

# MSU9631/MSU9632 DISK INSTALLATION PROCEDURES

## SUBJECT

Preparation and Installation Procedures

## SPECIAL INSTRUCTIONS

This document provides instructions for installing the MSU9631/MSU9632 disk drives to an initial DPS 6 system and instructions for installing additional disk drives to existing DPS 6 systems. This document must be used in conjunction with the appropriate system installation manual.

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ORDER NUMBER

VK20-00

DOCUMENT NUMBER

71018076-100

September 1986

**Honeywell**

**USER COMMENTS FORMS** are included at the back of this manual. These forms are to be used to record any corrections, changes, or additions that will make this manual more useful.

This document was issued September 1986 as VK20-00 by Document Issue Notice BLCDG7398.

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# Section 1 INTRODUCTION

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**Summary**            Section 1 provides an overview description for the MSU9631 fixed disk with the cabinet, and the MSU9632 fixed disk units two through four without a cabinet.

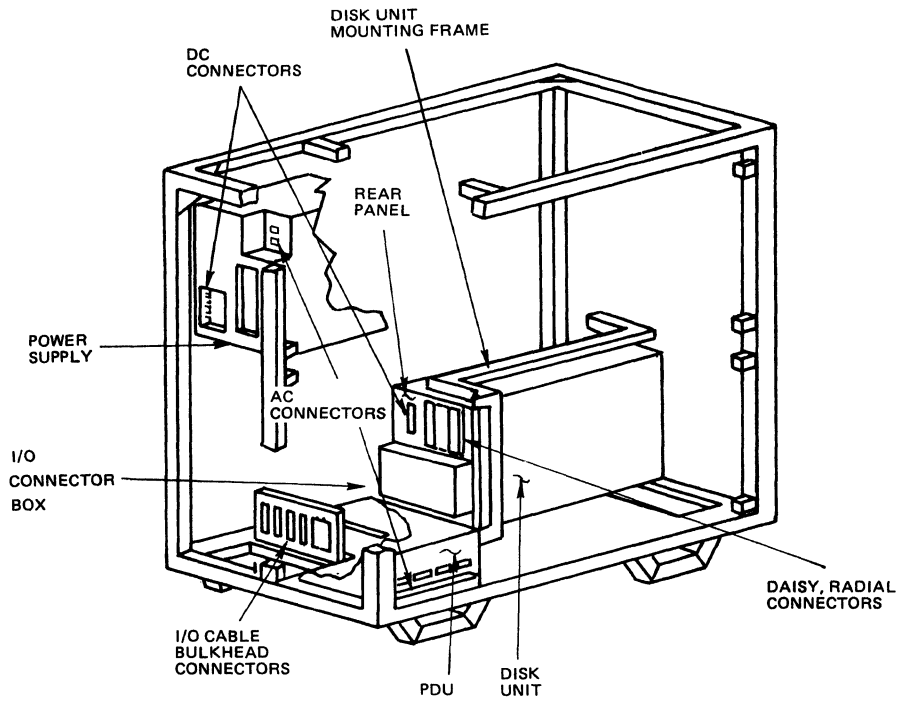
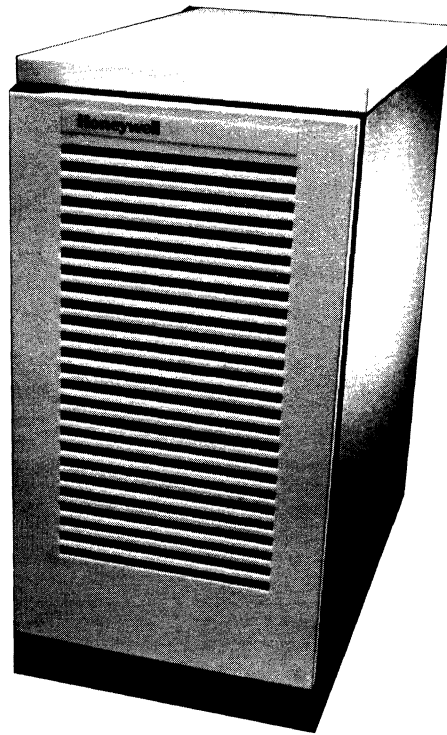
DEVICE OVERVIEW

**Summary** This document provides the procedures required to install the MSU9631/MSU9632 Mass Storage Unit hereinafter referred to as the disk unit, as shown in Figure 1-1 on the adjacent page. The disk unit is installed in a cabinet, and together they form a subsystem that can be configured in a DPS 6 type system.

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**Disk Unit** The disk unit is a random access device with a 14.52 MHz bit transfer rate and has eight-inch fixed disks. A single 15-inch wide cabinet can contain a maximum of four disk units, four power supplies, and one Power Distribution Unit (PDU). The disk units are mounted vertically and swing out for maintenance access. The disk units are defined as follows:

- MSU9631 - one disk unit with a formatted storage capacity of 295 megabytes, one power supply, the required cables, and one PDU mounted in the cabinet assembly.
- MSU9632 - one add-on disk unit with a formatted storage capacity of 295 megabytes, one power supply, the required cables, and the cabinet assembly mounting hardware.



86-524-1

Figure 1-1. Disk Unit Subsystem

REFERENCE DOCUMENTS

Summary

This module provides a list of documents that aid in installing the system:

- Models 3X - 5X & DPS 6/3X - 7X System Installation (Order No. CB68)
- DPS 6/9X System Installation (Order No. FZ87)
- DPS 6/40, 6/42, 6/45, 6/75, and 6/85 System Installation (Order No. VG45).



# Section 2 SUBSYSTEM INSTALLATION

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Unpacking the Cabinet.....	2-2
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Cabling Preparation.....	2-6
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Switch Settings.....	2-12

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**Summary**            This section provides the procedures for unpacking and installing the basic subsystem configuration that consists of the disk cabinet with one disk unit installed.

Subsystem Installation  
UNPACKING THE CABINET

---

UNPACKING THE CABINET

**Summary** This module provides the procedures required to unpack the disk unit subsystem, as shown in Figure 2-1 on the adjacent page.

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**Unpacking** Prior to unpacking, locate the disk unit subsystem in the area where it is to be installed. To unpack the disk unit subsystem, perform the following procedure:

**CAUTION**

Follow instructions on the acclimation label prior to unpacking the subsystem.

To unpack the cabinet:

1. Using a dolly or forklift, move the cabinet to a 10-foot by 10-foot space at or near the area designated by the system layout plan.
2. Cut the shipping straps from around the box that contains the cabinet.
3. Remove the cover from the box.
4. Remove the two top foam cushions.
5. Lift up and remove the box.
6. Cut open the protective bag as close to the bottom as possible.
7. Remove the top portion of the bag.
8. Remove the dessicant bags that are taped to the bottom of the unit.
9. Check for missing or damaged items. Report any discrepancies to the District Manager and the Installation Control Center.

**Remove  
Packing  
Material**

**Check All  
Items**

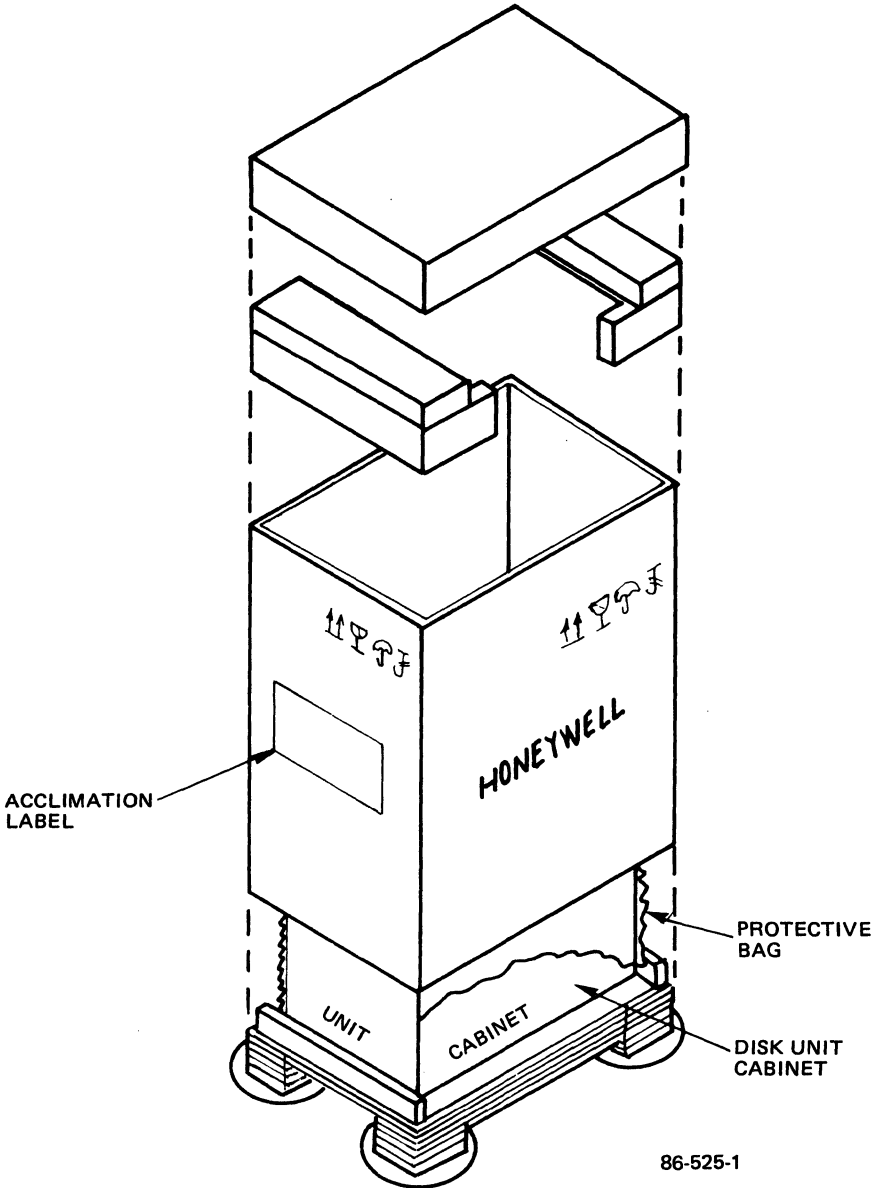


Figure 2-1. Unpacking the Subsystem

Subsystem Installation  
REMOVING THE CABINET FROM THE PALLET

REMOVING THE CABINET FROM THE PALLET

Summary

The pallet converts to a ramp so the cabinet can slide off, as shown in Figure 2-2 on the adjacent page. Loosen the hardware that secures the skid rails to the pallet. Swing out the two skid rails. Slide the cabinet off the pallet.

