BA654 DSSI Disk PIU Installation Guide

Order Number EK–BA654–IN.001

This manual is intended for Digital customer service engineers and self-maintenance customers installing the BA654 disk PIU option.

digital equipment corporation
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Preface

Intended Audience

This manual is written for Digital customer service engineers and self-maintenance customers who install the BA654 option in an H9F00- Ax or an H9F00- Bx cabinet.

Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient on- line and printed reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

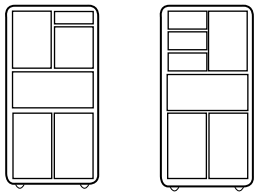
This manual has three chapters as follows:

- **Chapter 1, Preparation,** gives an overview of the option and tells how to prepare for the installation.
- **Chapter 2, Installing the BA654 PIU Option,** gives instructions on how to install and cable the BA654 PIU.
- **Chapter 3, Acceptance and Troubleshooting,** describes the acceptance procedure.

Conventions Used in This Document

Book titles. In text, if a book is cited without a product name, that book is part of the hardware documentation. It is listed in Table 1 along with its order number.

Icons. The icons shown below are used in illustrations for designating part placement in the system described. A shaded area in the icon shows the location of the component or part being discussed.



Documentation Titles

Table 1 lists the books in the DEC 7000 and VAX 7000 documentation set. Table 2 lists other documents that you may find useful.

Table 1 DEC 7000/VAX 7000 Documentation

Title	Order Number
Installation Kit	EK–7000B–DK
Site Preparation Guide	EK–7000B–SP
Installation Guide	EK–700EB–IN
Hardware User Information Kit	EK–7001B–DK
Operations Manual	EK–7000B–OP
Basic Troubleshooting	EK–7000B–TS
Service Information Kit—VAX 7000	EK–7002A–DK
Platform Service Manual	EK–7000A–SV
System Service Manual	EK–7002B–SV
Pocket Service Guide	EK–7000A–PG
Advanced Troubleshooting	EK–7001A–TS
Service Information Kit—DEC 7000	EK–7002B–DK
Platform Service Manual	EK–7000A–SV
System Service Manual	EK–7002B–SV
Pocket Service Guide	EK–7700A–PG
Advanced Troubleshooting	EK–7701A–TS
Reference Manuals	
Console Reference Manual	EK–70C0B–TM
KA7AA CPU Technical Manual	EK–KA7AA–TM
KN7AA CPU Technical Manual	EK–KN7AA–TM
MS7AA Memory Technical Manual	EK–MS7AA–TM
I/O System Technical Manual	EK–70I0A–TM
Platform Technical Manual	EK–7000A–TM

Table 1 DEC 7000/VAX 7000 Documentation (Continued)

Title	Order Number
Upgrade Manuals	
KA7AA CPU Installation Card	EK–KA7AA–IN
KN7AA CPU Installation Card	EK–KN7AA–IN
MS7AA Memory Installation Card	EK–MS7AA–IN
KZMSA Adapter Installation Guide	EK–KXMSX–IN
DWLMA XMI PIU Installation Guide	EK–DWLMA–IN
DWMBB VAXBI PIU Installation Guide	EK–DWMBB–IN
H7237 Battery PIU Installation Guide	EK–H7237–IN
H7263 Power Regulator Installation Card	EK–H7263–IN
BA654 DSSI Disk PIU Installation Guide	EK–BA654–IN
BA655 SCSI Disk and Tape PIU Installation Guide	EK–BA655–IN
Removable Media Installation Guide	EK–TFRRD–IN

Table 2 Related Documents

Title	Order Number
DSSI VAXcluster Installation and Troubleshooting Manual	EK–410AA–MG
KFMSA Module Installation and User Manual	EK–KFMSA–IM
KFMSA Module Service Guide	EK–KFMSA–SV
RF Series Integrated Storage Element User Guide	EK–RF72D–UG
TF85 Cartridge Tape Subsystem Owner's Manual	EK–OTF85–OM

Chapter 1

Preparation

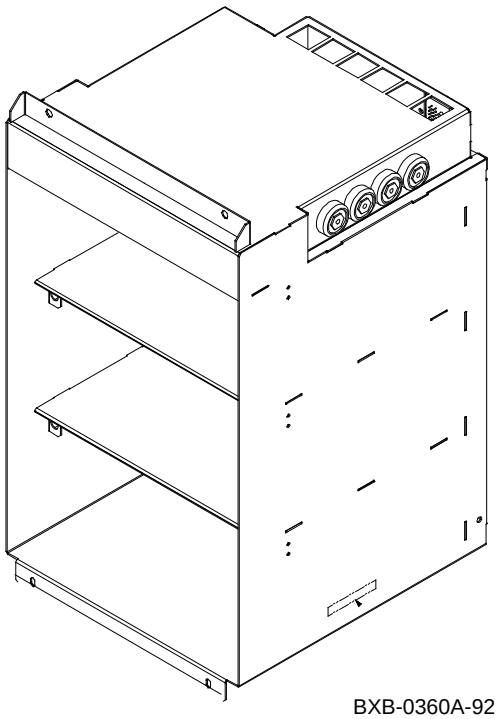
This chapter describes the BA654 disk PIU option and gives preparation guidelines for installing this option into an H9F00- Ax system cabinet or an H9F00- Bx expander cabinet. Chapter 2 describes the installation. Sections in this chapter include:

