56-Inch Data Center Cabinet Service Manual

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Warning – Procedures contained in this manual must be performed by qualified service-trained maintenance providers.

Refer to the section entitled “Notes, Cautions, and Warnings” found in the Preface of this manual.

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Preface

This manual provides information on servicing the 56-inch Data Center Cabinet. Included are trim, board, subassembly and mass storage removal and replacement procedures.

Organization

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Chapter 2

Subassembly Removal and Replacement — provides instructions for removing and replacing cabinet subassemblies.

Chapter 3

Mass Storage Removal and Replacement — provides instructions for and removal and replacement of cabinet mass storage devices.

Chapter 4

Logic Enclosure Assembly Removal and Replacement — provides instructions for removing and replacing logic enclosure subassemblies.

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Appendix A

SCSI Device Configuration in the SPARCserver 690MP—provides instructions on configuring SCSI devices and is applicable to the SPARCserver 690MP only.

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Appendix C

SPARCserver 690MP Card Cage Slot Assignment and Back Plane Configuration — provides 690MP card cage slot assignment information.

When You Need Help with UNIX Commands

This manual may not include specific software commands or procedures. Instead, it names software tasks and refers you to operating system documentation or the handbook that was shipped with your peripheral.

To find information about commands or procedures such as:

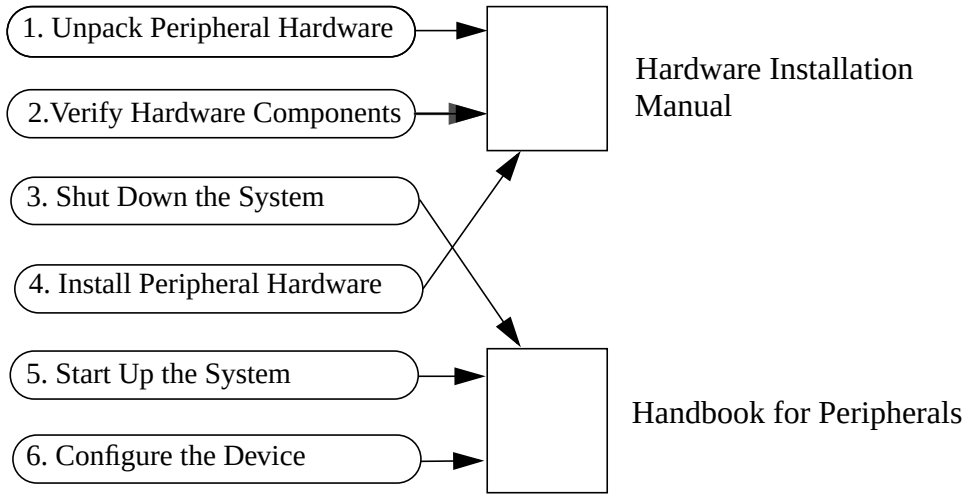
- Shutting down the system
- Configuring devices
- Other software procedures

See one or more of the following:

- *Solaris 1.x (SunOS 4.x) Handbook for SMCC Peripherals*, P / N 801-2424-xx. (Contains SunOS 4.x software commands.)
- *Solaris 2.x Handbook for SMCC Peripherals*, P / N 801-2425-xx. (Contains Solaris 2.x software commands.)
- On-line *AnswerBook*. (Contains the complete set of documentation supporting SunOS 4.x or Solaris 2.x.)
- Other software documentation that you received with your system.

Task Map for Getting Your System Running

The diagram below outlines the tasks you can perform to successfully install a new peripheral. Each numbered item in the diagram represents a procedure and the arrows point to manuals in which these procedures are detailed.



After you perform these tasks, you will be ready to use the new peripheral with your system.

Document Conventions

These typographical conventions are used in this document:

- `Courier type` identifies text that is displayed on the screen:
  `Syncing file systems . . . done`
- **`Bold type`** identifies the commands you type at the keyboard:
  % **`cd cdrom`**

Symbols

The following symbols mean:

Caution – Risk of personal injury and equipment damage. Follow the instructions.

Warning – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Notes, Cautions, and Warnings

Warning – This equipment contains lethal voltage. Accidental contact can result in serious injury or death.

Caution – Improper handling by unqualified personnel can cause serious damage to this equipment. Unqualified personnel who tamper with this equipment may be held liable for any resultant damage to the equipment.

Individuals who remove any outer panels to access this equipment must observe all safety precautions and ensure compliance with skill level requirements, certification, and all applicable local and national laws.