---

**WARNING**

Two persons are required to remove the cabinet from the pallet.

To remove the cabinet from the pallet:

1. At the front of the cabinet, remove the two inner front hex bolts and washers.
2. Remove the front rail.
3. Loosen the bolts at the right and left side of the pallet.
4. Remove two outer front bolts and washers.
5. On one side of the pallet, partially pull out the skid rail that is underneath the pallet. Do the same for the skid rail that is on the other side.
6. Continue to pull the two skid rails out from under the pallet. Pull each one out a little at a time to avoid having the full weight of the cabinet on one side. Once both skid rails are completely out from under the pallet, the front of the pallet will lower itself to the floor.
7. Slide the cabinet off the pallet and move it to its permanent position.
8. Reassemble the pallets, and store for possible future shipment of the system.

Subsystem Installation  
REMOVING THE PALLET FROM THE CABINET

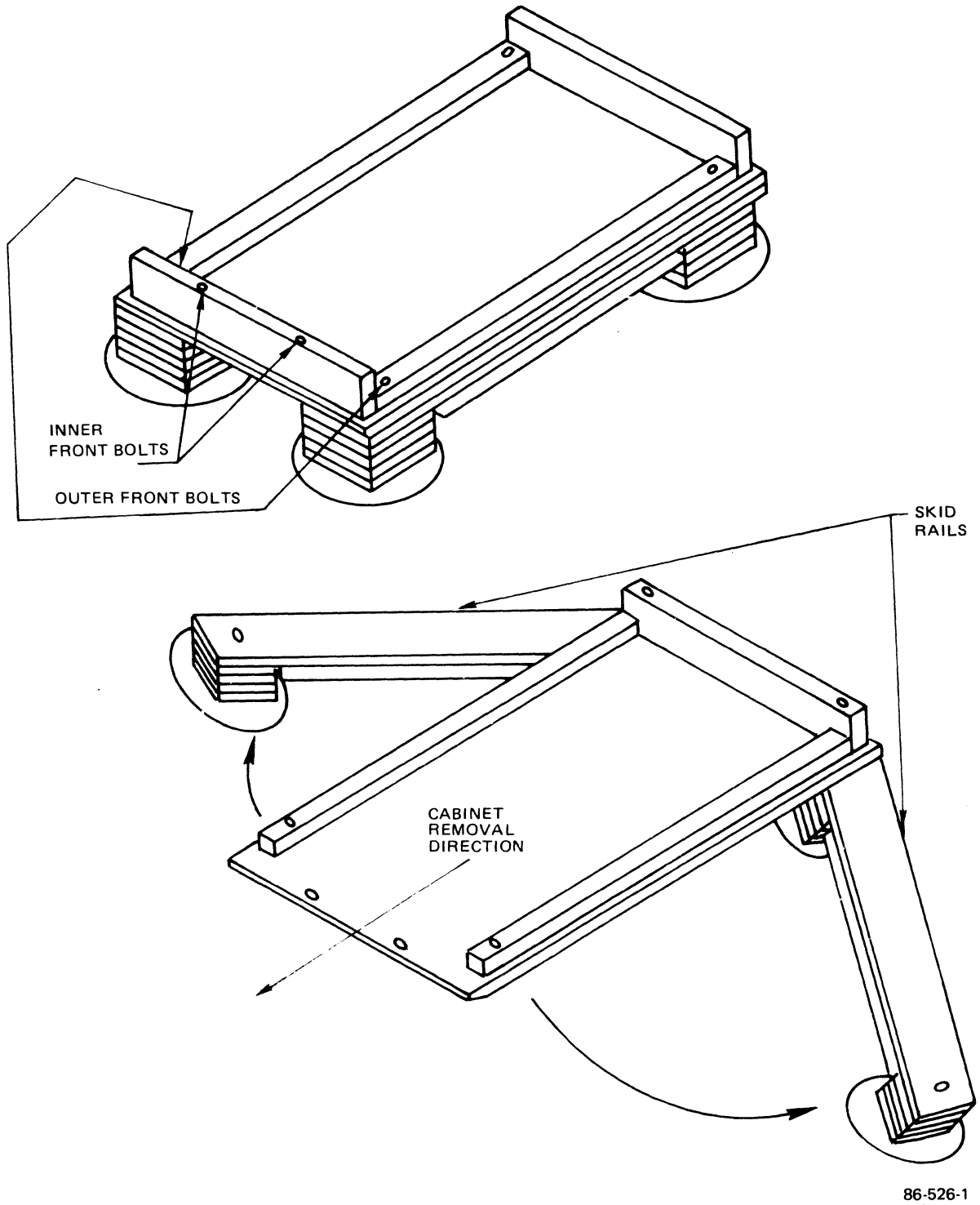


Figure 2-2. Removing the Cabinet from the Pallet

Subsystem Installation  
CABLING PREPARATION

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CABLING PREPARATION

**Summary**      This module describes the procedures required to remove the front and back doors and both the side panels.

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To remove the doors and side panels:

1. Remove front and rear cabinet doors by reaching through the top opening in the center of the door. Locate the latch and release the top of the door. Pull the door out and then lift off.
2. Remove the left side cabinet panels using an eight-inch allen wrench. Insert the wrench into the side access hole and turn the allen wrench counterclockwise until the panel is released. Pull the panel out and lift off.
3. Remove shipping wedge assemblies located at the top and bottom of each unit prior to cabling.
4. To remove shipping wedges from between the disk unit mounting frame and the disk unit, turn the screw on the wedge counterclockwise until the screw and both wedge pieces can be removed as shown in Figure 2-3 on the adjacent page. Note that the wedge can be removed without removing the two TORX screws that secure the frame to the cabinet.
5. Retain wedge assemblies for possible future shipment of the unit.

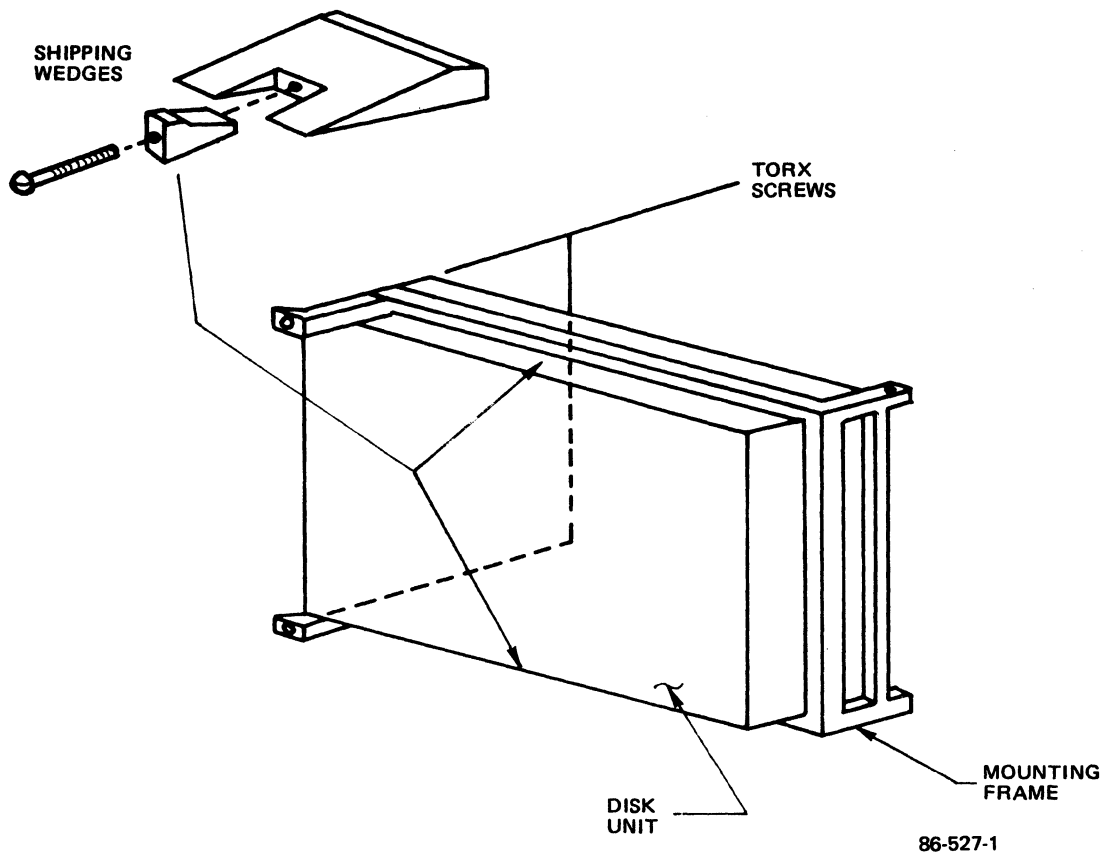


Figure 2-3. Disk Unit Mounting Frame

Subsystem Installation  
**CABLING**

CABLING

**Summary**

This module provides the procedures required to cable the disk unit subsystem.