- BA654 DSSI Disk PIU Description
- Prepare Area, Kit, and Tools
- Check PIU Enclosure for Proper Airflow

1.1 BA654 DSSI Disk PIU Description

The BA654 DSSI disk PIU can be installed to provide additional I/O. This option includes the enclosure and the internal power cable. The I/O adapter, storage array building blocks (SBBs), and DSSI cables must be ordered separately.

Figure 1-1 BA654 DSSI Disk PIU



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DEC 7000

The KFMSB- AA option is the DSSI adapter for DEC 7000 systems. If an additional KFMSB adapter is required, you must also order the CK- KFMSB- LB option. The CK- KFMSB- LB option includes the DSSI bulkhead cable assembly (17- 03451- 01) and four terminators (12- 31281- 01).

VAX 7000

The KFMSA- BA option is the DSSI adapter for VAX 7000 systems. If an additional KFMSA adapter is required, you must also order the CK- KFMSA- LN option. The CK- KFMSA- LN option includes the XMI- to- DSSI bulkhead cable assembly (70- 27661- 04) and fou terminators (12- 31281- 01).

DSSI devices and cables must be ordered separately. Table 1- 1 lists the storage devices, and Table 1- 2 lists the cables.

Table 1- 1 DSSI Storage Device Options

Option Number	Item
SF73- LA	Storage unit containing two 5.25" RF73 disks and one 12" jumper cable (17- 02382- 07)
EF51R- LA	Storage unit containing two 5.25" 100 Mbyte disks and one 12" jumper cable (17- 02382- 07)
EF52R- LA	Storage unit containing two 5.25" 200 Mbyte disks and one 12" jumper cable (17- 02382- 07)

Table 1- 2 DSSI Cable Options

Option Number	Item
BC21Q- 06	6 ft DSSI internal cable (17- 02382- 09)
BC21Q- 09	9 ft DSSI external cable (17- 02382- 02)
BC21Q- 16	16 ft DSSI external cable (17- 02382- 05)

1.2 Prepare Area, Kit, and Tools

Set up a work space near the system where you can store components while you work on the BA654 option installation. Unpack the BA654 option kit and check the contents against Table 1-3. Prepare the system for shutdown. You will need a Phillips head screwdriver.

Table 1- 3 BA654 Option Kit

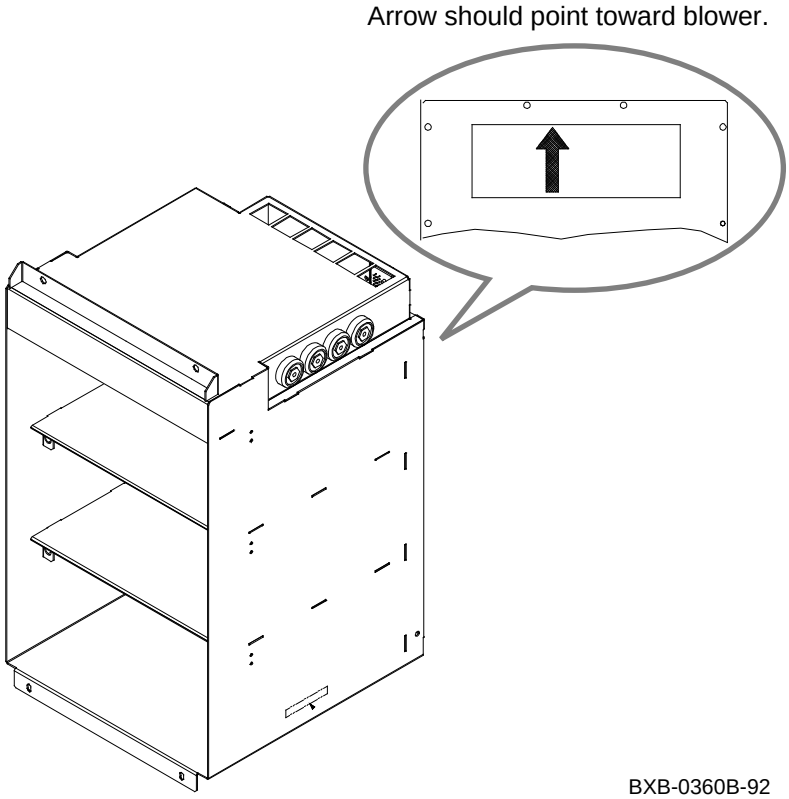
Part Number	Description
70- 29936- 01	DSSI PIU enclosure
17- 03422- 01	Power cable
74- 44639- 01	Rear panel
36- 38666- 01	Caution label
EK- BA654- IN	*BA654 DSSI Disk PIU Installation Guide*