Procedures contained in this document must be performed by qualified service-trained maintenance providers.

Note – Before you begin, carefully read each of the procedures in this manual. If you have not performed similar operations on comparable equipment, *do not attempt* to perform these procedures.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés:

Précaution – Risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

Avertissement – Présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

Notes, Precautions et Avertissements

Avertissement - Cet équipement contient une tension létale. Tout contact accidentel peut provoquer des blessures graves ou la mort.

Précaution - La manutention incorrecte par un personnel non qualifié peut gravement endommager cet équipement. Tout personnel non qualifié manipulant l'équipement pourra être tenu responsable de tout dégât pouvant résulter de cette manipulation.

Les personnes qui retirent les panneaux externes pour avoir accès à l'équipement doivent observer toutes les précautions de sécurité et s'assurer d'avoir le niveau de qualification, les certificats requis et de se conformer aux lois locales et nationales qui s'appliquent.

Les procédures contenues dans ce document doivent être exécutées par un personnel de maintenance qualifié et formé aux réparations.

Remarque : lire attentivement chacune des procédures contenues dans ce manuel avant de commencer. Si vous n'avez pas effectué d'opérations similaires sur des équipements comparables, ne tentez pas d'effectuer celles-ci.

Symbole

Die verwendeten Symbole haben die folgende Bedeutung:

Vorsicht – Gefahr von Personenverletzung und Geräteschaden. Anweisungen befolgen.

Warnung – Gefährliche Spannungen. Zur Reduzierung des Elektroschockrisikos und der Gesundheitsgefährdung die Anweisungen befolgen.

Anmerkungen, Vorsichtshinweise und Warnungen

Warnung - Dieses Gerät steht unter tödlicher Spannung. Eine versehentliche Berührung kann zu schweren Verletzungen oder zum Tod führen.

Vorsicht - Bei unsachgemäßer Handhabung durch unqualifiziertes Personal kann dieses Gerät schwer beschädigt werden. Unqualifizierte Personen, die an diesem Gerät herumbasteln, können für dadurch entstehende Schäden haftbar gemacht werden.

Personen, die die Außenwände dieses Geräts abnehmen, müssen alle Sicherheitsvorschriften beachten und die Anforderungen bezüglich Fachkenntniß und Zulassung erfüllen sowie alle anwendbaren lokalen und nationalen Gesetze einhalten.

Die in diesem Dokument beschriebenen Verfahren sind von qualifiziertem, geschultem Wartungspersonal auszuführen.

Anmerkung - Vor Beginn der Arbeiten sorgfältig alle in diesem Handbuch aufgeführten Verfahren durchlesen. Personen, die nicht mit ähnlichen Arbeiten an vergleichbaren Geräten vertrant sind, sollten nicht versuchen, diese Verfahren auszuführen.

Símbolos

Los siguientes símbolos significan:

Precaución– Peligro de lesión personal y daño al equipo. Siga las instrucciones.

Advertencia – Hay presentes voltajes peligrosos. Siga las instrucciones para reducir el riesgo de electrochoque y los peligros contra la salud.

Observaciones, Precauciones y Advertencias

Advertencia - El voltaje de este equipo puede ser mortal. Un contacto accidental puede producir lesiones graves o incluso la muerte.

Precaución - Este equipo debe ser manejado solamente por personal capacitado para ello pues de otro modo puede ser dañado seriamente. El personal no capacitado que manipule imprudentemente el equipo podrá ser responsable de los daños resultantes.

Las personas que retiren cualquiera de los paneles exteriores para ganar acceso al equipo deberán observar todas las debidas precauciones de seguridad y asegurarse de que poseen el nivel requerido de formación y certificación, asi como del cumplimiento de todas las leyes locales y nacionales aplicables.

Los procedimientos indicados en este documento necesitan ser aplicados por personal de mantenimiento capacitado y entrenado para el servicio.

Observación importante: antes de empezar, lea atentamente cada uno de los procedimientos descritos en este manual. Si no ha realizado usted anteriormente operaciones similares con equipos comparables, no intente poner en práctica estos procedimientos.

Note, Attenzione e Avvisi

Aviso - Questa apparecchiatura contiene una tensione letale. Contatto accidentale potrebbe causare gravi infortuni o decesso.

Attenzione - Il trattamento incorretto da parte di personale non qualificato potrebbe danneggiare seriamente l'apparecchiatura. Personale non qualificato che manomette questa apparecchiatura potrebbe essere ritenuto responsabile per qualsiasi danno causato.

