

DSS-3 Maintenance

HMM-389-0
SIO Architecture
Last Modified: May 1997

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Record of Revision

May 1997

Original printing.

Product Overview

The DSS-3 disk subsystem provides up to 99.2 Gbytes of data storage in a compact, rack-mounted peripheral enclosure. The enclosure contains up to four 5.25-in. hard disk drives with two separate, common power supplies. The disk drives and the power supplies may be replaced during normal system operation, which provides a high degree of equipment resiliency.

NOTE: In this document, the term “CRAY J90™ series system” refers to any J90 system configuration except a CRAY J90se™ series system.

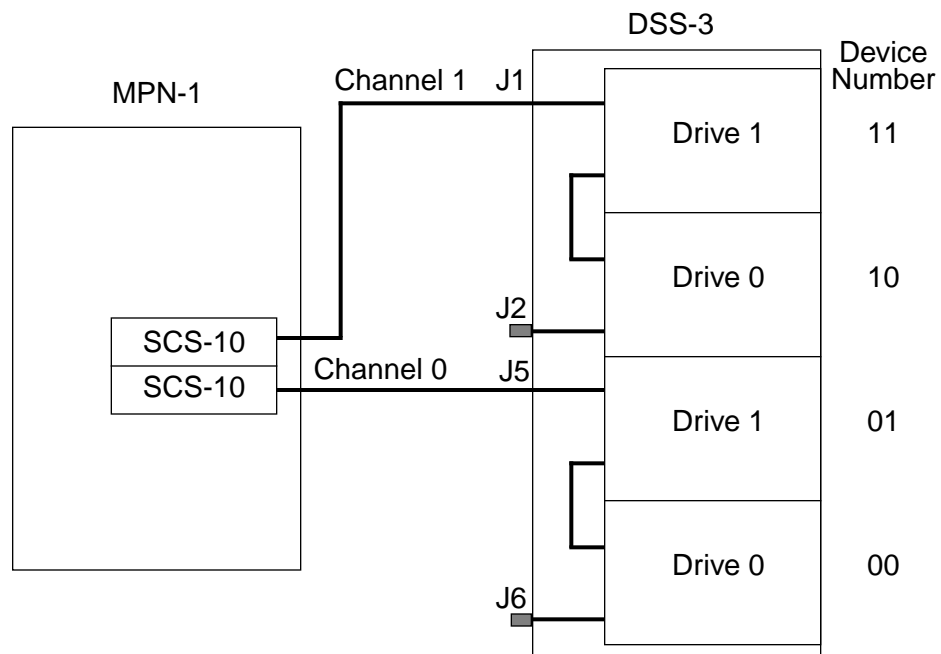
Functional Description

[Figure 1](#) provides a functional block diagram of the DSS-3. An I/O cable connects each DSS-3 disk drive to an I/O channel connector, in either a CRAY J90 series system or a multipurpose node (MPN-1) interface on a Cray Research GigaRing™ I/O channel. The interface protocol is the small computer system interface (SCSI-2) fast/wide differential standard protocol.

An SI-3 controller provides the interface from the DSS-3 to a CRAY J90 series system; an SCS-10 controller in the MPN-1 provides the interface to a GigaRing channel in a CRAY J90se series system.

As shown in [Figure 1](#), drives may be daisy-chained for greater channel capacity (although this limits individual channel accessibility). A terminator must be plugged onto the back panel of the DSS-3 enclosure to terminate each channel.

Figure 1. DSS-3 Block Diagram



NOTE: Each SCSI channel requires termination; see J2 and J6.

Physical Description

The DSS-3 is 5 standard units (SU) high, which is 8.75 in. or 22.2 cm (1 SU equals 1.75 in. or 4.44 cm). This enclosure contains disk drives in removable canisters, redundant power supplies, and connectors for data cables and subsystem status cables.

DSS-3 Enclosure

The DSS-3 enclosure can contain up to four field replaceable SCSI-2 fast/wide differential disk drives. The enclosure also contains two power supplies, two cooling fans, internal SCSI cables, a warning and control system (WACS) interface printed circuit board (PCB), and a backplane PCB; all are field replaceable units (FRUs).

[Figure 2](#) shows the DSS-3 front panel open for access to the disk drives. The front panel has two latches that release (when unlocked) to allow the front panel to open and swing down. ([Figure 7](#) shows the rear panel of the DSS-3.)

Figure 2. Disk Drive Locations

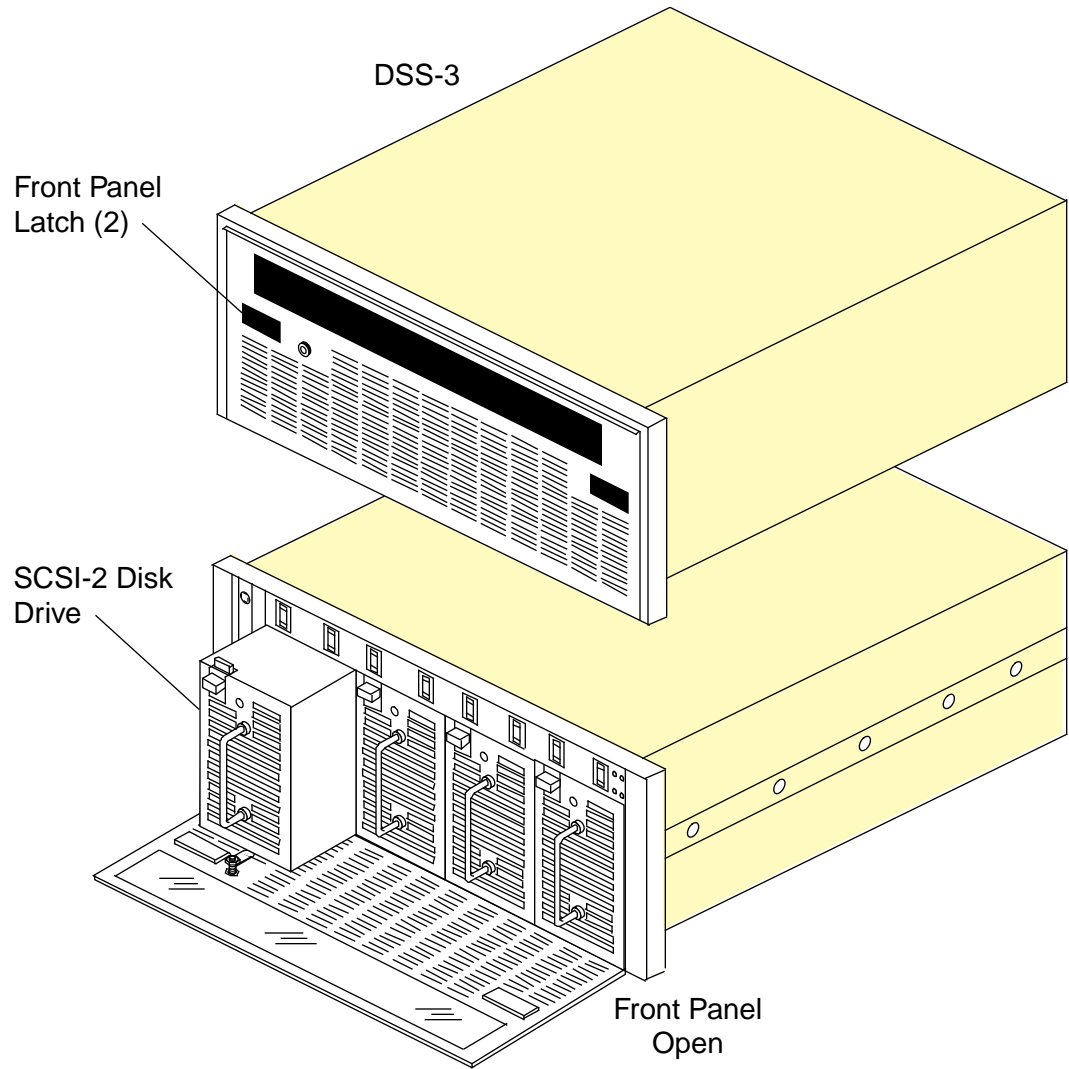
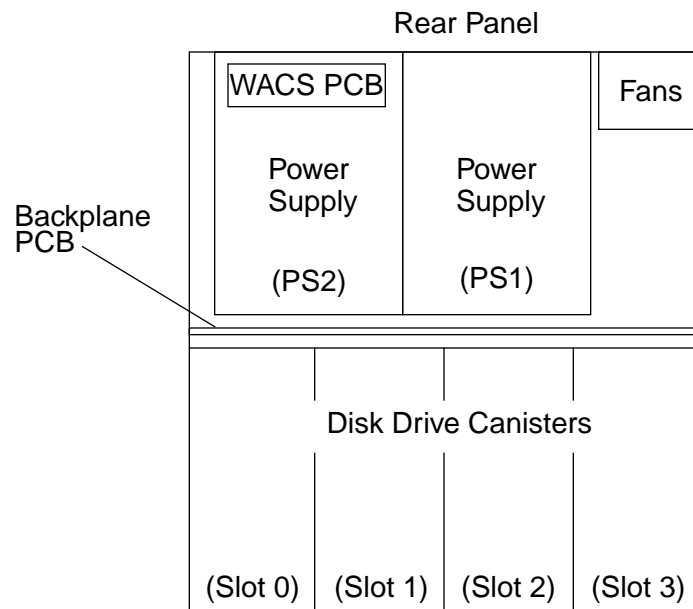


Figure 3 shows a top-down view of the contents of the DSS-3 enclosure with the top panel removed. The backplane PCB distributes DC power to all drives and to the two fans.