1. Prepare an area near the system where you can place system components during the installation.
2. Perform an orderly shutdown of the system.
3. Turn the control panel keyswitch to the Disable position.
4. Open the cabinet doors.
5. Push the AC power circuit breaker handle down to shut the circuit breaker off.

1.3 Check PIU Enclosure for Proper Airflow

When installing a BA654 PIU in the cabinet, make sure that the rear panel arrow points toward the blower to permit proper airflow. See Figure 1- 2.

Figure 1- 2 PIU Rear Panel

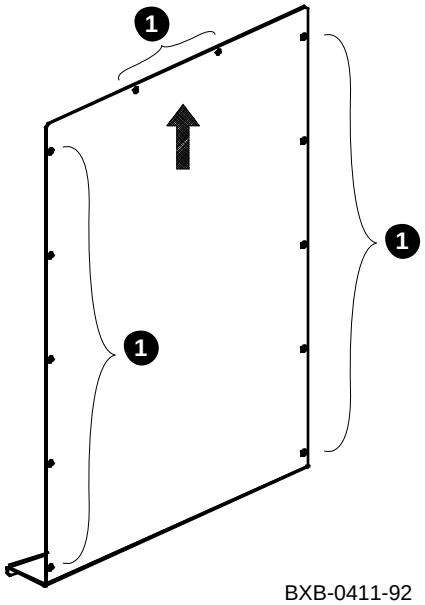


The arrow on the rear panel of the PIU enclosure must point toward the blower. That is, the arrow must point up when installing the PIU below the blower; it must point down when installing the PIU above the blower.

If necessary, use the following procedure to reinstall the PIU rear panel:

1. Using a Phillips screwdriver, remove the 12 screws on the rear panel (see ❶ in Figure 1- 3).
2. Remove and reposition the rear panel.
3. Install the 12 Phillips screws.

Figure 1- 3 Rear Panel Removal



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Chapter 2

Installing the BA654 PIU Option

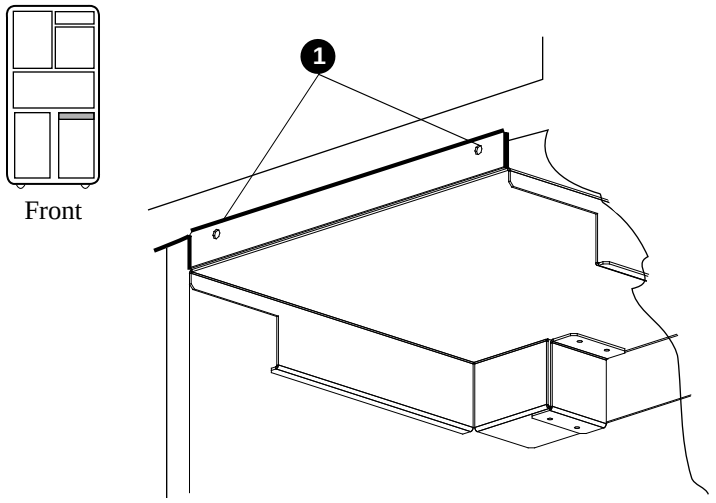
This chapter describes the installation of the BA654 PIU option into an H9F00- Ax system cabinet or an H9F00- Bx expander cabinet. Sections include:

- Remove the Cabinet Airflow Plate
- Install the BA654 PIU
- Install the Storage Array Building Blocks
- Cable the Storage Array Building Blocks
- Cable the BA654 PIU and Set Node IDs

2.1 Remove the Cabinet Airflow Plate

Remove the cabinet airflow plate located below the blower in the disk PIU space. The plate blocks airflow when a PIU is not present.

