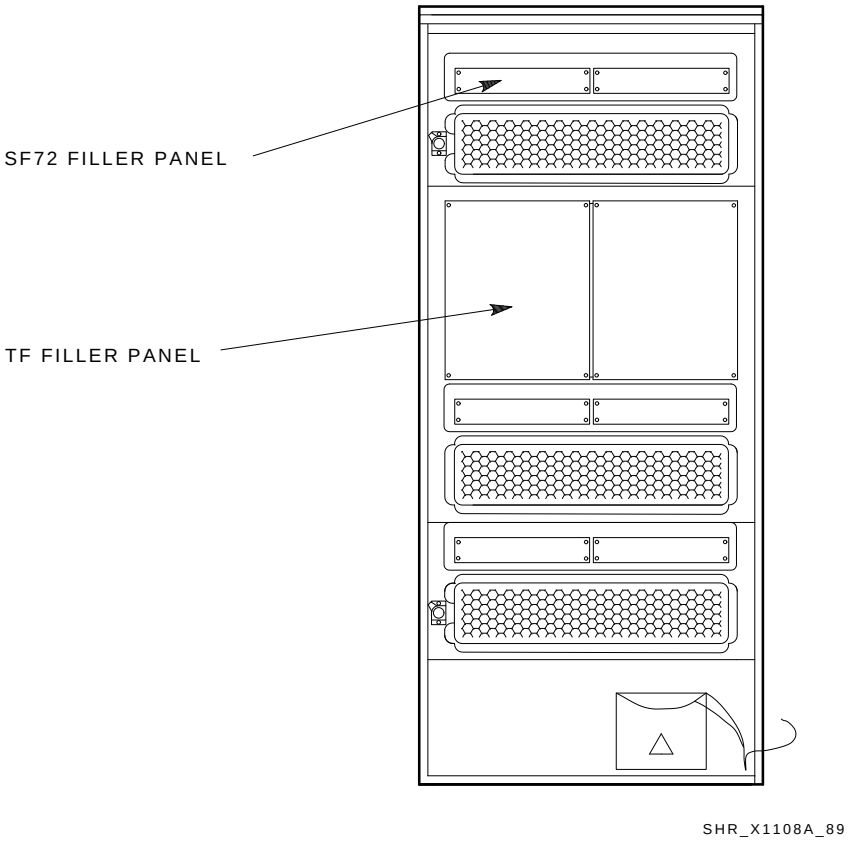


Figure 6–4 Removing a Filler Panel

6.1.4.2 Hardware Installation Procedures

Perform the following steps in full and in the order presented.

WARNING
Before performing the following steps, refer to the system documentation for the correct steps to peform an orderly shutdown of the system that the SF200 storage array is connected to.

1. Install the ac power cord (Figure 6–5).
   a. Swing open and remove the panel from the cabinet frame.

      CAUTION
      Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

   b. Locate the ac power cord retainer bracket at the third level of the SF200 storage array cabinet.
   c. Loosen lower screw of the ac retainer bracket. Remove the upper ac power cord retainer bracket screw and tilt the retainer 45 degrees. Then retighten the lower screw.
   d. Place ac power cord in the retainer space with the shrouded male plug end inside cabinet side rail.
   e. Loosen the lower screw and put the retainer bracket back to its original position. Then reinsert the upper screw and tighten both the top and bottom screws.
   f. Connect the male end of the ac power cord to the first available outlet on the 881 power controller.

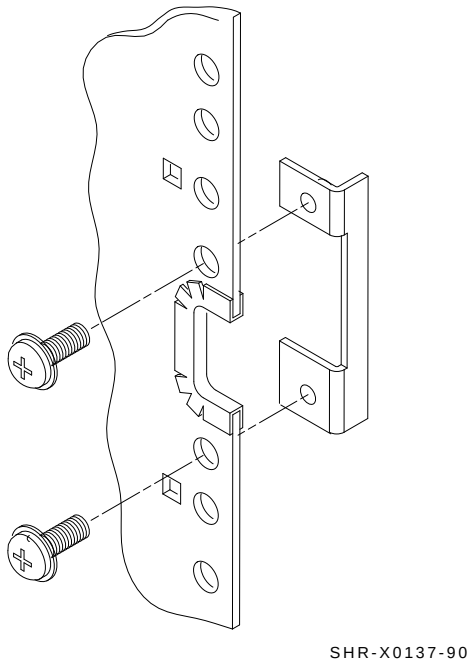


Figure 6–5 AC Power Cord Retainer

2. Install the slide mount and associated hardware (Figure 6–6).

   The slide mount has two parts. One part is called the “adjustable” end and the other is called the “slotted” end. The adjustable end has four screws that, when loosened, allow the slide mount to be placed in the cabinet and then extended to make a secure fit.

   When installing the slide mount in positions 3, 5, and 7, install the slotted end in the front left cabinet frame rail. When installing the slide mount in positions 2, 4, 6, and 8, install the adjustable end in the front right cabinet frame rail. The position numbers are visible on both the right and left cabinet frame rails from either the front or the rear.

   a. Loosen the four screws in the adjustable end of the slide mount.

   b. From the front of the cabinet, place the slide mount in the cabinet so that the stamped UP and arrow are visible.

   c. Align the guide pin with the X stamped in the cabinet frame rail.

   d. Install one 7/16-inch shoulder screw and washer (hand-tighten) in the center threaded hole of the slide mount.

   e. Install the opposite end of the slide mount into the rear cabinet side rail. Again, align the guide pins with the X on the rail.

   f. Install one 7/16-inch shoulder screw and washer (hand-tighten) in the center threaded hole of the slide mount.

   g. At the rear of the cabinet, install two 1/2-inch shoulder screws with washers and the DSSI cable retainer clip. Note that the DSSI cable retainer clip must always point away from the center of the cabinet and that it is installed on the lower half of the slide mount.

      - At the rear of the cabinet, install two 1/2-inch shoulder screws with washers and the DSSI cable retainer clip. Note that the DSSI cable retainer clip must always point away from the center of the cabinet.

      - Place a 1/2-inch shoulder screw with a washer through the lower hole of the DSSI cable retainer clip and install the screw (hand-tighten) in the bottom threaded hole in the slide mount.

      - Place the other 1/2-inch shoulder screw with a washer through the upper hole of the DSSI cable retainer clip and install the screw (hand-tighten) in the threaded hole in the slide mount.

h. While facing the rear of the cabinet, install two 7/16-inch shoulder screws with washers (hand-tighten) — one screw in the bottom threaded hole and the other in the threaded hole beneath the center rear shoulder screw (hand-tighten) previously installed.

i. While facing the front of the cabinet, install two 7/16-inch shoulder screws with washers (hand-tighten) — one screw in the bottom threaded hole and the other in the threaded hole beneath the center rear shoulder screw (hand-tighten) previously installed.

j. Tighten all shoulder screws.

k. Tighten the four slide mount screws.

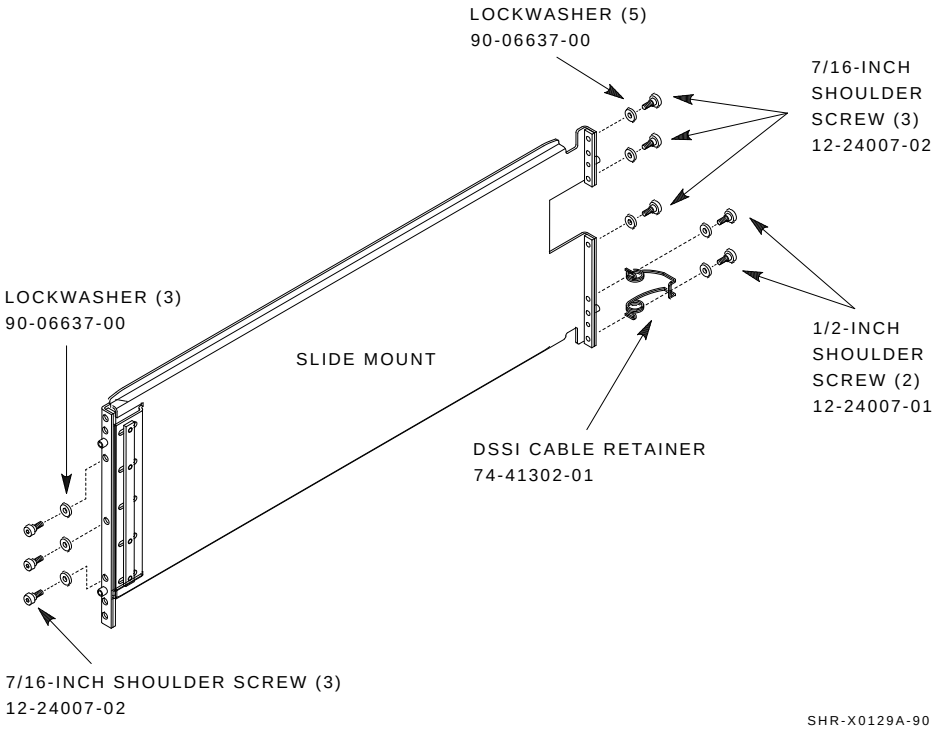


Figure 6–6 Installing the Slide Mount

l. From the front of the cabinet, install the upper and lower weldment brackets on the cabinet side rail using 1/2-inch shoulder screws and washers (Figure 6–7).

   The center hole of the weldment bracket goes over the guide pin on the slide mount so the large end of the top weldment bracket points up and the large end of the bottom weldment bracket points down, regardless of whether you are installing the brackets on the front right or left cabinet frame rails.

NOTE
Do NOT tighten the screws at this time.

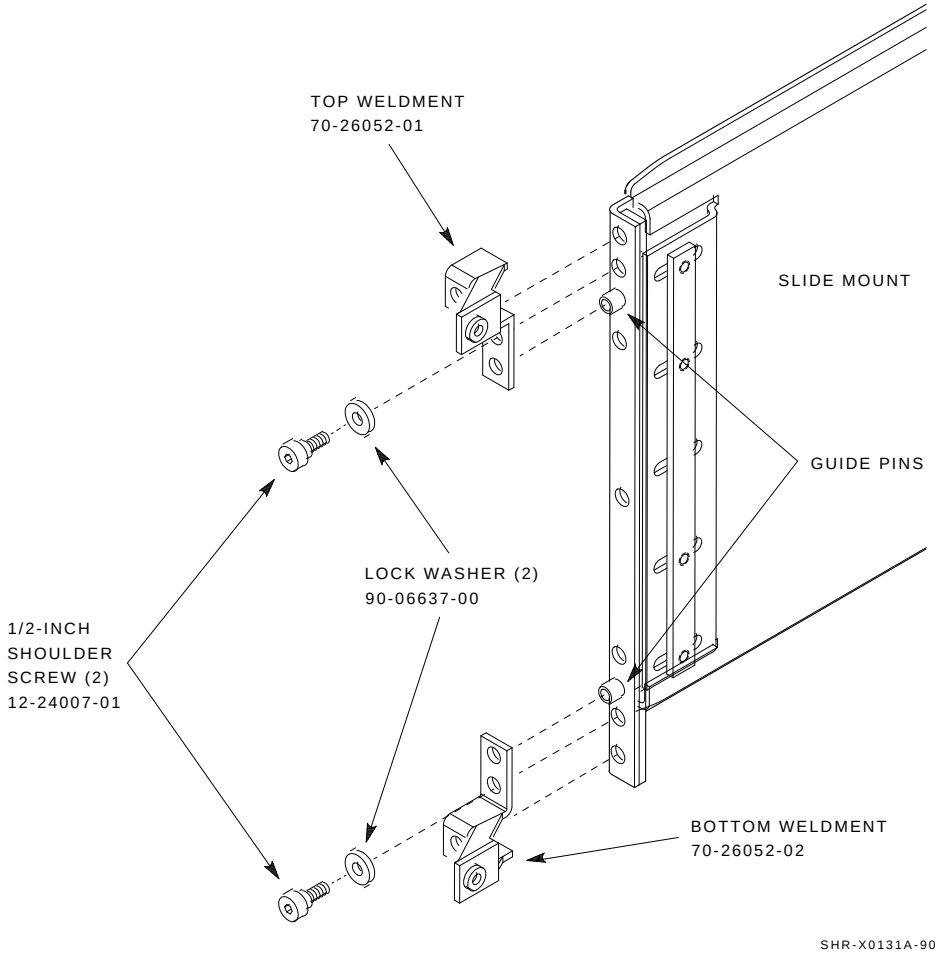


Figure 6–7 Installing the Weldment Brackets

3. Install the magazine tape subsystem.

   a. Loosen the shipping screw in the rear, upper right corner, of the magazine tape subsystem.

   b. Remove the magazine tape subsystem assembly from the extrusion tube. Push the inner assembly out to the first mechanical stop. Release the stop and then push the inner assembly out to the second mechanical stop. Then remove the inner assembly from the extrusion tube. Place the inner assembly off to one side.

      CAUTION
      Do NOT open the front of the magazine tape subsystem inner assembly while the inner assembly is out of the extrusion tube.

   c. Install both chassis retainers on the front, right side (position 5) or left side (position 6) of the extrusion tube (top and bottom, Figure 6–8).

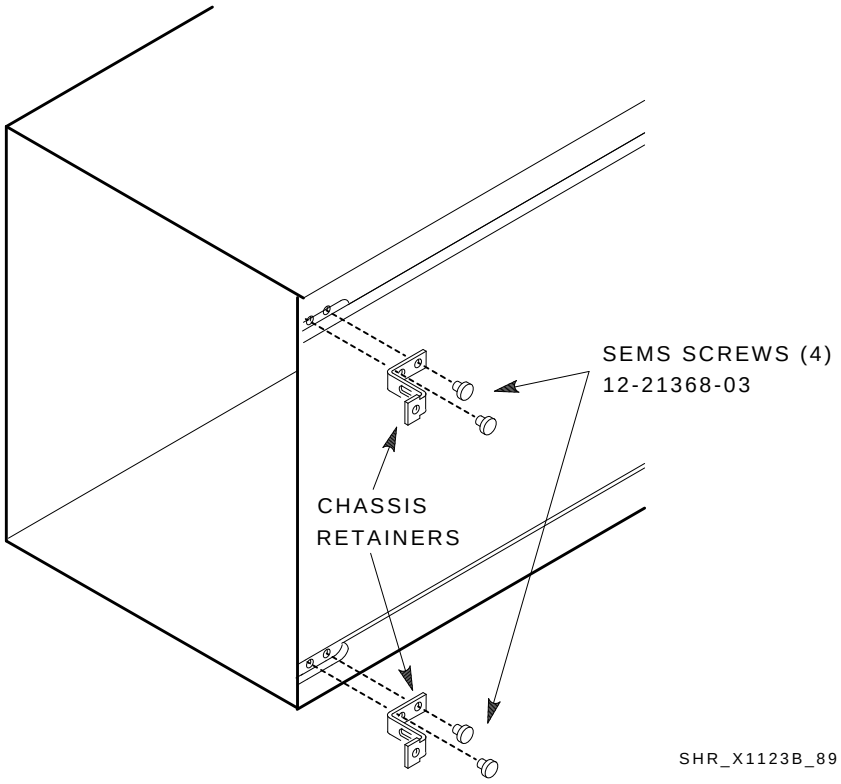


Figure 6–8 Chassis Retainers

d. At the front of the cabinet, lift the extrusion tube up and onto the slide mount until the chassis retainers touch the weldment brackets.

e. Install and tighten the two outer weldment screws, then install and tighten the two inner weldment screws (Figure 6–9).

f. Tighten the upper and lower weldment 1/2-inch shoulder screws and washers.

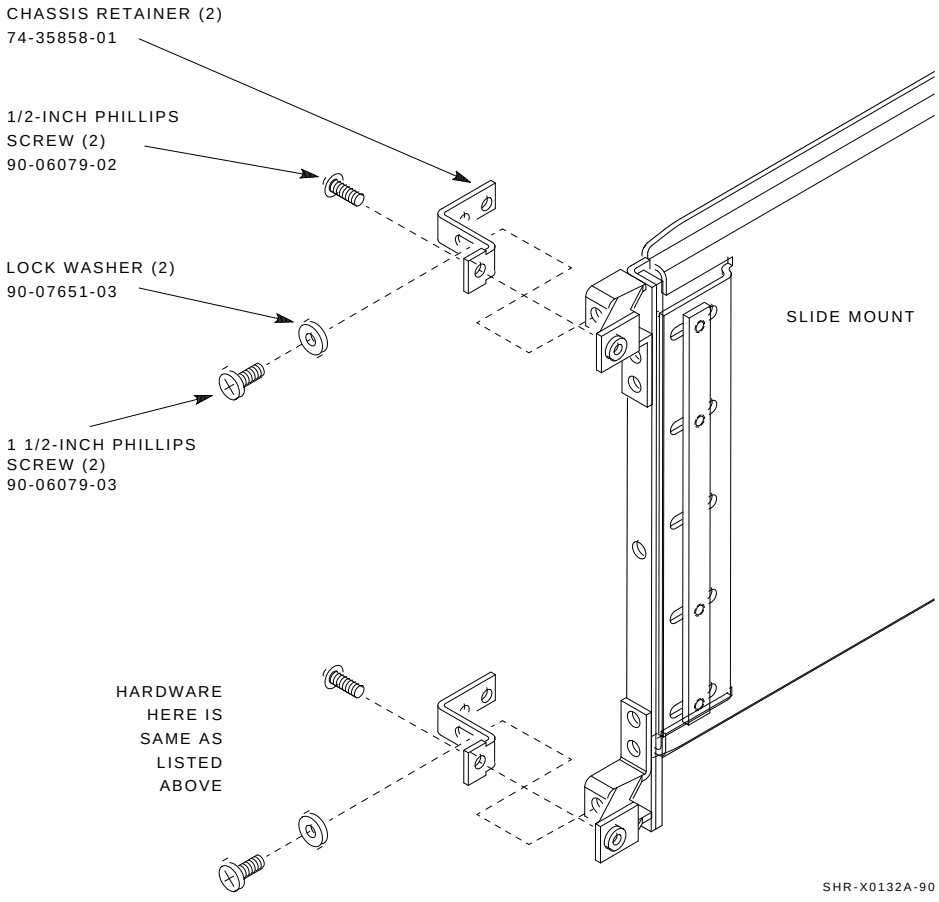


Figure 6–9 Securing the Tube to the Weldment Brackets

4. While the inner assembly is out of the extrusion tube, check the DSSI ID switches on the DSSI controller module. Ensure that the DSSI ID switch is set to 0 and that the TMSCP switch is down or enabled. Refer to the magazine tape subsystem documentation for information on how to access the DSSI controller module.
5. Perform the following steps to complete the hardware installation of the magazine tape subsystem:
   a. Lift and push the inner assembly back into the extrusion tube.
   b. At the rear of the magazine tape subsystem, make sure that the ac power switch is off or in the 0 position (Figure 6–10).
   c. Also check the factory set ac power on the magazine tape subsystem. Model variants –AA are 120 Vac and model variants –AB are 220 Vac.
   d. Place the subsystem in the head-cleaning position (first mechanical stop).
   e. At this time, connect the ac power cord to the subsystem.
   f. Check that this and all other OCP and magazine tape subsystem fronts project through the front door of the SF200 storage array correctly. If not, adjust height with shims. It maybe necessary to adjust cabinet door mounting at the door hinges.

CAUTION
Do not power up the enclosure at this time.

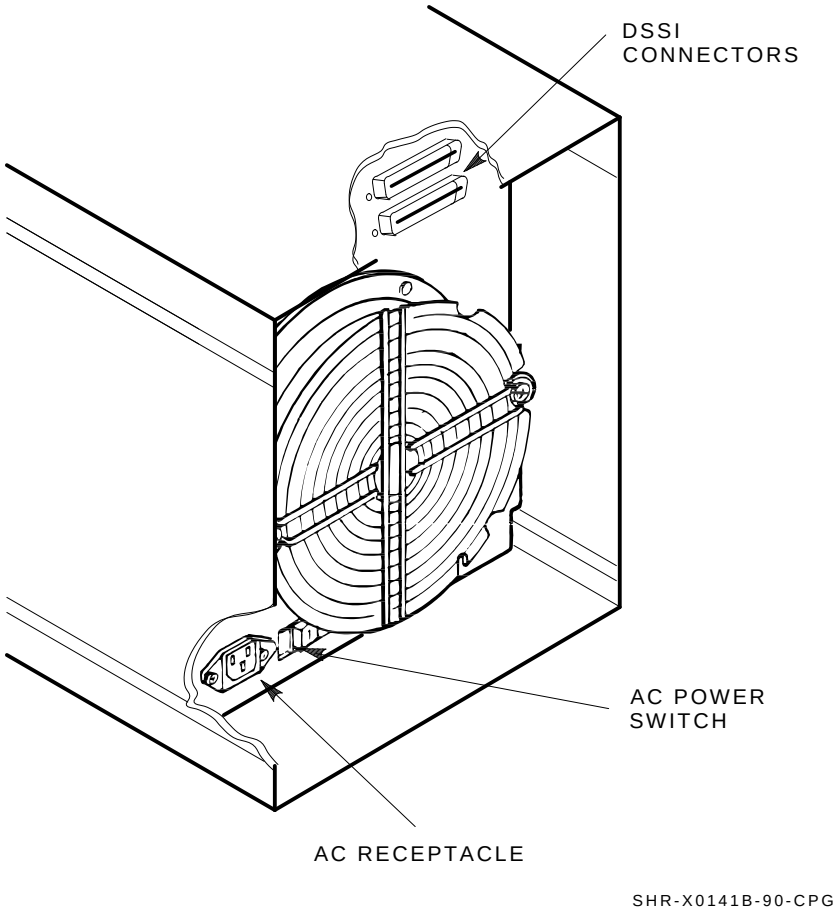


Figure 6–10 AC Power Switch, Voltage Selections, and Power Cord

6.2 Cabling the Subsystem in SF200 Storage Array Position

This section describes the step-by-step procedure to cable the magazine tape subsystem that you just installed to the existing DSSI bus configuration of the SF200 storage array.

Refer to Section 6.2.1 for instructions on how to cable the magazine tape subsystem in an SF200 storage array configured for single-host. Refer to Section 6.2.2 for instructions on how to cable the magazine tape subsystem in an SF200 storage array configured for dual-host.

6.2.1 Single-Host Configuration

6.2.1.1 Cabling Position 5

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

The following steps are for cabling a magazine tape subsystem in an existing SF200 storage array configured for single-host:

1. Take the disk ISEs in position 1 off-line before you proceed. To do so, first take each ISE off-line by pressing the Ready switches. Then press all the drive dc power switches to the out position. Last, turn off the ac power at the rear of the storage enclosure.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

2. Disconnect the 70-inch DSSI cable (part number BC21Q–3F) connected to the rightmost DSSI connector at the rear of the SF72 enclosure in position 1.
3. Pull the inner assembly to the head-cleaning position (first mechanical stop).
4. Connect the 70-inch DSSI cable removed from position 1 (Figure 6–11) and connect it to the top DSSI connector on the rear of the magazine tape subsystem. Route this DSSI cable under the cable retainers on the right side of the cabinet.
5. Connect a 42-inch DSSI cable (part number BC21Q–3F) to the rightmost DSSI connector at the rear of the SF72 in position 1 and to the bottom DSSI connector at the rear of the magazine tape subsystem in position 5. Route this DSSI cable under the cable retainers on the right side of the cabinet.
6. Push the inner assembly back into the extrusion tube.

CAUTION

Do not power up the magazine tape subsystem or the SF72 storage enclosure at this time.

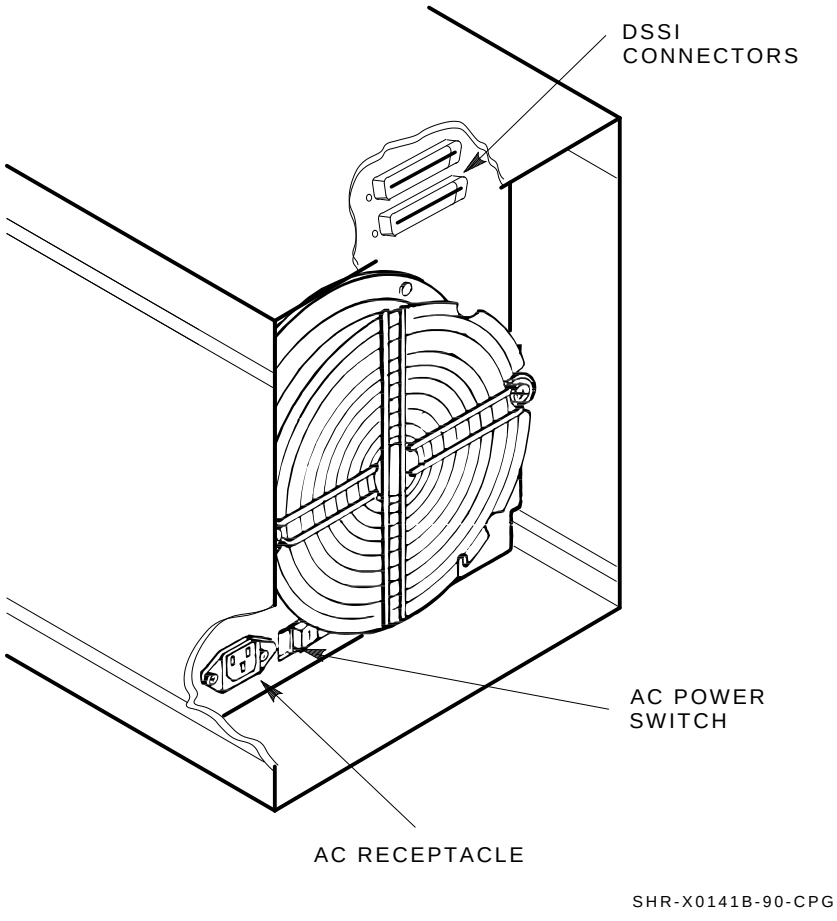


Figure 6–11 Installing the 42-Inch DSSI Cable (Position 5)

6.2.1.2 Cabling Position 6

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to peform an orderly shutdown of the system that the SF200 storage array is connected to.

1. If present, take the drives in the SF72 storage enclosure in To do so first take each ISE off-line by pressing the Ready switches. Then press all the drive dc power switches to the out position. Last, turn off the ac power at the rear of the storage enclosure. position 2 off-line before you proceed.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

2. Disconnect the 70-inch DSSI cable (part number BC21R–5L) connected to the rightmost DSSI connector at the rear of the SF72 enclosure in position 2.
3. Place the subsystem in the head cleaning position (first mechanical stop). DSSI connector on the rear of the magazine tape subsystem.
4. Install this 70-inch DSSI cable (refer to Figure 6–12) to the the top DSSI connector on the rear of the magazine tape subsystem.
5. Route this DSSI cable under the cable retainers on the right side of the cabinet.

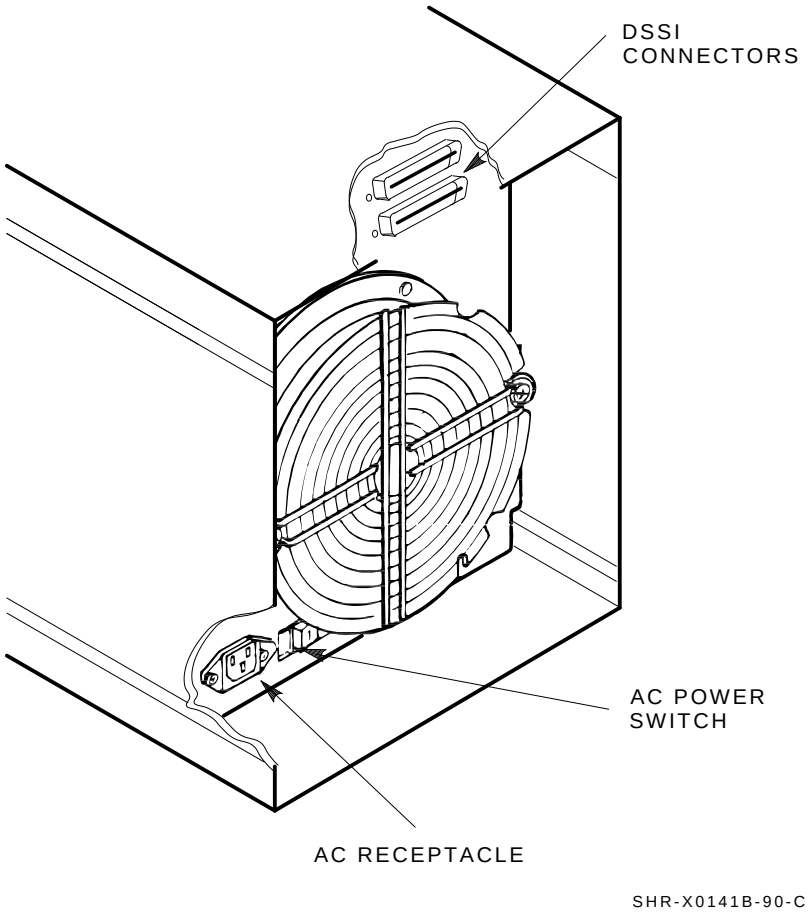


Figure 6–12 Installing the 42-Inch DSSI Cable (Position 6)

6. At this time, connect a 42-inch DSSI cable (part number BC21Q–3F) to the rightmost DSSI connector at the rear of the SF72 in position 2 and to the bottom DSSI connector at the rear of the magazine tape subsystem in position 6.
7. Route this DSSI cable under the cable retainers on the appropriate side of the cabinet.
8. Push the inner assembly back into the extrusion tube.

CAUTION

Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

9. If no SF72 storage enclosure is installed in position 2, then at the rear of the SF200 storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
10. Swing open and remove the panel from the cabinet frame.

CAUTION
Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

11. Remove the two Phillips screws that hold the panel blank in port 2 of the I/O panel.
12. Install a 70-inch DSSI cable (part number BC21R–5L) in place of the panel blank you just removed in the previous step.
13. Connect the other end of this cable into the top DSSI connector at the rear of the magazine tape subsystem. Refer to Figure 6–13.
14. Route this DSSI cable under the cable retainers on the left side of the cabinet.
15. Connect a 108-inch DSSI cable (part number BC21Q–09) into the port you just install in the previous steps. Tighten the retainer screws on this with your fingers.

16. Plug the other end of this cable into the appropriate port on the VAX6000 system I/O panel at the rear of the system cabinet. To determine which of the two DSSI connector on the system I/O panel to connect to:

    a. Open the system I/O panel by removing the six screws that secure the I/O panel to the system chassis. Let the panel swing down to its rest position.

    b. Find the first KFMSA module installed in the system XMI backplane. It will be the KFMSA module in the lowest numbered slot of the KFMSA modules installed.

    c. Follow the cabling from the backplane to the system I/O panel.

    d. While viewing the front of the I/O panel the DSSI connector on the right is KFMSA DSSI bus 1 and the left bus 2.

    e. For port 2 on the SF200 I/O panel connect the 108-inch DSSI cable to the left DSSI connector of the system I/O panel.