The WACS PCB in the DSS-3 provides power supply and fan status signals to the warning and control system (WACS) in the PC-10 cabinet. During power-up, the backplane sequences power to the drives to minimize surges in the power supply currents.

Figure 3. DSS-3 Layout

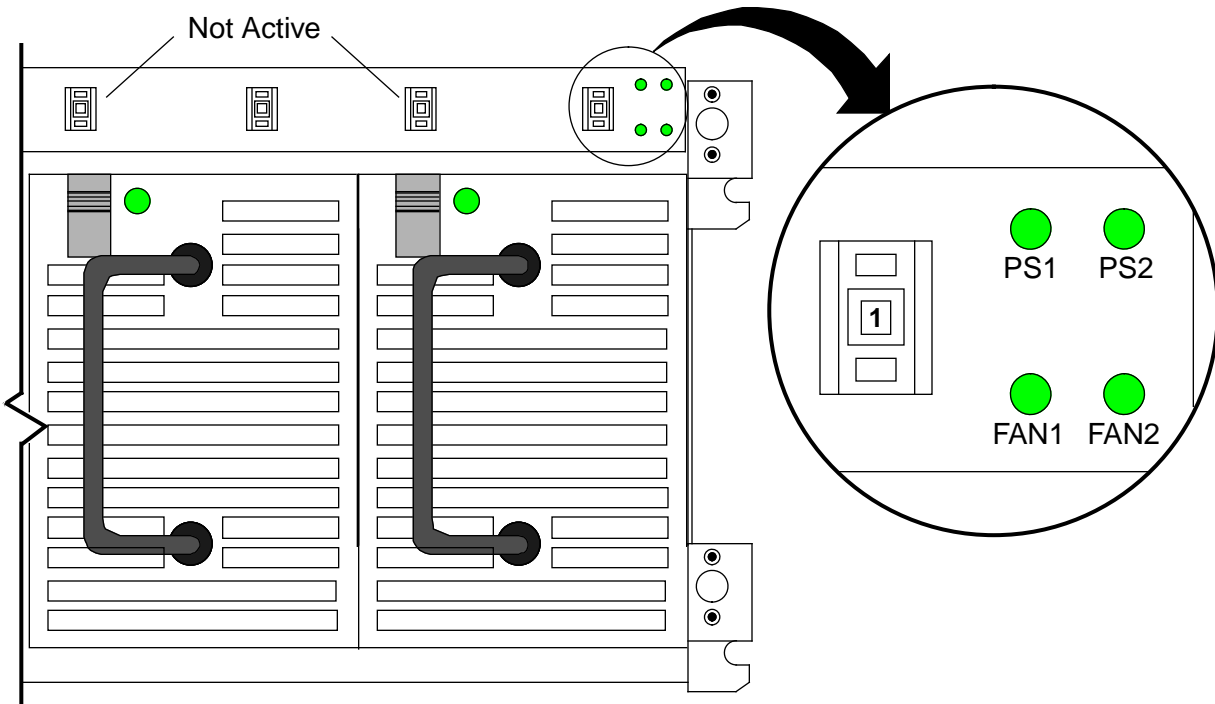


Enclosure Switches and Indicators

A device ID switch above each drive identifies the drive with a unique device number that ranges from 0 through 15. The switch displays the selected number, as shown in Figure 4.

NOTE: Of the two ID switches above each disk drive, the one to the right sets the device address. The one to the left sets the address for the device slot that does not have a disk drive plugged into it. (The backplane PCB contains 8 connectors for half-height disk drives; the DSS-3 holds only 4 full-height drives.)

Figure 4. Enclosure LEDs and Drive ID Switch



Two bicolor LEDs (PS1 and PS2), on the upper-right corner of the front panel, display the status of the two power supplies. Each indicator is green when its power supply is operating properly and red when a power supply fault occurs.

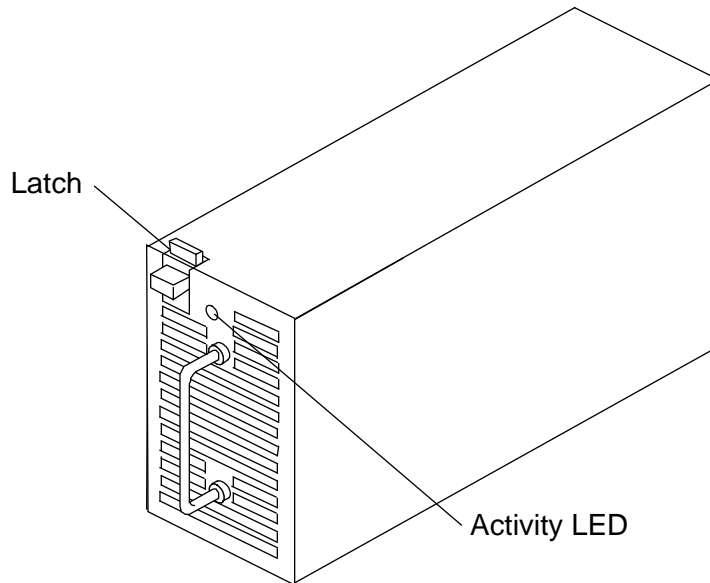
Two bicolor LEDs (FAN1 and FAN2), which are located below the power supply status indicators, display the status of the two cooling fans on the rear panel of the enclosure. Each indicator is green when its fan is operating properly and red when a fan fault occurs.

Disk Drive (DD-501)

Each DSS-3 disk drive (designated DD-501) is mounted in a canister that plugs into the enclosure. [Figure 5](#) shows the front panel of the disk drive in its canister. DSS-3 drive storage capacity is 24.8 Gbytes.

DD-6S disk drives (DDS-30) may be migrated from a CRAY J90 series system to the DSS-3 enclosure as described in the *DSS-3 Hardware Upgrade and Migration Procedure* (currently not a released document).

Figure 5. DSS-3 Disk Drive Front Panel



CAUTION

The disk drive is susceptible to mechanical damage if improperly handled. Observe handling and packing precautions provided with the DSS-3 and replacement disk drives.

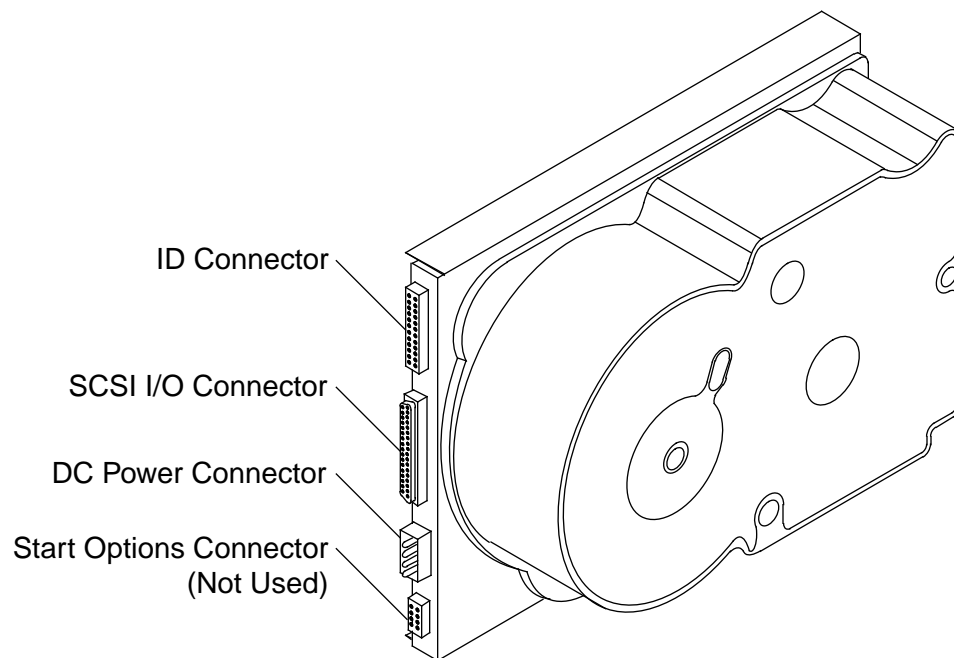
The front panel of the drive includes a swing-out, bail-style handle, a thumb-release latch, and a green activity status LED. The latch snaps into a slot in the enclosure and holds the drive securely. When you install the drive, be sure to push the drive firmly into the enclosure to seat the connector.

You must release the latch before you can pull the drive from the enclosure. During operation, the illuminated activity LED indicates that the drive is in the process of reading or writing data.

NOTE: You will lose data if you power down or unplug the drive while the activity LED is illuminated.

As shown in [Figure 6](#), the drive has a DC power connector, a drive ID connector, and a SCSI I/O connector on the rear panel. Cables within the disk drive canister plug onto these connectors and carry data, control, and power between the drive and a 96-pin connector on the rear panel of the drive canister. This arrangement enables automatic signal, power, and control connections during insertion and removal of the drive (in its canister) from the front of the DSS-3 enclosure. The “Installation” section, which begins on page 15, lists connector pinouts of the SCSI I/O connector, the DC power connector, and the ID connector.