Figure 2- 1 Airflow Plate



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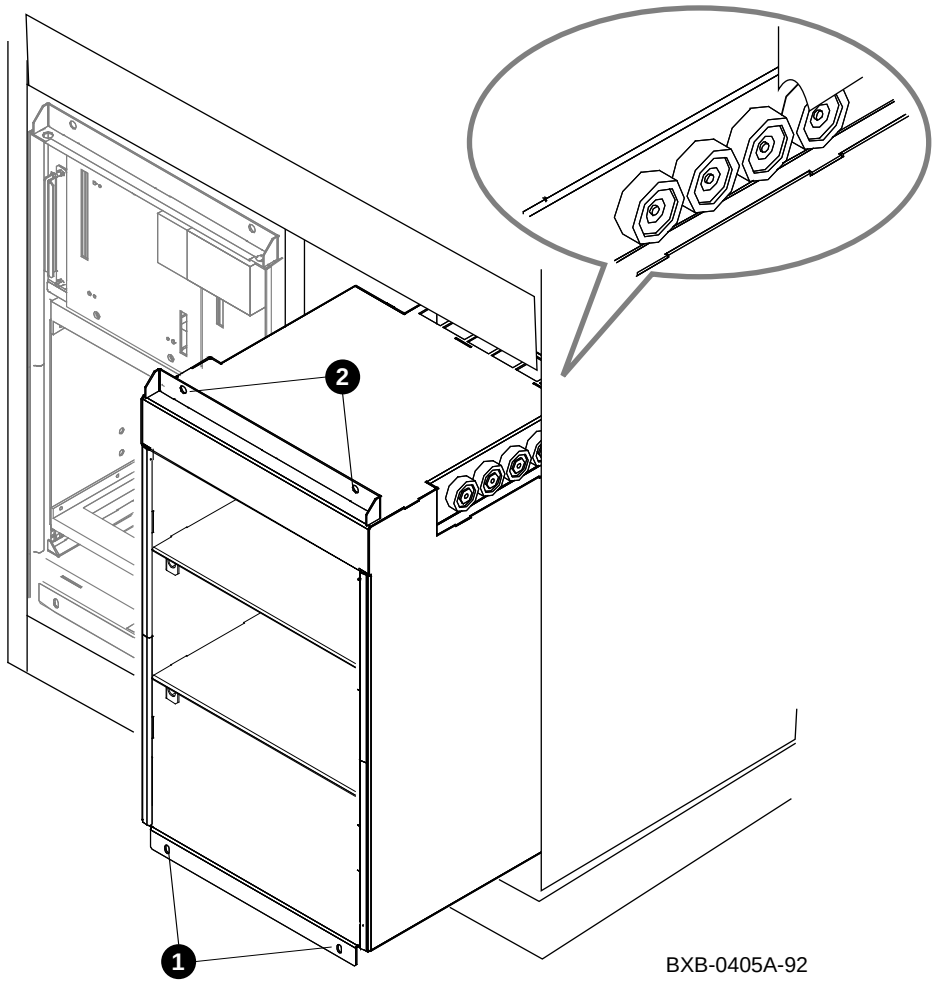
1. Open the front cabinet door.
2. Using a Phillips screwdriver, remove the two screws (see ❶ in Figure 2- 1) and slide the airflow plate out of the cabinet.

2.2 Install the BA654 PIU

Insert the BA654 PIU into the cabinet.

Figure 2- 2 Installing the BA654 PIU



1. Line up the rollers at the top of each side of the PIU enclosure with the slides in the cabinet. See Figure 2- 2. Push the PIU enclosure straight into the cabinet until it seats.
2. Install the two Phillips screws at the bottom of the PIU enclosure (see ❶).
3. Tighten the two captive screws (see ❷).

2.3 Install the Storage Array Building Blocks

Insert the storage array building blocks (SBBs) into the BA654 PIU.