    CAUTION
    Do not apply power to the subsystem at this time.

17. Install a DSSI terminator plug in the bottom DSSI connector at the rear of the subsystem.

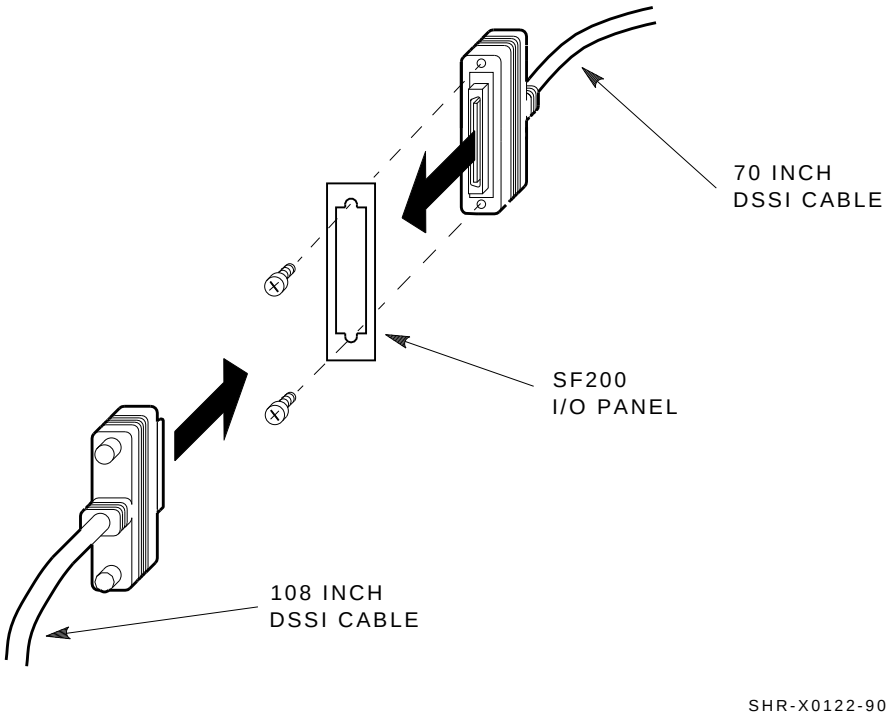


Figure 6–13 Installing the DSSI Cables

6.2.2 Dual-Host Configuration

Use the following sections for cabling a magazine tape subsystem in an existing SF200 storage array configured for dual-host.

6.2.2.1 Cabling Position 5

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

1. Take the disk ISEs in position 1 off-line before you proceed. To do so first take each ISE off-line by pressing the Ready switches. Then press all the drive dc power switches to the out position. Last, turn off the ac power at the rear of the storage enclosure.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

2. Pull the inner assembly of the magazine tape subsystem out to the head-cleaning position (first mechanical stop).
3. Disconnect the 70-inch DSSI cable (part number BC21R–5L) connected to the rightmost DSSI connector at the rear of the SF72 enclosure in position 1.
4. Connect the 70-inch DSSI cable removed from the SF72 storage enclosure to the the top DSSI connector on the rear of the magazine tape subsystem.
5. Route this DSSI cable under the cable retainers on the right side of the cabinet.
6. Connect a 42-inch DSSI cable (part number BC21Q–3F) to the rightmost DSSI connector at the rear of the SF72 in position 1 to the bottom DSSI connector at the rear of the magazine tape subsystem in position 5. Refer to Figure 6–14.
7. Route this DSSI cable under the cable retainers on the right side of the cabinet.

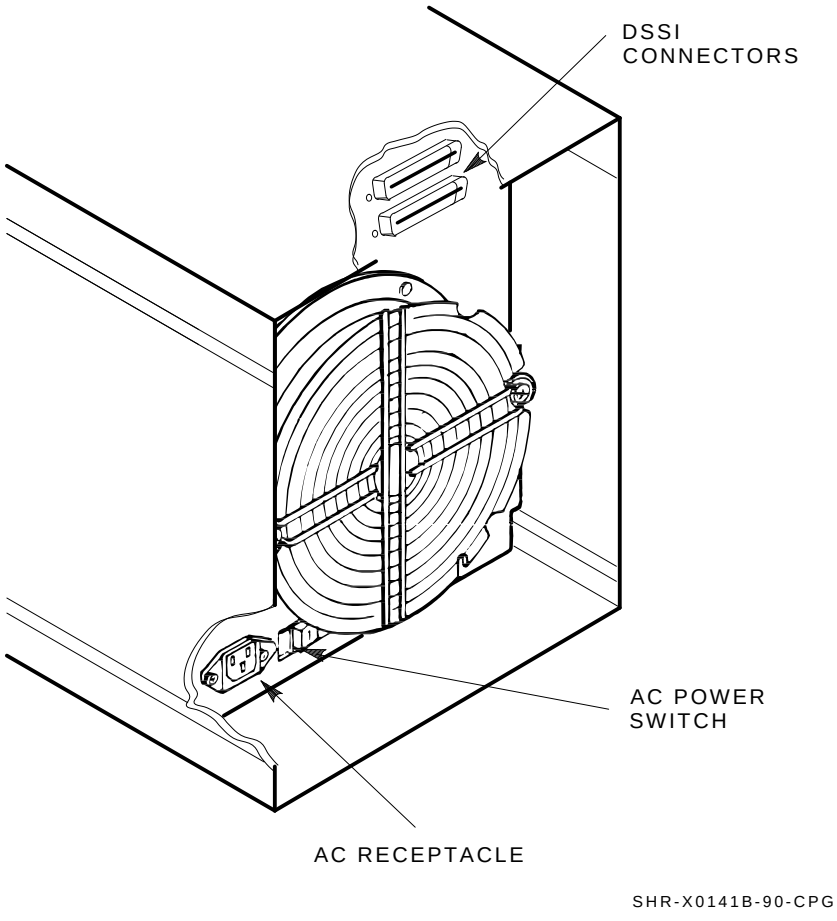


Figure 6–14 Installing the 42-Inch DSSI Cable (Position 6)

6.2.2.2 Cabling Position 6

WARNING

Before performing the following steps, refer to the system documentation for the correct steps to perform an orderly shutdown of the system that the SF200 storage array is connected to.

1. If an SF72 storage enclosure is installed in position 2, take the disk ISEs in position 2 off-line before you proceed. To do so first take each ISE off-line, then press all the drive dc power switches to the out position and then turn off the ac power at the rear of the storage enclosure.

   CAUTION

   Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

2. Disconnect the 70-inch DSSI cable (part number BC21Q–3F) connected to the rightmost DSSI connector at the rear of the SF72 enclosure in position 2.
3. Pull the inner assembly of the magazine tape subsystem out to the head-cleaning position (first mechanical stop).
4. Connect this 70-inch DSSI cable to the the top DSSI connector on the rear of the magazine tape subsystem.
5. Route this DSSI cable under the cable retainers on the left side of the cabinet.
6. Connect a 42-inch DSSI cable (part number BC21Q–3F) to the rightmost DSSI connector at the rear of the SF72 in position 2 to the bottom DSSI connector at the rear of the magazine tape subsystem in position 6.
7. Route this DSSI cable under the cable retainers on the left side of the cabinet.

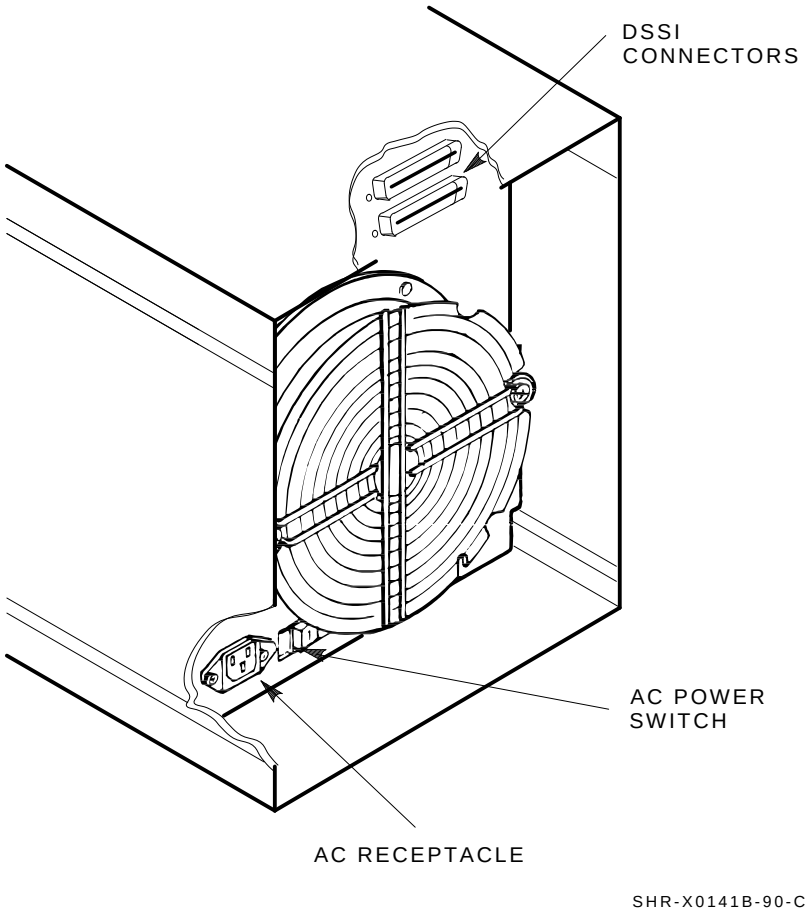


Figure 6–15 Installing the 42-Inch DSSI Cable (Position 6)

8. If there is no SF72 storage enclosure installed in position 2, then at the rear of the SF200 storage array, locate the DSSI I/O panel at the bottom. Use a 3/16-inch flatblade screwdriver to loosen the two captive screws at the right of the panel.
9. Swing open and remove the panel from the cabinet frame.

CAUTION
Use care not to disturb or damage power cords and DSSI cables that are already connected to the DSSI I/O panel.

10. Install a 70-inch DSSI cable (part number BC21R–5L) to port 2 on the SF200 storage array I/O panel by first removing the panel blank.
11. Connect the other end of this 70-inch DSSI cable to the top DSSI connector on the rear of the magazine tape subsystem.
12. Install a 70-inch DSSI cable (part number BC21R–5L) to port 10 on the SF200 storage array I/O panel by first removing the panel blank.
13. Connect the other end of this 70-inch DSSI cable to the bottom DSSI connector on the rear of the magazine tape subsystem.

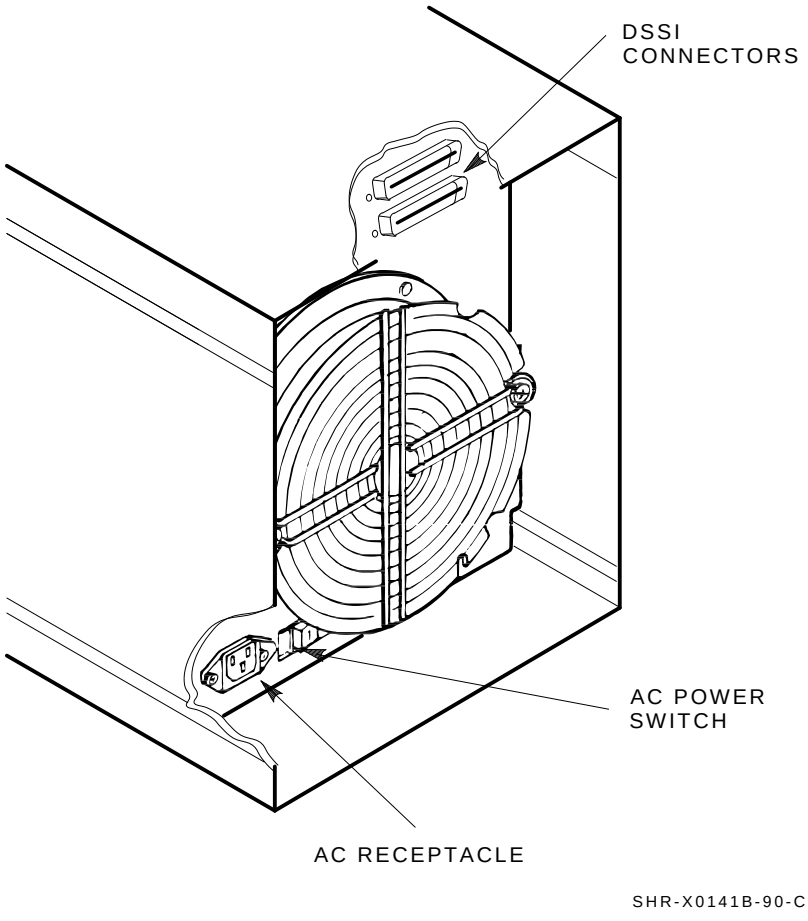


Figure 6–16 Installing the 42-Inch DSSI Cable (Position 6)

6.3 Powering Up the Magazine Tape Subsystem

Follow these steps to apply power to a newly install SF72 storage enclosure.

1. Turn the ac power switch on the rear of the subsystem on or to the "1" position.

   After you power on the TF837 magazine tape subsystem,

   1. All its OCP indicators turn on (generally within 15 seconds.)
   2. While the elevator scans the magazine, all OCP indicators, except for Power On, turn off
   3. Assuming the subsystem has a magazine with a cartridge in position 0, and there's no cartridge in the drive, the final power-on self-test status displayed
      a. Power On indicator on
      b. Eject indicator on
      c. Load/Unload indicator on
      d. Position Select indicator on
      e. Position 0 indicator on.

2. Should a fault occur, refer to Chapter 7 or the *TF837 Magazine Tape Subsystem Service Manual* (EK–TF837–SM).

Once these steps are accomplished and the subsystem has passed POST, then proceed to the next section.

6.3.1 Updating the System Configuration Sheet

Now that the subsystem has been successfully installed, power has been applied, and the drives have passed POST, you are ready to update the system configuration sheet.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for complete details on how to fill out a system configuration sheet.

6.4 Labeling the DSSI Cables and Magazine Tape Subsystem

For a single-host configuration, use the following colored labels on the SF72 OCP door, magazine tape subsystem front panel, and all DSSI cables.

Label Colors	Connections
Blue	Port 1, positions 5, 1, 3
Red	Port 2, positions 6, 2, 3
Yellow	Port 3, positions 4, 8
Green	Port 4, positions 7, 8

For a dual-host configuration, use the following colored labels on the SF72 OCP door, magazine tape subsystem front panel, and all DSSI cables.

Label Colors	Connections
Blue	Port 1, positions 5 and 1, port 9
Red	Port 2, positions 6 and 2, port 10
Yellow	Port 3, position 3, port 11
Green	Port 4, position 4, port 12
Blue with white strip	Port 5, position 7, port 13
Red with white strip	Port 6, position 8, port 14

6.4.1 Filling Out the Labels

Follow the steps on the inside cover of the *SF Family Label Booklet* (part number 36–32882–01) to fill out the labels for the DSSI cables and SF72 operator control panels.

Proceed once you have filled the cable and OCP labels.

6.4.2 Labeling the Cables

For each cable you just installed, place a label 2 inches behind the connector as shown in Figure 6–17.

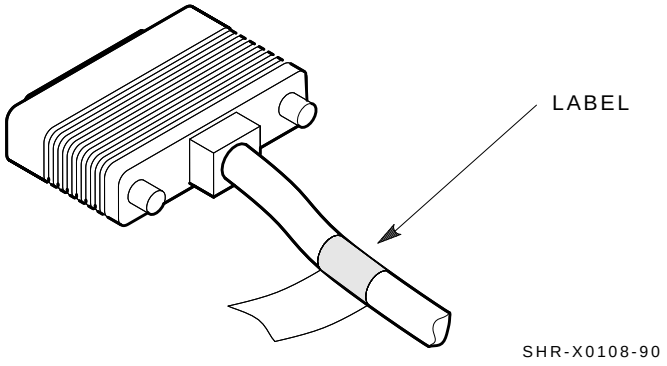


Figure 6–17 Placing a Label on a DSSI Cable

6.4.3 Labeling the Magazine Tape Subsystem

Place the labels for the front panel of the magazine tape subsystem as shown in Figure 6–18.

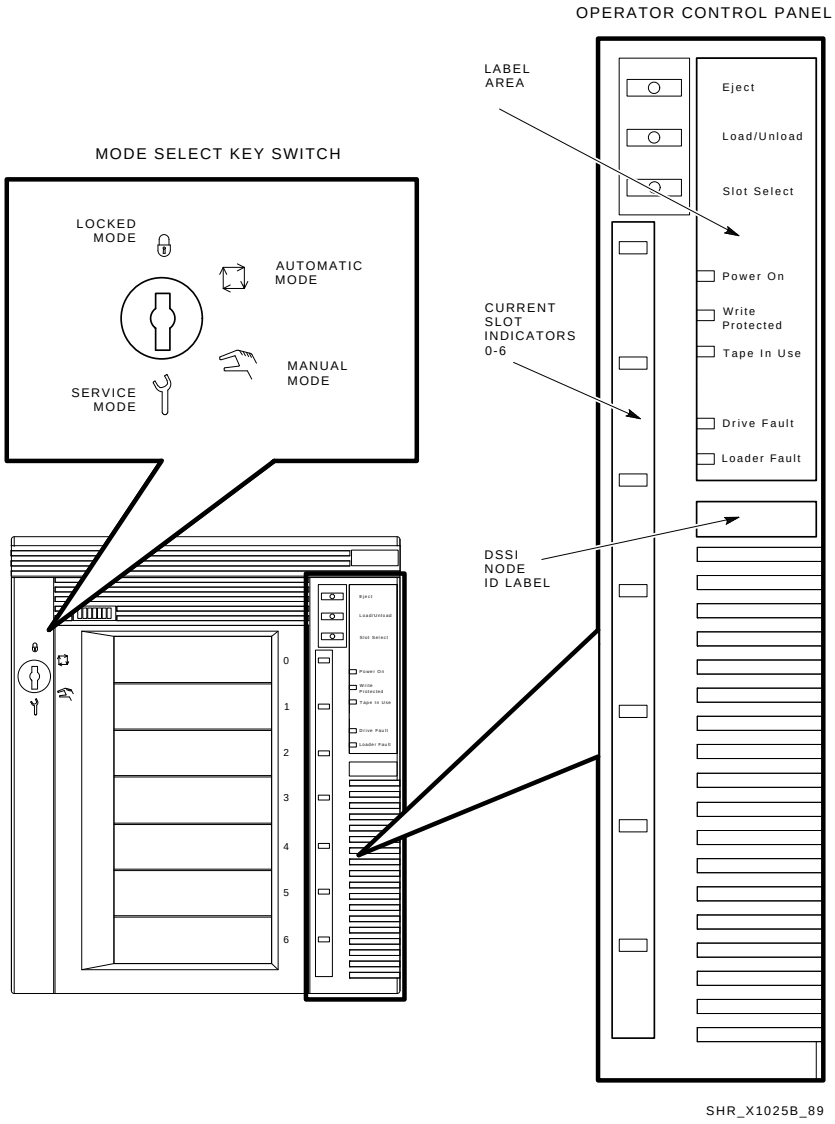


Figure 6–18 Placing a Label of on the Magazine Tape Subsystem

6.5 Final Verification

Now that all the hardware installation, cabling and labeling, and the powering up steps are complete, you are ready to configure the DSSI subsystem and verify the correct operation of each ISE in the array with the host system.

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) and the *TF837 Magazine Tape Subsystem Service Manual* (EK–TF837–SM) for detailed information and how to proceed with verifying the correct operation of each ISE that has been installed. In these manuals, you will find the procedure for establishing the communications between the ISEs, the adapter module, and the system. You will also find the step-by-step procedures for reconfiguring the system with its newly installed DSSI devices.

Refer to the manuals for the disk ISE and tape ISE for detailed information on the local programs in the ISEs.

Remember, each SF72 enclosure can contain two or four disk ISEs. Each magazine tape subsystem contains one tape ISE. A fully configured SF200 storage array contains 24 disk ISEs and 2 tape ISEs.

If at any time you detect a failure, refer to Chapter 7.

Once the verification is complete, close the cabinet doors; turn the hex-Allen fasteners one quarter turn clockwise to lock. The system is ready to be turned over to the system manager.

7
Installation Troubleshooting

This chapter explains what to do if you detect problems during the installation of the SF72 storage enclosure.

The procedures in this chapter involve taking devices on- and off-line. This causes a failure in the communications with the devices affected, resulting in potential user problems. For this reason, the system manager should perform an orderly shutdown of all DSSI ISEs before any troubleshooting. Refer to the service or maintenance manuals for the device.

7.1 Troubleshooting the SF72 Storage Enclosure

This section presents symptoms of a failed device, the probable cause or causes of the failure, and the corrective action to take for correcting the failure. Much of the corrective action calls either for taking a device or devices off-line or for removing power from the enclosure containing the failed device.

WARNING
Take all ESD and safety precautions when handling the devices, more specifically, when taking a device off-line or when removing a device. Failure to do so will damage the device.

Use the following basic steps for all troubleshooting that you perform for the RF72 disk ISE in an SF72 storage enclosure, as it resides in an SF200 storage array:

1. Inspect the ISE's operator control panel (OCP). Is a Fault indicator lit? If so, press the Fault button and read the error code.
2. Access the ISE in question. Open the front or rear of the SF72 enclosure and gain access to the ISE's various cables and check that they are seated correctly.
3. Run various tests on the ISE by using DUP.
4. According to the findings from the error codes and results from DUP, repair or replace the ISE.
5. Run EVCXE configuration programs, EVCXF configuration programs, or both.
6. Verify the repair or replacement of the ISE with DRVTST and DRVEXR under DUP.
7. Return the system to the user.

Use Table 7–1 to isolate a failure in an SF72 storage enclosure.

Table 7–1 Troubleshooting Chart

Symptom(s)		Probable Cause(s)		Corrective Action(s)
No OCP indicators are lit.	1.	SF72 enclosure is not plugged in or not turned on.	1.	At the rear of the SF72 enclosure, plug in the ac power cord or turn on the SF72.
	2.	Drive dc power switch is off.	2.	At the front of the SF72 enclosure, turn on the drive dc power switch.
	3.	OCP is not plugged in or seated firmly.	3.	Press the OCP firmly in place.
	4.	Bad OCP.	4.	Configure and replace a new OCP.
	5.	Bad TTM.	5.	Configure and replace a new TTM.
Single Fault indicator lit on OCP.	1.	Faulty RF72 disk ISE.	1.	Press lit Fault button, then read fault code and replace failed FRU.
	2.	Conflicting DSSI ID numbers.	2.	Verify correct DSSI ID switch settings on KFMSA module, SF72, and magazine tape subsystems for that bus.
Multiple Fault indicators lit on OCP.	1.	Conflicting DSSI ID number.	1.	Verify correct DSSI ID switch settings on KFMSA module, SF72, and magazine tape subsystems for that bus.
	2.	Bad OCP.	2.	Configure and install a new OCP.

Table 7–1 (Cont.) Troubleshooting Chart

Symptom(s)		Probable Cause(s)		Corrective Action(s)
	3.	Bad DSSI cable(s).	3.	Isolate with DSSI bus meter[1] and replace.
One or more indicators continue to cycle.		Conflicting DSSI ID numbers.		Verify correct DSSI ID switch settings on KFMSA module, SF72, and magazine tape subsystems for that bus.
One ISE is not accessible.	1.	DC power to ISE is not on.	1.	Turn on dc power switch.
	2.	Bad ISE drive module.	2.	Replace ISE drive module.
	3.	Bad DSSI cable(s).	3.	Isolate with DSSI bus meter[1] and replace.
	4.	Bad remote front cable.	4.	Replace cable.
	5.	Bad power harness.	5.	Replace power harness.
ISE is not seen or seen at unexpected DSSI ID value.	1.	RFP cables are not plugged in the SF72 TTM or ISE.	1.	Check that both ends of RFP cables are plugged in.
	2.	Bad OCP ID switch.	2.	Reconfigure and replace OCP.
	3.	Bad RFP cable.	3.	Replace appropriate RFP cable.
Fan is not spinning and power supply LED is lit.	1.	Bad power supply.	1.	Replace power supply.
	2.	Bad fan.	2.	Replace fan.
	3.	Bad TTM.	3.	Configure a new TTM and replace.

[1]The DSSI bus meter part number is 29–28008–01.

Table 7–1 (Cont.) Troubleshooting Chart

Symptom(s)		Probable Cause(s)		Corrective Action(s)
Fan is not spinning and power supply LED is not lit, but SF72 enclosure is on.	1.	Bad power supply.	1.	Replace power supply.
	2.	Bad power cord.	2.	Replace cord.
	3.	Bad TTM.	3.	Configure a new TTM and replace.

NOTE

The DSSI bus meter, or DBM, is a small, easily portable device used to look at bus signals in real-time as well as to verify DSSI ID numbers. The DBM can quickly locate faulty cables or duplicate DSSI ID numbers on a given DSSI bus.

7.1.1 Removing an RF72 Disk ISE from an SF72 Storage Enclosure

This section provides the procedure for removing an RF72 disk ISE from an SF72 storage enclosure.

WARNING

Take all possible ESD precautions when unpacking the RF72 disk ISEs. Wear a correctly grounded ESD strap.

Have an orderly shutdown of the SF72 enclosure containing the disk ISE performed. Refer to the system documentation.

1. Power down the SF72 enclosure.
   a. Take each existing RF72 disk ISE on that DSSI bus off-line (Figure 7–1) by pressing and releasing each Ready button on the operator control panel (OCP). The button indicators go out.
   b. Press and release the drive dc power switches for all the ISEs on that DSSI bus.
   c. Set the ac power switch on the rear of the enclosure to 0.

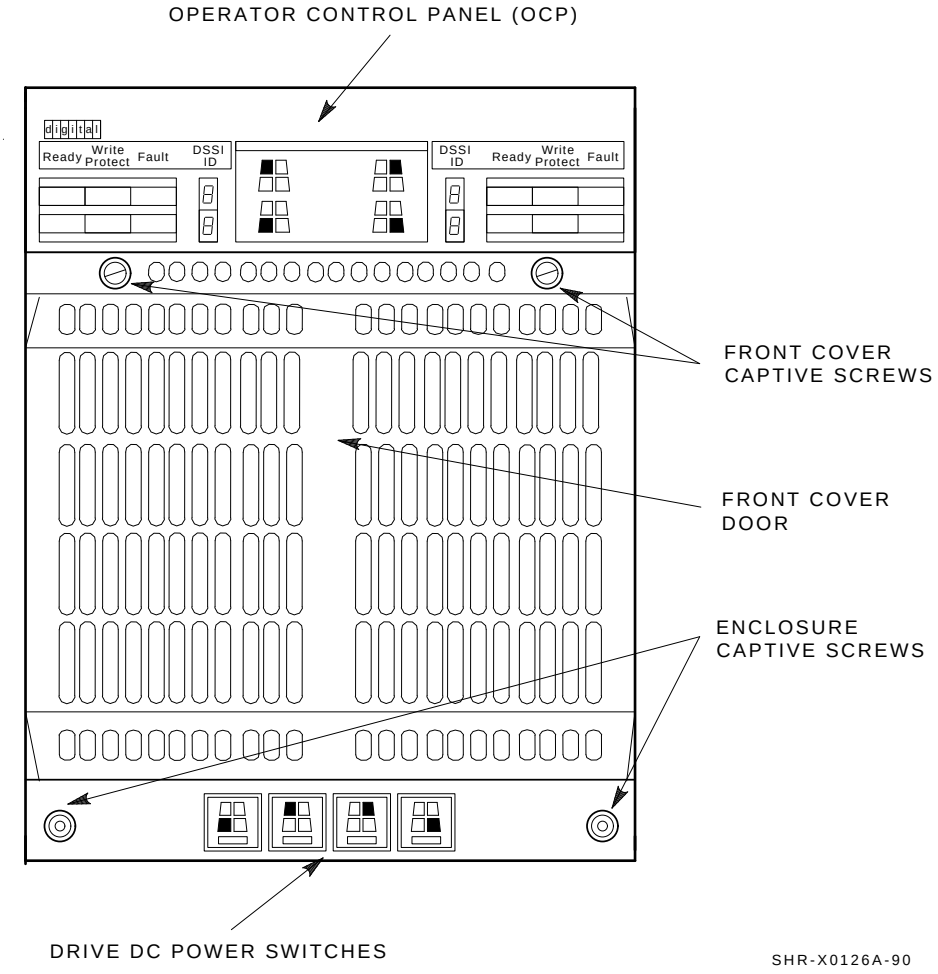


Figure 7–1 Powering Down the SF72 Storage Enclosure

2. Remove the RF72 disk ISE.
   a. Remove the SF72 enclosure front cover (Figure 7–2). Loosen the screws and lift off the covers.
   b. Loosen the wedges on the disk ISE.

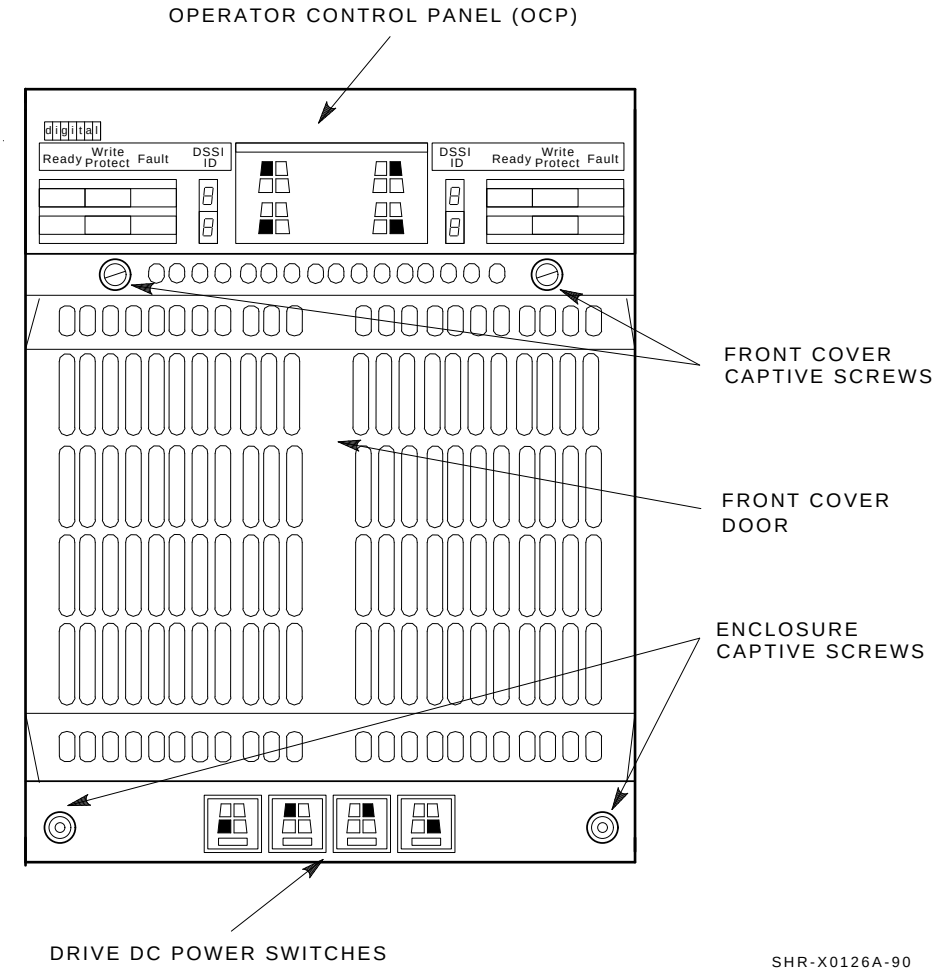


Figure 7–2 SF72 Front Cover Removal

c. Disconnect all cables to the disk ISE as shown in Figure 7–3.