Figure 6. DSS-3 Disk Drive (Removed from Canister)



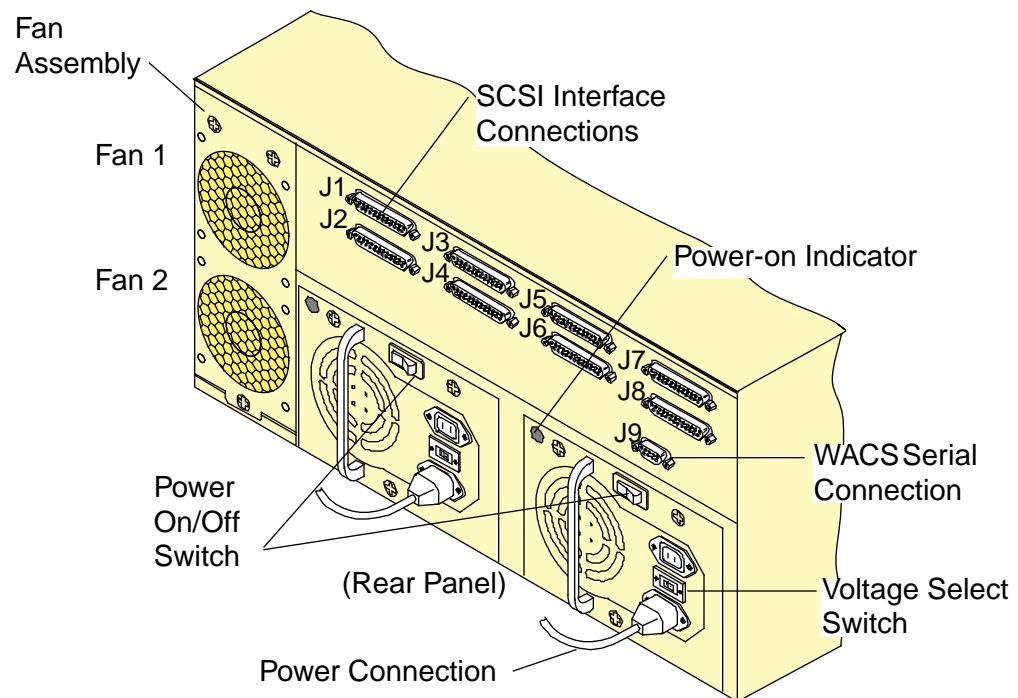
Air that is drawn in through the enclosure front panel cools the drive. Power supply fans and enclosure fans create this air movement.

NOTE: Proper drive cooling requires adequate airflow. Never operate the DSS-3 without the enclosure top panel in place. Always cover any open drive slots in the enclosure front panel to avoid loss of airflow through operating disk drive canisters. Never block airflow through the front panels of either the enclosure or the disk drives.

Power Supply

The two DSS-3 power supplies, shown in [Figure 7](#), are connected in parallel; each is capable of providing power for all drives within the enclosure. This redundant (N+1) configuration enables the disk drive subsystem to continue operating if one of its two power supplies fails and needs to be replaced.

Figure 7. DSS-3 Power Supplies



Each power supply has a power on/off switch that is accessible from the rear of the enclosure. A green power-on indicator, which is part of the DSS-3 enclosure, indicates a functioning power supply.

NOTE: Each power supply may contain a voltage select switch (labeled 115/230) that is located just above the power cable connector. Make sure this switch is set for the proper line voltage (230) before you turn on the power supply.

Each power supply is *hot swappable*, which means that it may be turned off, unplugged, and replaced without affecting normal system operation. In order to hot swap a power supply, the remaining power supply must be functioning properly. In addition, the rear panel must not be open for more than a few seconds because of the constant airflow that is required for adequate drive cooling.

AC power flows to the power supplies through a Y-configuration cable, which enables either power supply to operate while the power cable is removed from the other. The upper, power-out daisy chain connector should not be used in the DSS-3.

Fan Assembly

The fan assembly is hot swappable. It may be unplugged and replaced without affecting normal system operation. The rear panel must not be open for more than a few seconds because of the constant airflow that is required for adequate drive cooling.

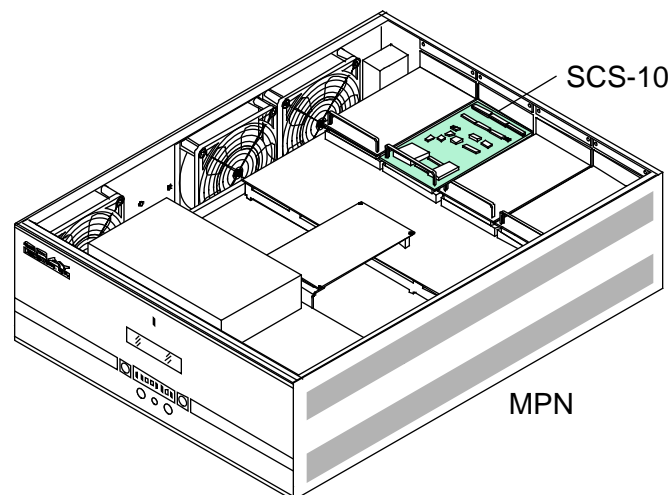
Controllers

The DSS-3 may be interfaced to either a computer system that uses a GigaRing channel for internal system communication or to a CRAY J90 series system. Each type of interface requires a different peripheral controller.

MPN Controller (SCS-10)

The peripheral controller that interfaces the DSS-3 to the GigaRing channel is an SBus-based controller (the SCS-10) that is located in the MPN as shown in [Figure 8](#). The SCS-10 plugs into one of eight SBus slot connectors on the SBus peripheral interface (SPI) printed circuit board in the MPN. The SCS-10 provides a standard SCSI-2 protocol for transfer of 16-bit differential data to the disk drives. Each SCS-10 controller has a single channel that can provide an interface connection for up to 15 SCSI-2 devices. However, for optimum performance, each channel connects to only two drives (0 and 1) as shown in [Figure 1](#).

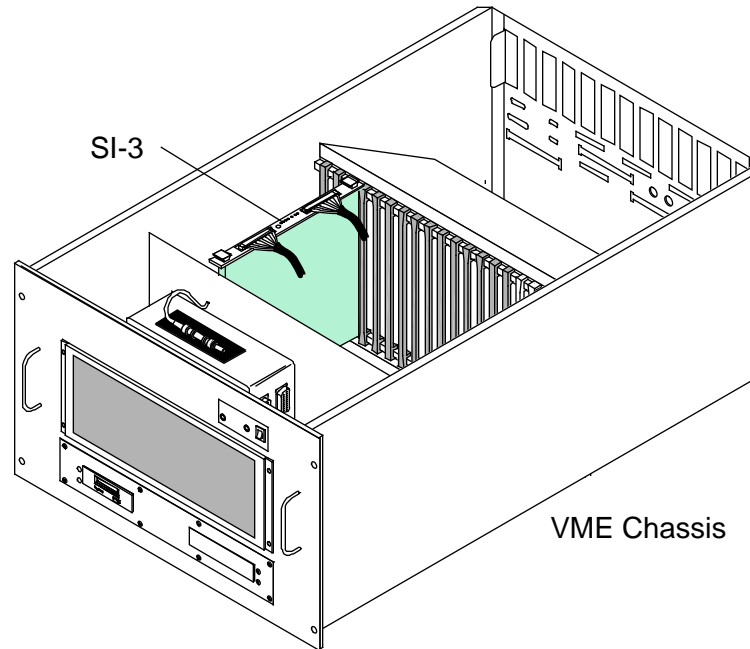
Figure 8. SCS-10 Controller in the MPN



CRAY J916™ and CRAY J932™ Controller (SI-3)

A VME-based peripheral controller (the SI-3) interfaces the DSS-3 to a CRAY J90 series system. The SI-3 is located in the VME chassis as shown in [Figure 9](#). Each SI-3 supports two SCSI-2 channels. Each of these channels can provide an interface connection for up to seven SCSI-2 devices. However, for optimum performance, each channel connects to only two drives in the DSS-3.

Figure 9. SI-3 Controller in the VME Chassis



Equipment Specifications

Table 1 contains a list of physical, functional, and performance specifications for the disk subsystem and for each drive in the subsystem.

Table 1. DSS-3 Equipment Specifications

Parameter	Value
DSS-3 Specifications (installed in a PC-10 cabinet)	
Height	8.75 in. (22.2 cm) (5 SU)
Width	19.0 in. (48.3 cm)
Depth	27.5 in. (69.8 cm)
Weight	95 lb (43.2 kg) maximum
Power required	115 Vac, 1.0 Amp 230 Vac, 0.5 Amp 47 – 63 Hz
Cooling required	440 Btu/hr maximum
DD-501 Drive Specifications (installed in a DSS-3 enclosure)	
Capacity (formatted in 4096-byte sections)	24.6 Gbytes
Logical block size (sector size)	4096 bytes
Logical blocks	6,019,481
Read/write heads	28
Data cylinders	6,876
Tracks per surface	6,876
Bytes per surface	1,060 Mbytes (unformatted)
Sectors per track	24 - 36
Bytes per track	112,477 (minimum) 162,897 (maximum) 7 zones
Rotational speed	5,400 rpm
Rotational latency	5.56 ms (average)
Seek time (average)	13.0 ms (read) 14.0 ms (write)
Track-to-track seek time	1.1 ms (read) 2.1 ms (write)
Full-stroke seek time	28.0 ms
Sustained transfer rate	10.7 - 15.5 Mbytes/s
Data buffer (cache-usable)	2,048 Kbytes (multi-segmented)

Installation

The DSS-3, like any disk product, is sensitive to condensed moisture. Therefore, if the shipping crate arrives after extended exposure to cold conditions, allow it to stand at room temperature before you open it. Use the temperatures and delay periods that [Table 2](#) lists as an approximate guideline for equipment climatization. Avoid ambient temperature changes of greater than 10 °C (18 °F) per hour and relative humidity changes of greater than 10% per hour during operation.