Figure 2- 3 Sample DSSI Configuration

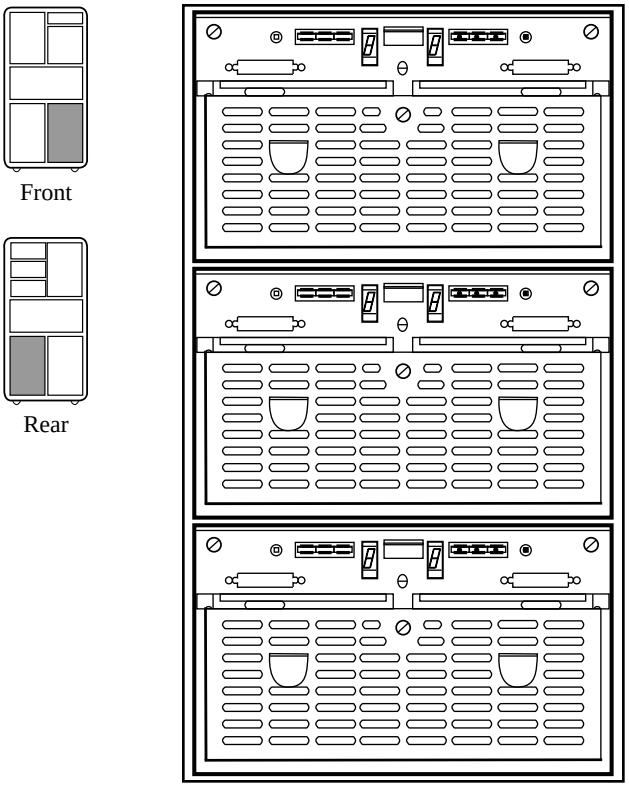


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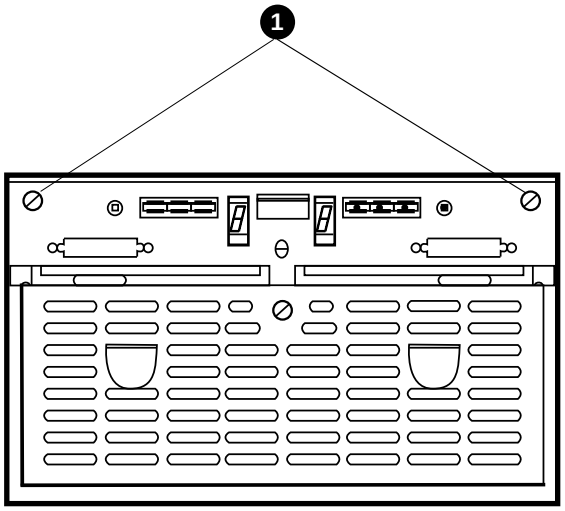
Figure 2- 3 shows a DSSI PIU with three SBBs. Each SBB houses two 5.25" disks.

To install an SBB:

1. Insert the SBB onto the shelf closest to the blower.
2. Tighten the two large flathead screws (see ❶ in Figure 2- 4) to secure the SBB.

Figure 2- 4 SBB Screws



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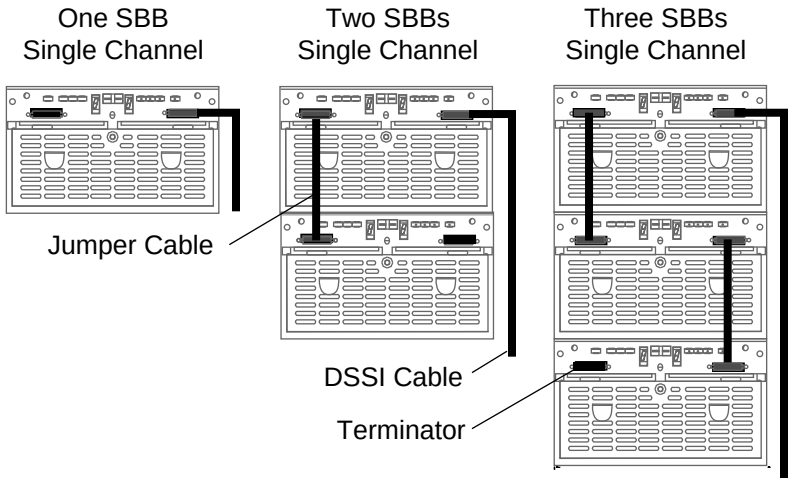
BA654 DSSI Disk PIU Configuration Rules

- The DSSI disk PIU can occupy any quadrant in the cabinet.
- In the system cabinet or in the bottom of the expander cabinet, SBBs are installed starting closest to the blower and working down.
- In the top of the expander cabinet, SBBs are installed starting closest to the blower and working up.
- The arrow on the rear panel of the PIU enclosure must point toward the blower.

2.4 Cable the Storage Array Building Blocks

Connect the SBB jumper cables and terminators. Section 2.5 shows how to connect the DSSI cable.