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Power off the system to which the disk subsystem is to be connected. Install the I/O cables for the configured device, using Figure 2-4 on the adjacent page and the procedure that follows:

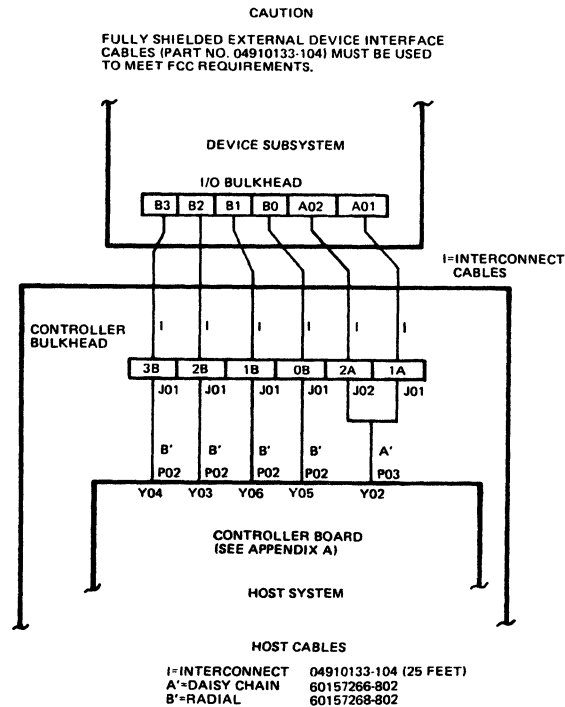
1. At the controller bulkhead, connect the A' cable J01 to bulkhead 1A and cable J02 to bulkhead 2A, and then connect the other end of this connector pair (P03) at the controller board connector Y02 (refer to Appendix A for more detailed information regarding controller boards).
2. At the device subsystem I/O bulkhead, connect the I cable to A01 and secure it with the two captive screws. Connect the other end of this cable to the controller bulkhead 1A.
3. At the device subsystem I/O bulkhead, connect the I cable to A02 and secure it with the two captive screws. Connect the other end of this cable to the controller bulkhead 2A.
4. At the controller bulkhead, connect the B' cable J01 to 0B and connect the other end (P02) of this cable to Y05 of the controller board (refer to Table 2-1, and Appendix A).

Table 2-1. Disk Unit Cable Connections

Device No.	Cont. Board	Cont. Blkhd	I/O Blkhd	Cabinet	
				Front 2nd Add On	View 1st Add On
0	Y05	0B	B0	3rd Add On	Basic Unit
1	Y06	1B	B1		
2	Y03	2B	B2		
3	Y04	3B	B3		



5. At the device subsystem I/O bulkhead, connect the I cable to B0 and secure it with the two captive screws. Connect the other end of this cable to the controller bulkhead 0B.
6. If other drives are to be cabled, repeat steps 4 and 5 while referencing Table 2-1.
7. Check that the disk unit's power supply ON/STANDBY switch is in the ON position.
8. Check that the disk unit's power supply voltage select switch S2 is set correctly.
9. Check each disk unit's logical address switch to ensure that the correct drive number is selected.
10. Using the allen wrench, install the right and left cabinet side panels.
11. Close the front and back cabinet doors.



86-538

Figure 2-4. Subsystem Cabling

## Subsystem Installation

### POWER ON

### POWER ON

#### Summary

This module describes the power on sequence for the subsystem.

---

To power on the subsystem:

1. Verify that the subsystem POWER ON/OFF switch located on the front of the cabinet, as shown in Figure 2-5 on the adjacent page, is in the OFF position.
2. Connect the PDU ac input cable to the customer input power source. If the ac power cable is not connected to the PDU, install the cable, as shown in Figure 2-6 on the adjacent page.
3. Place the subsystem POWER ON/OFF switch in the ON position.
4. Turn the system power on.
5. Run the FSDX1 T&V to verify correct operation of the subsystem.