Table 2. Shipping Climatization Period

Recent Shipping/ Storage Temperature	Delay Period
-5 °F (-20 °C)	10 hr
15 °F (-10 °C)	6 hr
25 °F (-5 °C)	4 hr
50 °F (10 °C)	2 hr
70 °F (20 °C)	1 hr

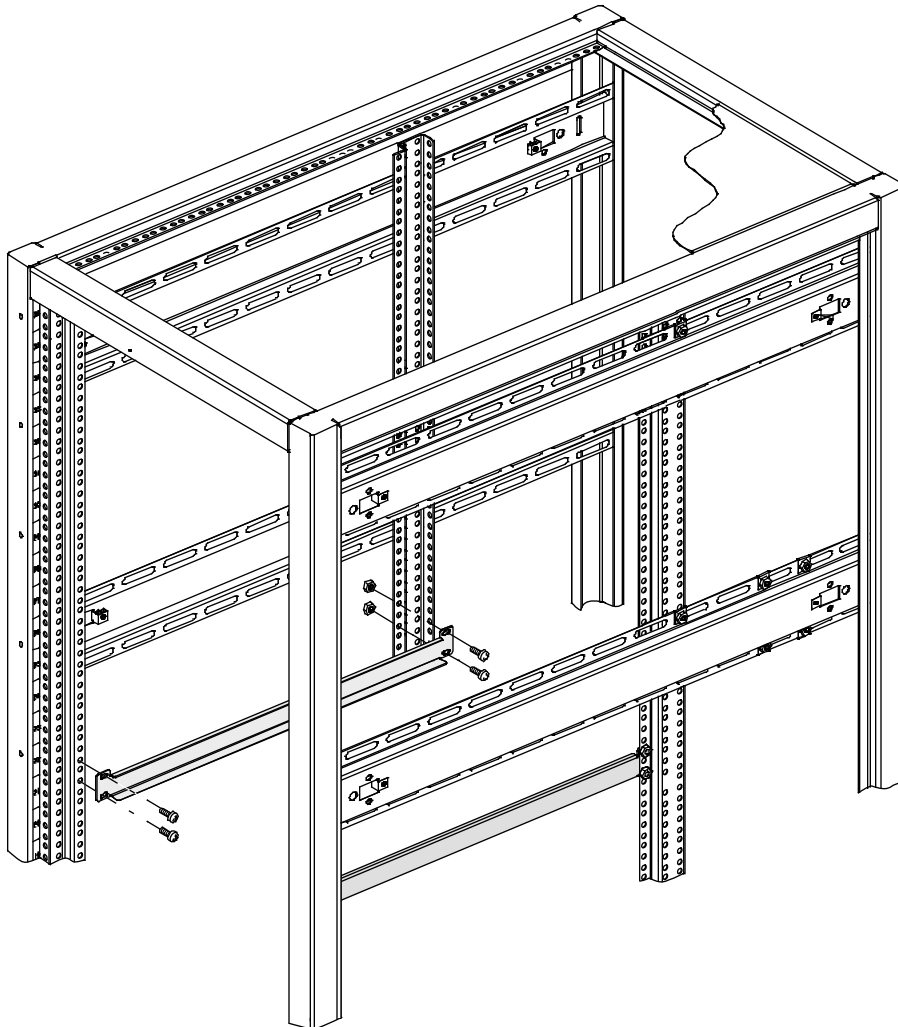
You need dedicated system time to add or replace a DSS-3 subsystem in a computer system that uses a GigaRing channel or in a CRAY J90 series system. Installation requires that you add rack-mounting hardware to hold the enclosure, connect the I/O and power cables, and power up the subsystem. Refer to the *DSS-3 Hardware Upgrade and Migration Procedure* (currently not a released document) for installation details.

1. After you halt all processes, power down the PC-10 cabinet.
2. Select the location for the DSS-3 enclosure and install the two angle brackets as shown in [Figure 10](#). Make sure the location aligns with the proper “SU” line on the rack to ensure that the hole patterns match.
3. Carefully lift the DSS-3 enclosure onto the angle brackets and secure it to the front of the PC-10 equipment rack by using the bolts that are supplied with the brackets.
4. Install all I/O cables from the computer system by routing them up through the PC-10 cabling space and connecting them to the DSS-3 I/O connectors.
5. Install the WACS cable between the DSS-3 WACS connector and the PC-10 WACS subrack.

6. Verify that all disk drives are properly plugged and latched into the DSS-3 enclosure.
7. Install the power cable between the DSS-3 power supplies and the PC-10 power distribution strip.
8. Power up the subsystem by moving the power switch on the power distribution strip to the ON position.
9. Reconfigure the computer system to add the DSS-3 subsystem to the system configuration.
10. Run online tests to verify proper operation of the DSS-3 subsystem.

The procedure to remove a DSS-3 subsystem begins on [page 31](#).

Figure 10. Angle Bracket Installation



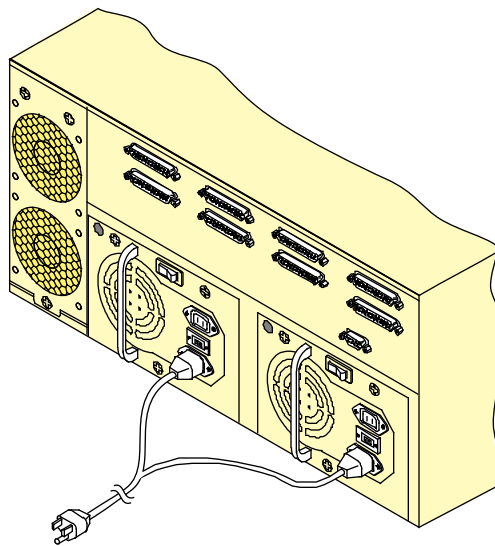
Cabling Guidelines

Power Cable

A Y-cable (refer to [Figure 11](#)) connects both power supplies to one power plug, which plugs into one of the outlets of the PC-10 power distribution strip.

NOTE: Do not use the second, daisy-chain power connector on either power supply to provide power to any other equipment; you cannot hot-swap the power supplies if you do so.

Figure 11. DSS-3 Power Cable



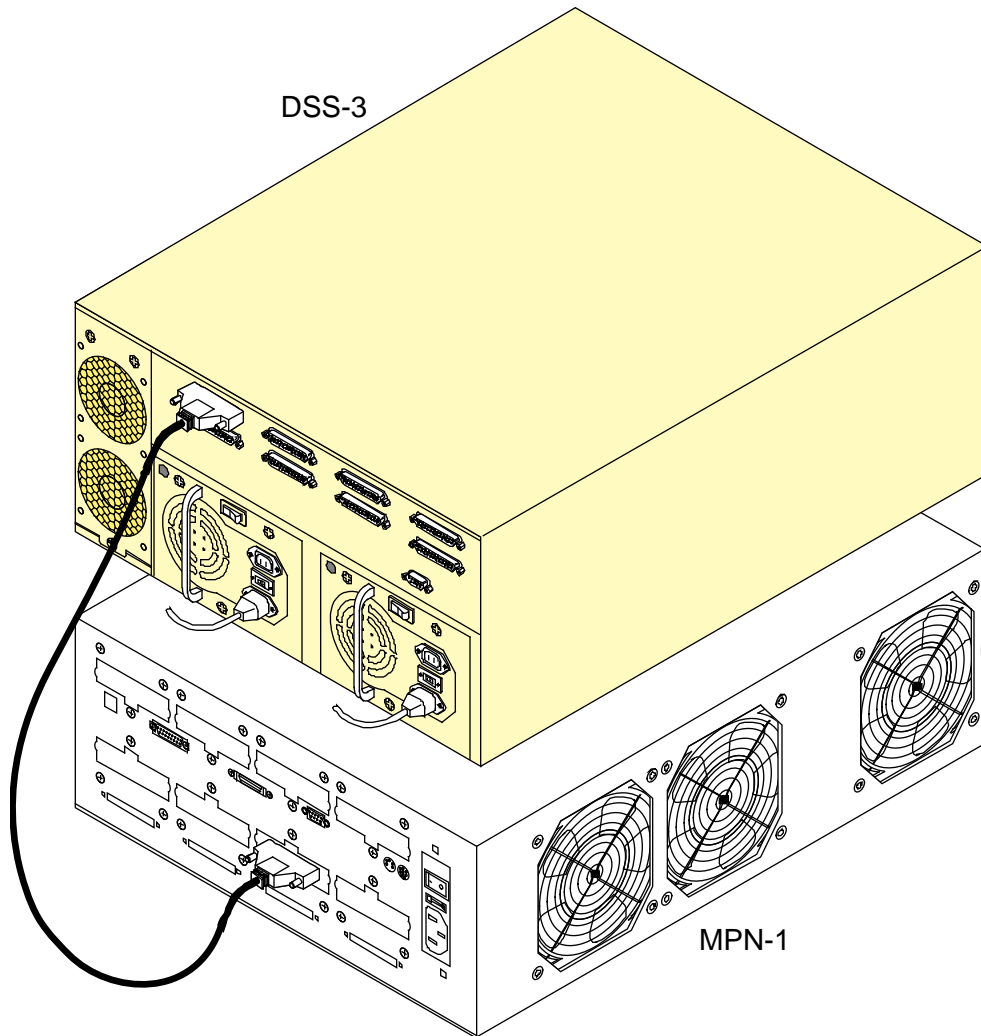
DSS-3 I/O Cable

The I/O cable between the computer system and the DSS-3 rear panel I/O (SCSI interface) connector (refer to [Figure 12](#)) has a micro-D style, 68-pin male connector. The connectors on the rear panel of the DSS-3 are labeled J1 through J8. [Table 3](#) describes the signals that the connector carries.