Chiunque rimuova i pannelli esterni per accedere a questa apparecchiatura deve rispettare tutte le precauzioni di sicurezza e garantire l'osservanza dei requisiti per il livello di competenza, certificazione e di tutte le leggi locali e nazionali in vigore.

Le procedure contenute in questo documento devono essere svolte da personale di servizio debitamente addestrato.

Nota - Prima di procedere, leggere attentamente ogni procedura contenuta in questo manuale. Chi non ha mai svolto simili operazioni per apparecchiature di questo tipo, dovrà astenersi dal procedere.

Obs, Försiktighet och Varning

Varning - Denna utrustning innehåller livsfarlig spänning. Om den vidrörs kan det leda till allvarlig skada eller dödsfall.

Försiktighet - Om okvalificerad personal behandlar utrustningen på olämpligt sätt kan det leda till allvarliga skador på utrustningen. Okvalificerad personal som utför otillåtna åtgärder på denna utrustning kan komma att hållas ansvariga för eventuella skador som uppstår på utrustningen.

Personer som tar bort ytterpaneler för att komma åt denna utrustning måste iaktta alla försiktighetsåtgärder och se till att de uppfyller krav på kompetensnivå och tillstånd samt krav i gällande lokala och nationella lagar och bestämmelser.

De förfaranden som beskrivs i detta dokument måste utföras av kvalificerad serviceutbildad underhållspersonal.

Obs - Innan du startar ska du noggrant läsa igenom var och en av de förfaranden som beskrivs i denna handbok. Om du inte utfört liknande åtgärder på jämförbar utrustning ska du inte försöka utföra dessa förfaranden.

Preparing the System for Service 1

This chapter provides the information necessary to prepare the system for servicing. Included are a tool list, safety precautions, system shutdown, and trim removal and replacement procedures.

Some systems in the field differ from the majority of production units in several minor details. When these differences affect the preparation procedures, this text covers both the standard and the variation.

Caution – Servicing procedures, as directed in this manual, should be performed by qualified personnel only.

1.1 Tools and Test Equipment Required

The following list of tools and test equipment represents the minimum requirement to service the cabinets.

- M4 (7mm) hex socket
- 1/2-inch (13mm) open-end or adjustable-end wrench
- 5/64 hex driver
- Flashlight (to view interior of the cabinet)
- Flat-blade screwdriver
- 3/16-inch hex socket
- No. 2 Phillips screwdriver
- Voltmeter
- Sun ESD mat, P/N 250-1088-01

- 2.0mm hex wrench
- ESD grounding strap

1.2 Safety Precautions

Ensure the voltage and frequency of the power outlet used matches electrical rating labels on the cabinet and the video monitor.

Wear ESD wrist straps when removing printed circuit boards or disk drives. Refer to Section 5.1 where “Electrostatic Discharge Precautions” are described.

Only use properly-grounded power outlets.

Caution – MAKE NO mechanical or electrical modification to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

Caution – All power cords for components in the cabinet must plug into the power sequencer. Additional power sequencers MAY NOT be added to the cabinet.

Caution – Power off the cabinet and all equipment attached to it before proceeding with any of the following procedures; do so by following Section 1.4, “Shutting Down the System” of this chapter.

1.3 Identifying the UNIX Version of Your System

Determine which version of the operating system you are running. For example, for either Solaris 1.x (SunOS 4.x) or Solaris 2.x enter:

```
uname -rs
```

1.4 Shutting Down the System

Before turning off the system power, you must halt the operating system:

1. **Go to the appropriate handbook for your operating system (the *Handbook for SMCC Peripherals* that came with the 56" Data Center Cabinet).**
2. **See the section about shutting down the system, and return to this book after you perform the procedure.**
3. **Wait for the system-halted message and the boot monitor prompt.**
4. **Turn off the system power in this order:**
   - External drives (if connected)
   - System unit
   - Monitor

Caution – Turn off the power at the main AC breaker before inserting or removing boards and disk drives. Do not disconnect the AC power cord from its receptacle (or the power distribution box). These connections provide ground paths necessary to prevent damage from electrostatic discharge to drives or boards installed in the system.

However, when servicing components other than disk drives or PCBs, gracefully shut down the system and unplug the power cord from the wall receptacle.