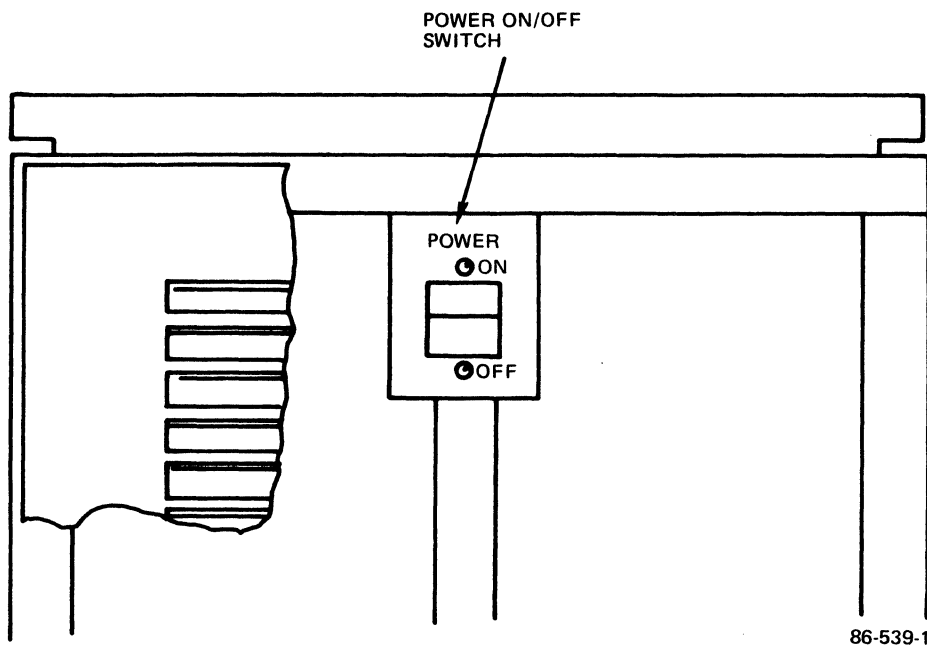


Figure 2-5. Subsystem Power Switch

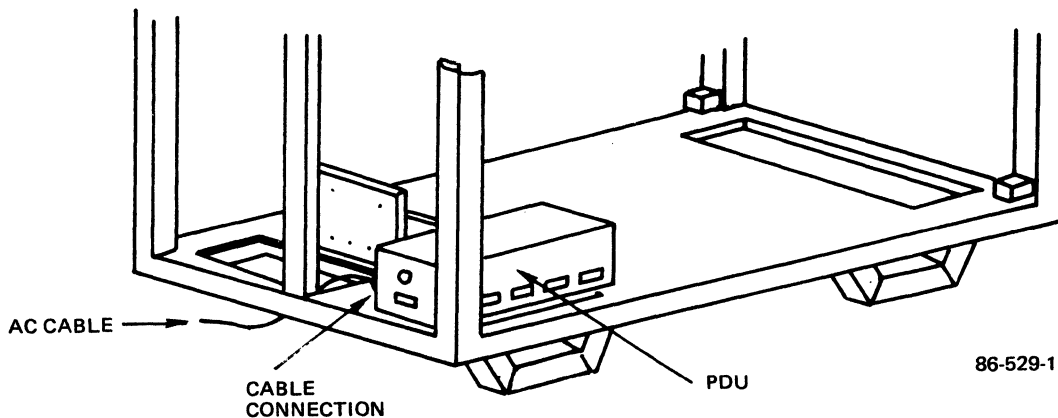


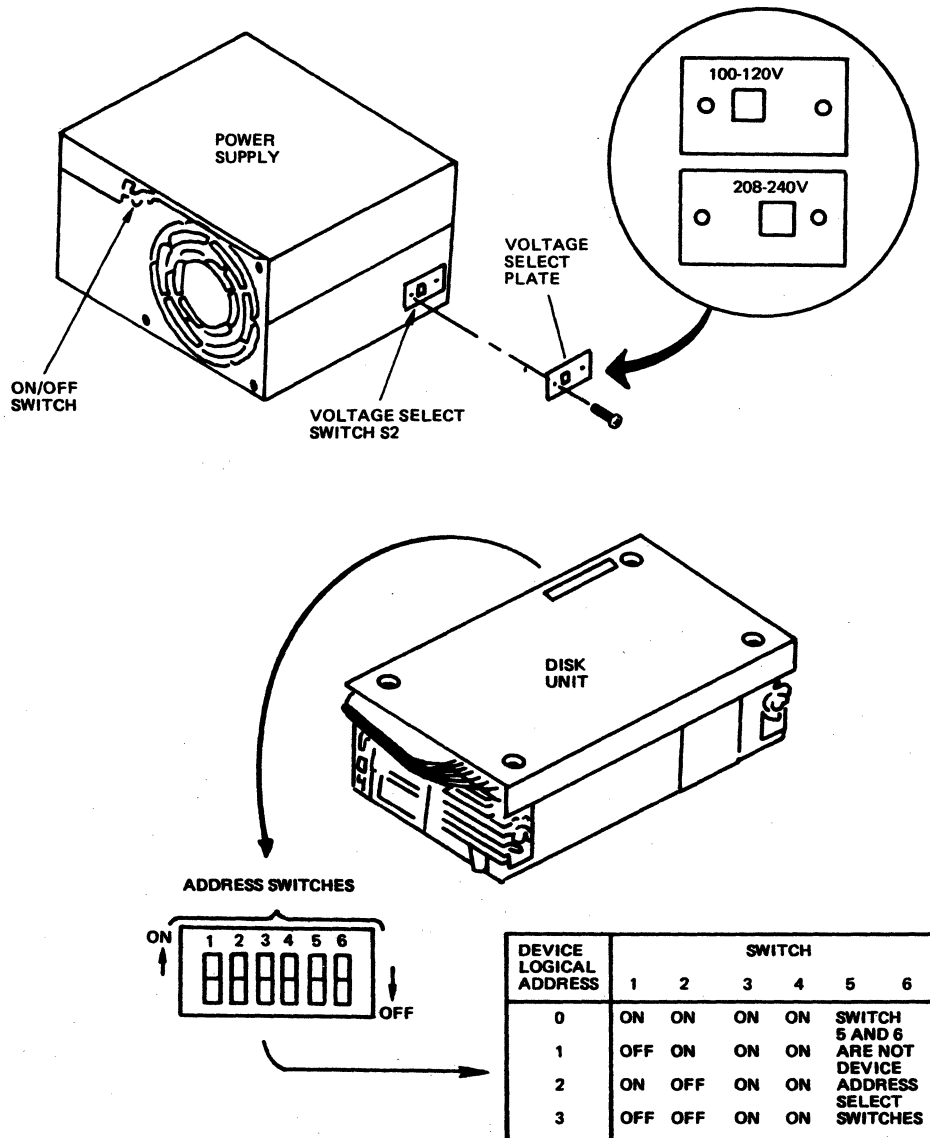
Figure 2-6. PDU AC Input Cable Connection

**Subsystem Installation**  
**SWITCH SETTINGS**

**SWITCH SETTINGS**

**Summary**

The switch settings for the power supply and the fixed disk unit are shown in detail in Figure 2-7.



86-530-1

Figure 2-7. Switch Settings

# Section 3 ADD-ON DISK UNIT INSTALLATION

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In this section:	See page
Unpacking.....	3-2
Power Supply.....	3-4
Disk Unit.....	3-6
Power Cabling.....	3-8
Disk Cabling.....	3-10
Power On.....	3-12

---

**Summary**      This section provides the procedures for installing up to three add-on disk units into the subsystem cabinet. Sequentially repeat the first five procedures in this section each time a disk unit is to be installed. After all disk units are installed, perform the power on procedure.

**CAUTION**

Damage to the disk unit or the power supply may result unless a protective ESD wrist strap is grounded to the cabinet and worn when handling these units.

**UNPACKING**

**UNPACKING**

Summary

This module provides the procedures required to unpack the add-on disk unit kit, as shown in Figure 3-1 on the adjacent page.

---

**CAUTION**

Follow the instructions on the acclimation label prior to unpacking the disk unit.

To unpack the add-on disk unit, perform the following procedure:

Remove  
Packing  
Material

1. Remove disk unit packing material from the shipping container. There is a terminator taped to the underside of the accessories box. Remove terminator and place aside. Save all packing materials for future reshipment.
2. Carefully cut the disk unit protective bag at the seam.
3. When the disk unit is ready to install, remove the antistatic material that surrounds the power supply.
4. Open the box containing the cables, power supply mounting plate, and disk drive mounting frame.

Check All  
Items

5. Check for missing or damaged items in both the disk unit and cable boxes. Report any discrepancies to the District Manager and the Installation Control Center.
6. Prepare a clean padded surface to place the disk unit and power supply for installation in the subsystem cabinet.

Power Down

7. Turn the POWER OFF/ON switch on the front of the cabinet to the OFF position. Remove the ac power cord from the wall receptacle.

8. Open the front and back cabinet doors of the subsystem cabinet using an allen wrench.
  9. Remove the right and left side subsystem cabinet panels by turning the fasteners one-quarter of a turn counterclockwise.
- Terminator
10. The terminator that was removed in step 1 above is not necessary in the upgrade procedures. It can be used as a spare terminator if immediate use is not required.

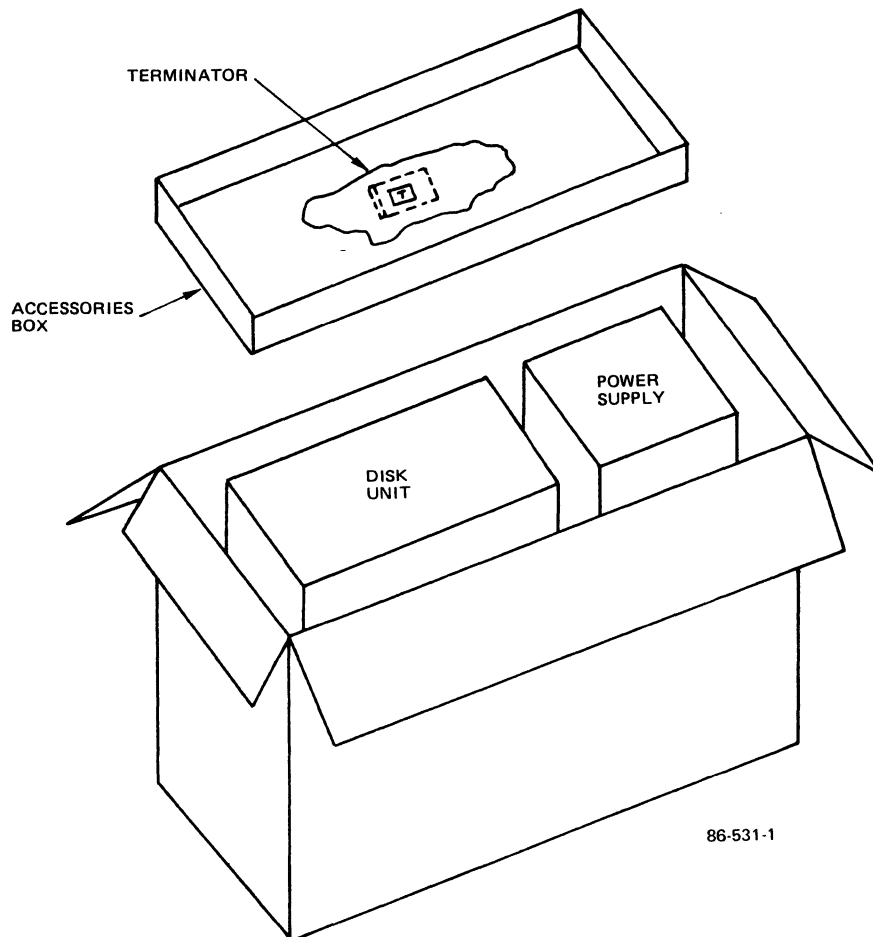


Figure 3-1. Unpacking the Add-On Disk Kit

## Add-On Disk Unit Installation

### POWER SUPPLY

### POWER SUPPLY

**Summary** This module provides the procedures to prepare and install the add-on disk unit's power supply.

#### **CAUTION**

Damage to the disk unit or the power supply may result unless a protective ESD wrist strap is grounded to the cabinet and worn when handling these units.

---

To install the power supply, perform the following:

- |                       |  |
|-----------------------|--|
| <b>Prepare Unit</b>   | <ol style="list-style-type: none"><li>1. Remove the packing and power supply out of the shipping container. Carefully place the power supply on a clean padded surface.</li><li>2. The Voltage Select Switch can be set for either 115 or 230 Vac at 60/50 Hz. Verify that this switch is set correctly for the incoming ac power source (see Figure 3-2).</li><li>3. The ON/STANDBY switch must be in the 1 or ON position.</li></ol> |
| <b>Install Frame</b>  | <ol style="list-style-type: none"><li>4. Using the four 6-32 X 3/8 TORX screws, secure the power supply to the power supply mounting plate, as shown in Figure 3-3 on the adjacent page.</li></ol>   |
| <b>Install Supply</b> | <ol style="list-style-type: none"><li>5. Using the four 8-32 X 3/8 TORX screws, secure the power supply mounting plate to the cabinet side rails directly behind the position where the disk unit will be installed.</li></ol>   |