Table 3. DSS-3 SCSI-2 Connector Pinout

Pin No.	Signal Name	Pin No.	Signal Name
1	+DB12	35	-DB12
2	+DB13	36	-DB13
3	+DB14	37	-DB14
4	+DB15	38	-DB15
5	+DBP1	39	-DBP1
6	Ground	40	Ground
7	+DB0	41	-DB0
8	+DB1	42	-DB1
9	+DB2	43	-DB2
10	+DB3	44	-DB3
11	+DB4	45	-DB4
12	+DB5	46	-DB5
13	+DB6	47	-DB6
14	+DB7	48	-DB7
15	+DBP	49	-DBP
16	DIFFSENS	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	(Reserved)	53	(Reserved)
20	+ATN	54	-ATN
21	Ground	55	Ground
22	+BSY	56	-BSY
23	+ACK	57	-ACK
24	+RST	58	-RST
25	+MSG	59	-MSG
26	+SEL	60	-SEL
27	+C/D	61	-C/D
28	+REQ	62	-REQ
29	+I/O	63	-I/O
30	Ground	64	Ground
31	+DB8	65	-DB8
32	+DB9	66	-DB9
33	+DB10	67	-DB10
34	+DB11	68	-DB11

Figure 12. DSS-3 I/O Cable



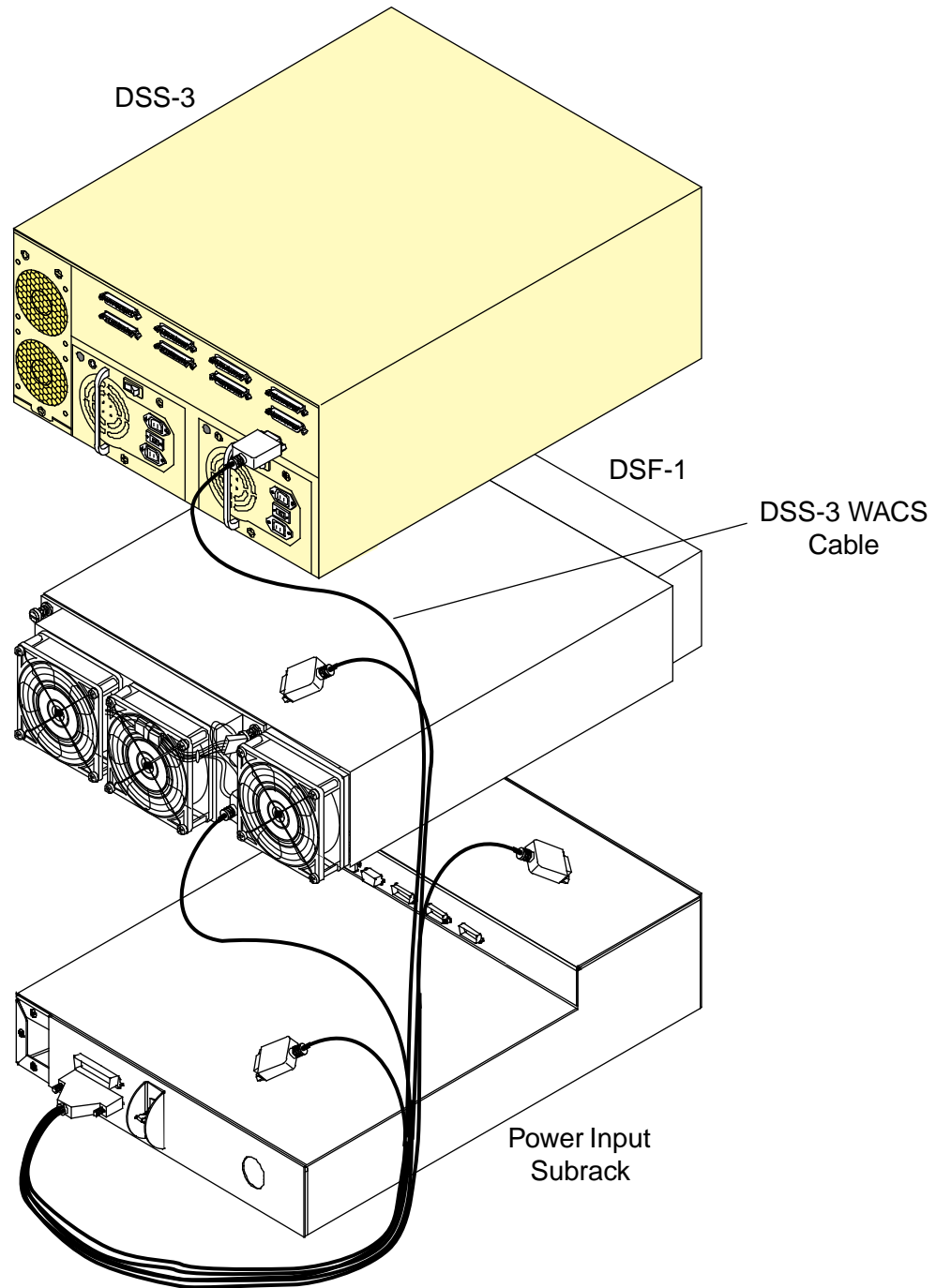
DSS-3 WACS Cable

The DSS-3 WACS cable, as shown in [Figure 13](#) between the DSS-3 rear panel and the power input subrack, carries the WACS signals that [Table 4](#) lists.

Table 4. WACS Connector Pinout

Pin No.	Signal Name	Pin No.	Signal Name
1	PS1 Good	6	Fan Return (Ground)
2	PS1 Return (Ground)	7	Install
3	PS2 Good	8	Install Return (Ground)
4	PS2 Return (Ground)	9	+5 Vdc (Power from WACS)
5	Fan Fault		

Figure 13. WACS Cable Connection



Internal I/O Cable

Each pair of disk drives has an I/O cable, as shown in [Figure 19](#) (on [page 34](#)), that carries the signals from the backplane PCB to the rear panel. The rear panel connector pinout is listed in [Table 3](#).

Disk Drive Power Connector

The 4-pin power connector on the rear panel of each disk drive, inside the drive canister, provides connections for the voltages that are listed in [Table 5](#).

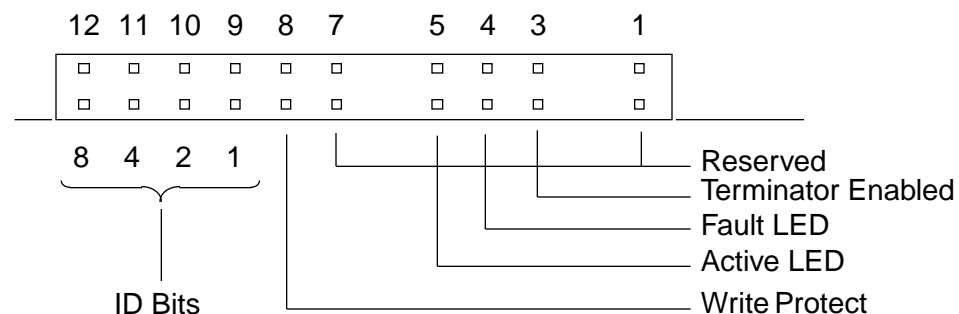
Table 5. Disk Drive Power Connector Pinout

Pin No.	Voltage
1 (nearest to I/O connector)	+12 Vdc
2	+12 Vdc return
3	+5 Vdc return
4	+5 Vdc

Disk Drive ID Connector

A 24-pin header on the rear of the disk drive (inside the drive canister, as shown in [Figure 6](#)) carries identification (ID) address bits from the front-panel device ID switch. It also carries the drive active signal to the drive front-panel green LED. In positions 3, 4, and 5 of the header, the pin closest to the drive PC board is the LED cathode. All other header pins (positions 1, 7, and 8) are unused.

Figure 14. ID Connector Pinouts



Configuration Guidelines

Each pair of drives operates independently. The entire DSS-3 subsystem operates as separate devices that connect to independent channels, as shown in [Figure 1](#). Consult the *Scalable I/O Product Configuration Guide*, EDS-1002, for further information about configurations.

Flaw Management

Each disk drive contains its own SCSI controller, which automatically performs flaw management for errors that have recoverable error-correction codes (ECCs). Errors that have unrecoverable ECCs can be reallocated using the `xdfs` command. Refer to the *SIO Concurrent Diagnostic Reference* (currently not a released document) for details on using `xdfs` to reallocate disk space.

Troubleshooting

SCSI Disk Error Information

You can obtain SCSI disk error information about the MPN by using the `errprt` command and the MPN command `sserrprt`. Refer to the *SIO Troubleshooting Guide*, publication HMM-204-0, for details on using `errprt` and `sserrprt`.

Diagnostic Descriptions

Refer to the *SIO Boot Diagnostics and Tests* document, publication HDM-301-PR1, for descriptions of tests that you can use to boot the multipurpose node.