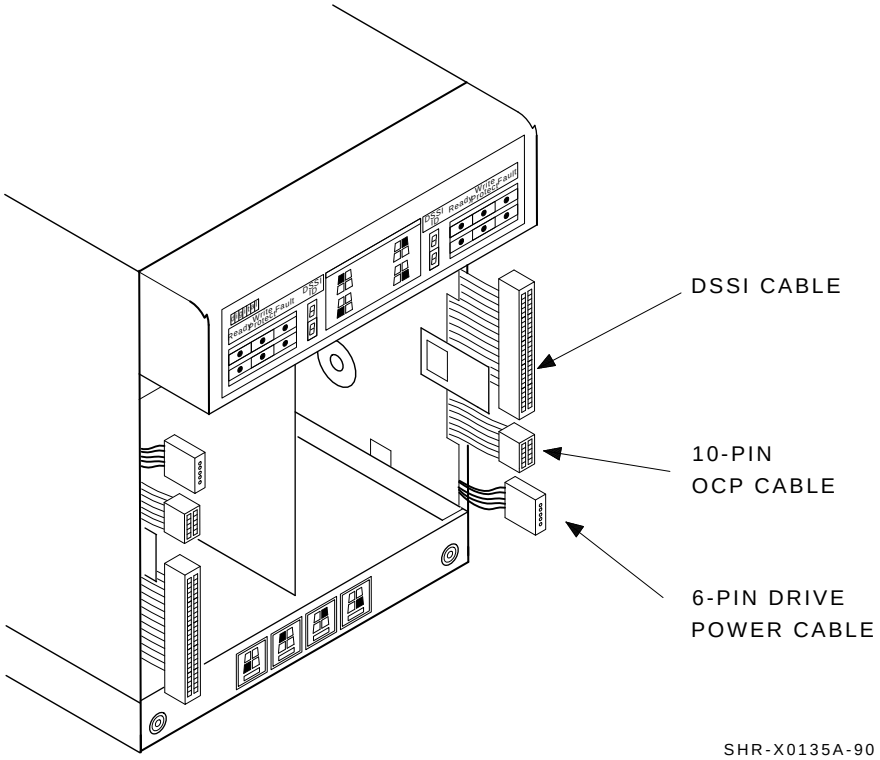


Figure 7–3 Disconnecting the Cables

d. Remove the RF72 disk ISE as shown in Figure 7–4. Slide out the disk ISE gently, while holding all cables out of the way. Do not force the disk ISE.

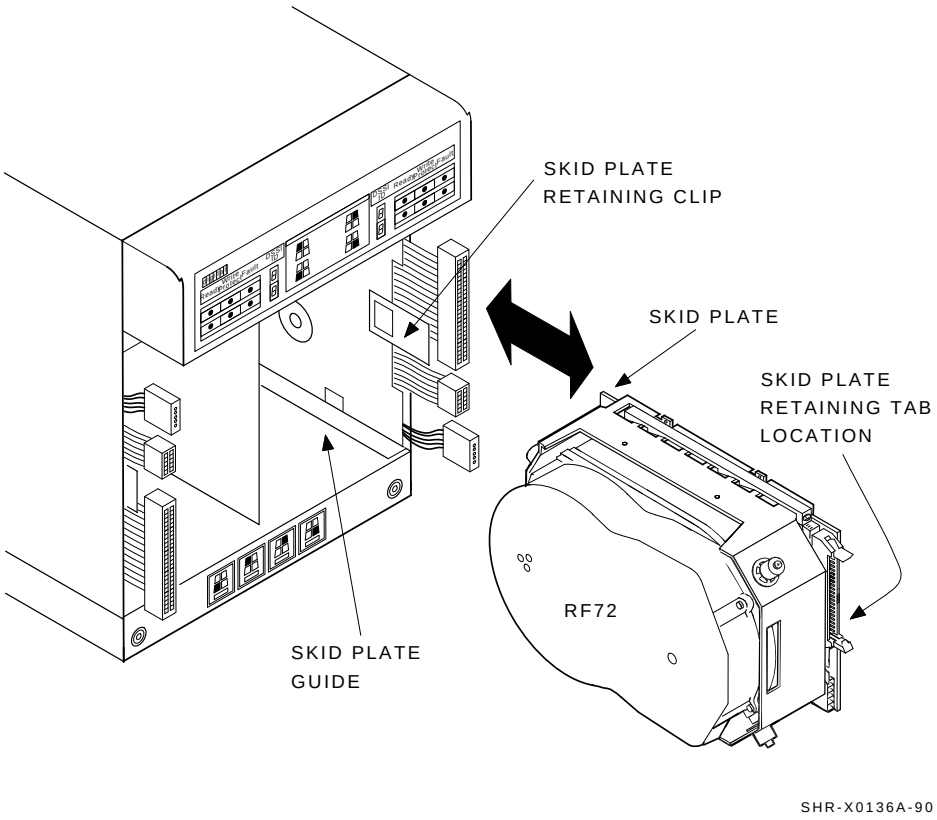


Figure 7–4 RF72 Disk ISE Removal

3. Unpack the replacement RF72 disk ISE:
   a. Open the shipping carton.
   b. Remove the disk ISE wrapped in the protective wrapper.
   c. Open the protective wrapper and remove the disk ISE. Discard the desiccant bags.
   d. Place the disk ISE on the protective wrapper.
4. Remove the skid plate and wedges from the faulty disk ISE and install them on the replacement disk ISE (Figure 7–5).

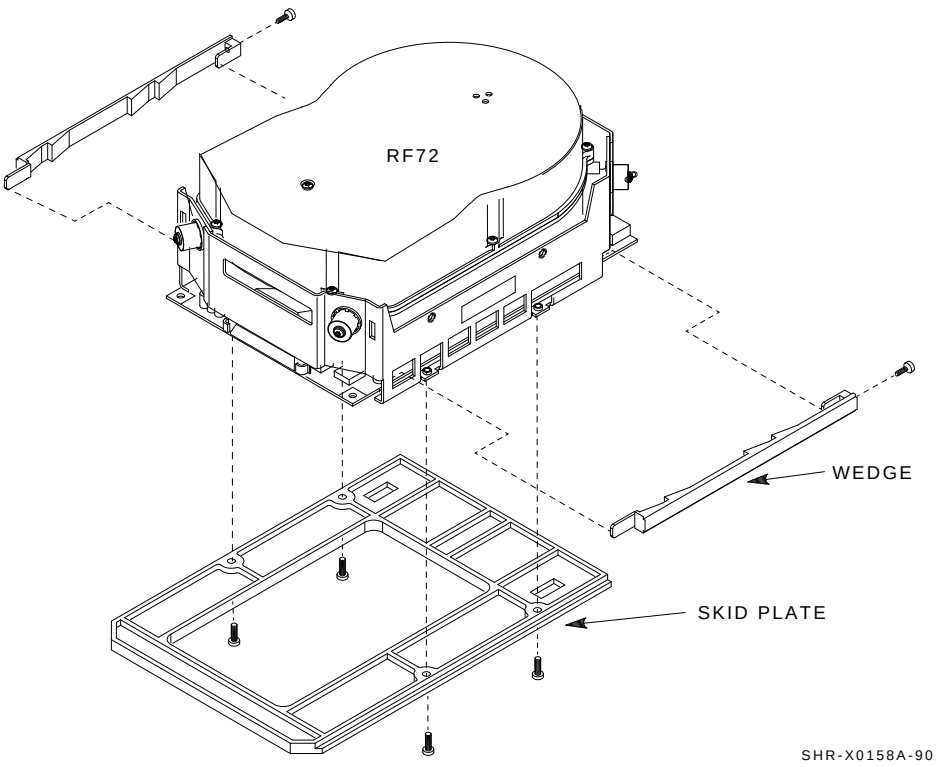


Figure 7–5 RF72 Wedges and Skid Plate

5. Orient the RF72 disk ISE as shown in Figure 7–6 and install the disk ISE in the enclosure. Slide the disk ISE gently into place, while holding all cables out of the way. Do not force the disk ISE.

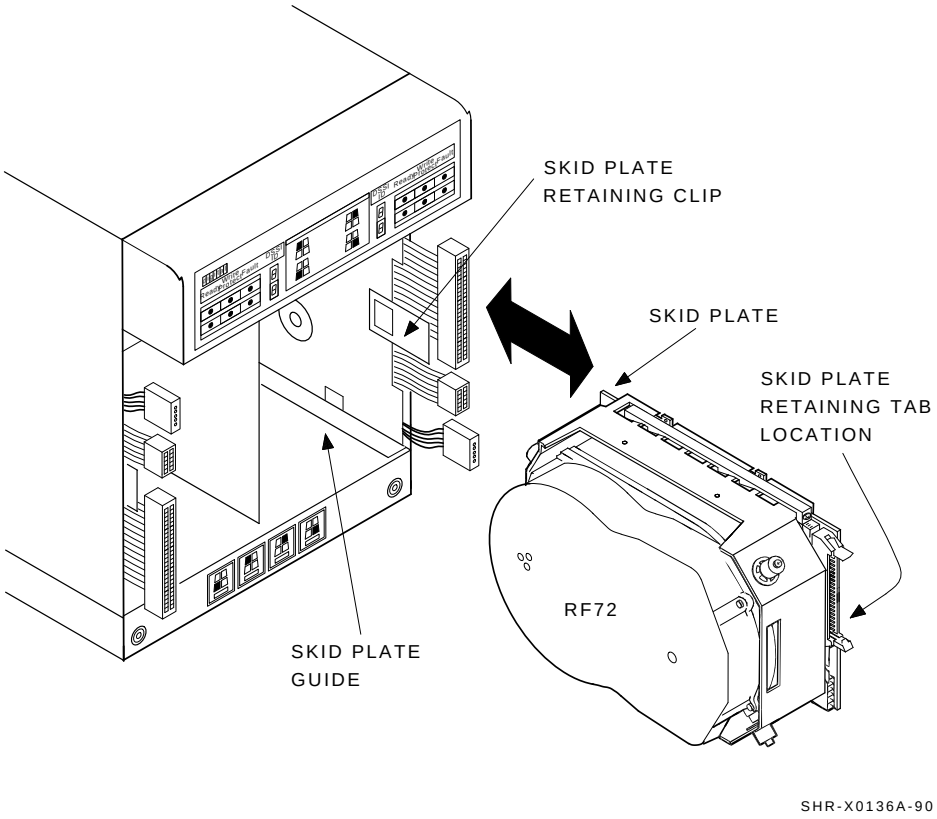


Figure 7–6 RF72 Disk ISE Orientation

6. Verify that the disk ISE is locked into place and tighten the wedges.
7. Connect all cables as shown in Figure 7–7. Connectors are keyed so that the cables cannot be installed incorrectly.

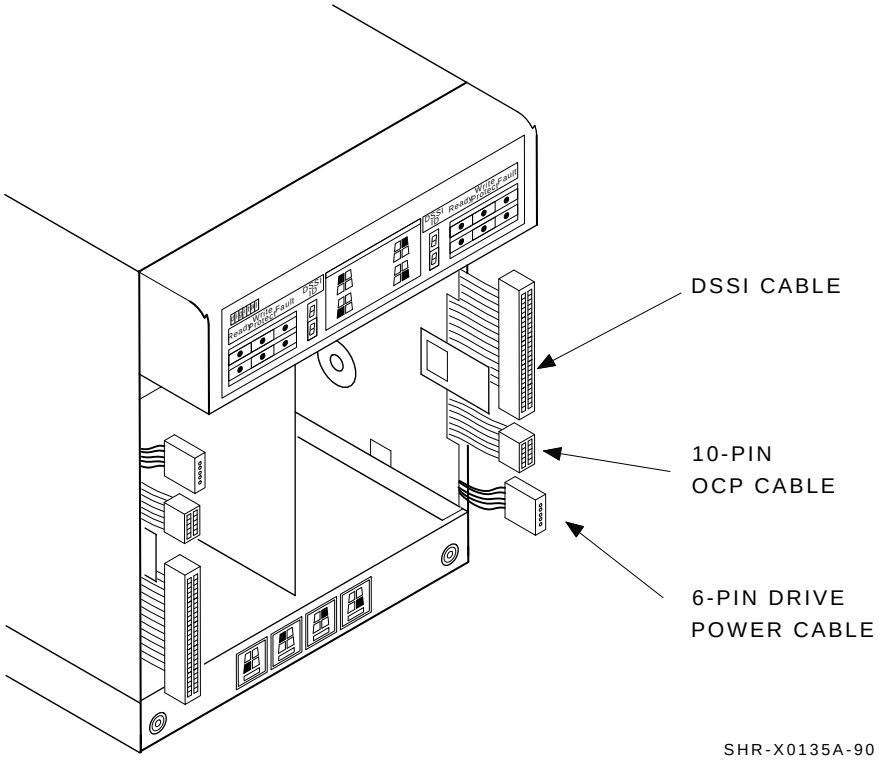


Figure 7–7 Cabling the RF72 Disk ISE

8. Replace the front cover on the SF72 enclosure (Figure 7–8).

Proceed to Section 7.1.2.

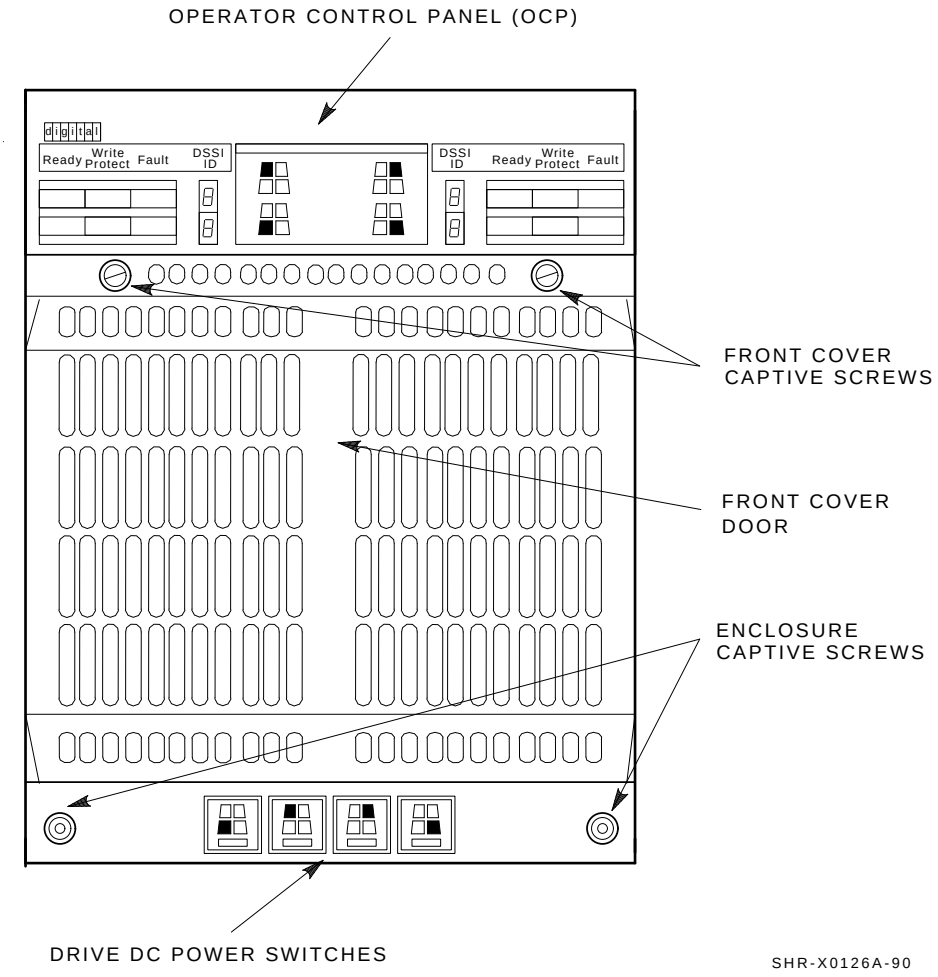


Figure 7–8 SF72 Front Cover Replacement

7.1.2 Bringing the RF72 Disk ISE On-Line

This section provides the procedure for bringing all the ISEs in the SF72 enclosure on-line and for setting DSSI ID numbers.

1. Ensure that the DSSI ID switches (behind the door on the OCP) are set correctly. For positions 1, 2, 4, and 7, they are LR:1, RR:4, LF:2, RF:3. For positions 3 and 8, they are LR:6, RR:6, LF:5, RF:5.
2. Place the ac power switch at the rear of the SF72 enclosure to the 1 or ON position.
3. Press all drive dc power switches.
4. Press all four Ready buttons on that OCP, one at a time.
5. If no Fault indicators are lit, then continue. If a Fault indicator is lit, recycle the dc power once. If the failure appears again, refer to Section 7.1.1.
6. Run the EVCXE or EVCXF programs to add the new disk ISE to the configuration and to change any disk ISE internal parameters, if necessary.
7. Update the system configuration sheet.
8. Run DRVTST and DRVEXR (under DUP) to verify the correct operation of the new disk ISEs.
9. Return the system to the user.

7.2 Troubleshooting the Magazine Tape Subsystem

Refer to the magazine tape subsystem documentation for troubleshooting information.

A
SF200 Storage Array Cabling Diagrams

This appendix contains cabling diagrams for the SF200 storage array variations, in both the single-host (Section A.1) and dual-host (Section A.2) configurations.

Table A–1 explains the nomenclature used in the cabling diagrams.

Table A–1 Cabling Diagram Key

T and B R and L	Represent the top and bottom, right and left DSSI connectors in the rear of the magazine tape subsystems and SF72 storage enclosures.
TFx[1] SFx[2]	TF is the designation for a magazine tape subsystem. SF is the designation for a SF72 storage enclosure. The x refers to the number of that unit.
Px	Refers to the port number on the DSSI I/O panel.
Cables	Three DSSI cables are used: BC21Q–3F = 42-inch (unit to unit) BC21R–5L = 70-inch (SF200 I/O panel to unit) BC21Q–09 = 108-inch (SF200 to system)
T	T at a DSSI connector stands for a DSSI terminator (12–31281–01).

[1]There are only two magazine tape subsystems per SF200 storage array.

[2]There are up to six SF72 storage enclosures per SF200 storage array.

Table A–2 lists the diagrams in this appendix.

Table A–2 Cabling Diagram List

Title	Reference
Single-Host Configurations	
SF200-BA/BD and SF200-CA/CD Variants	Figure A–1
SF200-FA/FD Variants	Figure A–2
SF200-HA/HD Variants	Figure A–3
SF200-HA/HD Variants, with One SF72	Figure A–4
SF200-HA/HD Variants, with Two SF72s	Figure A–5
SF200-JA/JD Variants	Figure A–6
SF200-TA/TD Variants[1]	Figure A–7
Dual-Host Configurations	
SF200-BE/BH and SF200-CE/CH Variants	Figure A–8
SF200-FE/FH Variants	Figure A–9
SF200-HE/HH Variants	Figure A–10
SF200-HH/HH Variants, with One SF72	Figure A–11
SF200-HH/HH Variants, with Two SF72s	Figure A–12
SF200-JE/JH Variants	Figure A–13
SF200-TA/TD Variants[1]	Figure A–14

[1]These variants contain one or two magazine tape subsystems only.

A.1 Single-Host Configuration

This section contains cabling diagrams for SF200 storage array variations in the single-host configuration.

Note the following:

- DSSI bus termination is supplied by the TTM module inside the SF72 storage enclosures in position 3 and 8.
- The SF72 storage enclosures in positions 3 and 8 must be operating in split-bus mode.
- If a DSSI bus is not connected to a SF72 storage enclosure in position 3 or 8, then DSSI bus termination is accomplished by using a DSSI terminator (part number 12–31281–01).
- Split-bus mode is supported only in the single-host configuration.