Figure 2- 5 Cabling and Terminating the SBBs



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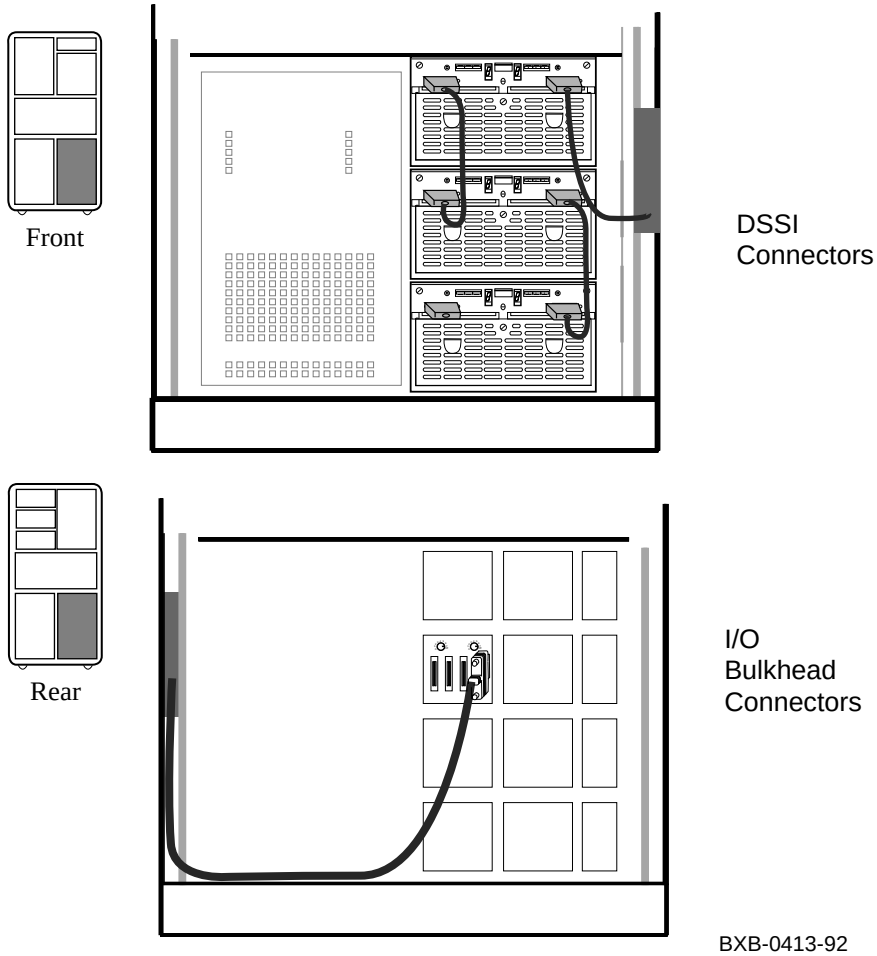
1. If only one SBB is present, attach a terminator (12- 31281- 01) to one connector. Connect the DSSI cable to the other connector (see Figure 2- 5).
2. If two or more SBBs are present, use jumper cables (BC21Q- 01) to daisy- chain the SBBs. Attach a terminator to the connector that is not cabled (see Figure 2- 5).

2.5 Cable the BA654 PIU and Set Node IDs

Connect the DSSI cable to the disk connector. Thread the cable through the cable trough. Connect the other end of the cable to the I/O bulkhead. See Figure 2- 6. If necessary, set node IDs.

Figure 2- 6 Cabling



1. Connect the BC21Q- xx cable to the DSSI connector that is closest to the cable opening.
2. Thread the cable through the cable trough at the side of the cabinet.
3. Connect the other end of the cable to the I/O bulkhead reserved for DSSI I/O.

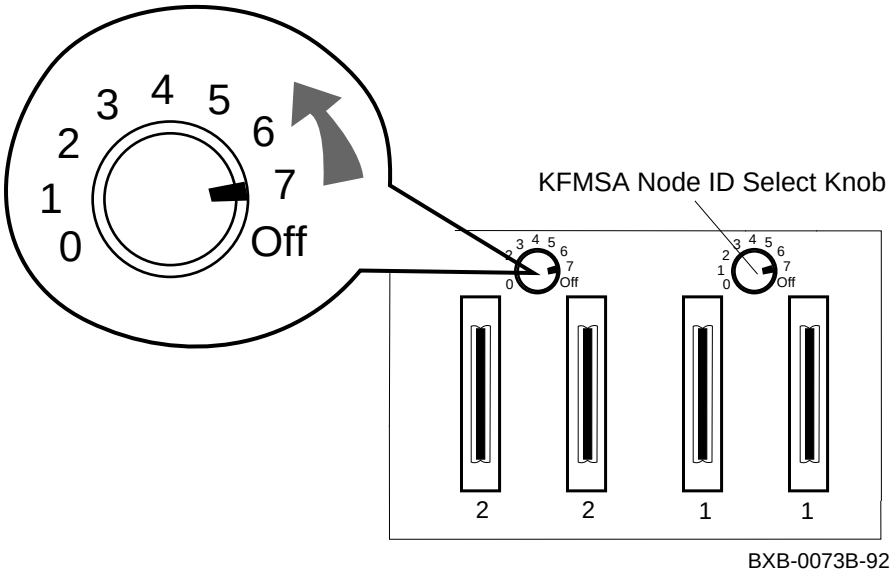
Setting Node IDs

The node IDs for KFMSA- BA modules are factory set with both ports having the node ID of 7. KFMSA- BA nodes IDs for single- host systems do not have to be changed. For a dual- host system, the second host system's KFMSA- BA node ID must be set to 6. On a tri- host system, the third host system's KFMSA- BA node ID must be set to 5. On a quad- host system, the fourth host system's KFMSA- BA node ID must be set to 4. For more information, see the *KFMSA Module Installation and User Manual*.