Troubleshooting Procedures

Refer to the *SIO Troubleshooting Guide*, publication HMM-204-0, which contains troubleshooting procedures for diagnosing faults in the MPN and in the SCSI-2 disk drives that connect to it.

Refer to the *CRAY J90 Series System Troubleshooting* document, publication HMM-114-B, for troubleshooting information about diagnosing faults in the SI-3 interface and in the SCSI-2 disk drives that connect to it.

Field Replacement Procedures (FRPs)

The following pages contain procedures for all field replaceable units (FRUs) in the DSS-3.

NOTE: The weight of the DD-501 disk drive is approximately 11 lb (5.0 kg). Use care in removing disk drives from the enclosure or from the shipping container.

CAUTION

Several FRUs are hot swappable and may be replaced without powering down the DSS-3. These FRUs are the disk drives (FRP 1), the power supplies (FRP 2), and the enclosure fan assembly (FRP 3). Removing any of these assemblies with power up will cause loss of cooling to the disk drives. You must cover the exposed opening in the enclosure to keep air moving through the operating disk drives, and you must perform the replacement quickly to regain full air movement through the disk drives.

FRP 1: Disk Drive Replacement

Part Number

One of the following parts:

- 13336000 (disk drive assembly, DD-501)
- 13331400 (filler panel, disk drive)

Tools Required

- Front panel key (as required)

Disk Drive Removal

CAUTION

The disk drive is susceptible to mechanical damage if improperly handled. Observe handling and packing precautions provided with the DSS-3 and replacement disk drives.

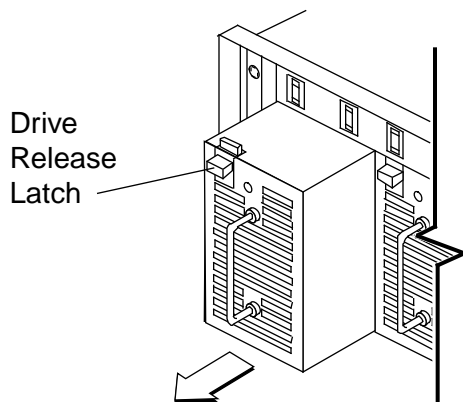
CAUTION

Removing this assembly with power up will cause loss of cooling to the disk drives. You must cover the exposed opening in the enclosure to keep air moving through the operating disk drives, and you must perform the replacement quickly to regain full air movement through the disk drives.

1. If the front panel is locked, use the key to unlock the latches.
2. With one hand on each side of the panel, press the front panel latches toward each other. Release the latches as the panel swings down.

3. Ensure that the selected drive is not active by observing that the green drive activity LED is not illuminated.
4. Rotate the handle of the selected drive outward and grasp it.
5. Press down on the drive release latch that is located above the handle, as shown in [Figure 15](#).

Figure 15. Disk Drive Removal



6. Gently pull the drive out about an inch to disconnect it from its connector.

NOTE: After pulling the drive clear of its connector, let the drive rest in the enclosure for at least 30 seconds to permit the spinning media to stop. If you move the drive too quickly or abruptly, a head crash will cause media damage.

7. If the drive will not be replaced immediately, install a filler panel to cover the front panel opening.

Disk Drive Installation

1. Slide the disk drive into the enclosure on the rails that align its connector with the mating enclosure connector.
2. Push the drive firmly into the enclosure to seat the connector. The drive release latch must snap into a slot to hold the drive securely.
3. Rotate the drive handle back to its closed position.
4. Rotate the front panel up and push it closed until the front panel latches snap into place. To secure the disk drive subsystem, use the key to lock the front panel latches.

FRP 2: Power Supply Replacement

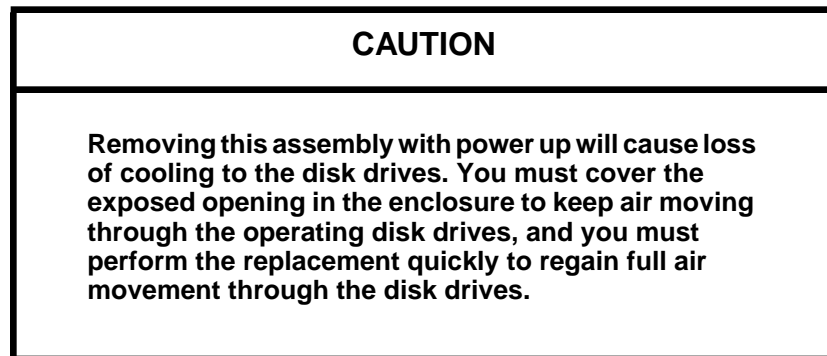
Part Number

- 15248100 (power supply, 300 W)

Tools Required

- #2 (medium) Phillips screwdriver

Power Supply Removal

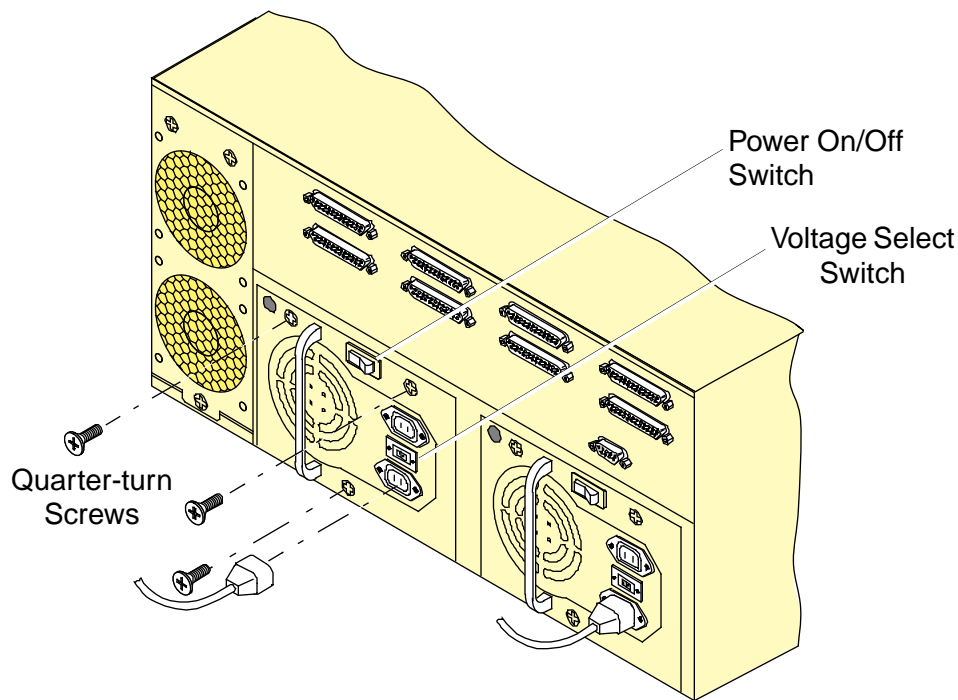


NOTE: The DSS-3 requires at least one functional power supply to operate. Do not power down the only operating power supply unless all drives are idle.

1. Move the power supply switch (as shown in [Figure 16](#)) to the off (0) position.
2. Unplug the power cable from the power supply.
3. Turn (counterclockwise) each of the 3 quarter-turn, flat-head, captive screws on the rear panel of the power supply.
4. Grasp and pull the power supply handle and slide the power supply out of the enclosure.

5. If the power supply will not be replaced immediately, cover the rear panel opening.

Figure 16. Power Supply Removal



Power Supply Installation

1. Make sure that the power supply connectors are clean and free of defects and that the power supply switch is in the off (0) position.
2. Align the power supply with the enclosure and slide the power supply into the enclosure. Push the handle firmly to seat the power supply in its connector within the enclosure.
3. Turn (clockwise) each of the 3 quarter-turn, flat-head, captive screws on the rear panel of the power supply.

NOTE: Before you attach the power cable, make sure that the voltage select switch (above the power cable connector) is set to the proper voltage (230).is

4. Plug the power cable into the connector on the rear panel of the power supply.
5. Move the power supply switch to the on (1) position.

FRP 3: Enclosure Fan Replacement

Part Number

- 13341300 (fan assembly, DSS-3)

Tools Required

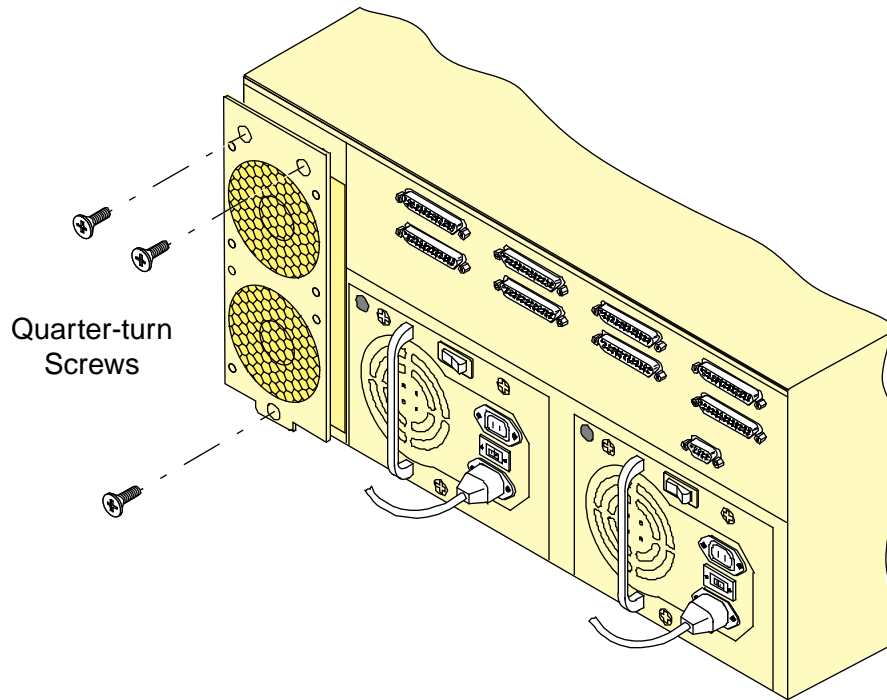
- #2 (medium) Phillips screwdriver

Enclosure Fan Removal

CAUTION
<p>Removing this assembly with power up will cause loss of cooling to the disk drives. You must cover the exposed opening in the enclosure to keep air moving through the operating disk drives, and you must perform the replacement with no delay to regain full air movement through the disk drives.</p>

1. Turn (counterclockwise) each of the 3 quarter-turn, flat-head, captive screws on the rear panel of the fan assembly.
2. Unplug the fan assembly from the enclosure.
3. If the DSS-3 system is operating, replace the fan assembly immediately to avoid causing an overtemperature condition in the enclosure.