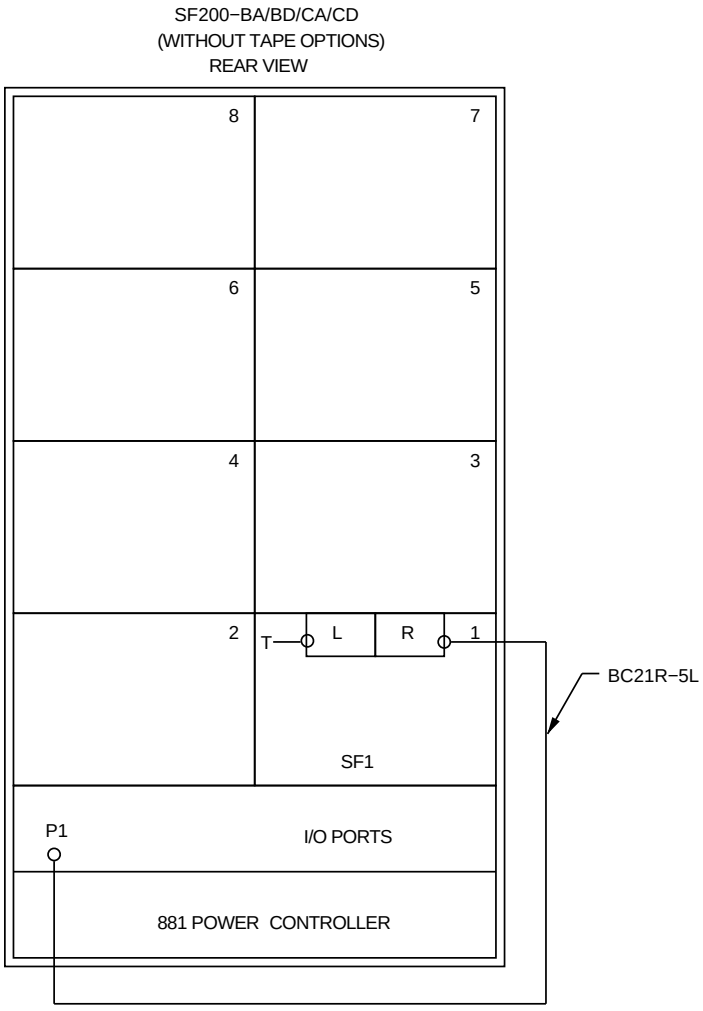


Figure A–1 (Cont.) SF200-BA/BD and SF200-CA/CD Variants

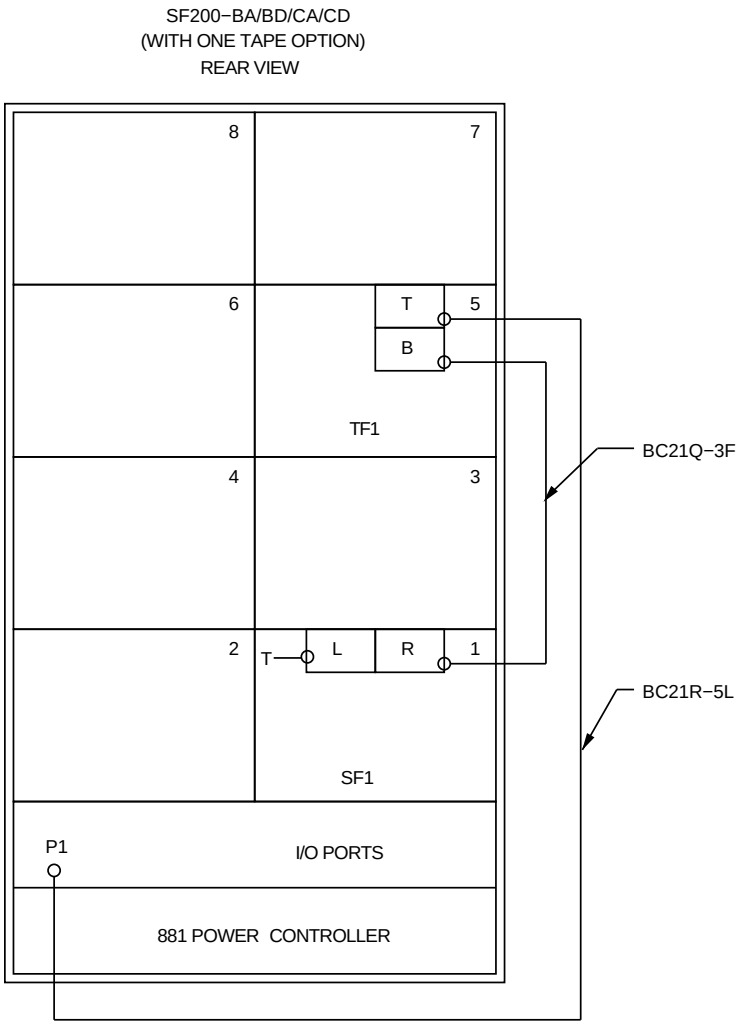


Figure A–1 (Cont.) SF200-BA/BD and SF200-CA/CD Variants

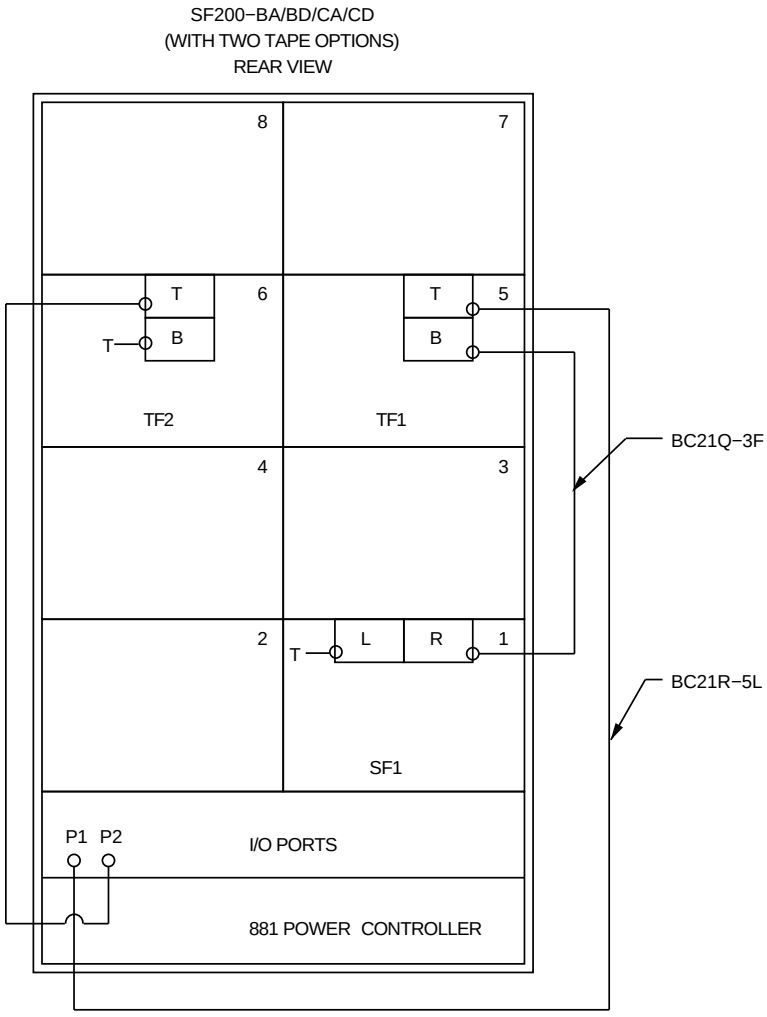


Figure A–1 SF200-BA/BD and SF200-CA/CD Variants

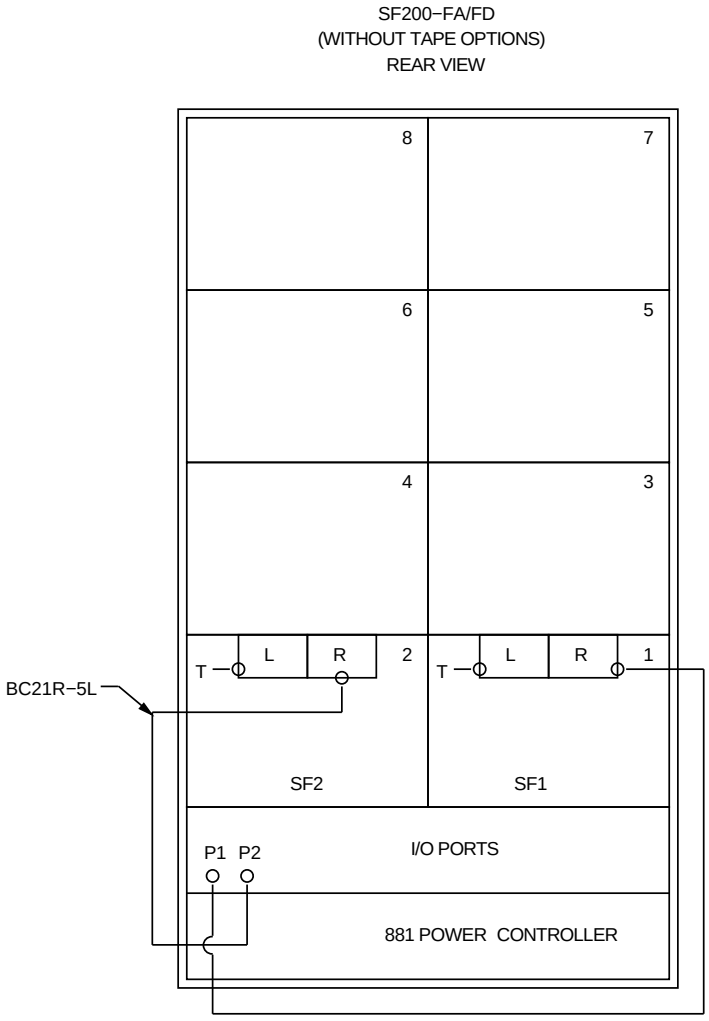


Figure A–2 (Cont.) SF200-FA/FD Variants

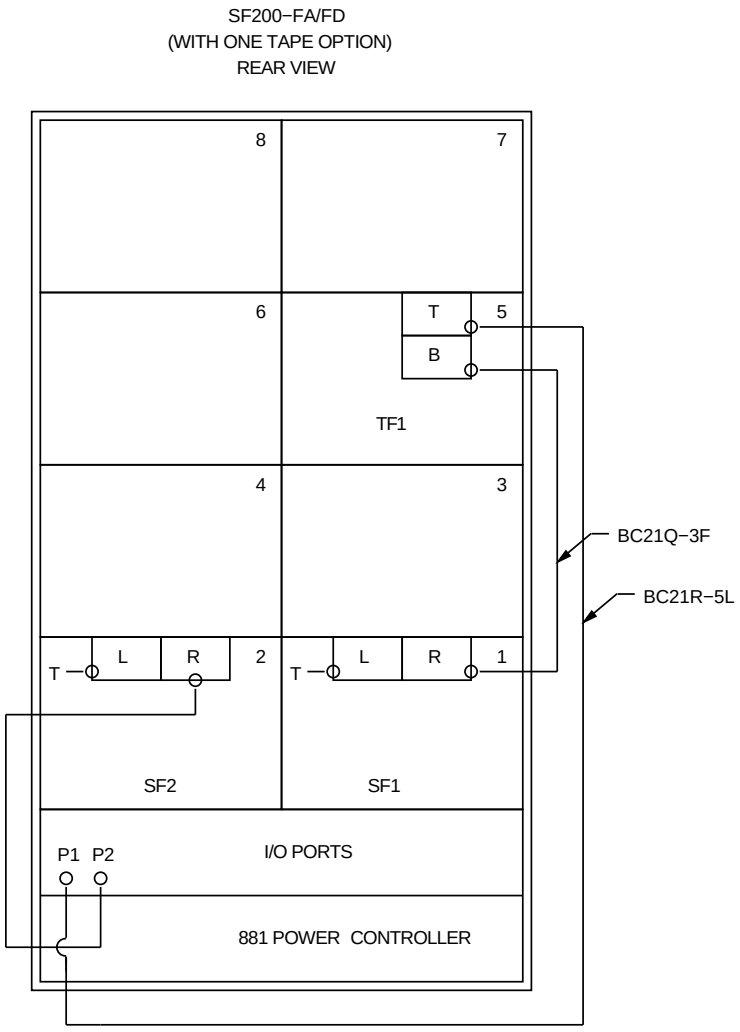


Figure A–2 (Cont.) SF200-FA/FD Variants

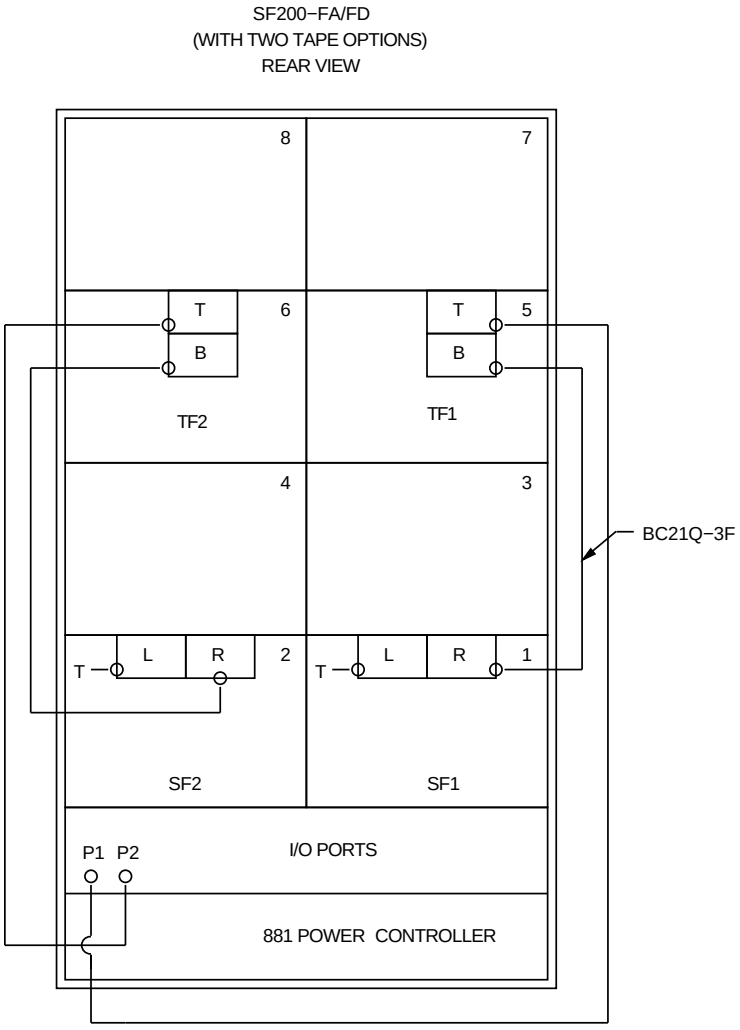


Figure A–2 SF200-FA/FD Variants

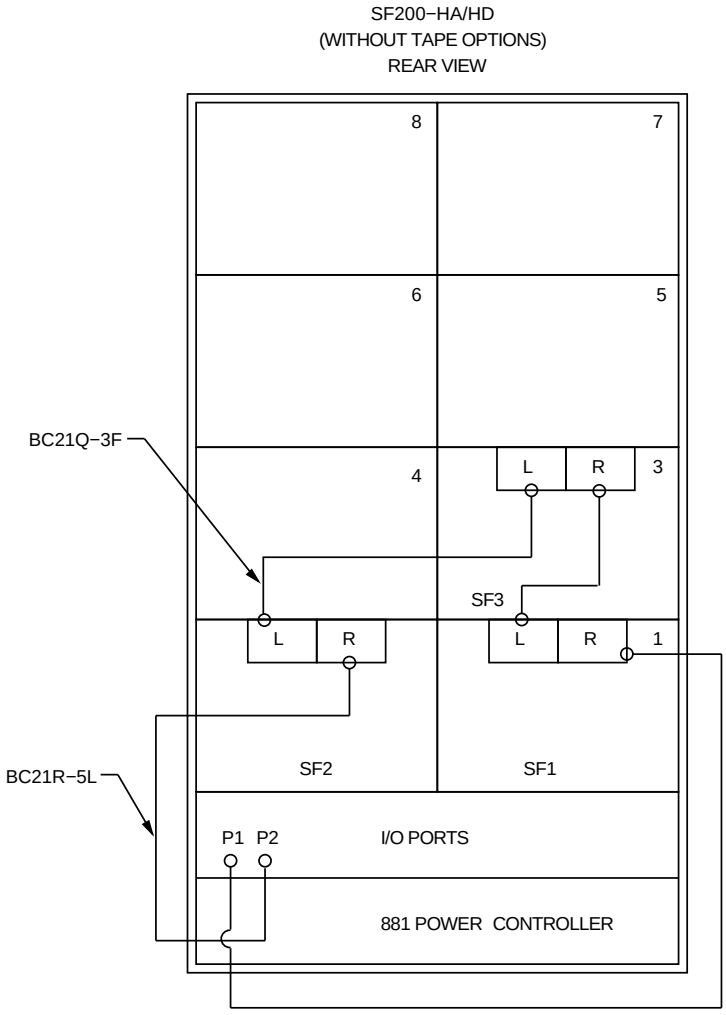


Figure A–3 (Cont.) SF200-HA/HD Variants

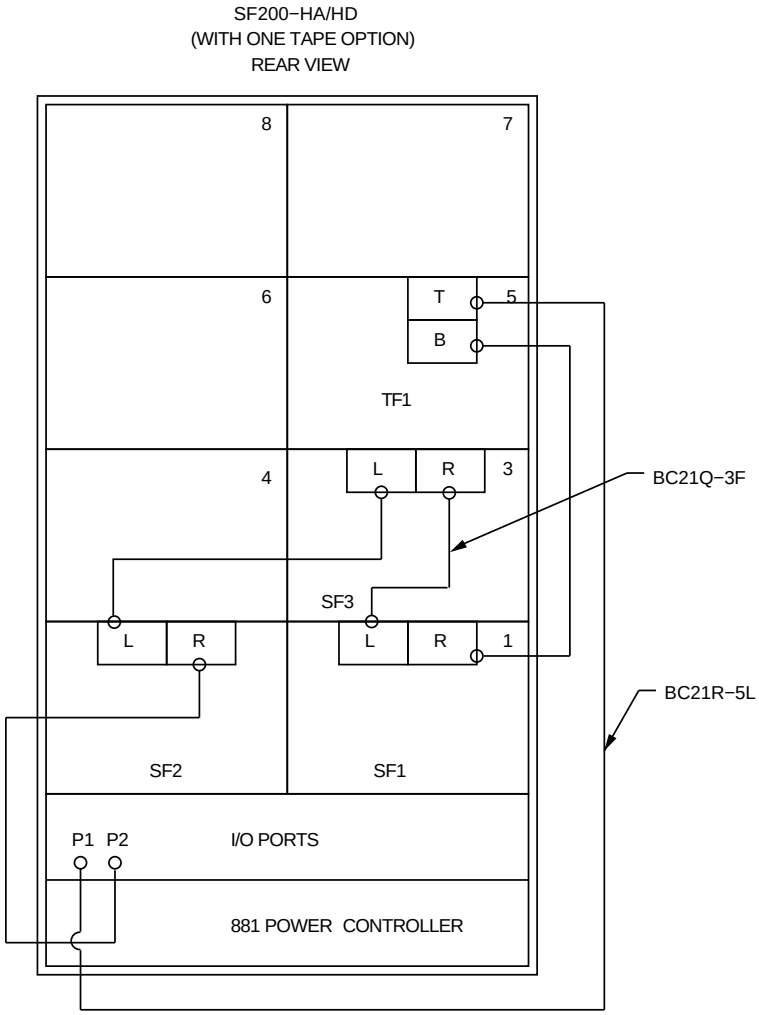


Figure A–3 (Cont.) SF200-HA/HD Variants

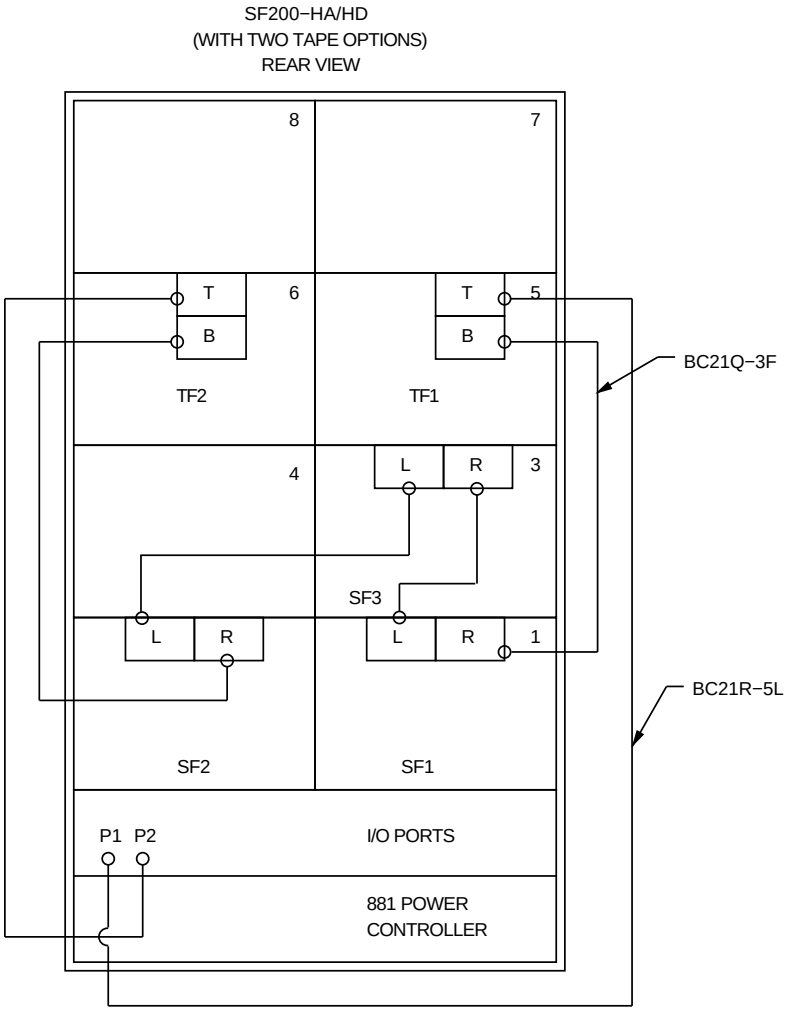


Figure A–3 SF200-HA/HD Variants

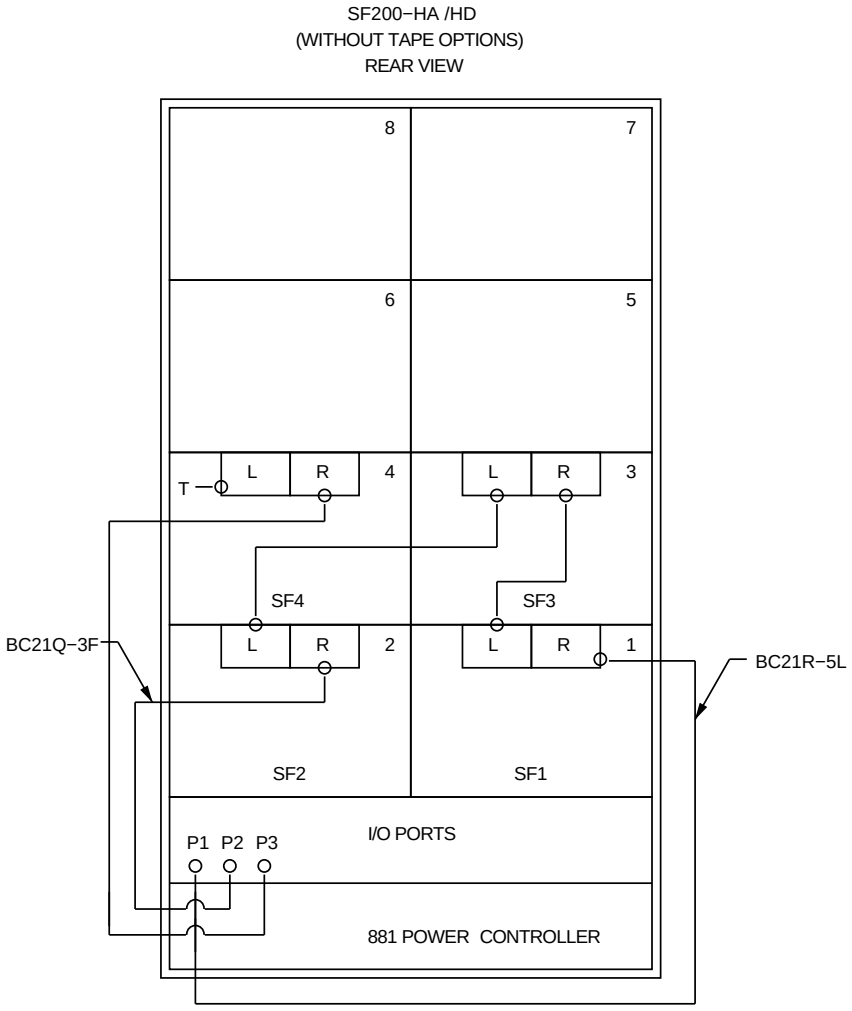


Figure A–4 (Cont.) SF200-HA/HD Variants, with One SF72

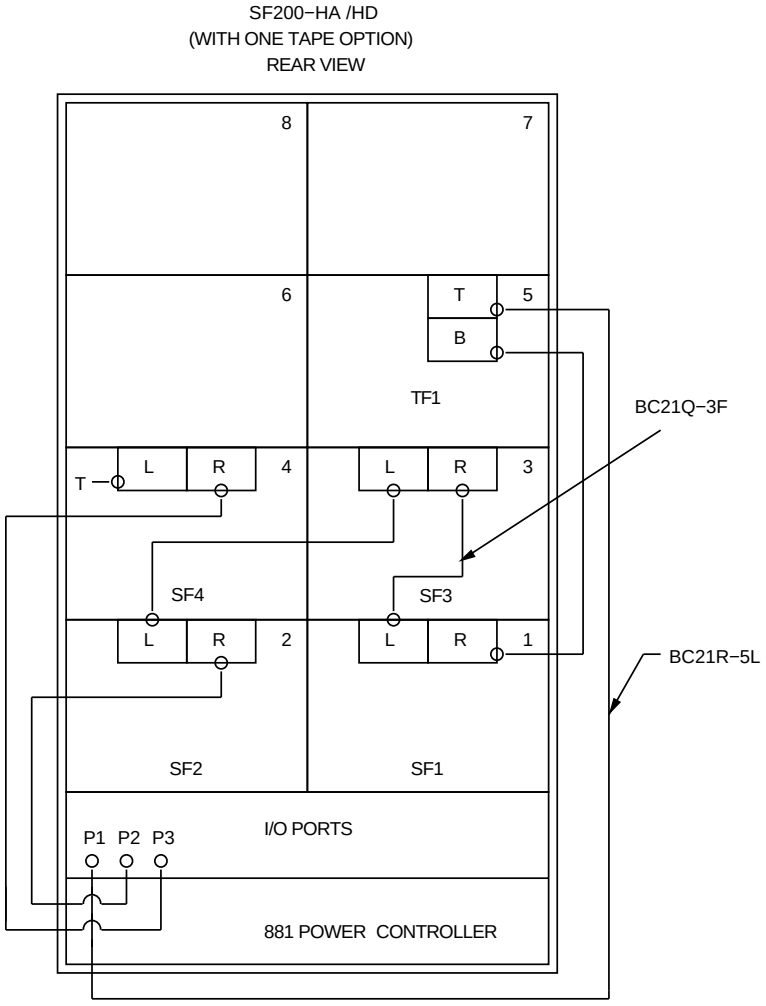


Figure A–4 (Cont.) SF200-HA/HD Variants, with One SF72

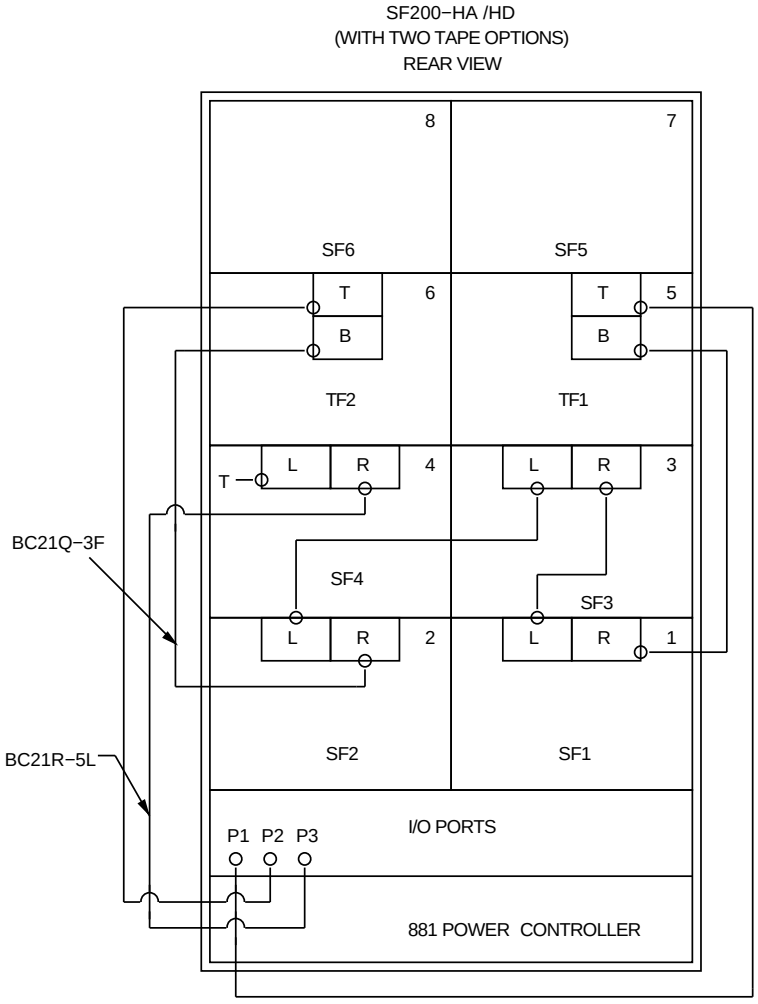


Figure A–4 SF200-HA/HD Variants, with One SF72

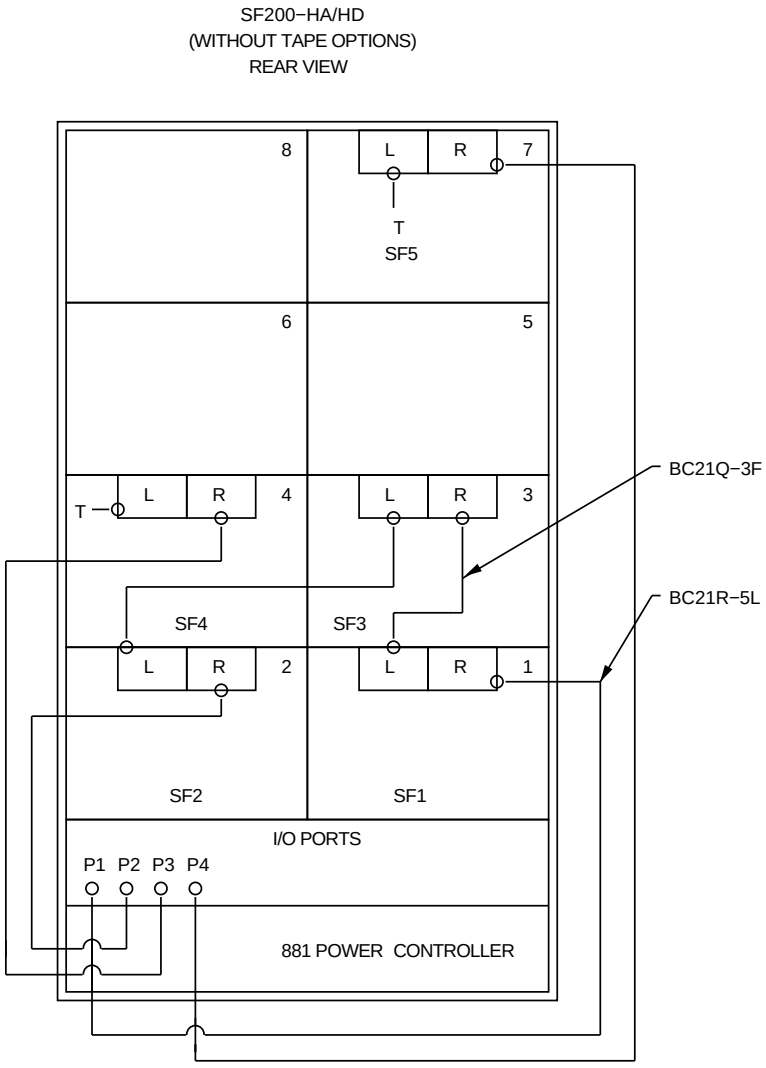


Figure A–5 (Cont.) SF200-HA/HD Variants, with Two SF72s

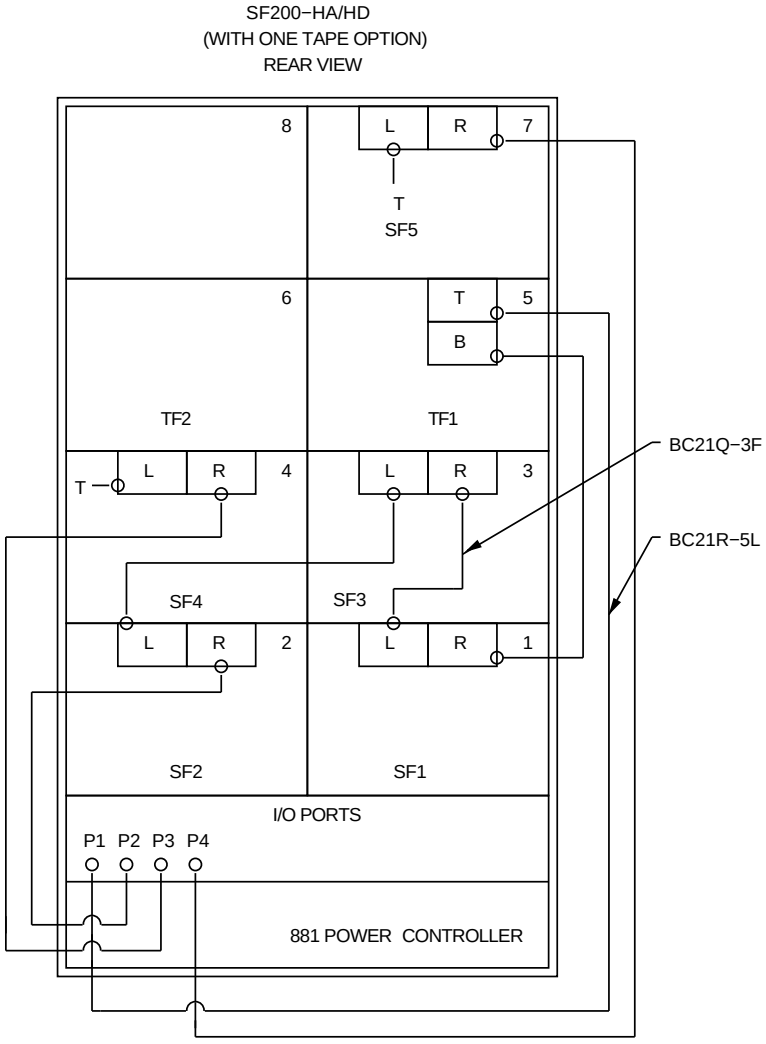


Figure A–5 (Cont.) SF200-HA/HD Variants, with Two SF72s

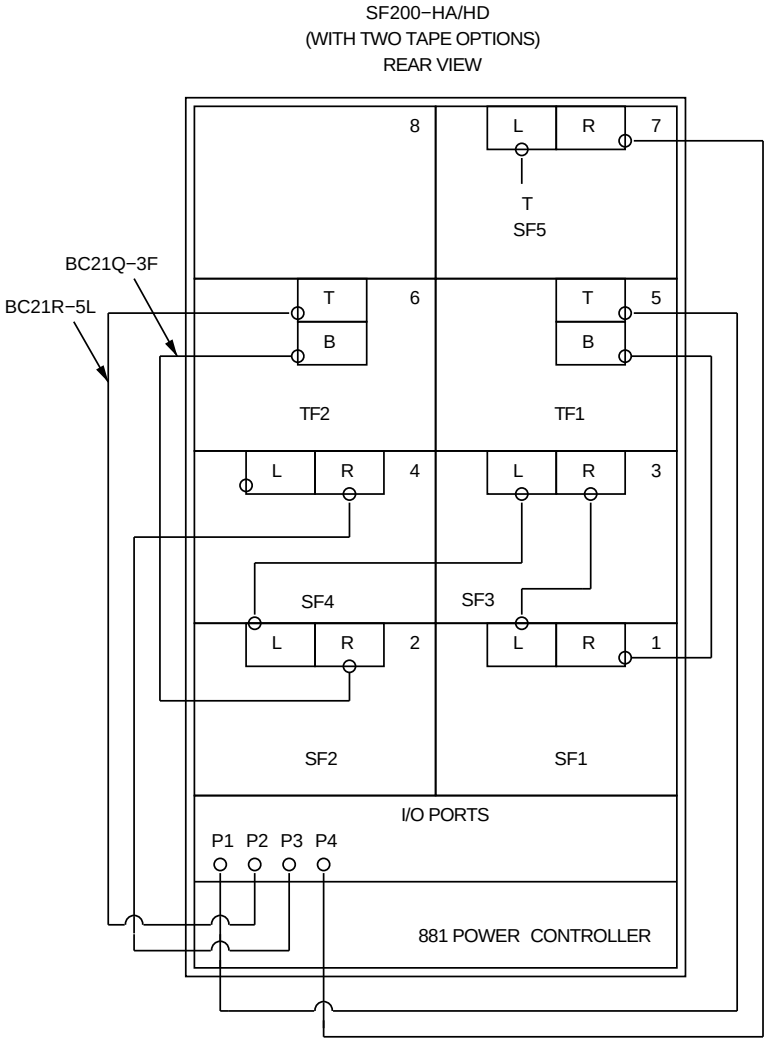


Figure A–5 SF200-HA/HD Variants, with Two SF72s

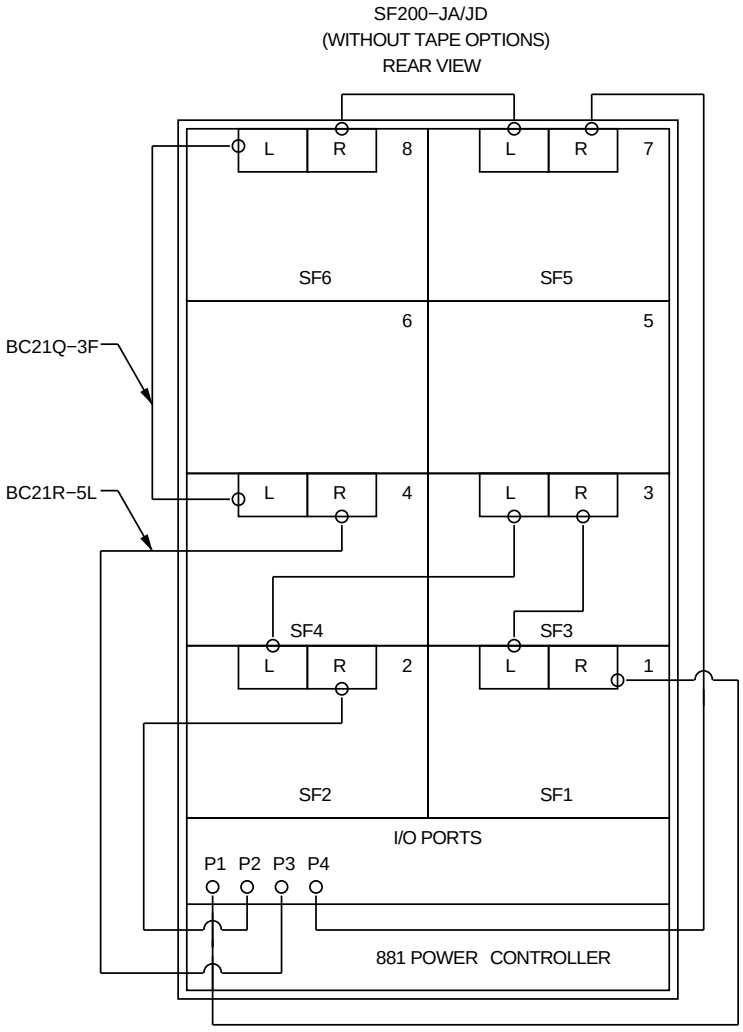


Figure A–6 (Cont.) SF200-JA/JD Variants

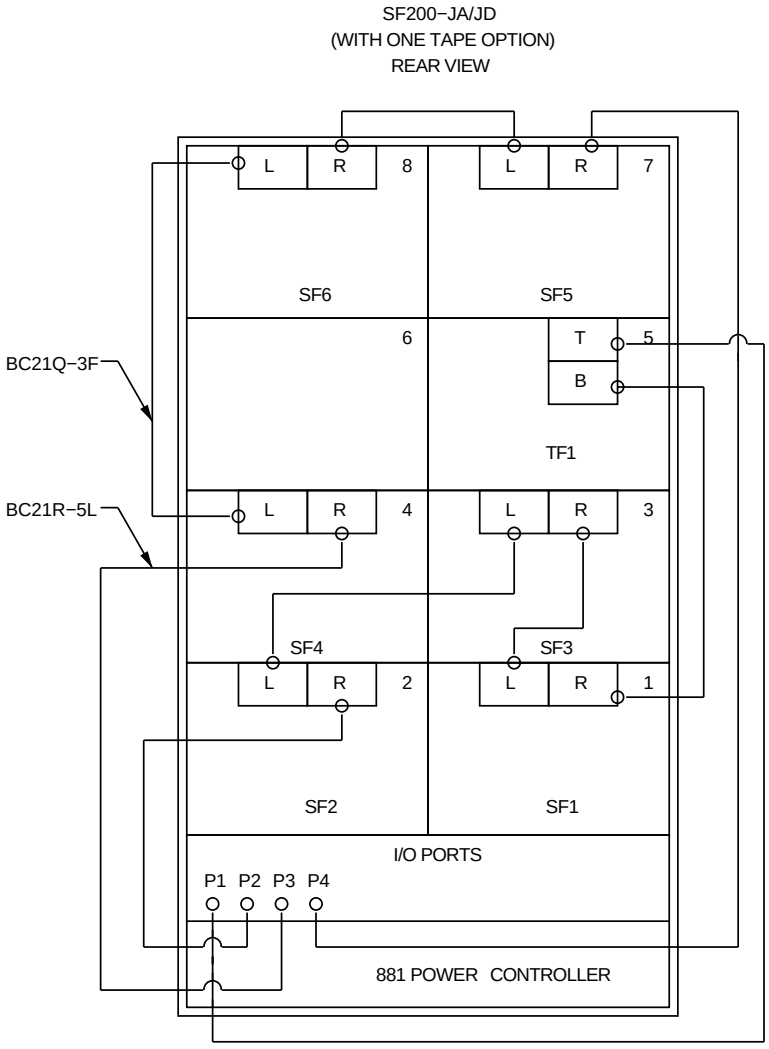


Figure A–6 (Cont.) SF200-JA/JD Variants

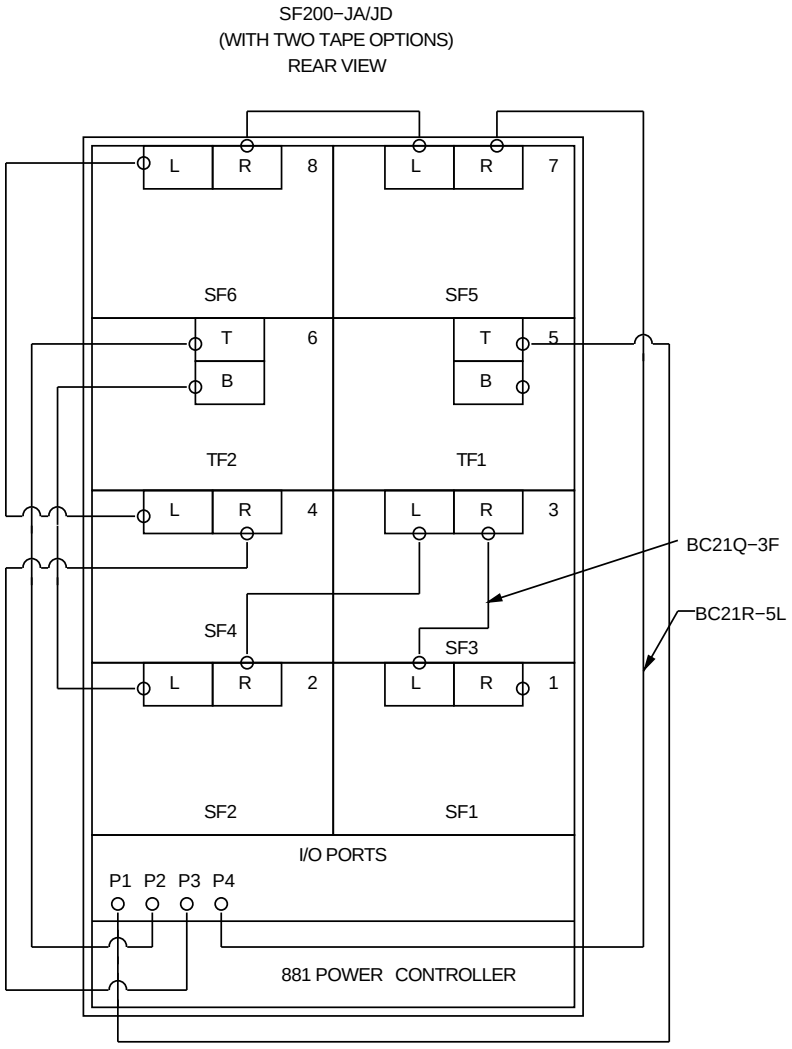


Figure A–6 SF200-JA/JD Variants

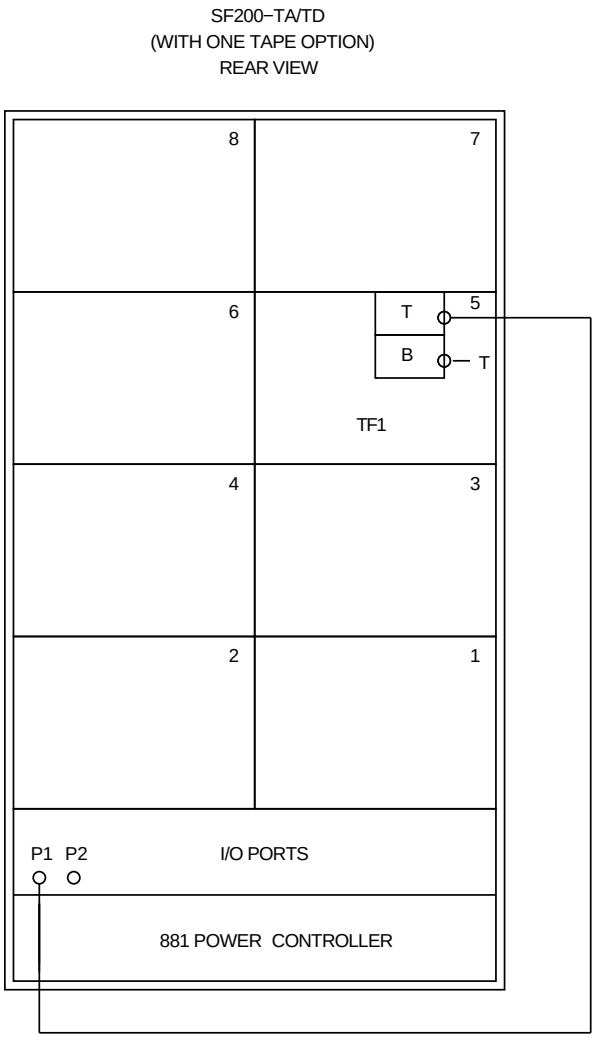


Figure A–7 (Cont.) SF200-TA/TD Variants (Magazine Tape Subsystems Only)

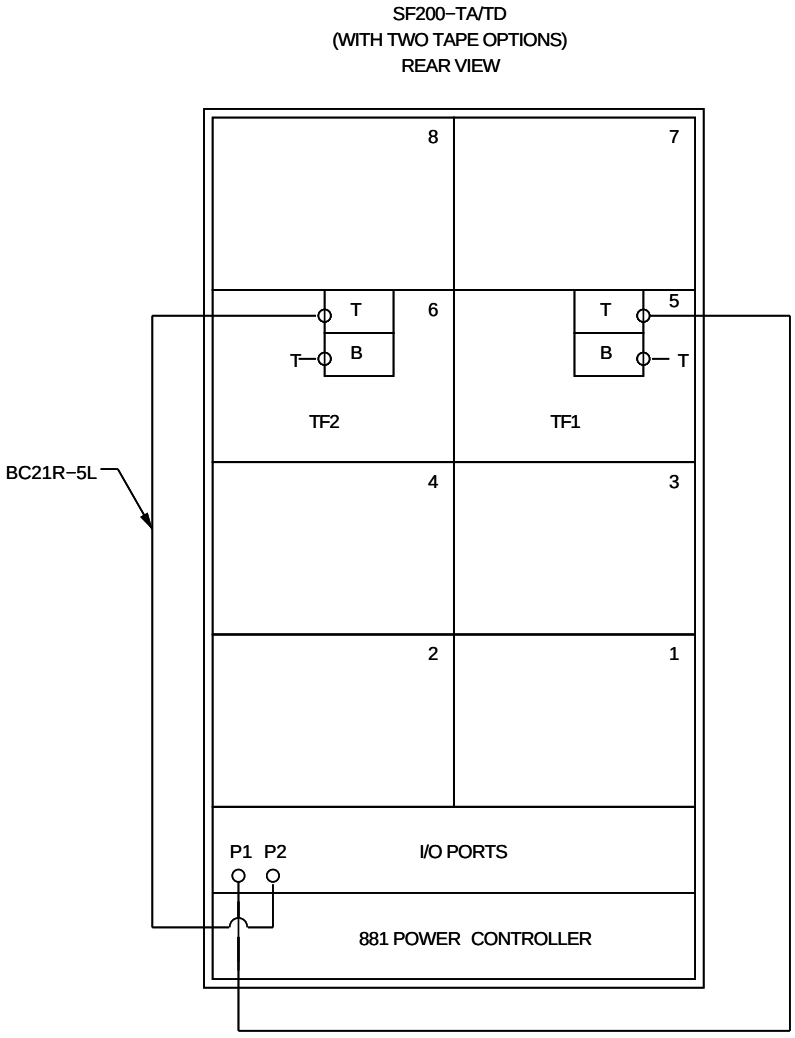


Figure A–7 SF200-TA/TD Variants (Magazine Tape Subsystems Only)

A.2 Dual-Host Configuration

This section contains cabling diagrams for SF200 storage array variations in the dual-host configuration.

Note the following:

- DSSI bus termination is supplied by the KFMSA modules installed in each host system.
- All KFMSA modules installed in each host system must be set to the same DSSI ID. DSSI ID 7 is used in one host system, and DSSI ID 6 is used in the other.
- All SF72 storage enclosures operate in through-bus mode.