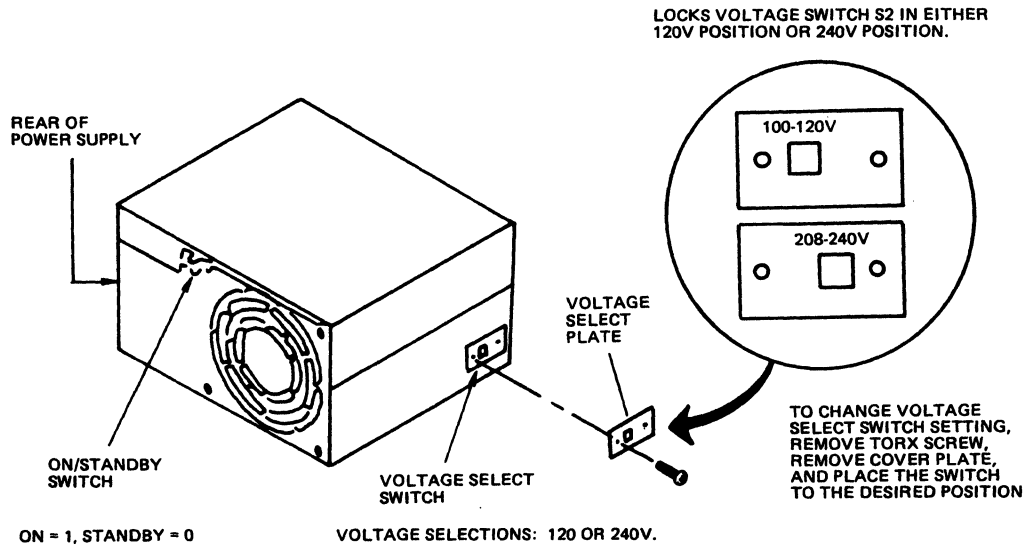


Figure 3-2. Power Supply Set Up

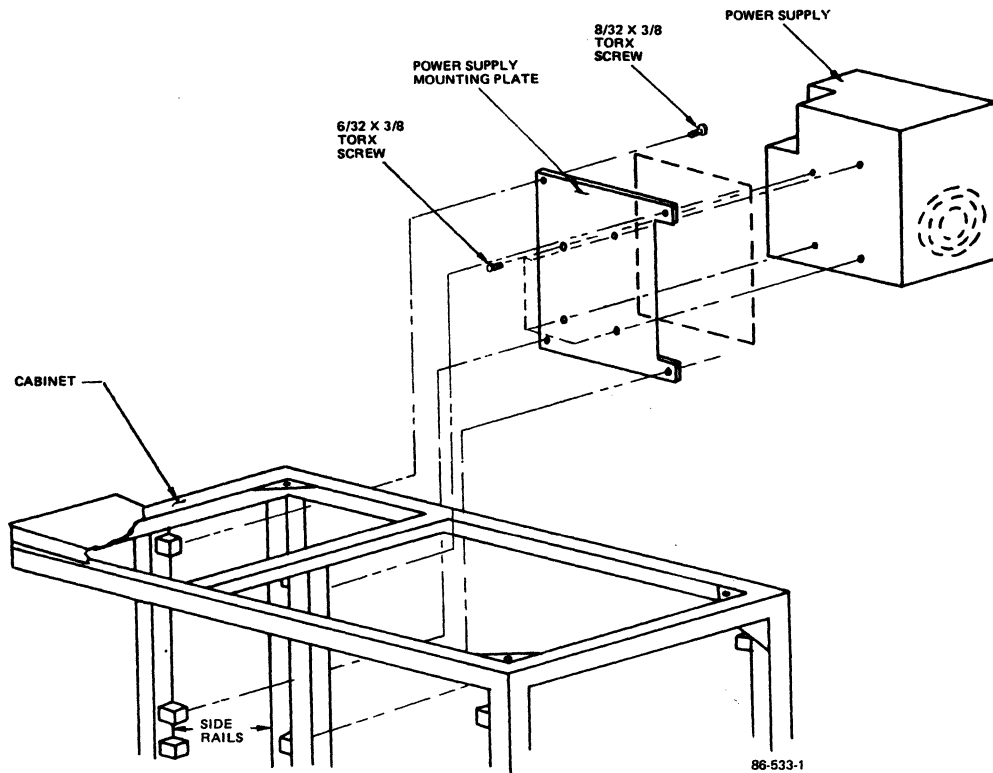


Figure 3-3. Power Supply Installation

**DISK-UNIT**

DISK UNIT

Summary

This module provides the procedures required to prepare and install the add-on disk unit.

**CAUTION**

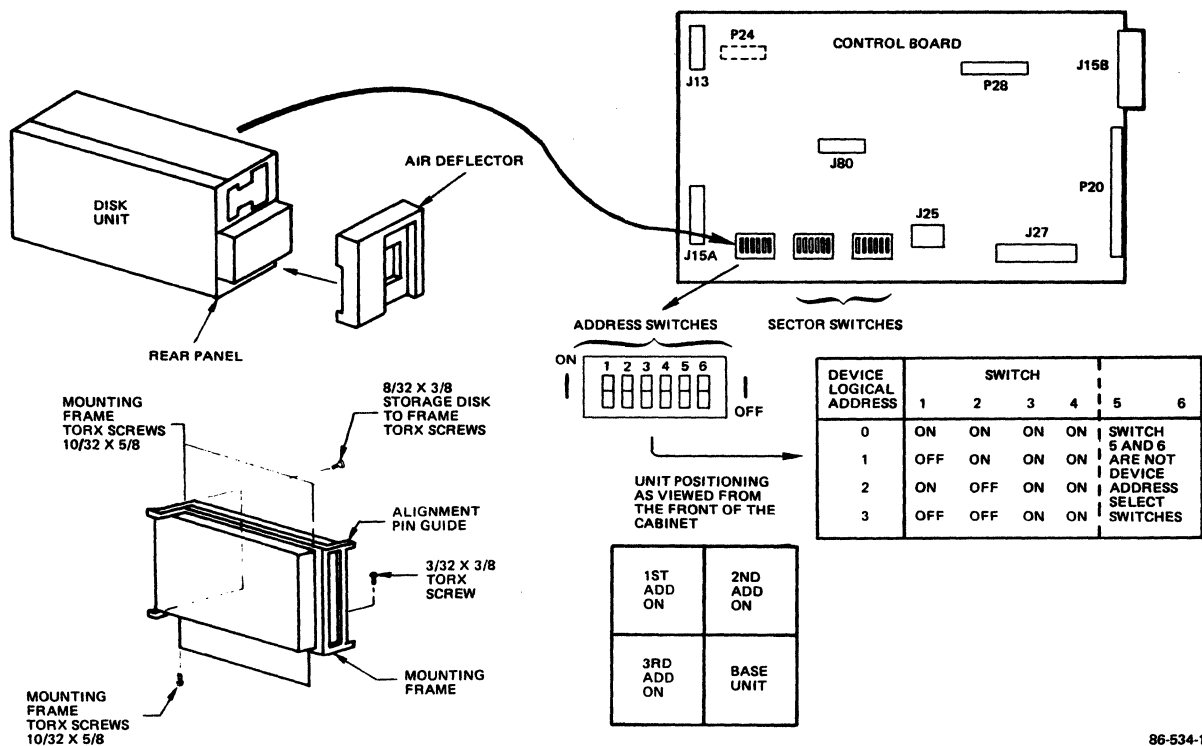
Damage to the disk unit or the power supply may result unless a protective ESD wrist strap is grounded to the cabinet and worn when handling these units.

---

To install the disk unit:

- |                     |   |
|---------------------|---|
| Prepare Unit        | 1. Remove the disk unit from the shipping container, and place it on a clean padded surface with the unit's top cover facing up and the back panel facing toward you. Do not touch the I/O connector pins as damage to the unit may result through electrostatic discharge. |
| Replace Panel       | 2. If the I/O panel of the disk unit is to be replaced (when the vendor rear panel is attached to the disk unit, it must be replaced with the back panel in the installation kit). Proceed to step 3; otherwise proceed to step 5.  |
|                     | 3. Loosen the top cover panel by turning the four allen screws that secure the top panel.   |
| Remove Back Panel   | 4. See Figure 3-4 on the adjacent page and remove the three allen screws that secure the back panel of the disk unit. Remove the panel.   |
|                     | 5. Remove the ground lug from the back panel and install it on the replacement back panel.  |
| Install Replacement | 6. Install the replacement back panel and secure with the three allen screws just removed. If the power supply is equipped with a 14 pin connector, the back panel knock-out must be removed from the replacement back panel.   |
|                     | 7. Secure the four allen screws on the cover.   |

- Set Address**      8. To set the disk unit logical address, see Figure 3-4. Access to the address switches is through the cutout in the top cover.
9. Depending on the physical positioning of the disk unit in the cabinet, set the logical disk unit address switches (a value of 1, 2, or 3).
- Install Frame** 10. Attach the disk unit mounting frame to the disk unit and secure it with four TORX 10-32 x 5/8 screws. Carefully tighten screws to ensure that the rubber portion of the shock mount is not damaged.
- Install Disk** 11. Install the disk unit in the proper cabinet position by guiding the alignment pin into the frame at the proper end of the pivot point. Secure disk subframe assembly to the frame using two TORX 8-32 x 3/8 screws. Secure the assembly at the opposite end of the pivot point with the TORX 8-32 x 3/8 screw.
- Install Air Deflector** 12. Install the air deflector on the rear of the disk unit as shown in Figure 3-4.



86-534-1

**Figure 3-4. Disk Unit and Frame Mounting Assembly**

POWER CABLING

Summary

This module provides the procedures required to connect the power cables from the Power Distribution Unit (PDU) to the power supply and from the power supply to the add-on disk unit (see Figure 3-5 on the adjacent page).