5. **To access the ON/OFF key switch, open the top front panel. Turn the key switch (top right hand side) to the vertical (OFF), position (Figure 1-1).**

Figure 1-1 System Power Key Switch

6. **Move to the rear of the cabinet and turn the main power circuit breaker to the OFF position (refer to Figure 1-2).**

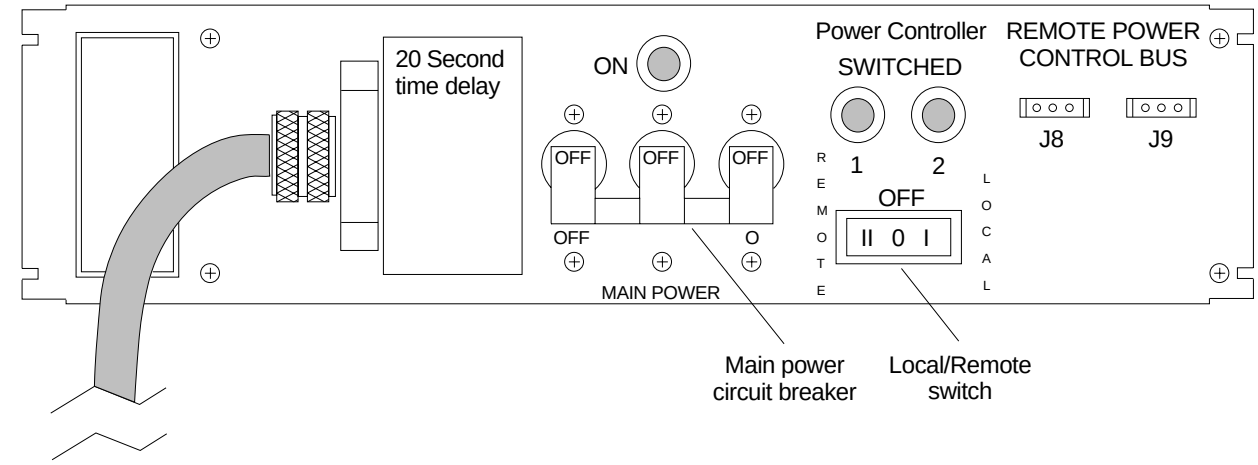


Figure 1-2 Control Panel

7. **If servicing components other than disk drives or PCBs such as the power supply, unplug the main cabinet power cord from the wall receptacle.**

For more information on system administration such as shut-down methods and backups, refer to documentation supplied with your operating system.

1.5 Trim Removal and Replacement

56-inch Data Center Cabinet outer panels (Figure 1-3 through Figure 1-9), consist of:

- Top panel
- Upper panel assembly / door assembly for Front-load tape drives
- Vented front panels
- Side panels (2)
- Anti-tilt bar and panel
- Rear panel
- Kick panel