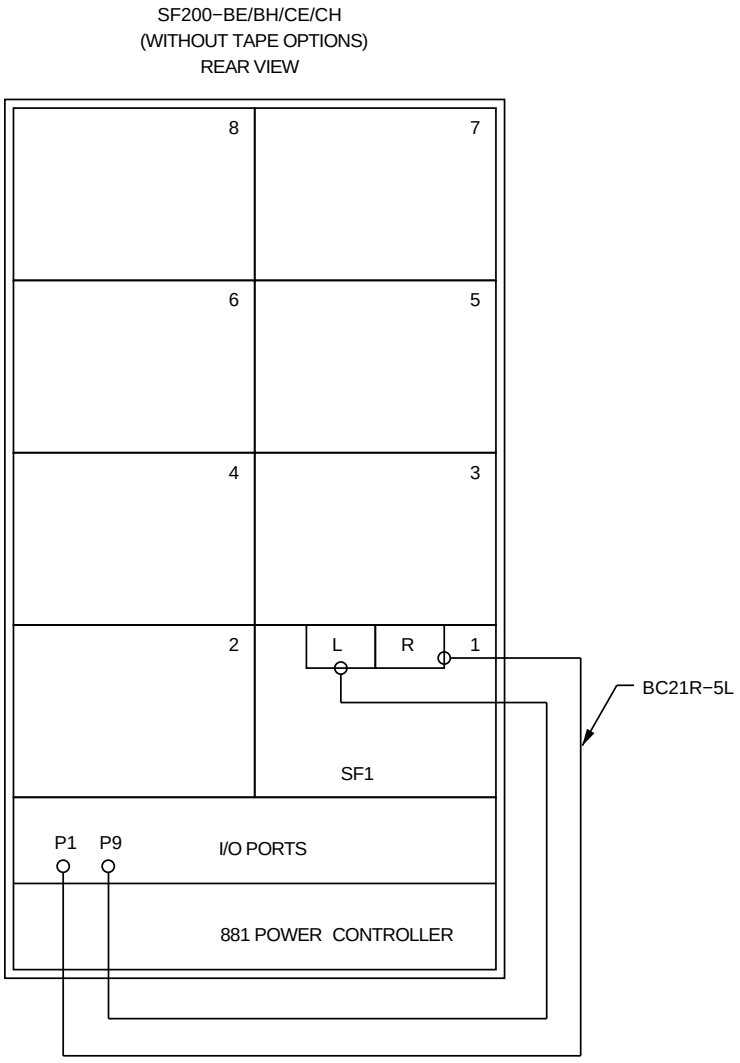


Figure A–8 (Cont.) SF200-BE/BH and SF200-CE/CH Variants

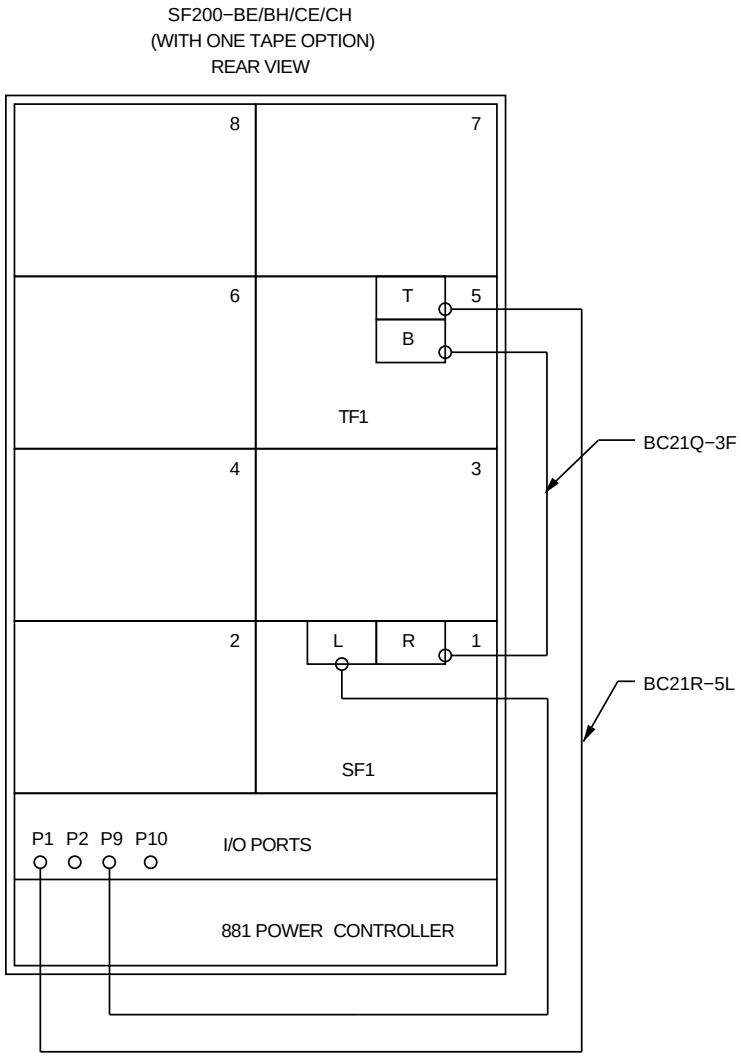


Figure A–8 (Cont.) SF200-BE/BH and SF200-CE/CH Variants

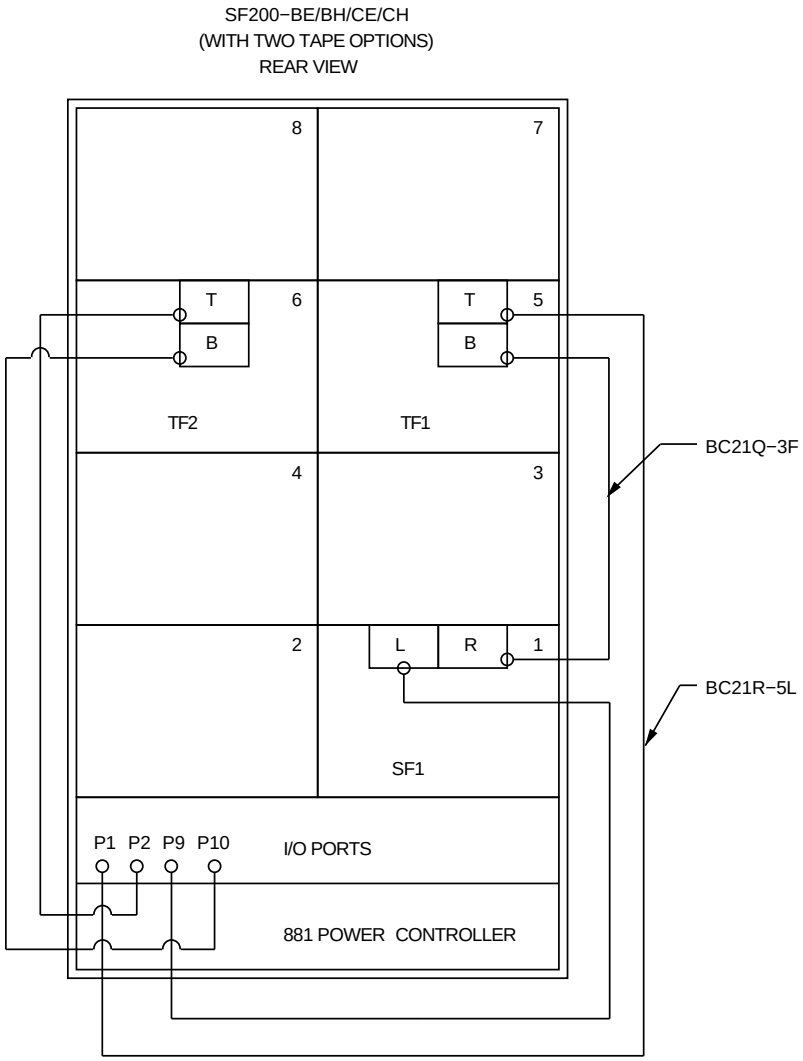


Figure A–8 SF200-BE/BH and SF200-CE/CH Variants

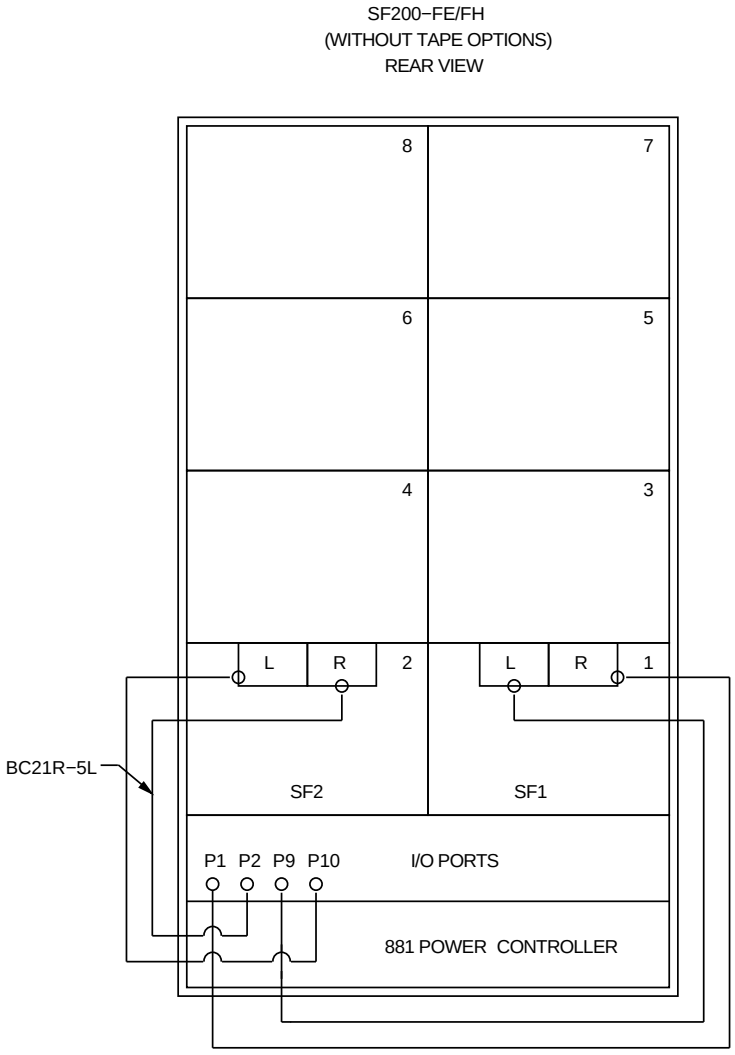


Figure A–9 (Cont.) SF200-FE/FH Variants

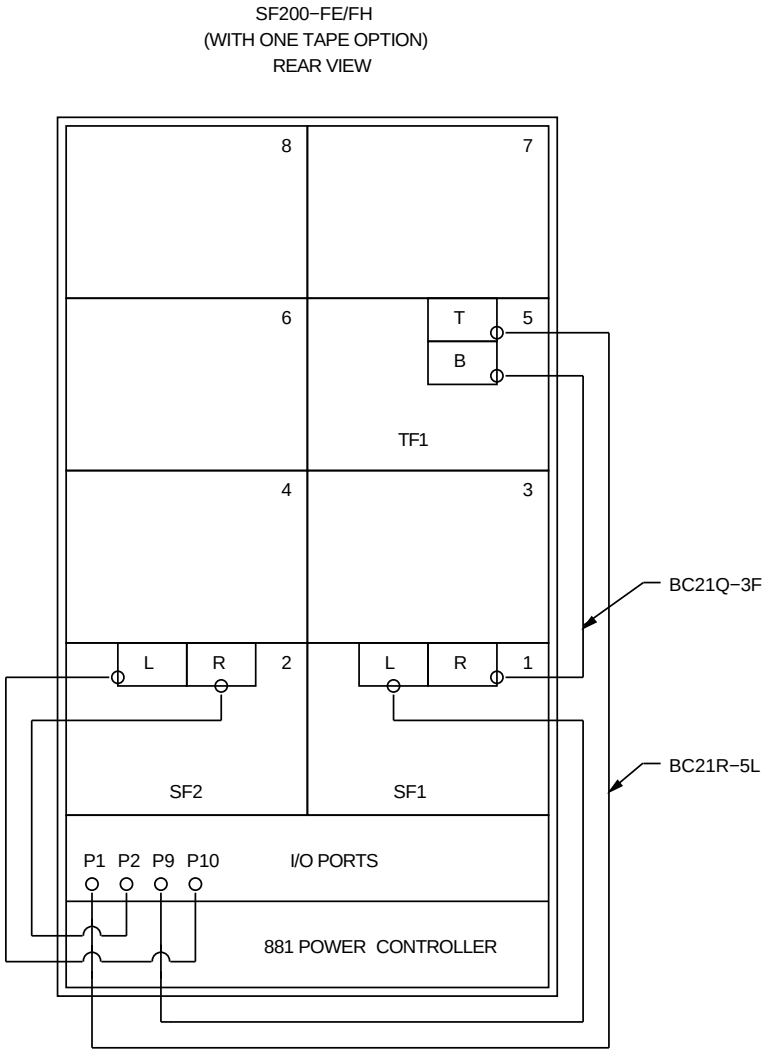


Figure A–9 (Cont.) SF200-FE/FH Variants

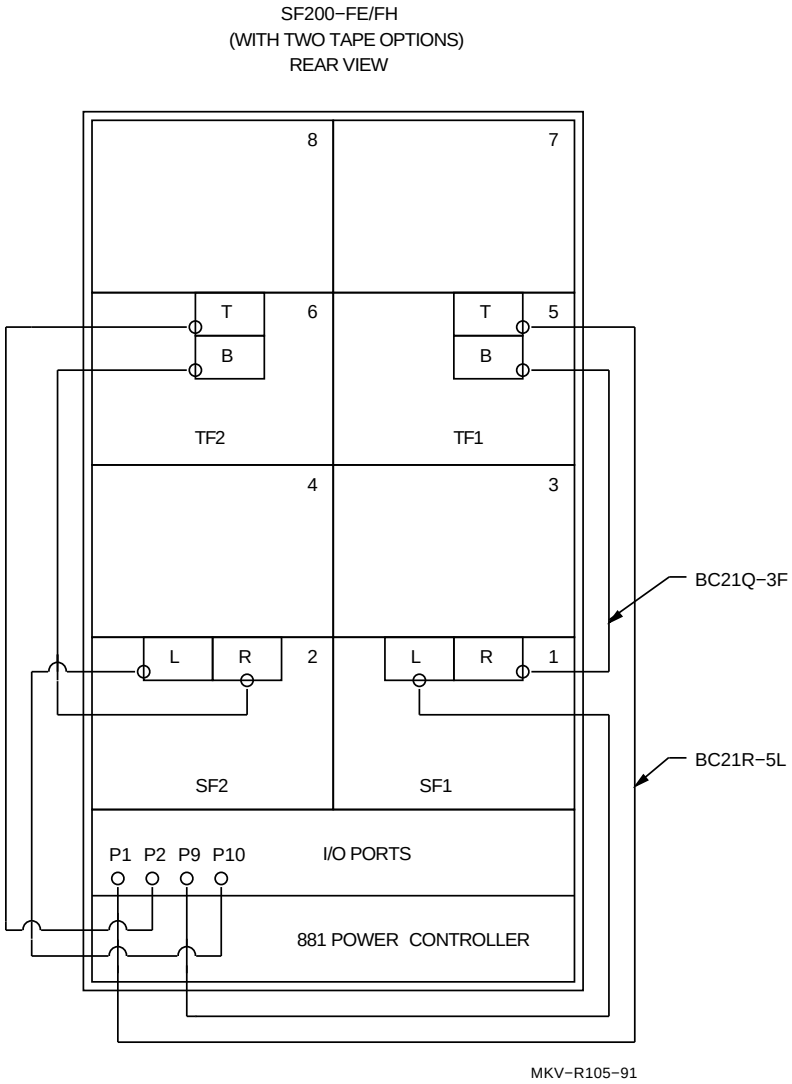


Figure A–9 SF200-FE/FH Variants

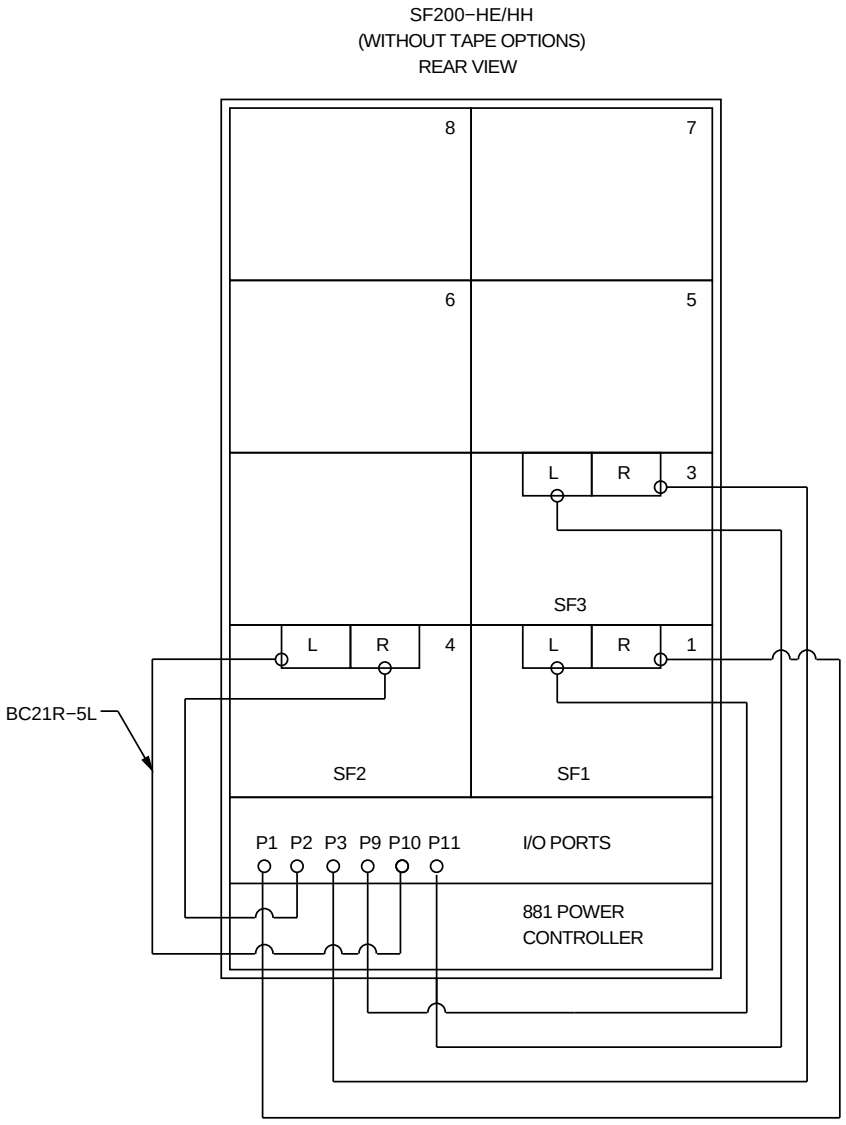


Figure A–10 (Cont.) SF200-HE/HH Variants

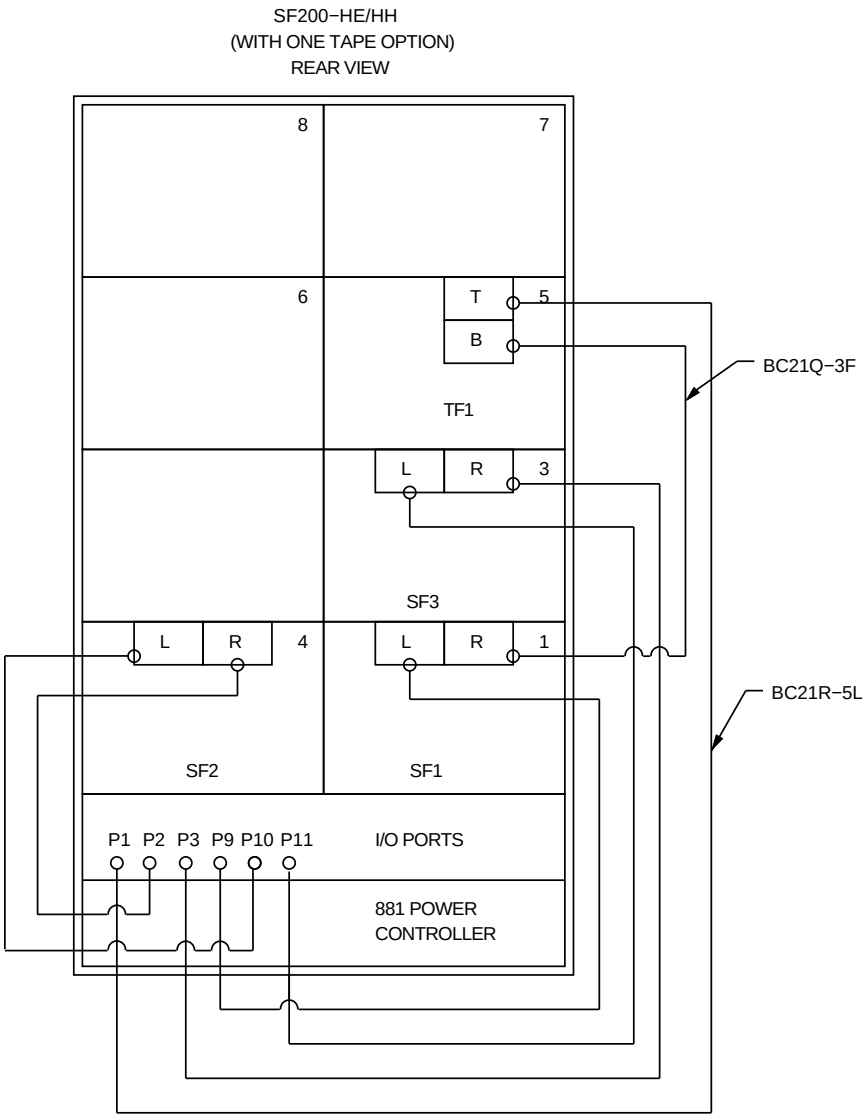


Figure A–10 (Cont.) SF200-HE/HH Variants

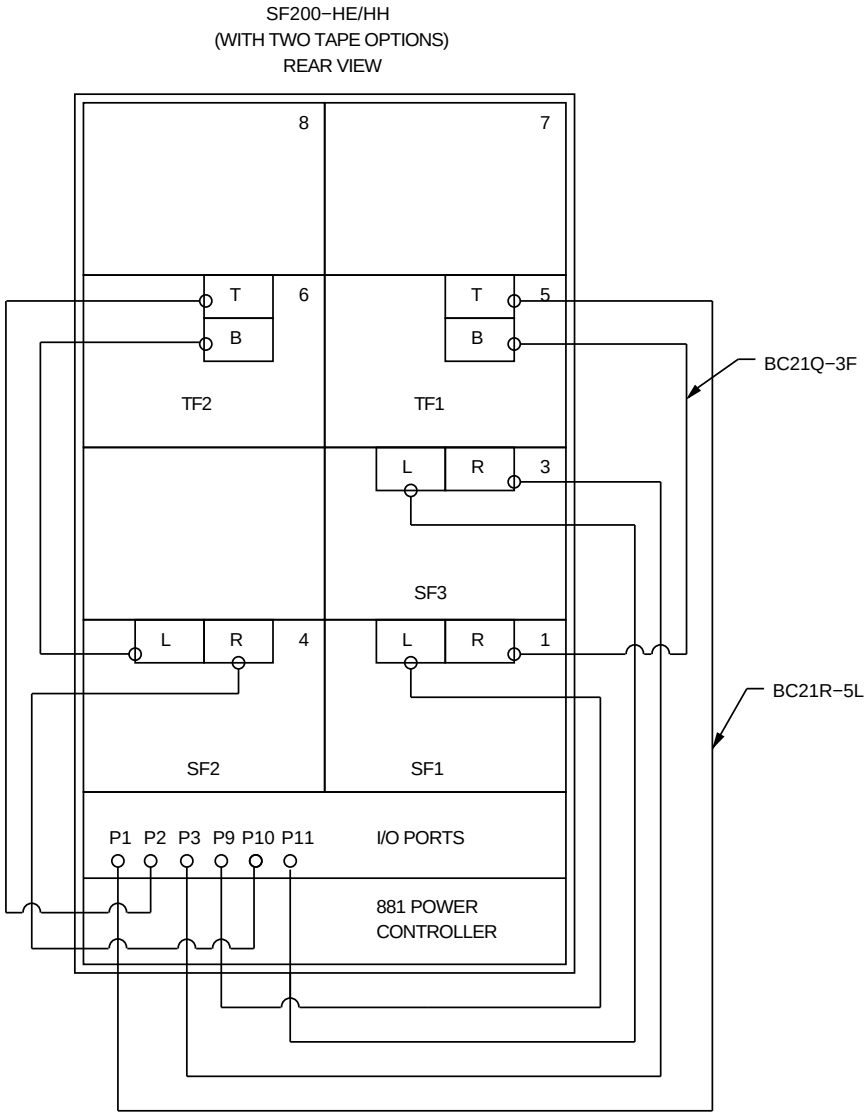


Figure A–10 SF200-HE/HH Variants

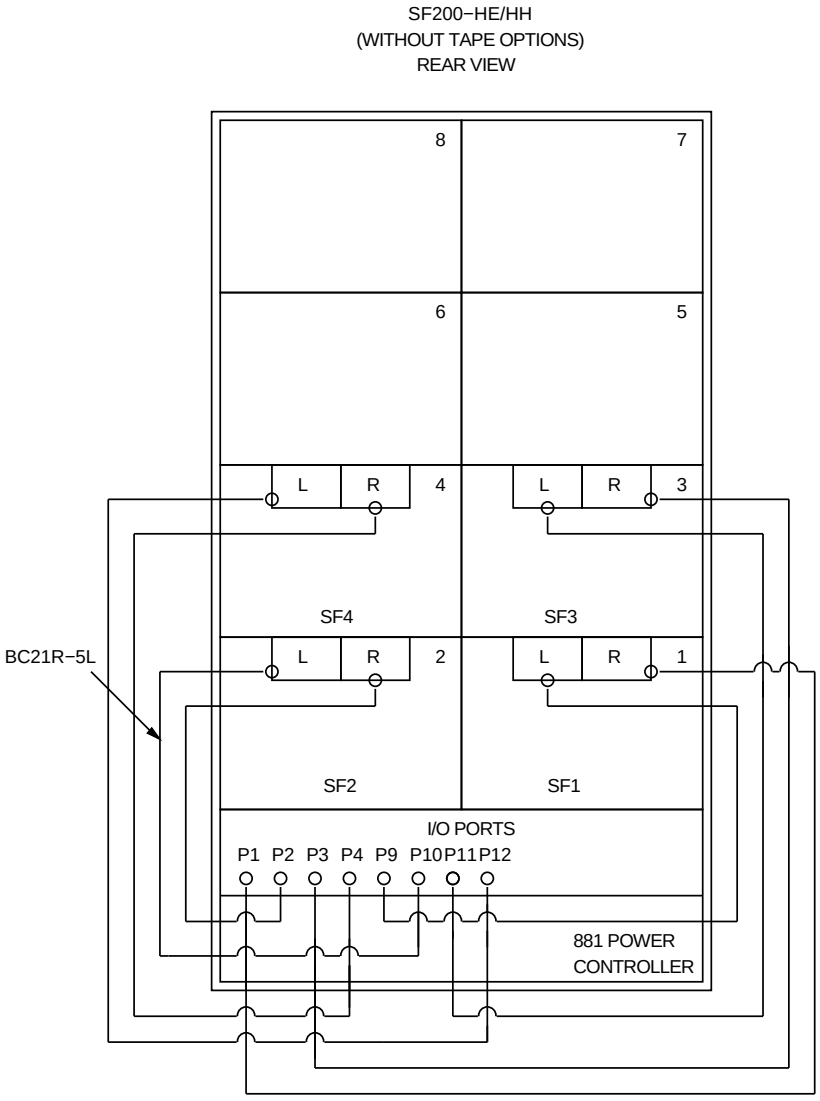


Figure A–11 (Cont.) SF200-HE/HH Variants, with One SF72