---

To install the power cables, perform the following procedure:

- D (DC) Cable
1. Connect the D cable between the power supply and J15 of the disk unit. The cable end with the shorter ground lead, plugs into the power supply and the cable end with the longer ground lead, plugs into the disk.
  2. On the power supply, install, the 6-inch ground jumper from the dc ground (+5V RETURN) to the ac ground.
  3. Remove the TORX screw that secures the dc ground jumper and connect the return cable terminal lug to the screw and reinstall the screw.
  4. At the disk unit, remove the TORX screw securing the dc ground terminal (marked DC Gnd), connect the return cable to this point, then using the nut secure the return cable.
- AC Cable
5. At the PDU, to gain access to the power connectors, remove the two screws that secures the protective shield to the PDU frame.
  6. Connect one end of the ac power cable to either J03, J04, J05, or J06 on the power distribution unit (J06 must be used with disk unit one), and insert the opposite end of the ac power cable into the ac connector of the power supply.
  7. Connect the protective shield to the PDU frame with the two screws removed in step 5.

**Add-On Disk Unit Installation**  
**POWER CABLING**

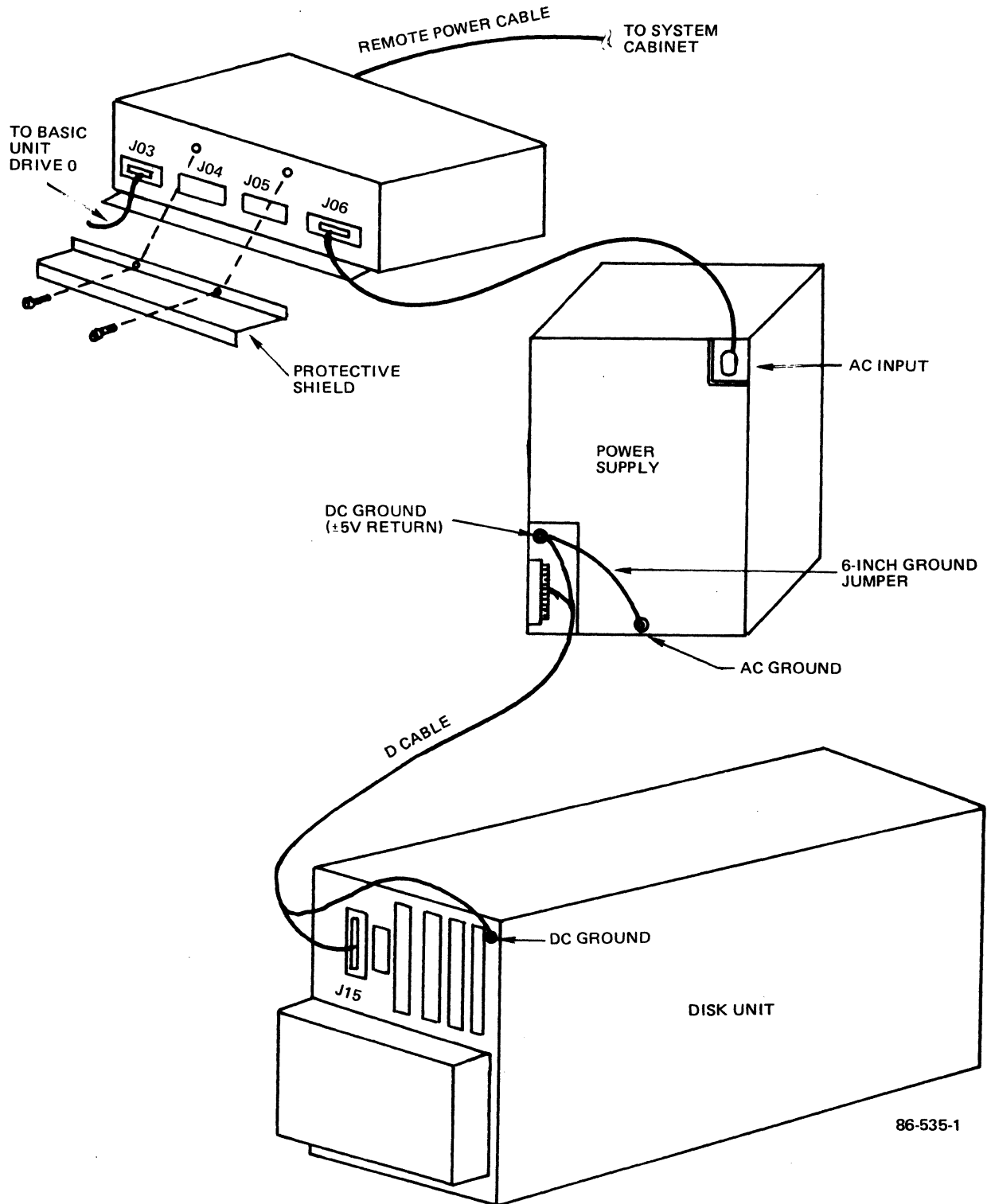


Figure 3-5. AC and DC Power Cabling

Add-On Disk Unit Installation  
DISK CABLING

DISK CABLING

Summary

This module provides the procedures required to connect the logic cables from the add-on disk unit just installed to the I/O connector box and from the I/O connector box to the controller (see Figure 3-6 on the adjacent page):

---

To install the unit cables, perform the following procedures:

C Cable  
04910239

1. Locate the last logical drive, and remove the two screws that secure that disk unit to the cabinet frame.
2. Loosen the pivot screw for the last drive and then slowly swing the disk unit open. Note that the unit can only open to a maximum of 20 degrees from the fully closed position.
3. Connect the C daisy chain cable from the last disk unit connector (in the daisy chain) to 1J3 of the next available disk unit by routing the cable through the inside of the cabinet. Reference terminator procedure below if this is the last add-on unit to be installed.

B Cable  
60157268

4. Connect the B radial cable, J01, from the I/O subsystem bulkhead (B1 for disk unit 1, B2 for disk unit 2, or B3 for disk unit 3) to 1J2 of the next disk unit installed.

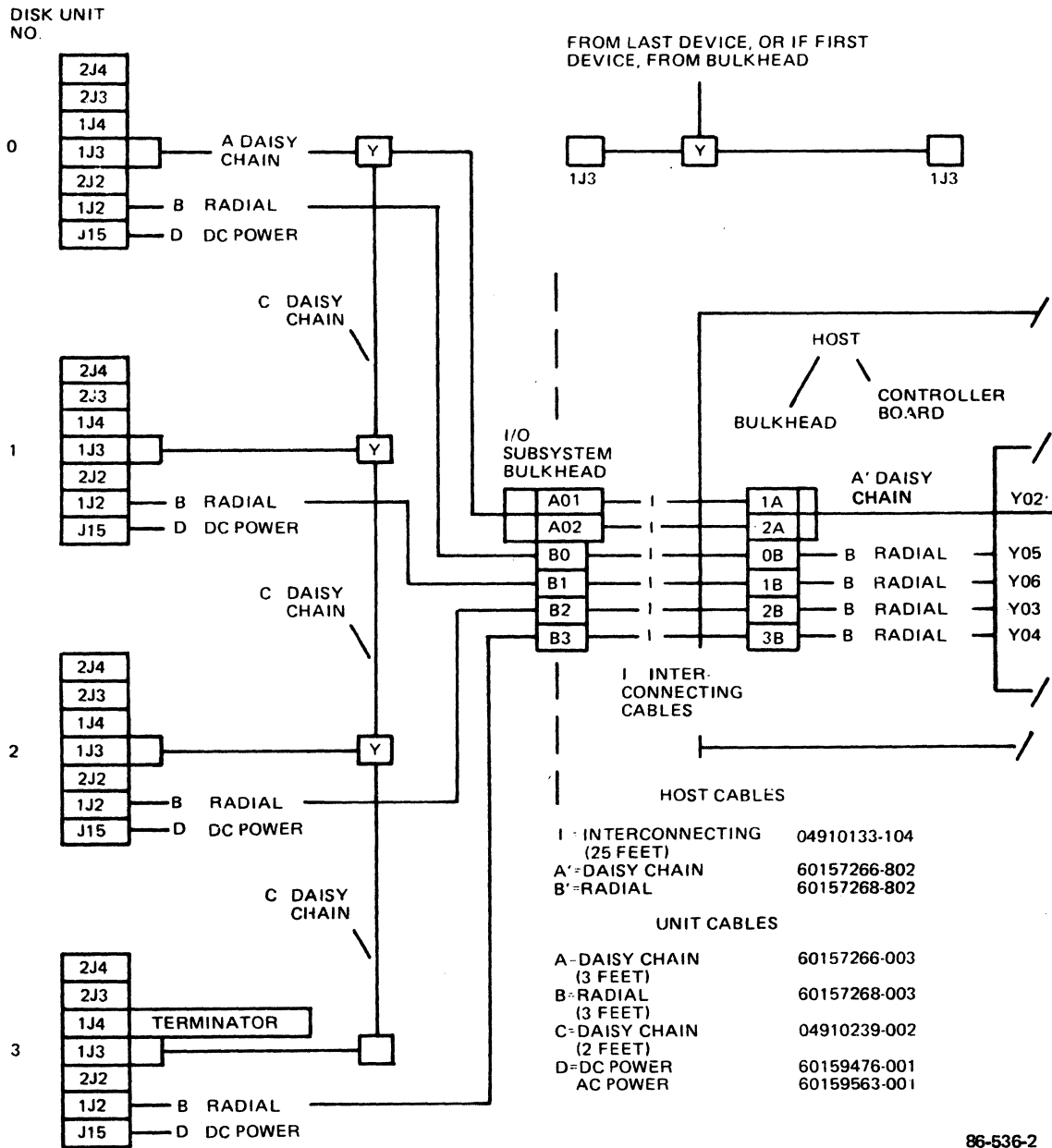
I Cable

5. Connect the I cable from the I/O subsystem bulkhead (B1 for disk unit 1, B2 for disk unit 2, or B3 for disk unit 3) to the Controller Bulkhead.