If the second and third hosts have multi- host I/O panels (as shown in Figure 2- 7), use the KFMSA- BA select knob to change the KFMSA- BA node ID.

If required, set the DSSI node IDs for the integrated storage elements (ISEs) using the switches on the DSSI disk PIU.

Figure 2- 7 Setting the KFMSA- BA Node ID on the I/O Panel



Chapter 3

Acceptance and Troubleshooting

This chapter discusses the acceptance procedure and troubleshooting guidelines for the BA654 option. See the *Advanced Troubleshooting* manual for more information on troubleshooting. Sections include:

- Restore Power and Check Self- Test Results
- Testing the KFMSx Adapter and DSSI Devices
- DSSI Disk Drive LEDs

3.1 Restore Power and Check Self- Test Results

Power up the system and check the self- test display to see if the KFMSx adapter passed self- test. You can also check the yellow LED on the KFMSx adapter. The LED is on when the adapter passes self- test. See Section 3.2 for more information on testing.

Example 3- 1 Sample Self- Test Display and Show Commands

```
Initializing the system... ❶
F  E  D  C  B  A  9  8  7  6  5  4  3  2  1  0  NODE #
                    A  M  .  .  .  .  .  .  P  TYP
                    o  +  .  .  .  .  .  .  +  ST1
                    .  .  .  .  .  .  .  .  B  BPD
                    o  +  .  .  .  .  .  .  +  ST2
                    .  .  .  .  .  .  .  .  B  BPD
                    +  +  .  .  .  .  .  .  +  ST3
                    .  .  .  .  .  .  .  .  B  BPD

   +  .  .  .  .  +  +  .  .  +  .  .  .  .     C0 XMI +
   .  .  .  .  .  .  .  .  .  .  .  .  .  .     C1 XMI
   .  .  .  .  .  .  .  .  .  .  .  .  .  .     C2 XMI
   .  .  .  .  .  .  .  .  .  .  .  .  .  .     C3 XMI

                    .  A0 .  .  .  .  .  .  .  ILV
                    . 128 .  .  .  .  .  .  .  128Mb
Firmware Rev = V1.0-1625 SROM Rev = V1.0-0 SYS SN = GAO1234567
>>> show config ❷
         Name      Type    Rev   Mnemonic
   LSB
   0+    KA7AA     (8002)  0000  ka7aa0
   7+    MS7AA     (4000)  0000  ms7aa0
   8+    IOP       (2000)  0002  iop0

   C0 XMI                        xmi0
   5+    KDM70     (0C22)  1E11  kdm700
   8+    DWLMA     (102A)  0104  dwlma0
   9+    KFMSA     (0810)  A2A6  kfmsa0 ❸
   E+    DEMNA     (0C03)  0802  demna0
```

Example 3- 1 Sample Self- Test Display and Show Commands (Continued)

```
>>> show device kfmsa0 ❹
polling for units on kfmsa0, slot 9, xmi0...
dua0.0.0.9.0       DUA0                      RF73
dua1.0.0.9.0       DUA1                      RF73
dua2.0.0.9.0       DUA2                      RF73
dua3.0.0.9.0       DUA3                      RF73
dua4.0.0.9.0       DUA4                      RF73
dua5.0.0.9.0       DUA5                      RF73
>>>
```

1. Close the cabinet doors.
2. Pull the AC power circuit breaker handle up to turn the circuit breaker on.
3. Turn the control panel keyswitch to the Enable position; the system should power up and run self- test.

In Example 3- 1:

❶ Self- test runs at power- up.

❷ The user enters a **show config** command.

❸ The KFMSA adapter, kfmsa0, passes self- test. This adapter supports the DSSI PIU option.

❹ The user enters a **show device kfmsa0** command. You can check to see if all the devices associated with the KFMSA adapter are reported by issuing this command.

For more information:

KFMSA Module Installation and User Manual

KFMSA Module Service Guide

3.2 Testing the KFMSx Adapter and DSSI Devices

Example 3- 2 shows how to test a KFMSx adapter and associated devices.