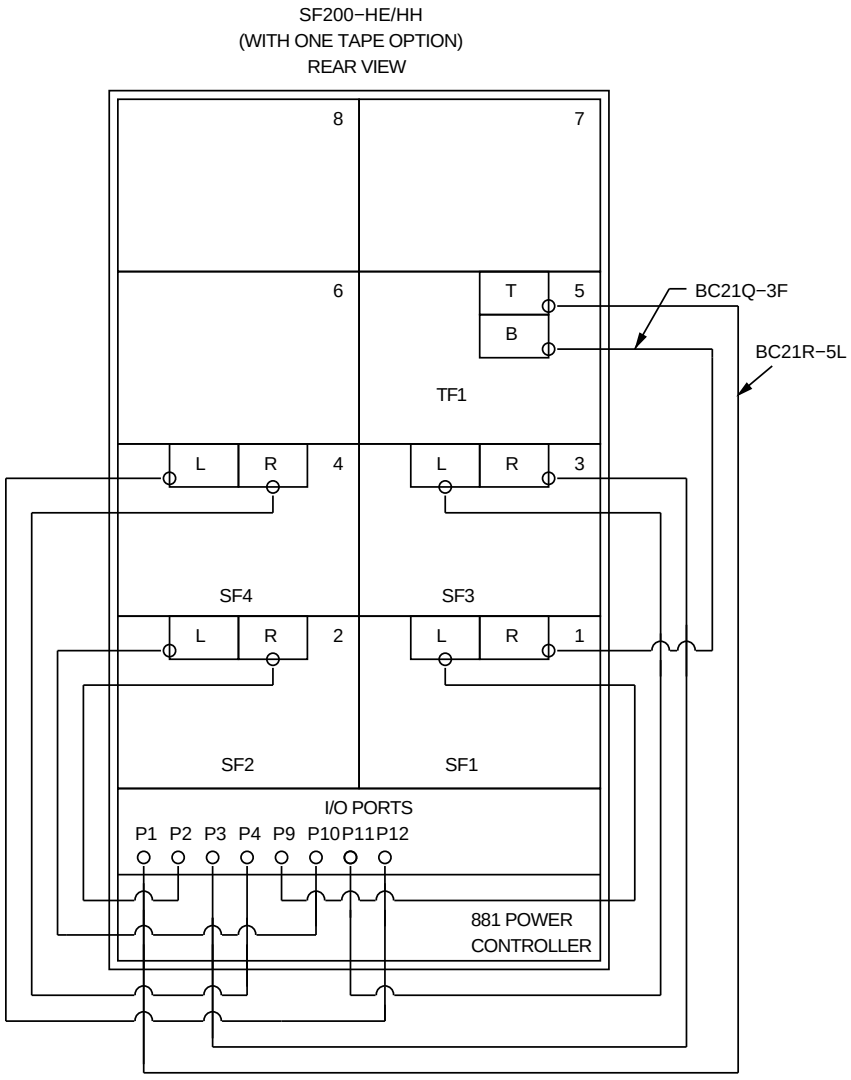


Figure A–11 (Cont.) SF200-HE/HH Variants, with One SF72

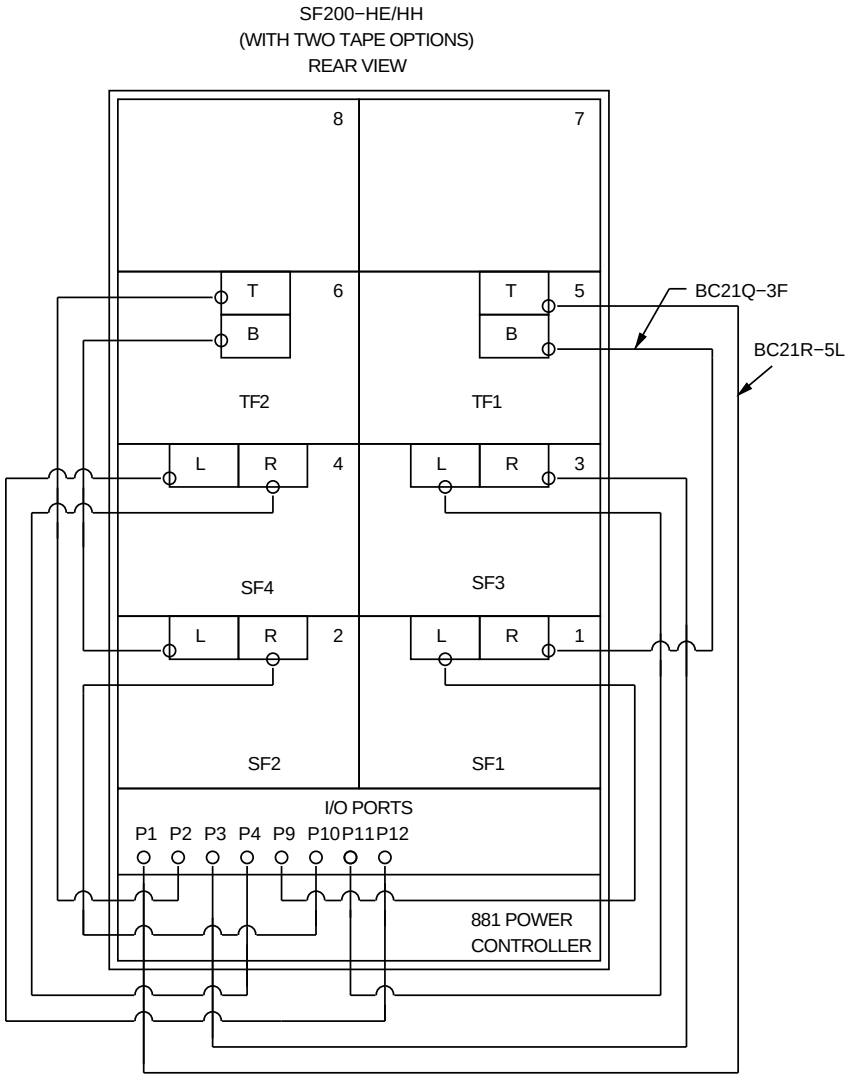


Figure A–11 SF200-HE/HH Variants, with One SF72

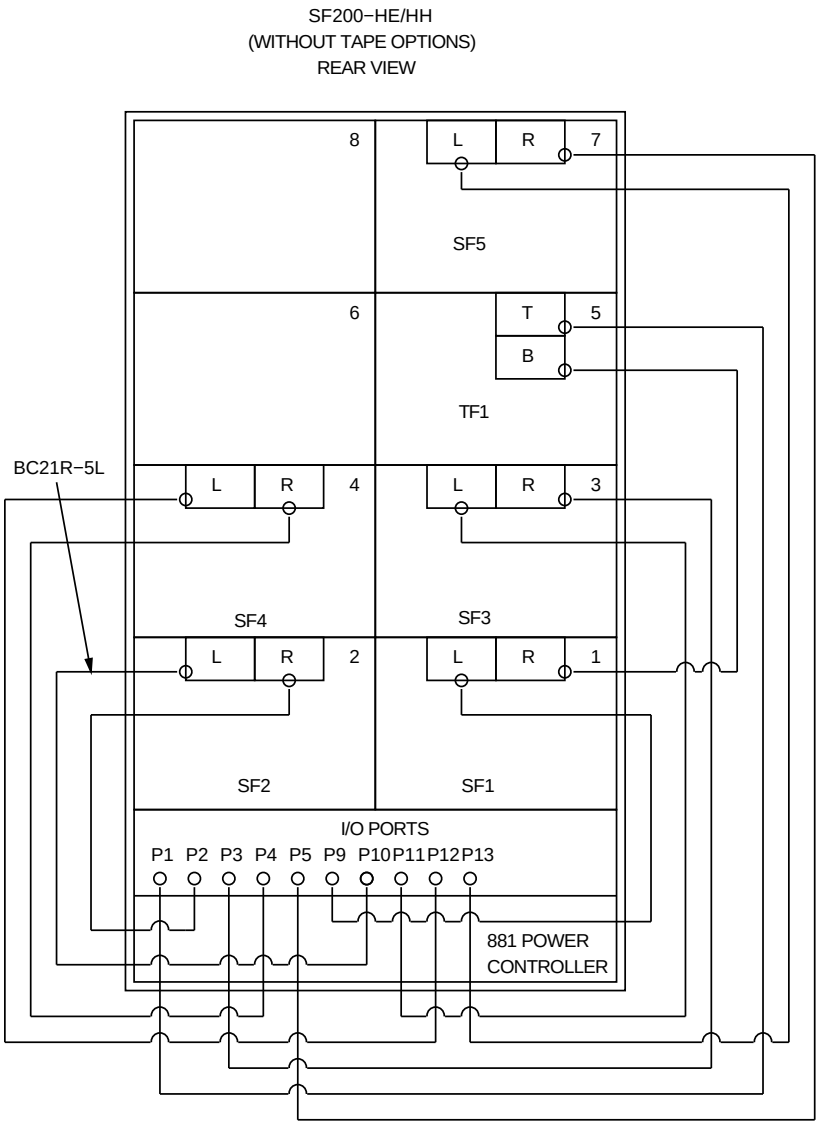


Figure A–12 (Cont.) SF200-HE/HH Variants, with Two SF72s

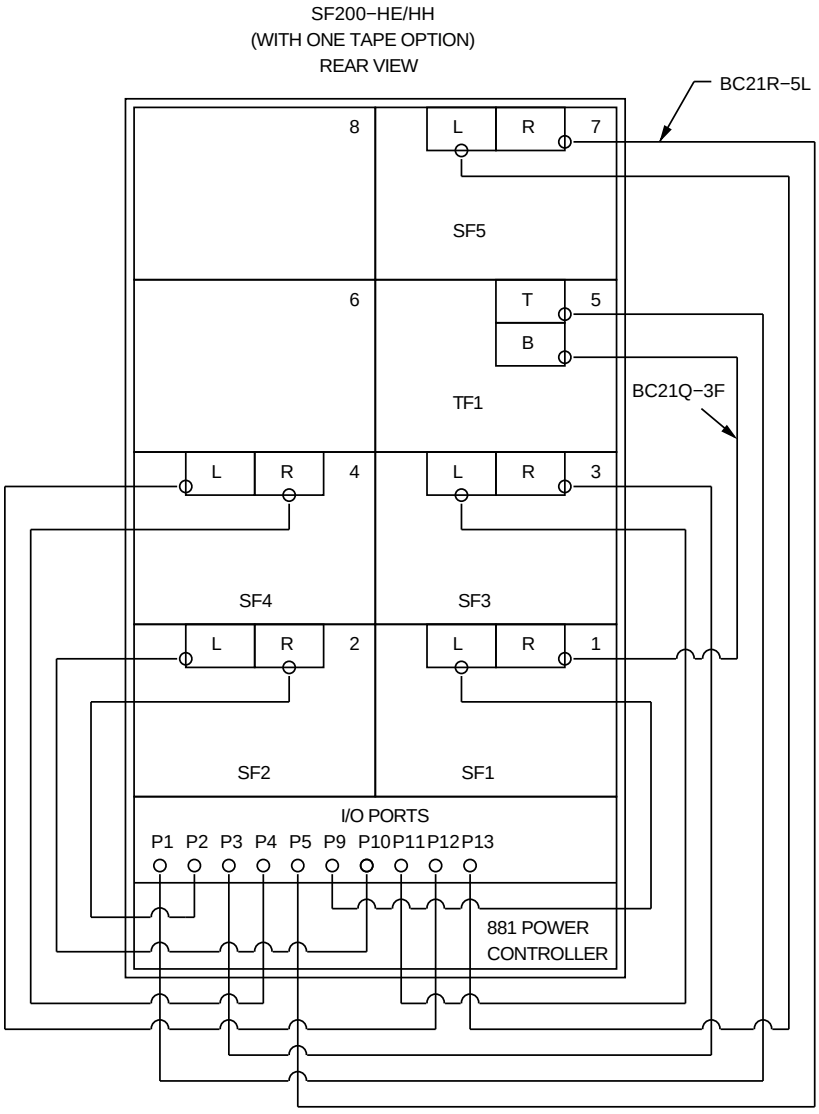


Figure A–12 (Cont.) SF200-HE/HH Variants, with Two SF72s

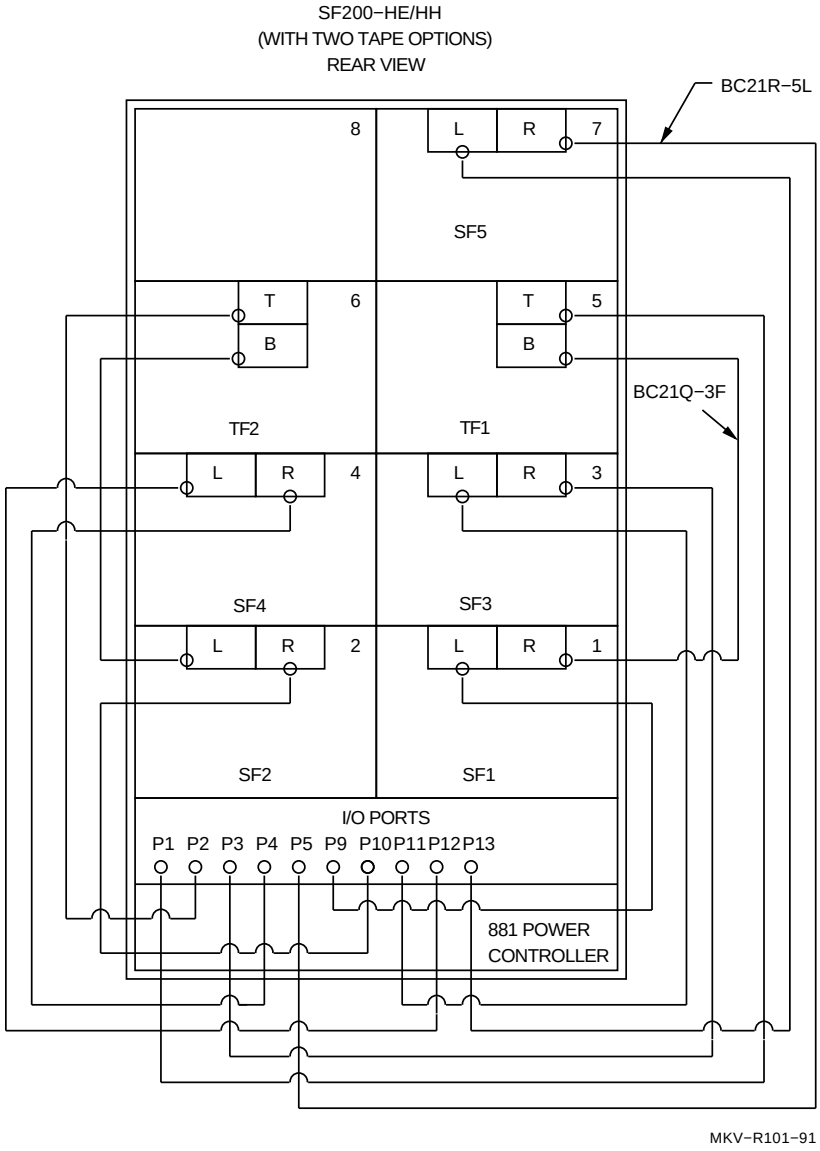


Figure A–12 SF200-HE/HH Variants, with Two SF72s

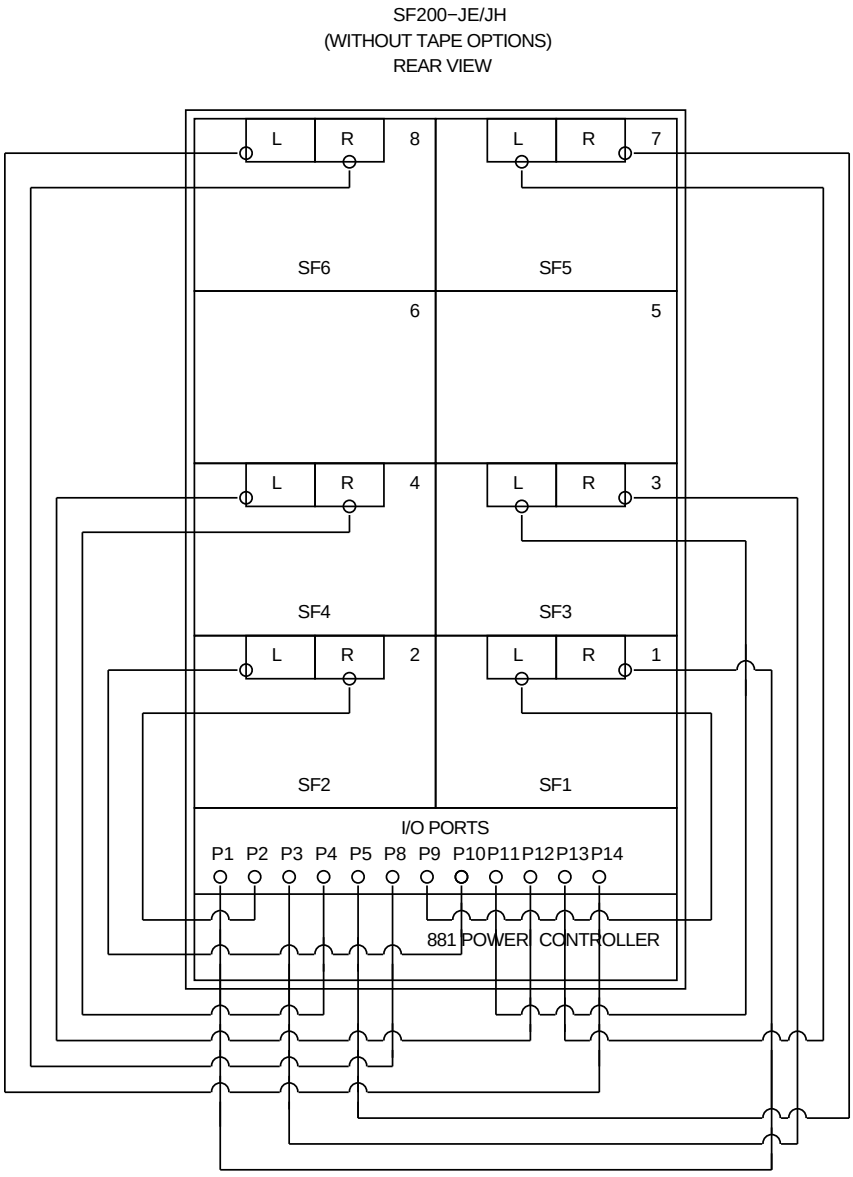


Figure A–13 (Cont.) SF200-JE/JH Variants

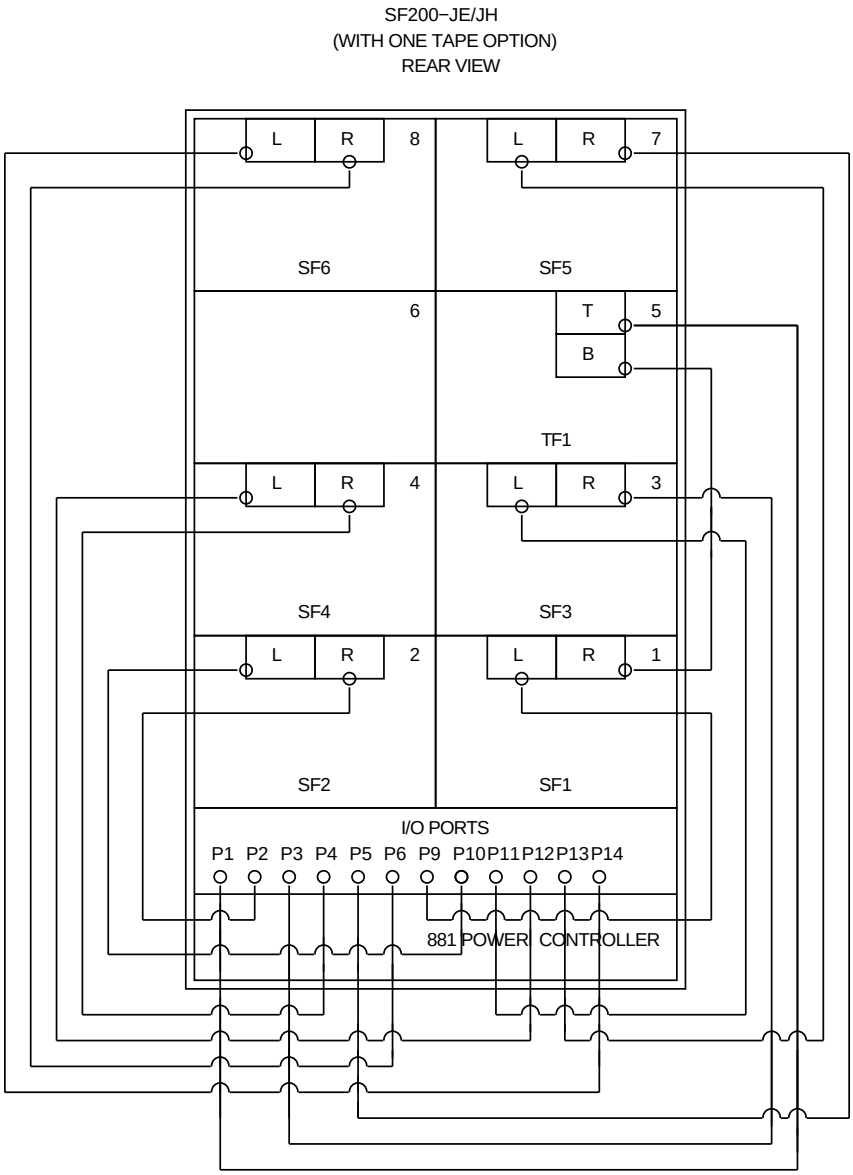


Figure A–13 (Cont.) SF200-JE/JH Variants

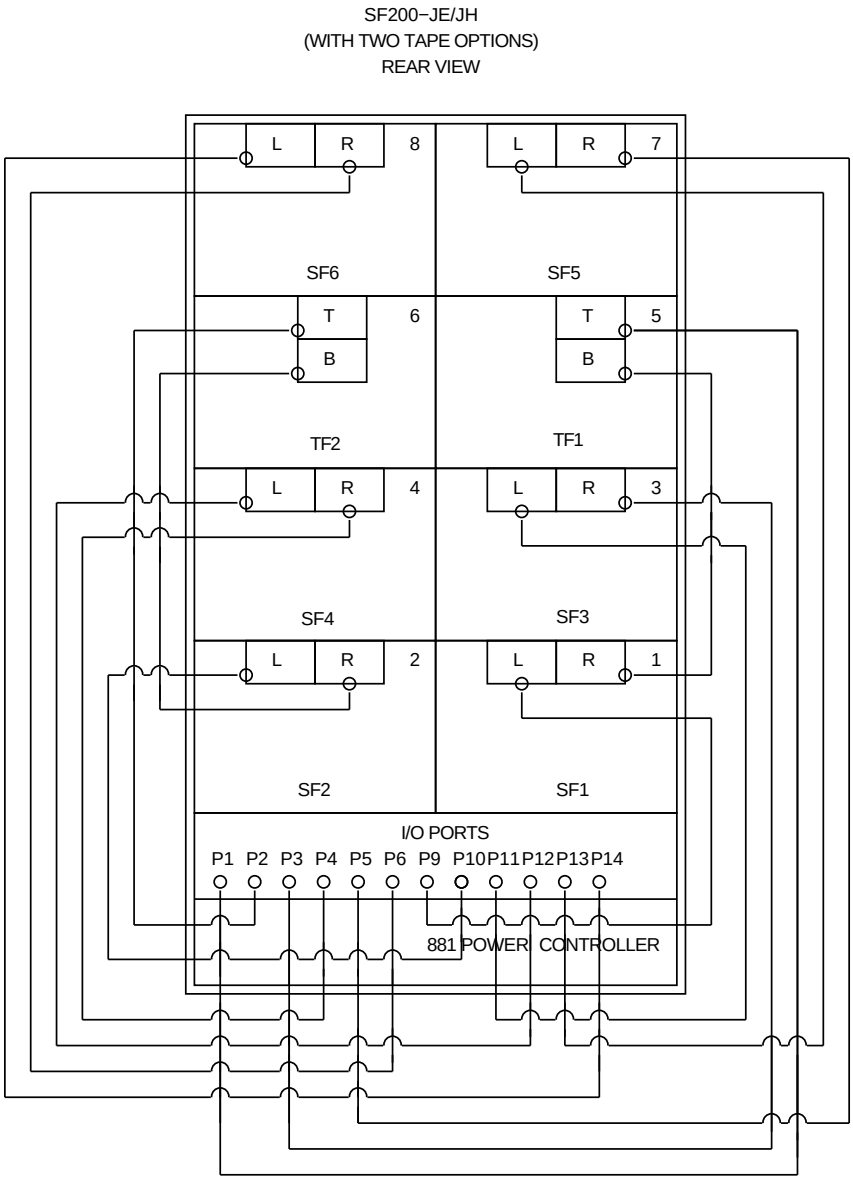


Figure A–13 SF200-JE/JH Variants

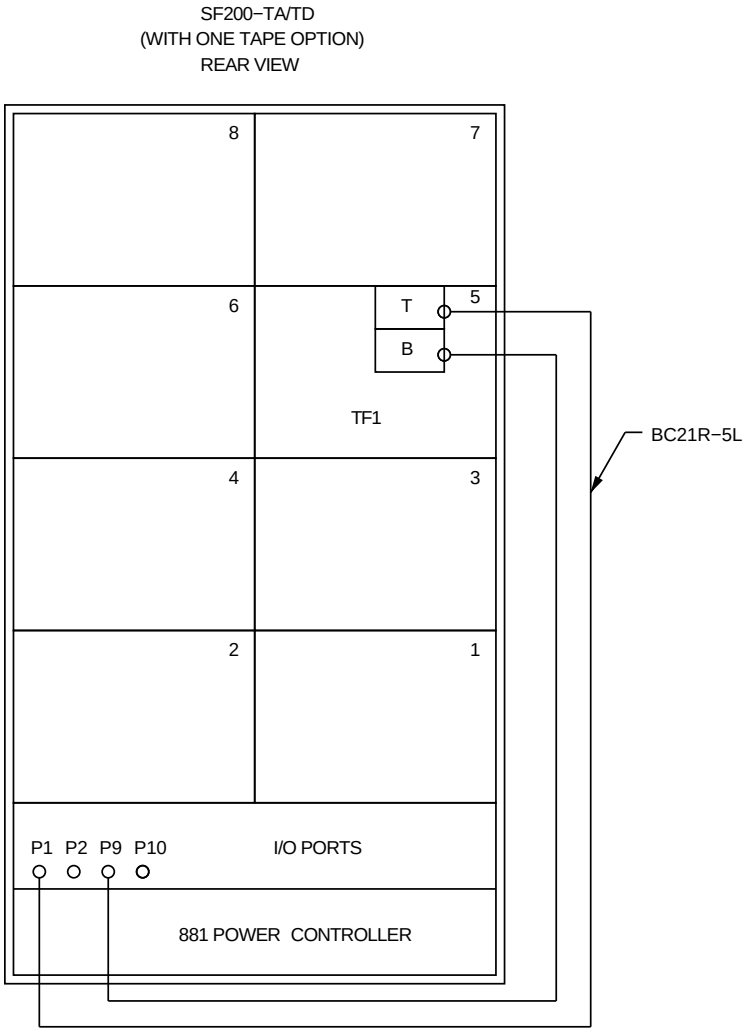


Figure A–14 (Cont.) SF200-TA/TD Variants (Magazine Tape Subsystems Only)