B' Cable

6. Connect the B' radial cable from the Controller Bulkhead to the controller board connector (refer to Appendix A).
7. Secure the add-on disk unit mounting frame in place to the cabinet frame by installing the two TORX screws removed in step 1. Tighten the pivot screw that was loosened in step 2.

- Terminator 8. If this is the last add-on disk unit to be installed, move the terminator card (currently located in 1J4 of disk unit 0, or 1, or 2) to connector 1J4 of the last device, and continue to the Power On module. Otherwise, return to the Unpacking module in this section to install the next add on disk unit.



86-536-2

Figure 3-6. Subsystem Cable Diagram

## Add-On Disk Unit Installation

### POWER ON

### POWER ON

Summary            This module describes the power on sequence for the subsystem.

---

To power on the subsystem:

1. Verify that the subsystem POWER ON/OFF switch located on the front of the cabinet (see Figure 2-5) is in the OFF position.
2. Connect the PDU ac input cable to the customer input power source.
3. Place the subsystem POWER ON/OFF switch in the ON position.
4. Run the FSDX1 T&V to verify correct operation of the subsystem.



# Appendix A SYSTEM CONTROLLERS

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In this Appendix:	See page
HPDC Boards.....	A-2
HSDC Boards.....	A-4

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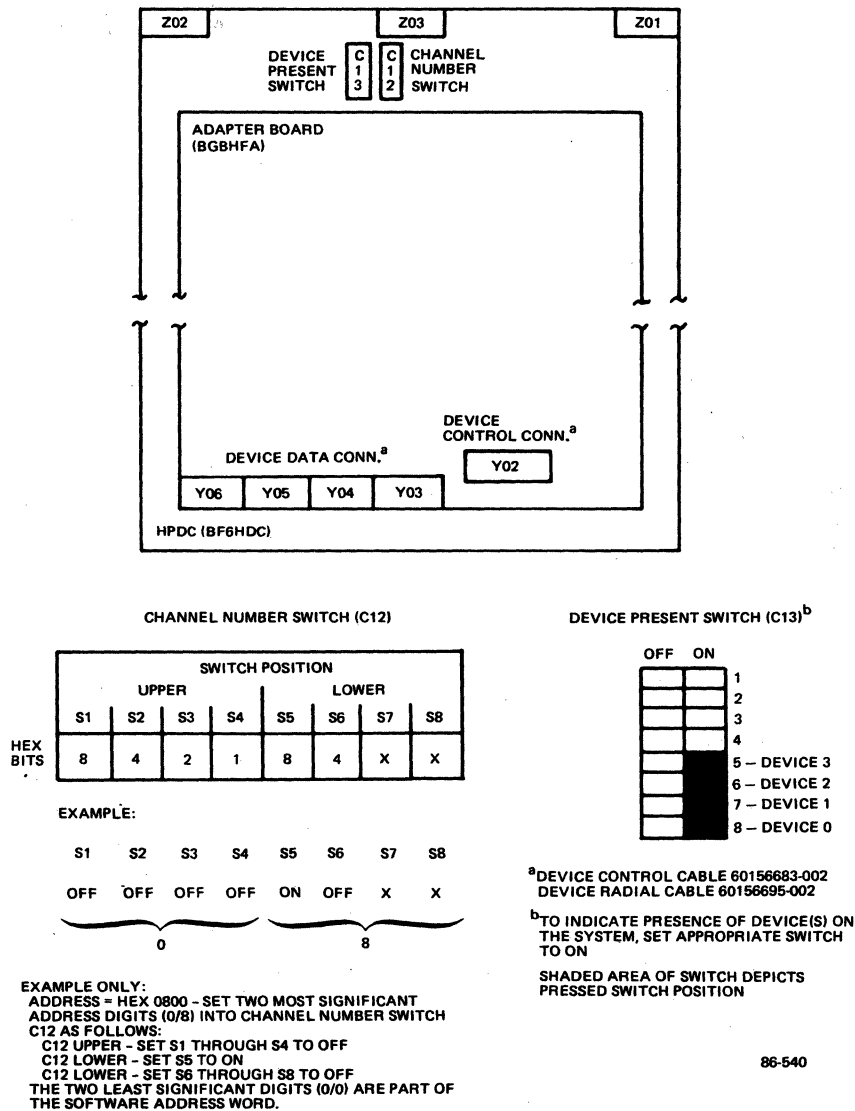
**Summary**      This appendix provides the reference information required to cable the disk subsystem to the system controller.

**System Controllers**  
**HPDC BOARDS**

**HPDC BOARDS**

**Summary**

This module shows the BF4HDC (see Figure A-1) and the BF6HDX (see Figure A-2) board switch locations and settings.



CHANNEL NUMBER SWITCH (C12)

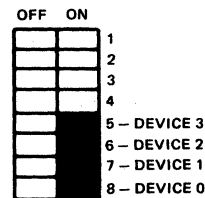
		SWITCH POSITION							
		UPPER				LOWER			
		S1	S2	S3	S4	S5	S6	S7	S8
HEX	BITS	8	4	2	1	8	4	X	X

EXAMPLE:

S1	S2	S3	S4	S5	S6	S7	S8
OFF	OFF	OFF	OFF	ON	OFF	X	X
0				8			

EXAMPLE ONLY:  
 ADDRESS = HEX 0800 - SET TWO MOST SIGNIFICANT ADDRESS DIGITS (0/8) INTO CHANNEL NUMBER SWITCH C12 AS FOLLOWS:  
 C12 UPPER - SET S1 THROUGH S4 TO OFF  
 C12 LOWER - SET S5 TO ON  
 C12 LOWER - SET S6 THROUGH S8 TO OFF  
 THE TWO LEAST SIGNIFICANT DIGITS (0/0) ARE PART OF THE SOFTWARE ADDRESS WORD.

DEVICE PRESENT SWITCH (C13)<sup>b</sup>



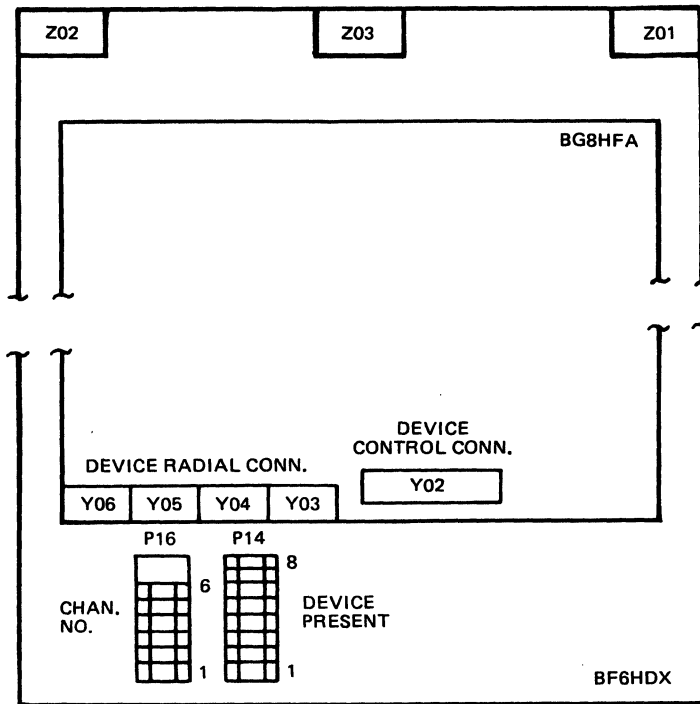
<sup>a</sup>DEVICE CONTROL CABLE 60156683-002  
 DEVICE RADIAL CABLE 60156695-002

<sup>b</sup>TO INDICATE PRESENCE OF DEVICE(S) ON THE SYSTEM, SET APPROPRIATE SWITCH TO ON

SHADED AREA OF SWITCH DEPICTS PRESSED SWITCH POSITION

86-540

**Figure A-1. BF4HDC HPDC Board Switch Locations and Settings**



CHANNEL NUMBER SLIDE SWITCH (P16)

		SWITCH POSITION							
		1	2	3	4	5	6	7	8
HEX		8	4	2	1	8	4	X	X
BITS									

EXAMPLE:

1 2 3 4 5 6 7 8  
 OFF OFF OFF OFF ON OFF OFF OFF  
 0 8

ADDRESS = HEX 0800 - SET TWO MOST SIGNIFICANT ADDRESS DIGITS (0/8) INTO CHANNEL NUMBER JUMPER PLUG P16 AS FOLLOWS:  
 SET SWITCH POSITION 5 TO ON, LEAVE OTHER POSITIONS OFF.  
 TWO LEAST SIGNIFICANT DIGITS (0/0) ARE PART OF SOFTWARE WORD.