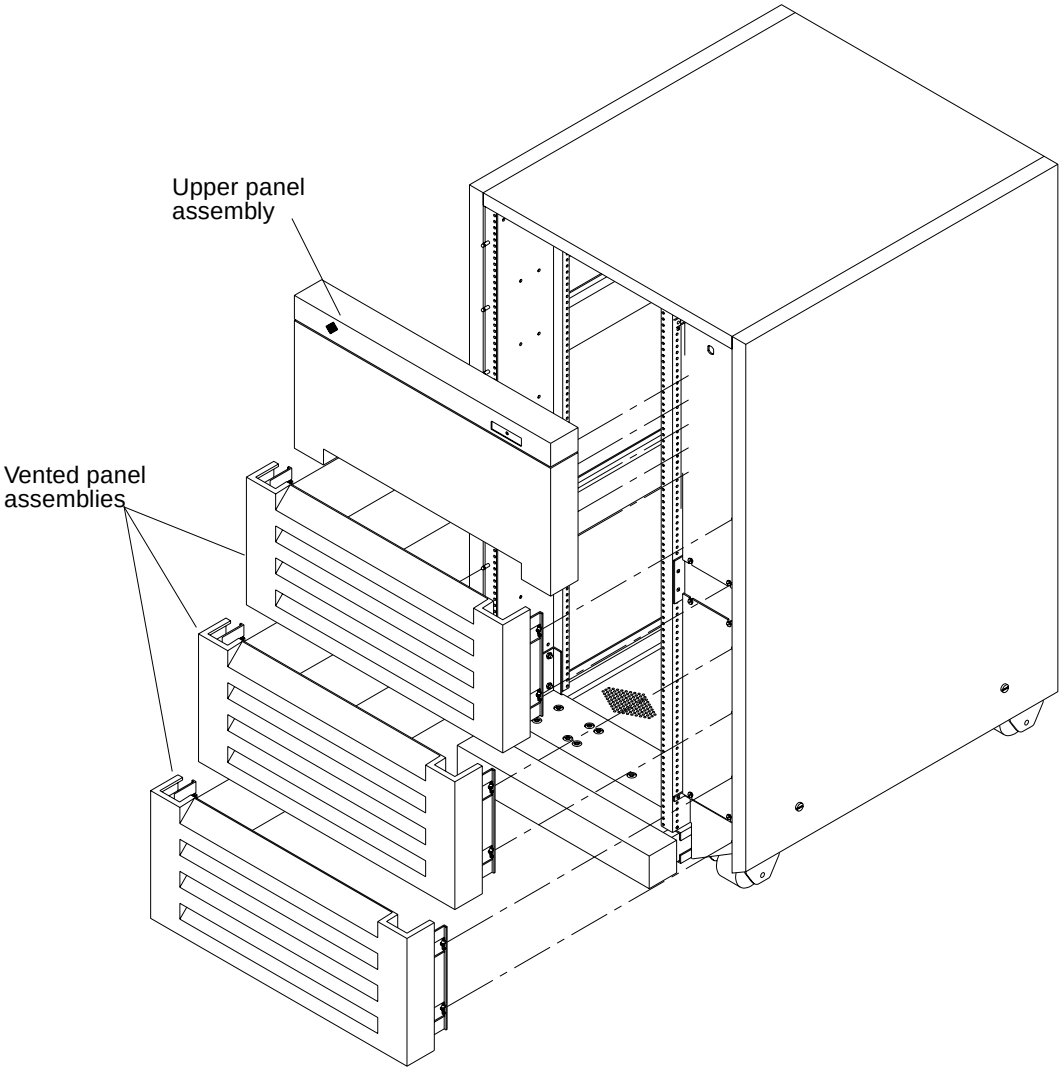


Figure 1-3 Data Center Cabinet (with Front-load Tape)