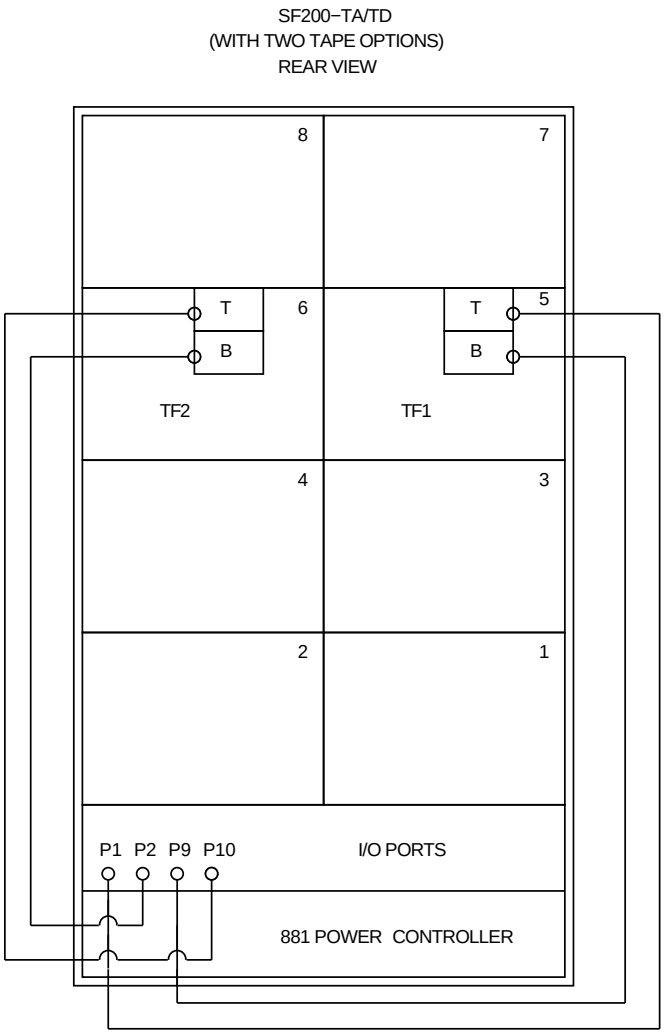


Figure A–14 SF200-TA/TD Variants (Magazine Tape Subsystems Only)

B
Installation Procedures for an SF72-UK Upgrade Kit

B.1 Introduction

This procedure allows the SF72-UK upgrade to be performed while the host system and the disk ISEs in the SF72-HK storage enclosure are off-line. Refer to Section B.2 for instructions on how to take a disk ISE off-line.

To ensure the integrity of the host system, follow the steps in this procedure in order and exactly as instructed.

NOTE

You must upgrade the two-drive SF72-HK to contain four drives before adding any other SF72 storage enclosures on that bus of the SF200 storage array.

Only one SF72-HK SF72 storage enclosure can exist in an SF200 storage array at one time.

WARNING

The following procedure assumes that the SF200 storage array, and the SF72 storage enclosures and magazine tape subsystems in the array, have been correctly installed and configured according to the standard bus and configuration guidelines in this guide.

Locate the system configuration sheet and ensure that it is filled out.

- **At this point, the host system must be brought down to continue.**
- **If the system configuration sheet reflects a configuration other than what is recommended in this guide, you must maintain that particular configuration throughout this procedure and work to ensure that no two devices on a DSSI bus have the same DSSI ID number. Should this situation exist, Do *not* attempt to use this procedure while the system is on-line.**

NOTE

Make sure that no two ISEs have the same DSSI ID number.

If this upgrade is to be followed by the installation of another SF72 storage enclosure, a magazine tape subsystem, or both, the host system must be brought down according to the system documentation.

B.2 Securing the Array for the Upgrade

Once the host systems have been correctly brought down, perform the following steps:

1. Take each ISE installed in the SF200 storage array off-line.
   a. For all SF72 storage enclosures, press all OCP Ready buttons to their out position.
   b. For all magazine tape subsystems, press the Load/Unload button. Wait until the cartridge is returned to the magazine and the In-Use LED is extinguished.
2. For all SF72 storage enclosures, press all drive dc power switches to their out position.
3. For all SF72 storage enclosures and magazine tape subsystems, turn the ac power switches at the rear of each to their 0 or off position.
4. At the rear of the array, turn the 881 power controller circuit breaker off.

B.3 Installing the RF72 Disk ISE Into an SF72-HK Storage Enclosure

Use the following steps to install two RF72 disk ISEs into an SF72-HK storage enclosure:

WARNING
Do not disconnect or disturb the existing DSSI cables and terminators on the present SF72 storage enclosures, magazine tape subsystems, or on the SF200 storage array I/O panel.

Customer data corruption could result.

WARNING
Take all possible ESD precautions when unpacking the RF72 disk ISEs. Wear a correctly grounded ESD strap.

CAUTION
Only one SF72 storage enclosure inner assembly should be extended on the slide mount at a time.

The following sections provide the steps to install the two-drive SF72-UK upgrade to an SF72-HK storage enclosure with two RF72 disk drives.

The SF72-UK option includes the two RF72 disk ISEs to be installed in the two front positions of an SF72-HK enclosure.

1. To unpack an RF72 disk ISE:
   a. Open the shipping carton.
   b. Remove the RF72 disk ISE wrapped in the protective wrapper.
   c. Open the protective wrapper and remove the drive. Discard the desiccant bags.
   d. Place the drive on the protective wrapper.
2. Install the RF72 disk ISEs.

   WARNING
   Take all possible ESD precautions when handling the RF72 disk ISEs. Wear a correctly grounded ESD strap.

   a. Remove the SF72 storage enclosure front cover (Figure B–1) by loosening the screws and lifting the cover straight off.

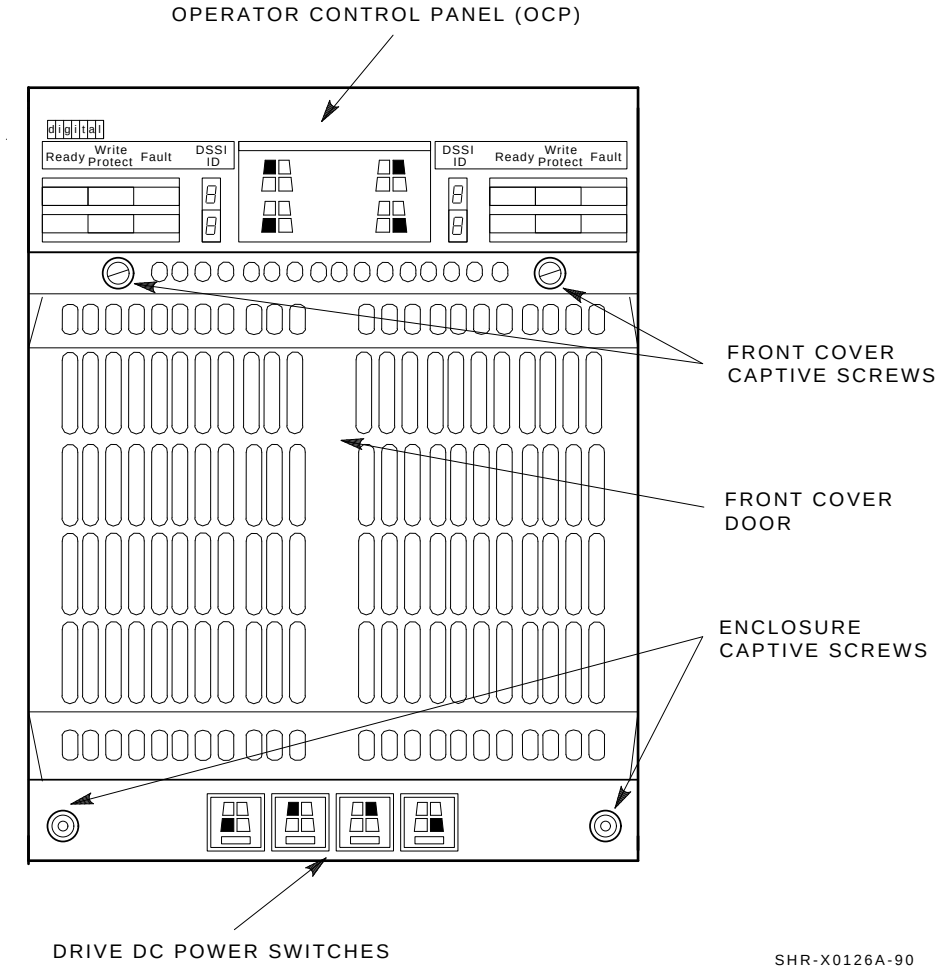


Figure B–1 SF72 Front Cover Removal

b. Orient the RF72 disk ISE as shown in Figure B–2 and install the disk ISE in the enclosure. Slide the disk ISE gently into place, while holding all cables out of the way. Do not force the disk ISE.

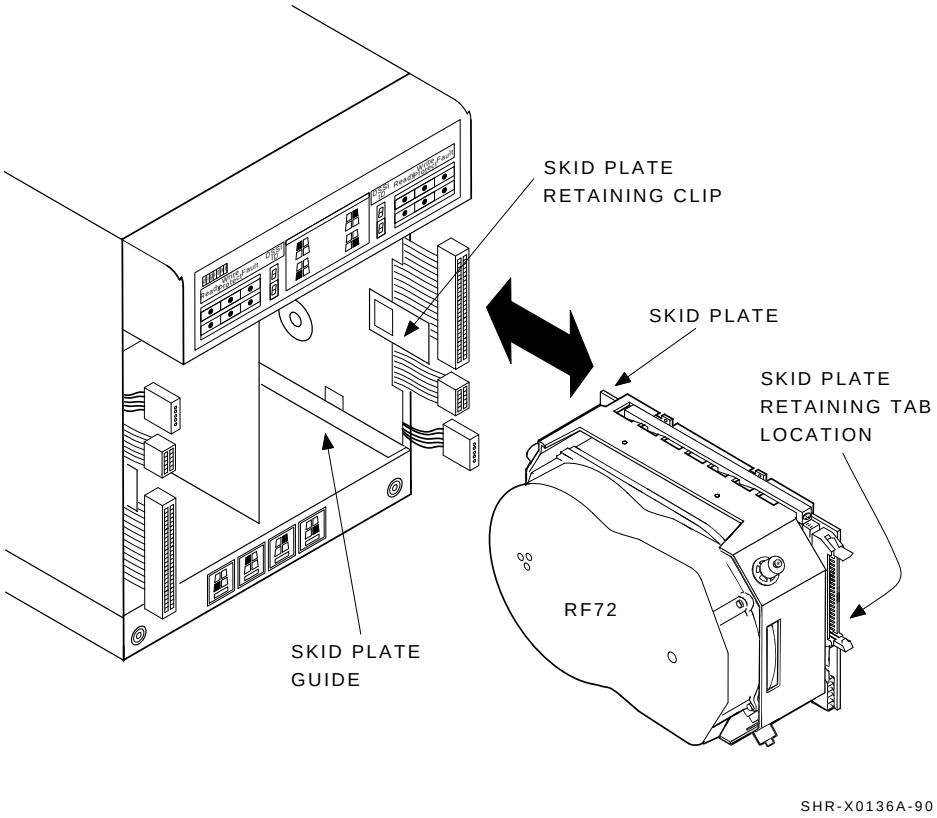


Figure B–2 RF72 Disk ISE Orientation

c. Verify that the disk ISE is locked into place and tighten the wedges.

d. Connect the cables (Figure B–3) in the following order: 6-pin power cable, 10-pin OCP cable, and 50-pin DSSI cable. The connectors are keyed so that the cables cannot be installed incorrectly.

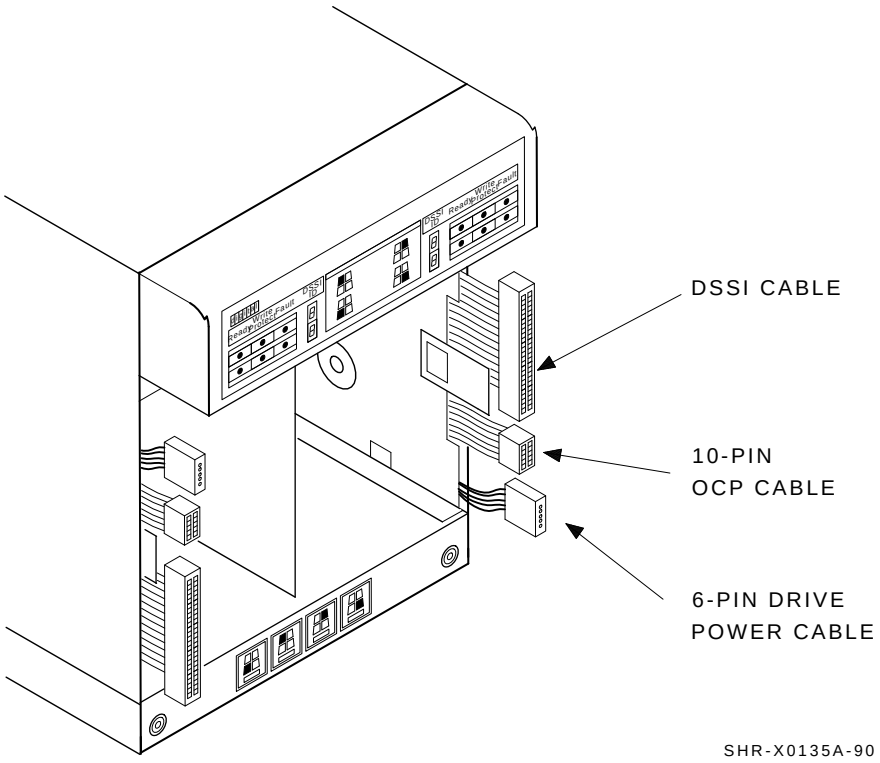


Figure B–3 Cabling the RF72 Disk ISE

e. Replace the front cover on the SF72 enclosure (Figure B–4).

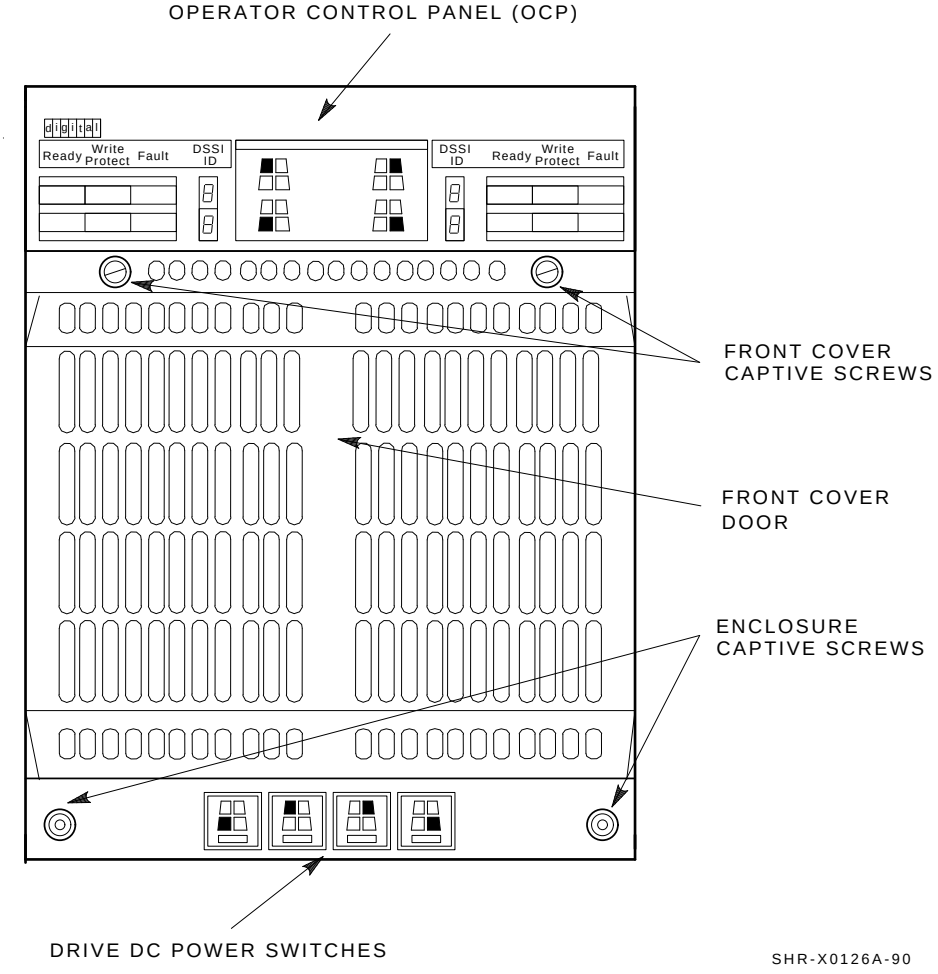


Figure B–4 SF72 Front Cover Replacement

B.4 Powering Up the ISEs

Once all of the previous steps have been performed, use the following steps to power up the ISEs in the SF200 storage array:

1. At the rear of the array, turn the 881 power controller circuit breaker on.
2. For all SF72 storage enclosures and magazine tape subsystems, turn the ac power switches at the rear of each to their 1 or on position.
3. For all SF72 storage enclosures, set all drive dc power switches to their in position.
4. Place each disk ISE installed in the SF200 storage array on-line by pressing all OCP Ready buttons to their in position.

B.5 Bringing the New RF72 Disk ISEs On-Line

Refer to the *KFMSA Module Installation and User Manual* (EK–KFMSA–IM) for the sections on configuring a single-host and dual-host configuration.

Note that you will be instructed by these sections to perform the following tasks:

- Boot VAS/DS on the host systems.
- Attach the KFMSA modules in each system.
- Select each KFMSA module in each system.
- Run EVCXE or EVCXF.
- Modify certain parameters in the disk ISEs.
- Ensure that all modified parameters are recorded as permanent values.
- Verify the communication path with all ISEs on the DSSI buses.

After all of the above have been accomplished successfully, return the systems and the SF200 storage array to normal operating mode.

C
Converting a Single-Host Configuration to a Dual-Host Configuration

This appendix describes how to convert an SF200 storage array, SF72 storage enclosure, or magazine tape subsystem that is configured according to single-host configuration guidelines to dual-host configuration guidelines.

Ensure that you have the following before starting any procedure:

- A #1 Phillips screwdriver (part number 29–11001–00)
- A 1/8-inch hex key (part number 29–26115–00)
- The *KFMSA Module Installation and User Manual* (EK–KFMSA–IM)
- The *SF Family Label Booklet* (36–32882–01)

NOTE

The host systems must be taken down to perform any of the steps in this procedures unless otherwise stated. Before cabling the SF200 storage array to the second host system, run the EVCXF configuration program under VAX/DS and set the DSSI ID number of all KFMSA modules in the second host system to 6. Refer to the *KFMSA Module Installation and User Manual* for instructions on how to change the KFMSA module DSSI ID number.

WARNING

The following procedure assumes that the SF200 storage array and the SF72 storage enclosures and magazine tape subsystems in the array have been correctly installed and configured according to the standard bus and configuration guidelines in this installation guide.

Locate the system configuration sheets (an example can be found in Figure C–1) and ensure that it is filled out. If the system configuration sheet does not exist then fill one out immediately.

CAUTION

Only one SF72 storage enclosure inner assembly should be extended on slide mount at a time.

Take all possible ESD precautions when performing this procedure. Wear a correctly grounded ESD strap.

Perform each step in the order they are presented.

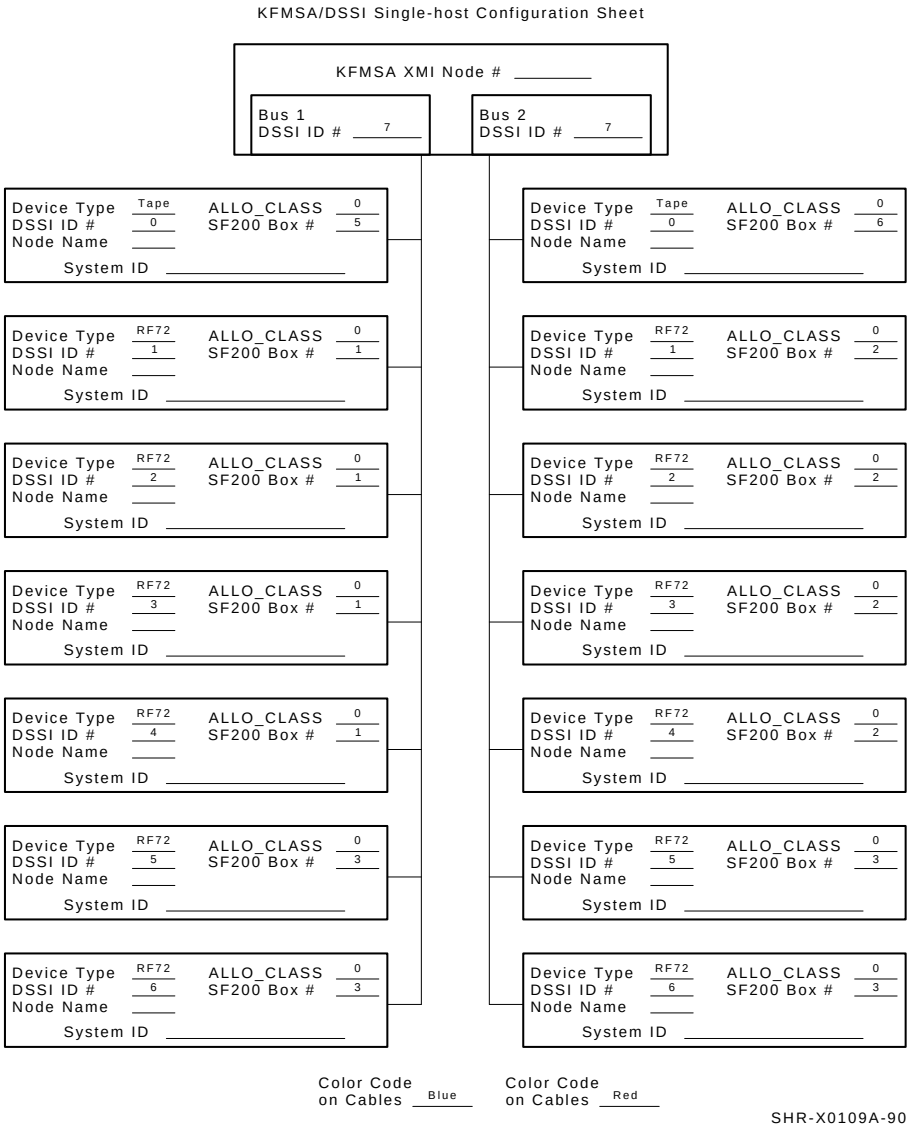


Figure C–1 Example of a Single-Host System Configuration Sheet

C.1 Securing the Array for Conversion

Once the host systems have been correctly brought down, perform the following steps:

1. Take each ISE installed in the SF200 storage array off-line.
   a. For all SF72 storage enclosures, press all OCP Ready buttons to their out position.
   b. For all magazine tape subsystems, push the Load/Unload button. Wait until the cartridge is returned to the magazine and the In-Use LED is extinguished.
2. For all SF72 storage enclosures, press all drive dc power switches to their out position.
3. For all SF72 storage enclosures and magazine tape subsystems, turn the ac power switches located at the rear of each to their 0 or off position.
4. At the rear of the array, turn the 881 power controller circuit breaker off.

C.2 Conversion Procedure

The following sections contain the steps necessary to:

- Convert an SF72 storage enclosure from split-bus to through-bus mode (refer to Section C.2.1).
- Convert an SF200 storage array that contains SF72 storage enclosures, and/or magazine tape subsystem and is cabled for single-host to dual-host configuration (refer to Section C.2.2).
- Label the cables (refer to Section C.2.3).

  Filling out a new configuration sheet (refer to Section C.2.3.1).
  Filling out the labels (refer to Section C.2.3.2).
  Placing the labels (refer to Section C.2.3.3).
- Power up the SF200 storage array (refer to Section C.2.4).
- Bring the new dual-host configuration back on-line. (refer to Section C.2.5).
- Verifying the operation of the converted SF200 storage array (refer to Section C.2.6).

Follow each step in each of these sections in order. In some configurations, not all steps are used. Such instances are clearly explained.

C.2.1 Split-Bus to Through-Bus Conversion Procedure

Use the steps in this section only if you are converting an SF72 storage enclosure resident in position 3 or 8 of an SF200 storage array from single-host to dual-host. SF72 storage enclosures in position 3 and 8 MUST be converted as split-bus mode is NOT supported in the dual-host configuration.

CAUTION
Maintain ESD precautions at all times. Before performing any of the following steps locate the ESD strap located in the ESD pouch at the bottom of the front door.

To maintain stability, only one SF72 storage enclosure or magazine tape subsystem should be extended on the slide mounts at a time.

1. Remove the OCP by firmly grasping the right and left side of the OCP and pulling the OCP straight off.
2. Loosen the four captive slide assembly screws. At the rear, push inner assembly out until drawer locks in the service position.

   NOTE
   Do NOT completely remove the SF72 inner drawer assembly from extrusion tube.

3. Reconfigure the TTM for through-bus mode by first moving the small black jumper to the through-bus terminals. Then move the cable connector from J3 to J5, and the cable connector from J2 to J4, as shown in Figure C–2.
4. Push the SF72 inner assembly back into the extrusion tube. To prevent pinching any cables, be sure that all cables are dressed correctly.
5. Tighten the four captive slide assembly screws.
6. Set the DSSI ID number switches located behind the OCP front door of positions 3 and 8 to match those located in positions 1, 2, 4, and 7 (refer to Table C–1).
7. Replace the OCP by lining up the taps on the back of the OCP with the slots on the front of the storage enclosure. The firmly press in on the right and left side of the OCP.