DEVICE PRESENT SWITCH (P14)

SET SWITCH POSITION 8 TO ON FOR DEVICE 0  
 SET SWITCH POSITION 7 TO ON FOR DEVICE 1  
 SET SWITCH POSITION 6 TO ON FOR DEVICE 2  
 SET SWITCH POSITION 5 TO ON FOR DEVICE 3

DEVICE CABLES

DEVICE CONTROL CABLE 60157266-002  
 DEVICE RADIAL CABLE 60157268-002

85-724

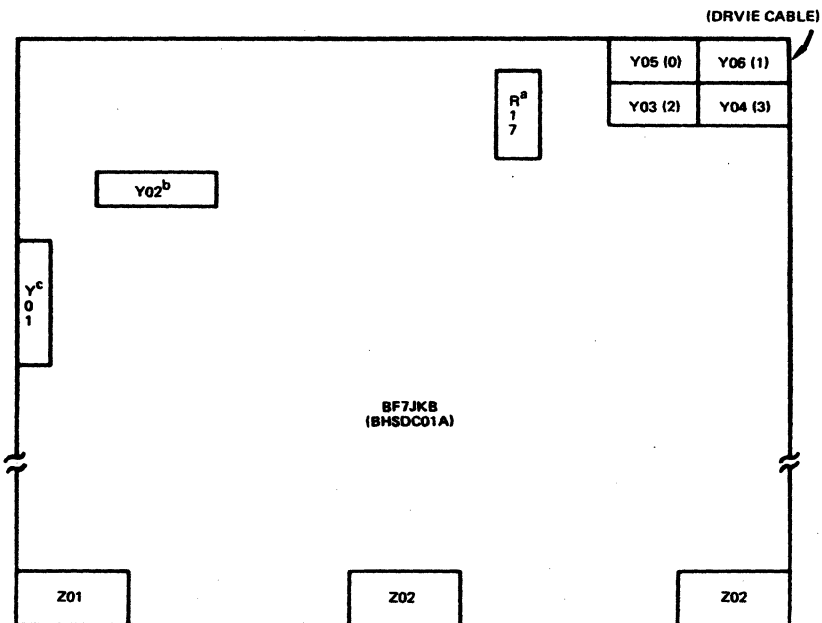
Figure A-2. BF6HDC/BF6HDX HPDC Board Switch Locations and Settings

**System Controllers**  
**HSDC BOARDS**

**HSDC BOARDS**

**Summary**

This module shows the HSDC board layout (see Figure A-3) and R17 switch settings (refer to Table A-1).



<sup>a</sup>THE ADDRESS BIT WEIGHTS FOR EACH SWITCH ON POSITION ARE GIVEN BELOW:

SWITCH POSITION	CHANNEL WEIGHT
1	8000
2	4000
3	2000
4	1000
5	800
6	400
7	
8	

MUST BE OFF

**NOTE**

SWITCH 1 IS AT THE TOP OF THE BOARD. REFER TO TABLE 6-2 FOR SWITCH SETTINGS.

INSTALL RADIAL CABLE (60157268-002):

FROM DEVICE	TO CONNECTOR
0	Y05
1	Y06
2	Y03
3	Y04

**NOTE**

THE FIRST FOUR CHANNEL NUMBERS OF THE SELECTED ADDRESS ARE DEDICATED TO FSD DISKS WHETHER OR NOT THEY ARE IN THE SYSTEM. THE REMAINING TWO CHANNEL NUMBERS ARE USED BY DEVICE ADAPTERS (I.E. IF ADDRESS 400 IS SELECTED, CHANNELS 400, 480, 500, AND 580 ARE RESERVED FOR FSD DISKS AND CHANNELS 600 AND 680 ARE USED BY THE DEVICE ADAPTERS).

<sup>b</sup>INSTALL DAISY CHAIN CABLE (60157255-002) AT Y02.

<sup>c</sup>FOR TEST PURPOSES ONLY.

86-541

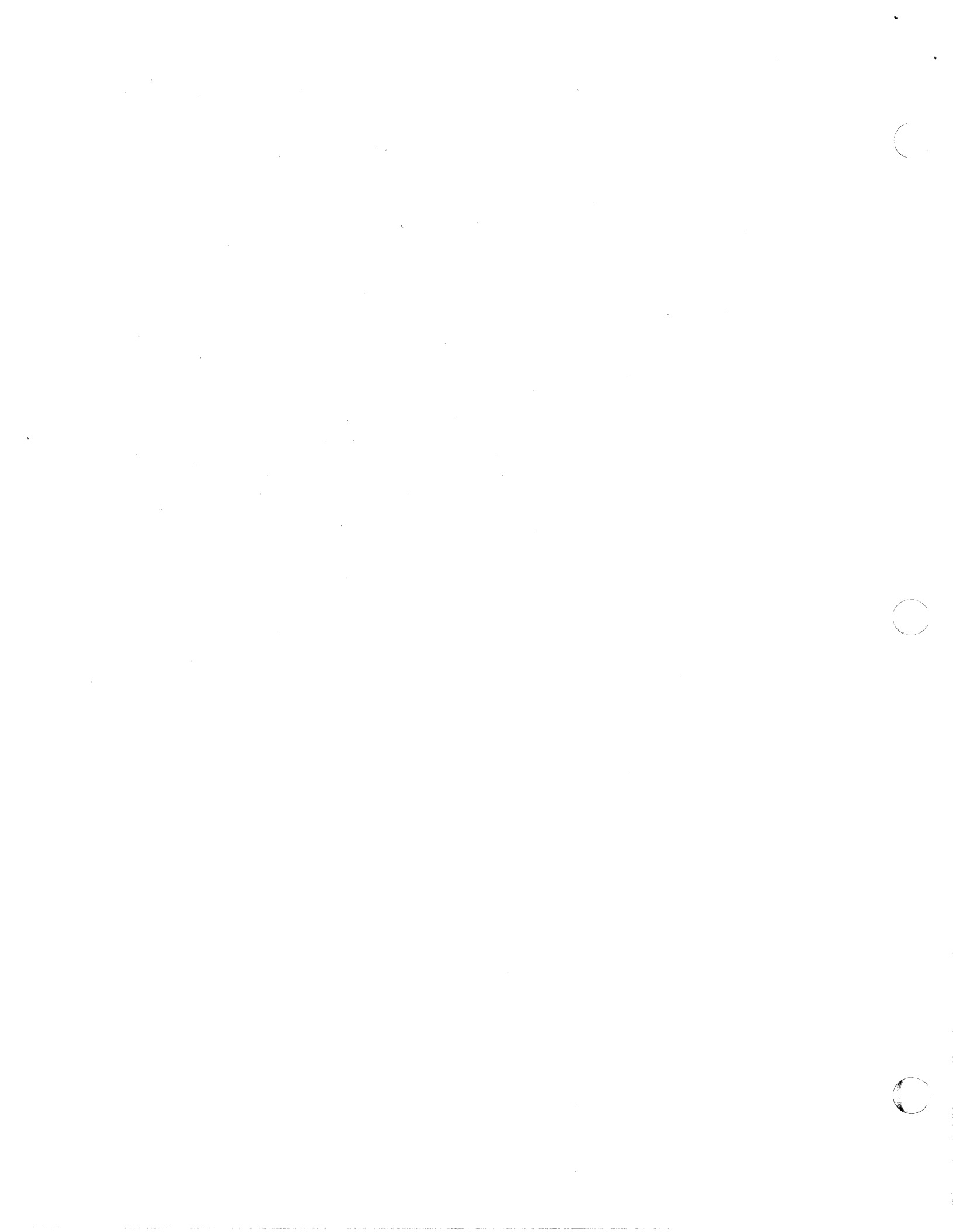
**Figure A-3. HSDC Board Layout**

Table A-1. HSDC R17 Switch Settings

Channel	Switch						Channel	Switch						
	1	2	3	4	5	6		1	2	3	4	5	6	
0400						X	8000	X						
0800					X		8400	X						X
0C00					X	X	8800	X				X	X	
1000				X			8C00	X				X	X	
1400				X		X	9000	X		X				
1800				X	X		9400	X		X				X
1C00				X	X	X	9800	X		X	X			
2000			X				9C00	X		X	X	X		
2400			X			X	A000	X		X				
2800			X		X		A400	X	X					X
2C00			X		X	X	A800	X	X		X			
3000			X	X			AC00	X	X		X	X		
3400			X	X		X	B000	X	X	X				
3800			X	X	X		B400	X	X	X				X
3C00			X	X	X	X	B800	X	X	X	X			
4000		X					BC00	X		X	X	X	X	
4400		X				X	C000	X	X					
4800		X			X		C400	X	X					X
4C00		X			X	X	C800	X	X			X		
5000		X		X			CC00	X	X			X	X	
5400		X		X		X	D000	X	X		X			
5800		X		X	X		D400	X	X		X			X
5C00		X		X	X	X	D800	X	X		X	X		
6000		X	X				DC00	X	X		X	X	X	
6400		X	X			X	E000	X	X	X				
6800		X	X		X		E400	X	X	X				X
6C00		X	X		X	X	E800	X	X	X		X		
7000		X	X	X			EC00	X	X	X		X	X	
7400		X	X	X		X	F000	X	X	X	X			
7800		X	X	X	X		F400	X	X	X	X			X
7C00	X	X	X	X	X	X	F800	X	X	X	X	X		
							FC00	X	X	X	X	X	X	

NOTE

An X denotes a switch in the ON position.



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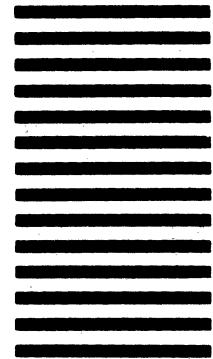
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