Example 3- 2 Testing the KFMSx and Devices

```
>>> test kfmsa0 ❶
Device exerciser selected for run time of 120 seconds
Type Ctrl/C to abort...
Initializing kfmsa0
Self-test passed on device kfmsa0 ❷
Configuring kfmsa0
polling for units on kfmsa0, slot 9, xmi0...
dua3.3.1.9.0    DUA3                        RF73 ❸
dkb4.4.1.9.0    DUA4                        RF73
Starting device exerciser on dua3.3.1.9.0 (id #12d) in READ-ONLY mode
Stopping device exerciser on dua3.3.1.9.0 (id #12d)
Starting device exerciser on dua4.4.1.9.0 (id #13e) in READ-ONLY mode
Stopping device exerciser on dua4.4.1.9.0 (id #13e)
Starting device exerciser on dua3.3.1.9.0 (id #154) in READ-ONLY mode
Stopping device exerciser on dua3.3.1.9.0 (id #154)
Starting device exerciser on dua4.4.1.9.0 (id #165) in READ-ONLY mode
Stopping device exerciser on dua4.4.1.9.0 (id #165)
Starting device exerciser on dua3.3.1.9.0 (id #17b) in READ-ONLY mode
Stopping device exerciser on dua3.3.1.9.0 (id #17b)
Starting device exerciser on dua4.4.1.9.0 (id #18d) in READ-ONLY mode
Stopping device exerciser on dua4.4.1.9.0 (id #18d)
Done testing...
>>>
```

❶ The user enters a **test kfmsa0** command to test the KFMSA adapter and devices associated with the adapter.

❷ The KFMSA passes self- test.

❸ The devices associated with kfmsa0 are polled. Two RF73 disk drives are listed. Testing begins.

3.3 DSSI Disk Drive LEDs

Each DSSI disk drive in a storage array building block has a set of LEDs. See Figure 3- 1.

Figure 3- 1 DSSI Disk Drive LEDs

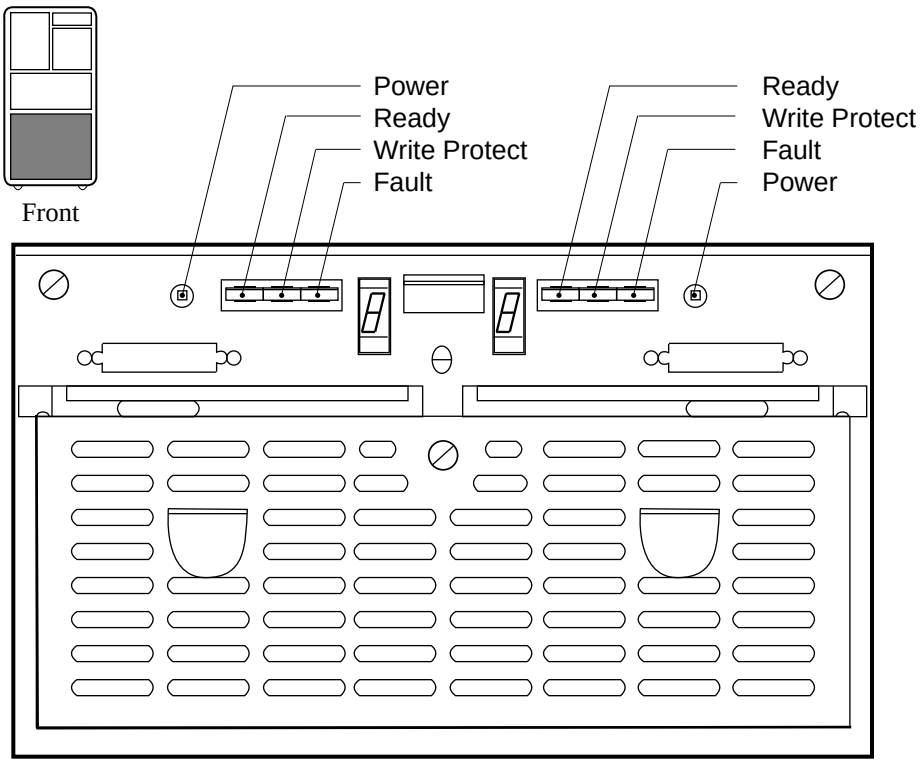


Table 3- 1 Indicator Switches on Disk Control Panel

Indicator Switch	Pushbutton Position	Light	Function
DC Pwr (Green)	In	On	DC power present.
	Out	Off	DC power not present.
Ready (Green)	In	On	Integrated storage element is on- line.
	Out	Off	Integrated storage element is off- line.
Wrt Prot (Yellow)	In	On	Write- protect enabled.
	Out	Off	Write- protect disabled.
Fault (Red)	Momentary Switch	On	Fault condition.
		Off	Normal operation.

The Fault indicator switch goes on for approximately 10 seconds during power- up, and then goes off. If the Fault indicator switch stays on, press the switch to diagnose the problem (see Table 3- 2). See the *RF Series Integrated Storage Element User Guide* for more information.

Table 3- 2 DSSI Disk Drive Fault Diagnosis

Fault Indicator Switch	When Pressed...	
On	Slow Flash	Integrated storage element calibrations being performed.
On	Fast Flash	Disk control panel failure.

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