Table C–1 DSSI ID Switch Settings (SF72 only)

	SF200 Positions 1, 2, 3, 4, 7, and 8
Left Rear (LR)	001
Left Front (LF)	010
Right Front (RF)	011
Right Rear (RR)	100

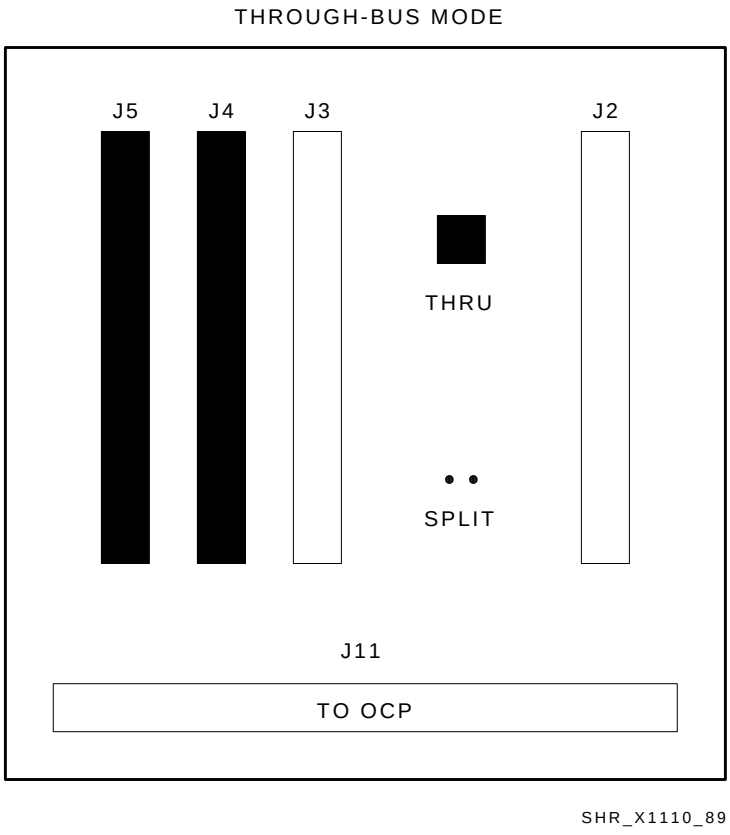


Figure C–2 Changing an SF72 to Through-Bus Mode

NOTE
Ensure that both host systems and the SF200 storage array are off-line and powered down

C.2.2 Single-Host to Dual-Host Cabling Conversion

The following procedure takes you through the steps to recable a DSSI bus configured for single-host applications to a a DSSI bus configured for dual-host application.

The five possible single-host bus configurations are shown in Figure C–3. The three possible dual-host bus configurations are shown in Figure C–4.

The conversion of each existing DSSI bus in the SF200 storage array is discussed individually in the following steps.

Follow each step for all DSSI buses present in the existing SF200 storage array paying careful attention to all warnings, cautions, and notes.

The term *DSSI bus n* (where n = 1 to 6), refers to the DSSI buses used by the host system, the SF200 storage array, the SF72 storage enclosures, and the magazine tape subsystems. In the single-host configuration, the four DSSI buses used are:

- DSSI bus 1, color code blue.
- DSSI bus 2, color code red.
- DSSI bus 3, color code yellow.
- DSSI bus 4, color code green.

In the dual-host configuration, the six DSSI buses used are:

- DSSI bus 1, color code blue.
- DSSI bus 2, color code red.
- DSSI bus 3, color code yellow.
- DSSI bus 4, color code green.
- DSSI bus 5, color code blue with a white strip.
- DSSI bus 6, color code red with a white strip.

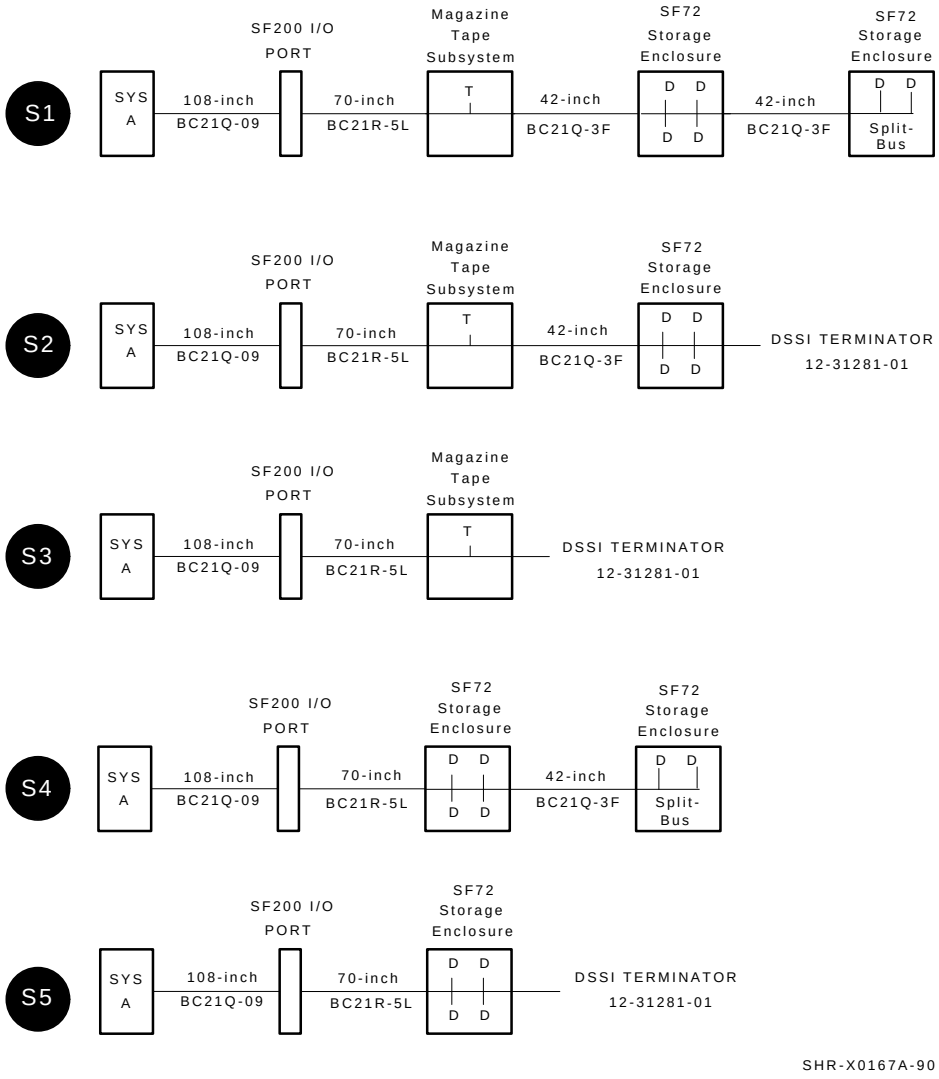


Figure C–3 Possible Single-Host Bus Configurations

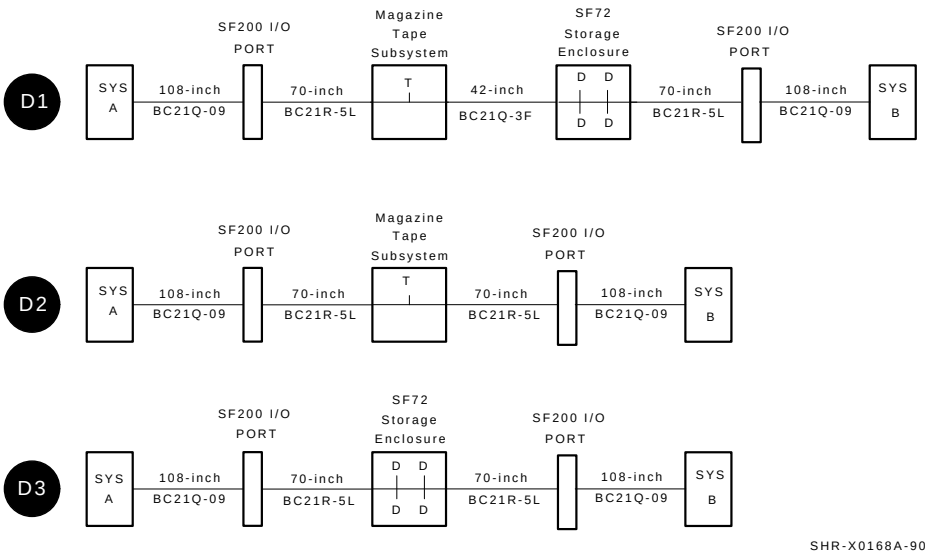


Figure C–4 Possible Dual-Host Bus Configurations

The steps in the following section instruct you on how to physically recable the SF200 storage array from its current single-host configuration to a daul-host configuration.

Use Table C–2 to convert the existing SF200 storage array from single-host configured DSSI buses to the dual-host configuration and to Figure C–3 and Figure C–4 for the actual bus configuration.

CAUTION
Do not disturb any existing DSSI cables unless otherwise instructed.

Do not remove any existing 42-inch DSSI cables (BC21Q–3F) between magazine tape subsystems and SF72 storage enclosures)

Table C–2 Single-Host to Dual-Host Conversion

Single-Host	To	Dual-Host
S1		D1[2]
S2[1]		D1
S3[1]		D2
S4		D3[2]
S5[1]		D3

[1]When converting these buses remove the DSSI terminator (12–31281–01) and store these terminators in the ESD pouches on the inside SF200 storage array front or rear doors.

[2]Remove and discard the 42-inch DSSI cables between SF72 storage enclosures only. Remember that SF72 storage enclosures in positions 3 and 8 MUST be converted from split-bus to through-bus mode and become a D3 configuration only.

Install the 70-inch DSSI cables (BC21R–5L) where necessary to complete the bus connections to the SF200 I/O panel. To do so:

1. Connect one end of the 70-inch DSSI cable to the DSSI connector located on the rear of the SF72 storage enclosure or magazine tape subsystem.
2. Install the other end to the appropriate port on the SF200 I/O panel. Refer to Figure C–5.

Connect the appropriate number of 108-inch DSSI cables (BC21Q–09) to all the newly installed 70-inch DSSI cables on the SF200 I/O panel.

Next, connect the other end of the 108-inch DSSI cables to the appropriate DSSI connector on the system I/O panel.

NOTE

If you have not chnaged the KFMSA module DSSI ID numbers in the other host system to 6 do so at this time. DO NOT attempt to connect the 108-inch DSSI cables to this host system until the DSSI ID numbers have been changed. Refer to the KFMSA Module Installation and Onwer's Manual.

Refer to Appendix A for cabling diagrams of both the single-host and dual-host configurations.

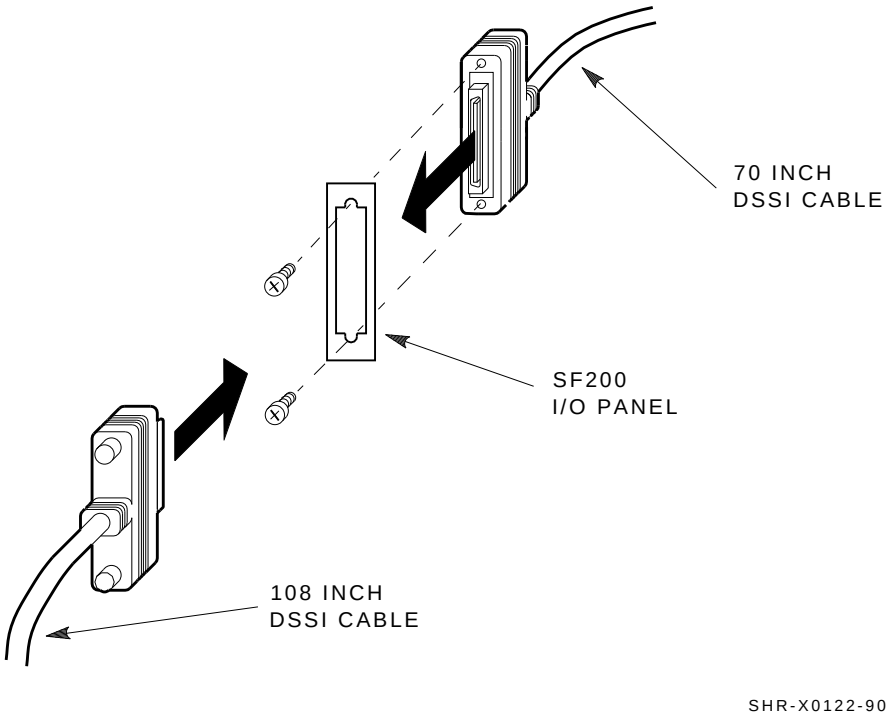


Figure C–5 How to Connect DSSI Cables on the SF200 I/O Panel

C.2.3 Labeling the Cables

This section details the steps required to correctly label all the cables for the VAX6000 series system's, the SF200 storage array and its SF72 storage enclosures and tape magazine subsystems.

At this point, all steps in the previous sections must be completed.

C.2.3.1 System Configuration Sheet

At this time you should be ready to fill out the system configuration sheets. Examples of this sheets can be found in Figure C–6 and in the *KFMSA Module Installation and User Guide*, EK–KFMSA–IM. Refer to these example when filling out the system's configuration sheets.

NOTE
Do not attempt to fill out and place the labels until you have all the information.

The information from the system configuration sheet is used to correctly fill out the labels for; all DSSI cables, Sf72 storage enclosure OCPs, and magazine tape subsystem front panels.

You can also refer to the inside cover of the *SF Family Label Booklet*, part number 36–32882–01, for instructions on how to fill out these labels.

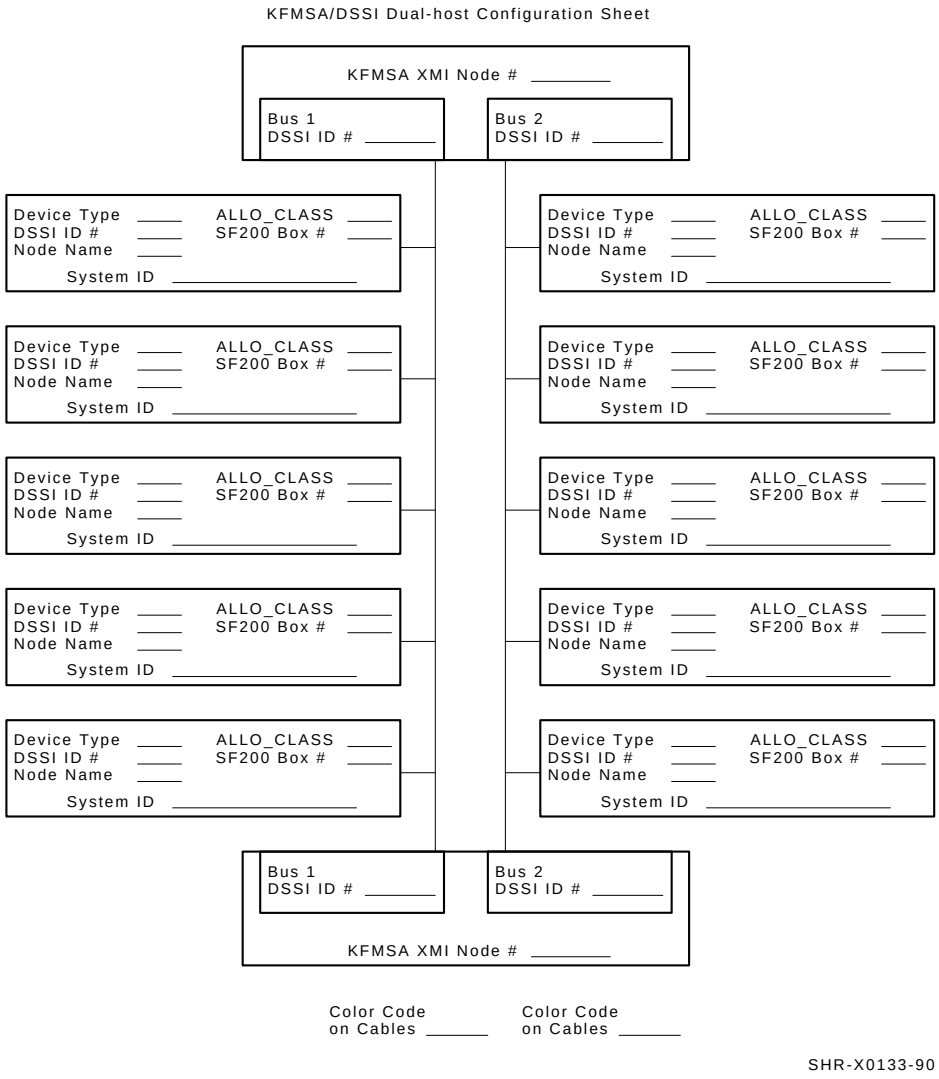


Figure C–6 Blank Dual-Host System Configuration Sheet

C.2.3.2 Filling Out the Labels

There are sizes of colored labels. The larger label is for the DSSI cables. The smaller label is for the inside of the SF72 stroage enclosure OCP door, the front panels of a magazine tape subsystem and the host system I/O panel.

Refer to the inside cover of the *SF Family Label Booklet*, part number 36–32882–01, for the instructions on what information to put on each of the two types of labels.

For dual-host, the following colored labels are to be used on the SF72 storage enclosure OCP doors, magazine tape subsystem front panels, and all DSSI cables.

COLOR	**SF200 Port/SF200 Position**
Blue labels	port 1, positions 5 and/or 1, port 9
Red labels	port 2, positions 6 and/or 2, port 10
Yellow labels	port 3, position 3, port 11
Green labels	port 4, position 4, port 12
Blue with white strip labels	port 5, position 7, port 13
Red with white strip labels	port 6, position 8, port 14

Once you have filled the cable and OCP labels according to the instruction on the inside cover of the *SF Family Label Booklet*, part number 36–32882–01, then proceed.

C.2.3.3 Placing the Labels

Now that the labels have all been filled out, place the labels on the DSSI cables and the SF72 OCP doors. Also place a label on the front of the magazine tape subsystem.

Cable labels are placed two inches behind the DSSI connector on both ends of the DSSI cable. Refer to Figure C–7.

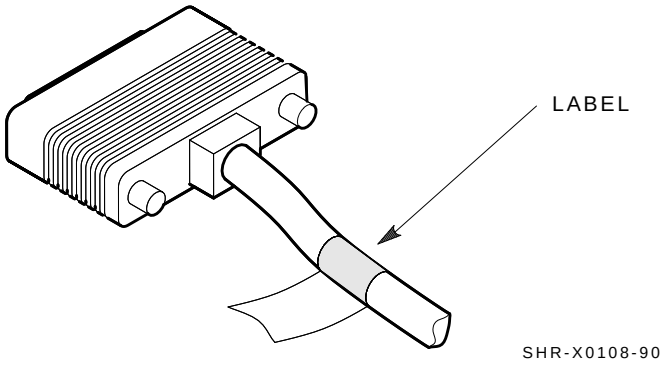


Figure C–7 Placing a Label on a DSSI Cable

OCP label is placed as shown in Figure C–8.

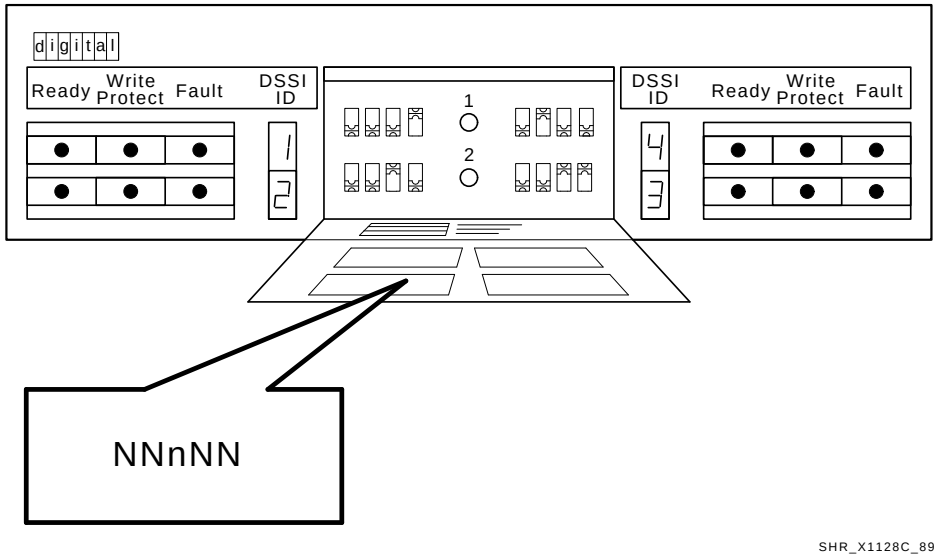


Figure C–8 Placing a Label on the OCP Door

C.2.4 Power up the SF200 Storage Array

Now that the SF200 storage array has been converted to dual-host and labeled you are ready to apply power.

CAUTION
Ensure that the ac power switch on each SF72 storage enclosure and magazine tape subsystem installed is in the off position.

1. At the rear of the storage array, turn the 881 power controller on. Ensure that the BUS/OFF/ON switch is in the down position.
2. At the rear of the storage array, turn on each magazine tape subsystem installed (if present). Power up position 5 and then 6. Observe the front panels for any fault indications.
3. At the rear of the storage array, turn on each SF72 storage enclosure starting with position 1 and following in numerical order.
4. Depress each drive dc power switch for each SF72 storage enclosure. Start with position 1 and continue in numerical order.
5. Observe the OCP indicators. Refer to Figure C–9.
   a. Check that the TERM PWR LED (located behind the door of the OCP) is on for all positions installed.
   b. Check that the SPLIT LED (located behind the door of the OCP) is off for all positions.
   c. Ensure that all DSSI ID switches on all OCPs are set to left-rear (ID=1), left-front (ID=2), right-front (ID=3), and right-rear (ID=4).
6. Depress the Ready button on the OCP. Refer to Figure C–9. The green Ready LED will flicker then light steady once the ISE is on-line.

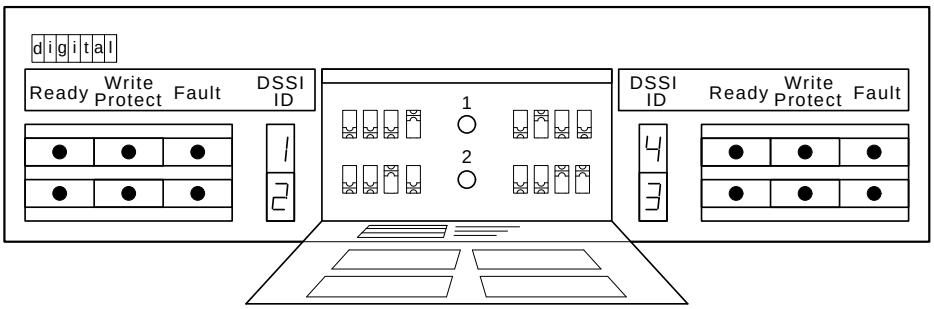


Figure C–9 OCP Indicators and Controls

C.2.5 Bringing a Newly Converted Dual-Host Conversion On-Line

Refer to the sections in the *KFMSA Module Installation and User Manual* that deal with configuring a dual-host configuration.

Note that you will be instructed by these sections to perform the following tasks:

- Boot VAX/DS on the host systems.
- Attach the KFMSA modules in each system.
- Select each KFMSA module in each system.
- Run EVCXE or EVCXF.
- Modify certain parameters in the disk ISEs.
- Ensure that all modified parameters are recorded as permanent values.
- Verify the communication path with all ISEs on the DSSI buses.

After all of the above have been accomplished successfully, return the systems and the SF200 storage array to normal operating mode.

C.2.6 Final Verification

Now that the SF200 storage array has been converted, cabling and labeling, and the powered up, you are ready to configure the DSSI subsystem and verify the correct operation of each ISE in the array with the host system.

Refer to the *KFMSA Module Installation and User Guide*, EK–KFMSA–IM, *TF837 Magazine Tape Subsystem Service and Installation Manual*, EK–TF837–IM, and the *RF31/RF72 Intregrated Storage Element User Guide*, EK–RF72D–UG) for the detailed information and how to proceed with verifying the correct operation of each ISE that has been installed. In these manuals you will find the procedure for establishing the communications between the ISEs, the adapter module, and the system. You will also find the step by step procedures for reconfiguring the system with its newly installed DSSI devices.

Refer to the manuals for the disk ISE and tape ISE for detailed information of the local programs contained within the ISEs.

REMEMBER, each SF72 enclosure can contain 2 or 4 disk ISEs. Each magazine tape subsystem contains one tape ISE. A fully configured storage array contains 24 disk ISEs and 2 tape ISEs.

Glossary

ADAPTER
A module that connects one or more device controllers to the host bus and hides many of the host bus requirements from the controller. The KFMSA module is an XMI to DSSI bus adapter.

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

BAD BLOCK
An address on a disk or tape that is determined by the device controller to be bad and, therefore, in need of replacement.

BAD BLOCK REPLACEMENT
The procedure used to locate a replacement block, mark the bad block as replaced, and move the data from the bad block to the replacement block.

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.

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).

DMA
Direct memory access.

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.

DUAL-HOST
Storage configuration where DSSI ISEs are shared between two DSSI adapters and host systems.

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

FCT
Factory control tables. Where factory found bad blocks are recorded.

ISE
Integrated storage element. All DSSI storage devices are ISEs.

KFMSA
XMI bus to DSSI bus adapter.

LBN
Logical block number. A logical block number is a volume-relative address of a block on a mass storage device. A block is a physical sector on the storage media that can contain customer data.

LTN
Logical track number. The actual data track in the customer data area.

MAGAZINE TAPE SUBSYSTEM
A DSSI tape ISE with tape loader.

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

NODE NAME
A 6-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.

PATH
A channel from the host to a device.

RBN
Replacement block number. The last sector on each track of the host accessible area reserved for bad block replacement.

RCT
Replacement and caching table. Used to store pointers to replaced blocks in the RBN area.

RF72
A 1-gigabyte capacity DSSI disk ISE.

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

SF72
A DSSI storage enclosure that houses either two or four RF72 ISEs.

SF200
DSSI storage array that houses up to six SF72 enclosures and up to two DSSI magazine tape subsystems.

SINGLE-HOST
Storage configuration where DSSI ISEs are connected to only one DSSI adapter and host system.

SPLIT-BUS
A mode of operation where the ISEs in the right side of an SF72 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.

THROUGH-BUS
A mode of operation where all the ISEs in an SF72 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 host to perform tape I/O operations and I/O control functions.

TTM
Transition termination module. A PC board that provides connection between the SF72 OCP and RF72 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 series systems.

VIRTUAL CIRCUIT
A logical point-to-point link between nodes.

XBN
External block number. The blocks located in the external block area contain the FCT. They are not visible to the host operating system.

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

Index

B

Bringing an RF72 disk ISE on-line, 7–15
Bringing disk ISE back on-line, B–11

C

Cabinet
  door removal, 3–11, 4–7, 4–31
Cabling the magazine tape subsystem
  SF200 storage array, 6–26
Cabling the SF72 storage enclosure
  in SF200 storage array, 5–32
Converting to split-bus mode, 5–22, C–6

D

DSSI ID switch settings, 5–25
DSSI ID verification, 4–7
  dual-host configuration, 4–31
DSSI terminators, 4–17, 4–18, 4–41
Dual-host configuration, 4–4, 6–35
  cabling an SF72 for, 5–52

E

ESD, electrostatic discharge, 3–2

F

Filling out the labels, 5–74, 6–42
  Dual-host, C–16
  dual-host configuration, 4–43
  single-host configuration, 4–20
Final verification
  magazine tape subsystem, 6–46
  SF72 storage enclosure, 5–77
Final Verification
  Dual-host, C–22
Front door removal, 3–11, 4–7, 4–31

H

Hardware installation procedures
  magazine tape subsystem, 6–14
Hardware installation procedures, SF200 storage array, 5–13

I

Inspection, ramps, 3–3
Installation
  SF200 storage array, 4–1
  troubleshooting, 7–1
Installation, SF200, 2–1
Installation procedures
  SF72-UK upgrade kit, B–1
Installing a magazine tape subsystem
  SF200 storage array, 6–3
Installing a Magazine Tape Subsystem in an SF200 Storage Array, 6–1

Installing an SF72 enclosure in an SF200 Storage Array, 5–1
Installing an SF72 Storage enclosure SF200 storage array, 5–3
Installing RF72 disk ISE into an SF72-HK storage enclosure, B–4

K

KFMSA bulkhead connector, 4–16, 4–40

L

Labeling the cables, 5–75, 6–42
Labeling the DSSI cables, 5–74
magazine tape subsystem, 6–42
Labeling the magazine tape subsystem, 6–42, 6–44
Labeling the operator control panel, 5–74, 5–76

M

Magazine tape subsystem
in an SF200 storage array, 6–11
shipping screw, 4–12
Magazine tape subsystem, unpacking, 6–3
Magazine tape subsystem, where to install, 6–6

P

Placing DSSI terminators, 4–18
Placing the labels
Dual-host, C–16
dual-host configuration, 4–44
single-host configuration, 4–20
Powering up, SF200 storage array
dual-host configuration, 4–47
single-host configuration, 4–24
Powering up the magazine tape subsystem, 6–41
Powering up the SF72 storage enclosure, 5–73
Power up the SF200 storage array
Dual-host, C–19
Preparing, the SF200 storage array, 5–12
Preparing, the SF200 Storage Array, 6–12
Procedures, safety, 3–3
Procedures, storage array unloading, 3–3

R

Ramp inspection, 3–3
Rear door removal, 3–11, 4–7, 4–31
Removing the RF72 disk ISE
SF72 storage enclosure, 7–6

S

Safety procedures, storage array unloading, 3–3
SF200 shipping container contents, 3–2
SF200 storage array
cabling
dual-host configuration, 4–39
single-host configuration, 4–15
inspection, 3–11
dual-host configuration, 4–31
single-host configuration, 4–7
installation
dual-host configuration, 4–30
single-host configuration, 4–6
installation of, 4–1
installing a magazine tape subsystem, 6–1
installing an SF72 enclosure, 5–1
labeling
dual-host configuration, 4–42

SF200 storage array
labeling (Cont.)
single-host configuration, 4–19
labeling, dual-host, C–14
leveling, 3–6
overview, 1–1 to 1–4
powering up
dual-host configuration, 4–47
single-host configuration, 4–24
recommended environmental limits, 1–3
unpacking, 3–2
SF200 storage array cabling diagrams, A–1
SF72 enclosure, unpacking, 5–4
SF72 enclosure, where to install, 5–6
SF72 storage enclosure
overview, 1–4 to 1–8
positions, 1–1
recommended environmental limits, 1–7
SF72 storage enclosure, in an SF200 storage array, 5–11
Single-host configuration, 4–2, 6–26
cabling an SF72 for, 5–35
Site preparation, SF200, 2–1
Slide mount, 5–15, 6–16
Split- and through-bus modes, 4–28, 4–51, 5–4, C–19
Split-bus mode, 1–6, 5–6
converting to,, 5–22
System configuration sheet, 5–8
dual-host, C–14
dual-host configuration, 4–42
magazine tape subsystems, 6–8
single-host configuration, 4–19
updating, 5–74

T

Thermal stabilization, 3–2
Through- and split-bus modes, 4–28, 4–51, 5–4
Through-bus mode, 1–6, C–19
Through-us mode
converting to,, C–6
Tools, SF200 storage array, 5–1, 6–1
Troubleshooting
basic steps, 7–2
installation, 7–1
magazine tape subsystem, 7–15
SF72 storage enclosure, 7–2
Troubleshooting chart, 7–3

U

Unloading procedures, storage array, 3–3
Unpacking, magazine tape subsystem, 6–3
Unpacking, SF72 enclosure, 5–4
Update the system configuration sheet, 6–41

V

Verification, final
dual-host configuration, 4–52
single-host configuration, 4–29

W

Weldment bracket, 5–17, 6–19
Where to install, magazine tape subsystems, 6–6
Where to install, SF72 storage enclosure, 5–6