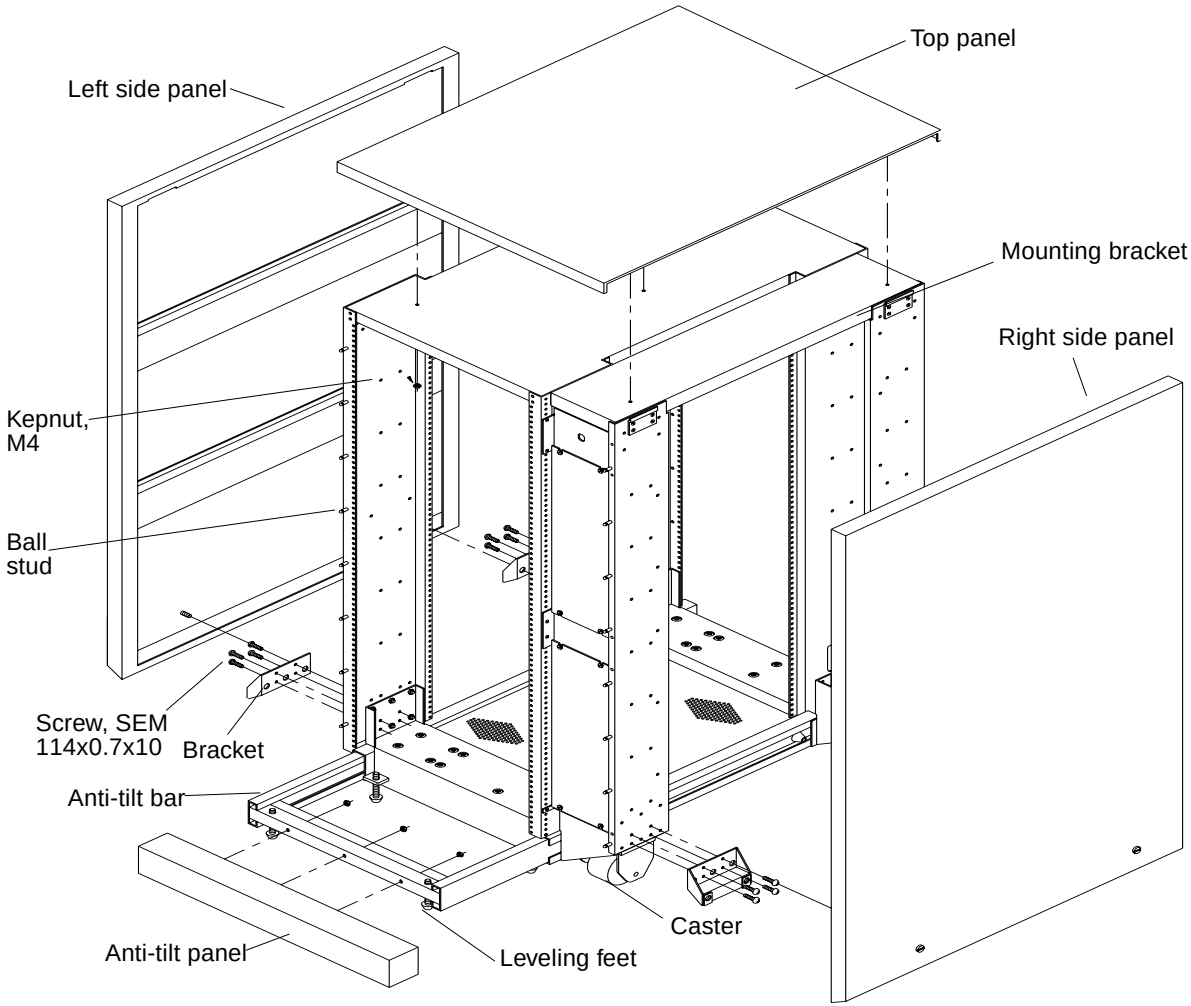


Figure 1-4 Data Center Cabinet Front Trim

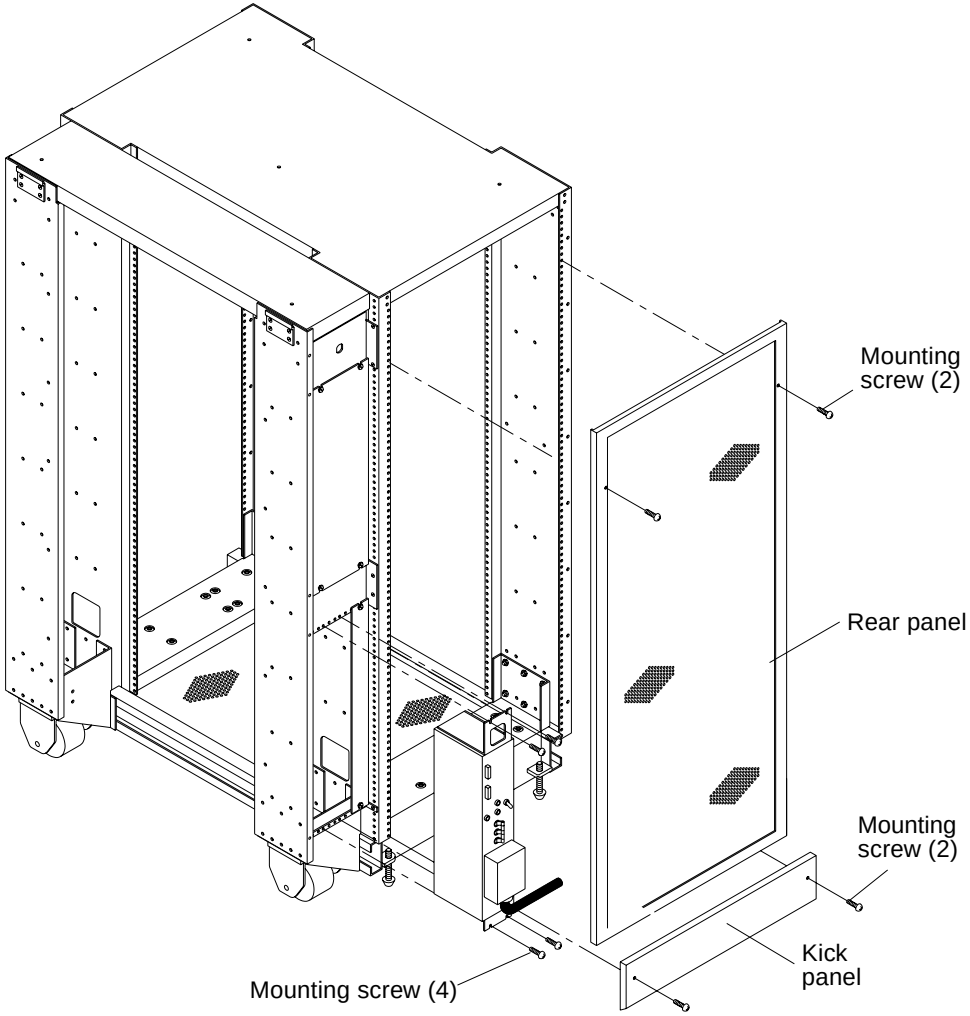


Figure 1-5 Data Center Cabinet Rear View

1.5.1 Top Panel

To remove the top panel proceed as follows:

1. **Remove the rear panel; refer to Section 1.5.8, “Rear Panel” for a description.**

2. **Remove five screws and nuts from the cosmetic top panel (Figure 1-4). Remove the panel.**

To replace the top panel:

1. **Install the panel and replace the five screws and nuts to secure the top panel.**
2. **Replace the rear panel as described in the Section 1.5.8, "Rear Panel."**

1.5.2 Upper Panel Assembly

To remove the upper panel assembly, remove the screws securing the upper panel assembly to the door bracket.

To replace the upper panel assembly, replace the screws that secure the upper panel assembly to the door bracket, as shown in Figure 1-3.

1.5.3 Vented Front Panel

To remove the vented front panels, refer to Figure 1-6. Grasp the outer edge of the panel and pull it towards yourself.

To replace a vented front panel, align the ball studs with the receptacles on each side of the panel and press the panel into place.

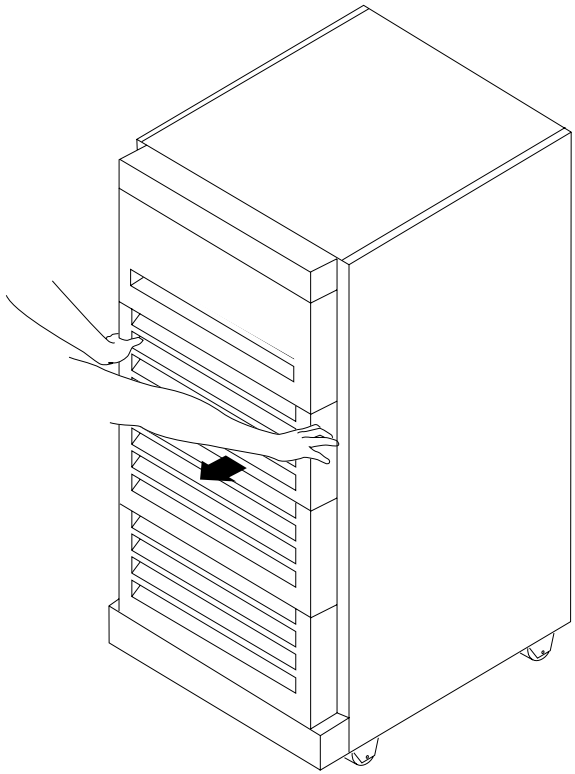


Figure 1-6 Vented Front Panel Removal and Replacement

1.5.4 Anti-tilt Panel

To remove the anti-tilt panel, remove the nuts securing the panel to the anti-tilt bar.

To replace the anti-tilt panel, position the panel and replace nuts securing the panel to the anti-tilt bar.

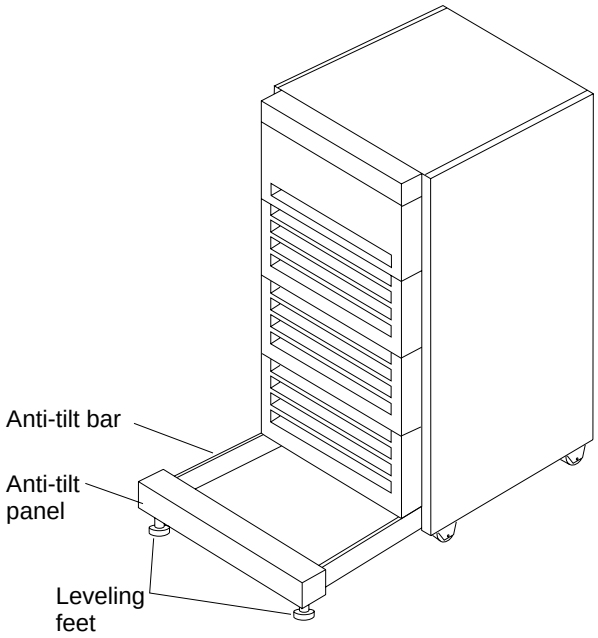


Figure 1-7 Anti-tilt Panel Removal and Replacement

1.5.5 *Leveling Feet*

Note – A Johnson bar or forklift is needed to raise the cabinet to replace this part. (Johnson bar: a tool used by movers for moving and lifting heavy objects like refrigerators.) Two people are required to perform these procedures.