Figure 17. Fan Removal



Enclosure Fan Installation

1. Place the fan into the enclosure as shown in [Figure 17](#) and ensure that its connector plugs into the connector in the enclosure.
2. Secure the fan assembly by turning (clockwise) each of the 3 quarter-turn, flat-head, captive quarter-turn screws.

FRP 4: DSS-3 Enclosure Removal

To replace the following FRUs, you must remove the DSS-3 enclosure from the PC-10 cabinet:

- Internal SCSI cable
- WACS PCB
- Backplane PCB
- SCSI ID switch PCB

Part Number

None

Tools Required

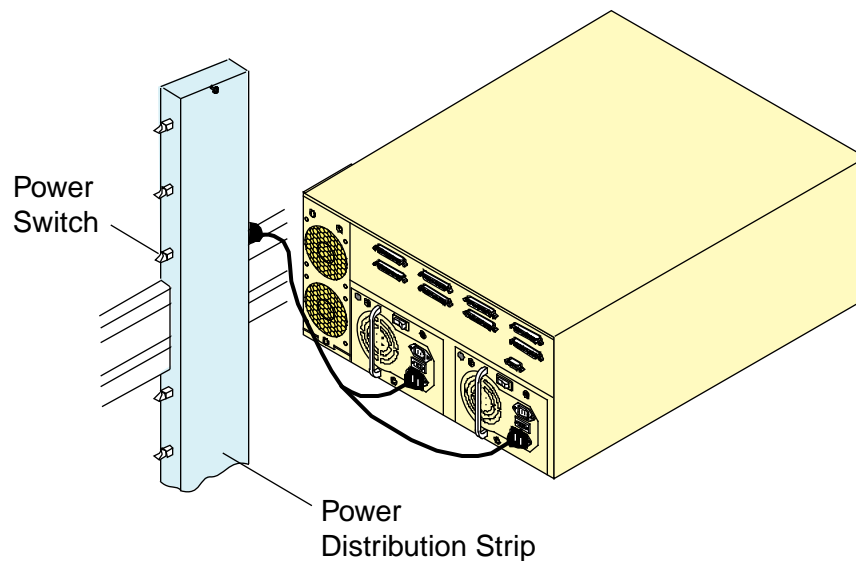
- #2 (medium) Phillips screwdriver
- Hex (Allen) wrench

Procedure

NOTE: This procedure requires two persons because of the weight of the subsystem. You may perform the procedure alone if you remove all disk drives and power supplies before you lift the enclosure.

You must schedule dedicated system time to power down the DSS-3 and remove it from the cabinet.

1. Stop all disk activity on the SCSI bus.
2. Use the `umount` command to unmount all DSS-3 disk drives.
3. Spin down all disks in the DSS-3.
4. Open the rear door of the PC-10 cabinet.
5. Locate the power switch on the PC-10 power distribution strip that controls power to the subsystem (refer to [Figure 18](#)). Move the switch to the OFF position to power down the subsystem.

Figure 18. PC-10 Power Distribution Strip

6. Disconnect the power cable from both DSS-3 power supplies and disconnect the status cable that goes to the WACS.
7. Disconnect the I/O cables from the DSS-3 enclosure connectors. Make sure that each cable is clearly identified for future reconnection.
8. To decrease the weight of the enclosure, you may unplug both power supplies and all drives before you remove the DSS-3 enclosure. Follow the procedure on [page 27](#) to remove the power supplies.
9. Mark the location of all drives so that you can return them to the same slots in the replacement enclosure. Follow the procedure on [page 25](#) to remove all drives.
10. Remove the 4 bolts that hold the DSS-3 enclosure to the front vertical mounting rails in the PC-10 cabinet.
11. Carefully slide the DSS-3 enclosure out to near the end of its brackets; then lift the enclosure out of the PC-10 cabinet.

After replacing a FRU, install the DSS-3 subsystem in the PC-10 cabinet by reversing the previous Steps 1 through 11.

FRP 5: Internal SCSI Cable Replacement

Part Number

- 15248200 (cable kit)

Tools Required

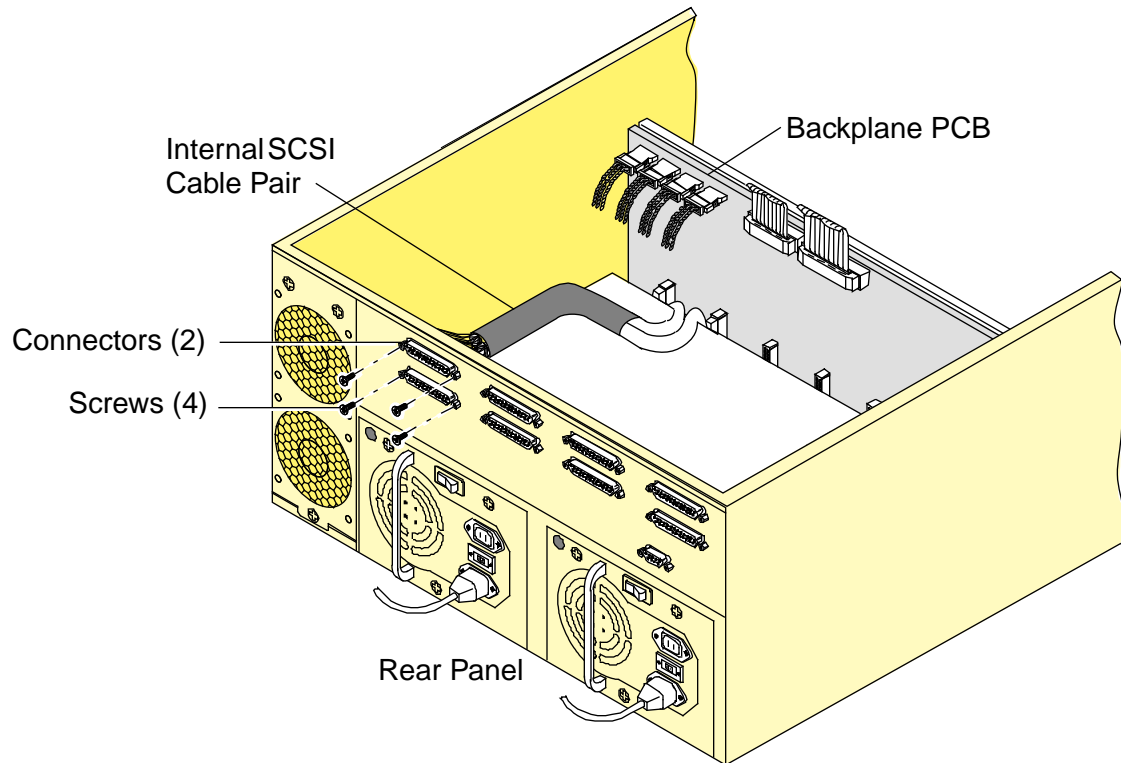
- #2 (medium) Phillips screwdriver
- #1 (small) Phillips screwdriver

Internal SCSI Cable Removal

This procedure requires the removal of the DSS-3 enclosure from the PC-10 cabinet. Refer to [FRP 4](#).

1. Remove the 10 screws that hold the top panel to the enclosure and set the panel aside.
2. Select the pair of cables (one of two pairs) that you want to replace, as shown in [Figure 19](#).
3. Remove the 4 screws that hold the two I/O connectors to the enclosure rear panel.
4. Unplug the connectors at the other end of the cables from the backplane PCB.

Figure 19. SCSI Cable Replacement



Internal SCSI Cable Installation

1. Place the replacement cable into the enclosure as shown in [Figure 19](#); orient the connectors toward the backplane PCB and the rear-panel connector openings.
2. Plug the 2 PCB connectors onto the backplane PCB.
3. Secure the 2 I/O connectors in the enclosure rear-panel openings using 4 screws.
4. Place the top panel onto the enclosure and secure it with 10 screws.
5. Install the DSS-3 enclosure in the PC-10 cabinet.

FRP 6: WACS PCB Replacement

Part Number

- 15248800 (PC board assembly, WACS)

Tools Required

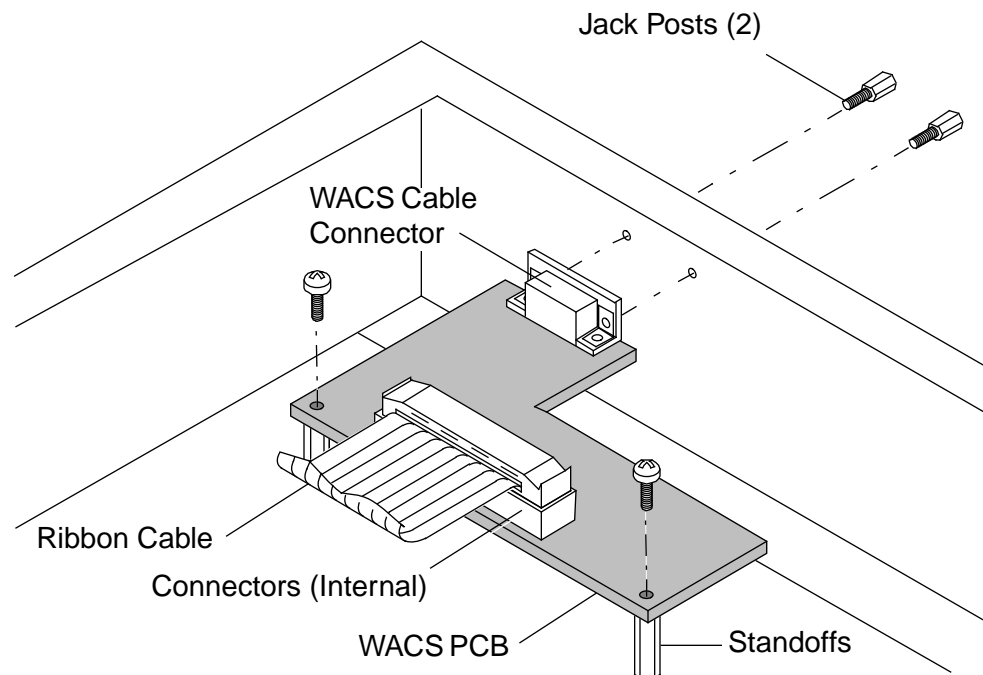
- #2 (medium) Phillips screwdriver
- #1 (small) Phillips screwdriver
- 3/16-in. Hex driver wrench

WACS PCB Removal

This procedure requires the removal of the DSS-3 enclosure from the PC-10 cabinet. Refer to [FRP 4](#).

1. Remove the 10 screws that hold the top panel to the enclosure and set the panel aside.
2. Locate the WACS PCB in the rear corner of the enclosure, above the power supplies, as shown in [Figure 20](#).
3. Unplug the ribbon cable from the WACS PCB.
4. Remove the 2 jack posts that hold the WACS cable connector to the enclosure rear panel.
5. Remove the 2 screws that hold the WACS PCB to standoffs below the PCB.
6. Lift the WACS PCB off the standoffs.

Figure 20. WACS PCB Removal



WACS PCB Installation

1. Place the replacement WACS PCB into the enclosure as shown in [Figure 20](#).
2. Secure the WACS PCB to the 2 standoffs using 2 screws. For proper alignment, do not tighten the screws until after you perform Step 3.
3. Screw the 2 jack posts through the enclosure rear panel into the WACS cable connector. Then tighten the 2 screws into the 2 standoffs.
4. Plug the ribbon cable onto the connector on the WACS PCB.
5. Place the top panel onto the enclosure and secure it with 10 screws.
6. Install the DSS-3 enclosure in the PC-10 cabinet.

FRP 7: Backplane PCB Replacement

Part Number

- 15248000 (PC board assembly, backplane)

Tools Required

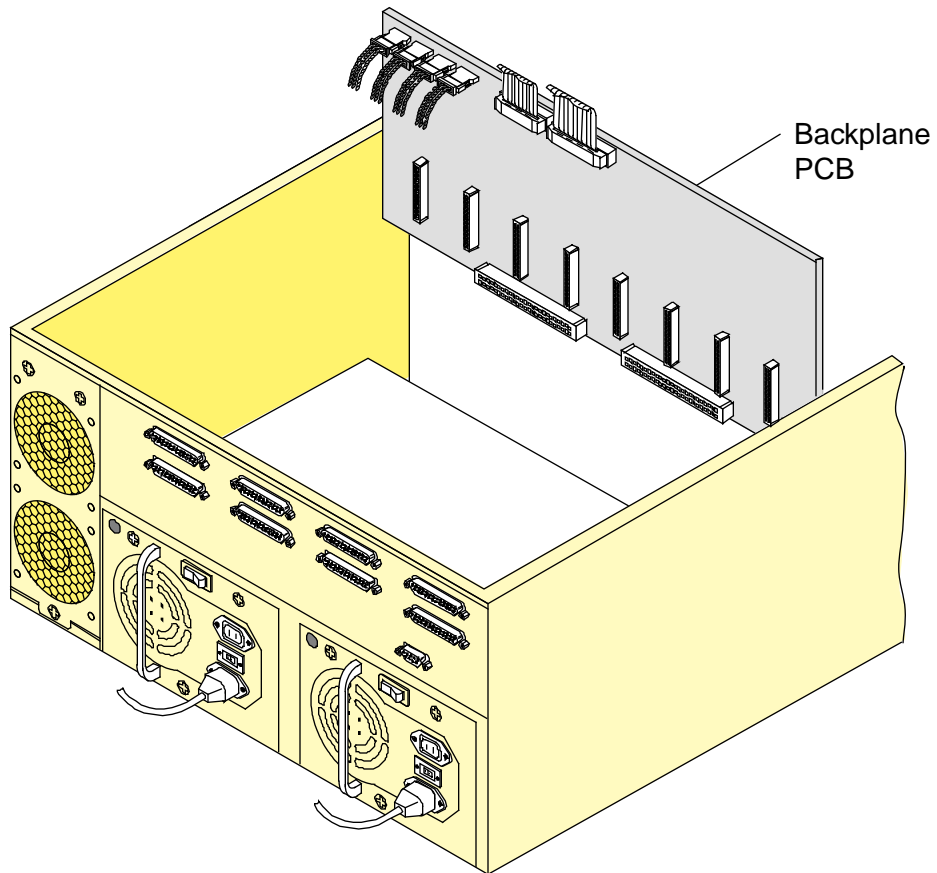
- #2 (medium) Phillips screwdriver
- #1 (small) Phillips screwdriver
- Long-shaft Phillips screwdriver

Backplane PCB Removal

This procedure requires the removal of the DSS-3 enclosure from the PC-10 cabinet. Refer to [FRP 4](#).

1. Remove the 10 screws that hold the top panel to the enclosure and set the panel aside.
2. Refer to [Figure 21](#) for the location of the PCB backplane.
3. Remove the rear access panel next to the power supplies.
4. Remove the 2 power supplies.
5. Unplug all disk drives. After you unplug them, you may leave the drives in the enclosure or set them aside. Before you remove the drives, mark each one so that each can be installed in its original slot.
6. Unplug the following connectors from the backplane PCB:
 - A ribbon cable across the top of the backplane PCB
 - A 2-wire cable and a 4-wire cable to the front-panel ID switch PCB
 - Two 4-wire cables to the enclosure fans
 - Two ribbon cables to the front-panel ID switch PCB
 - Two pairs of SCSI cables to the rear-panel I/O connectors

Figure 21. Backplane PCB Removal



7. Using a long-shaft Phillips screwdriver, remove the 10 screws that secure the backplane PCB to the panel.
8. Lift the backplane out of the enclosure.

Backplane PCB Installation

1. Place the PCB into the enclosure as shown in [Figure 21](#), aligned with the mounting holes.
2. Secure the PCB with 10 screws.
3. Connect the following cables to the backplane PCB:
 - A ribbon cable across the top of the backplane PCB
 - A 2-wire cable and a 4-wire cable to the front-panel ID switch PCB
 - Two 4-wire cables to the enclosure fans
 - Two ribbon cables to the front-panel ID switch PCB
 - Two pairs of SCSI cables to the rear-panel I/O connectors
4. Install all disk drives. Make sure each is in its original slot. Push each drive firmly into the enclosure to seat the connector and snap the release latch into the latch slot.
5. Install the 2 power supplies and the rear access panel next to the power supplies.
6. Place the top panel onto the enclosure and secure it with 10 screws.
7. Install the DSS-3 enclosure in the PC-10 cabinet.

FRP 8: SCSI ID Switch PCB Replacement

Part Number

- 15248300 (display PC board assembly)

Tools Required

- #2 (medium) Phillips screwdriver
- #1 (small) Phillips screwdriver

ID Switch PCB Removal

This procedure requires the removal of the DSS-3 enclosure from the PC-10 cabinet. Refer to [FRP 4](#).

1. Remove the 10 screws that hold the top panel to the enclosure and set the panel aside.
2. Unplug the 2 ribbon cables from the ID switch PCB. (These cables connect to the backplane PCB and the WACS PCB.)
3. Remove the 5 screws that hold the ID switch PCB to the enclosure front panel, and lift the PCB out of the enclosure.

ID Switch PCB Installation

1. Place the PCB behind the enclosure front panel; align it with the mounting holes.
2. Secure the PCB with 5 screws.
3. Plug the 2 ribbon cables from the backplane PCB and the WACS PCB into connectors on the ID switch PCB.
4. Place the top panel onto the enclosure and secure it with 10 screws.
5. Install the DSS-3 enclosure in the PC-10 cabinet.