To remove the leveling feet:

1. **Use the Johnson bar to raise the cabinet.**
2. **Pull the anti-tilt bar out from the cabinet.**
3. **Locate the leveling wrench attached to the chassis at the cabinet rear Unscrew the leveling feet.**

To replace the leveling feet:

1. **Screw the leveling feet into the cabinet.**

2. **Adjust each foot until it is one-eighth to one-fourth inch from the floor and then adjust the feet until they touch the floor. Do not overtighten the leveling feet. Refer to Figure 1-7.**

3. **Lower the cabinet.The feet should not lift the cabinet front when they are properly adjusted and the cabinet is lowered.**

1.5.6 Caster

Note – A Johnson bar or forklift is needed to lift the cabinet to replace this part. (A Johnson bar is a tool used for moving and lifting heavy objects like refrigerators.) Two people are required to perform these procedures.

To remove a caster:

1. **Use the forklift or Johnson bar to raise the cabinet up off of the floor.**

2. **Remove the bolts that attach the caster to the cabinet and remove it.**

To replace a caster:

1. **Insert the new caster into the hole in the cabinet and replace the bolts that attach the caster to the cabinet.**

2. **Use the forklift or Johnson bar to lower the cabinet to the floor.**

1.5.7 Side Panel

To remove side panels, unfasten two captive screws securing each side panel to the frame. Then firmly grasp the outer edges of the panel with both hands and lift up on the panel to release the catches at the top. Refer to Figure 1-8.

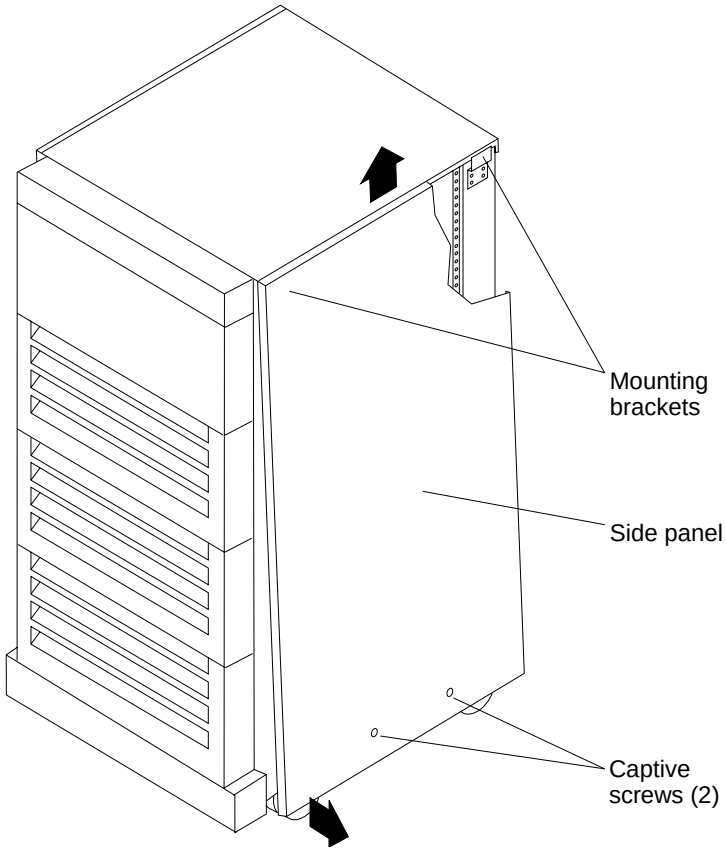


Figure 1-8 Side Panel Removal and Replacement

To replace the side panel:

1. **Insert the outer edges of the panel into the cabinet in order to connect with the catches at the top of the unit.**
2. **Fasten the two captive screws that secure each side panel to the chassis.**

1.5.8 Rear Panel

1. **Remove two screws securing the rear panel to the frame (Figure 1-9).**
2. **Pull the panel away from the cabinet and set it aside.**

To replace the rear panel:

1. **Insert the panel into the latch on the cabinet.**
2. **Replace the two screws that secure the rear panel to the chassis**

1.5.9 Kick Panel

To remove the kick panel, remove the two Phillips screws securing the kick panel to the bottom rear of the cabinet. Refer to Figure 1-9.

To replace the kick panel, replace the two Phillips screws that secure the kick panel to the bottom rear of the cabinet.

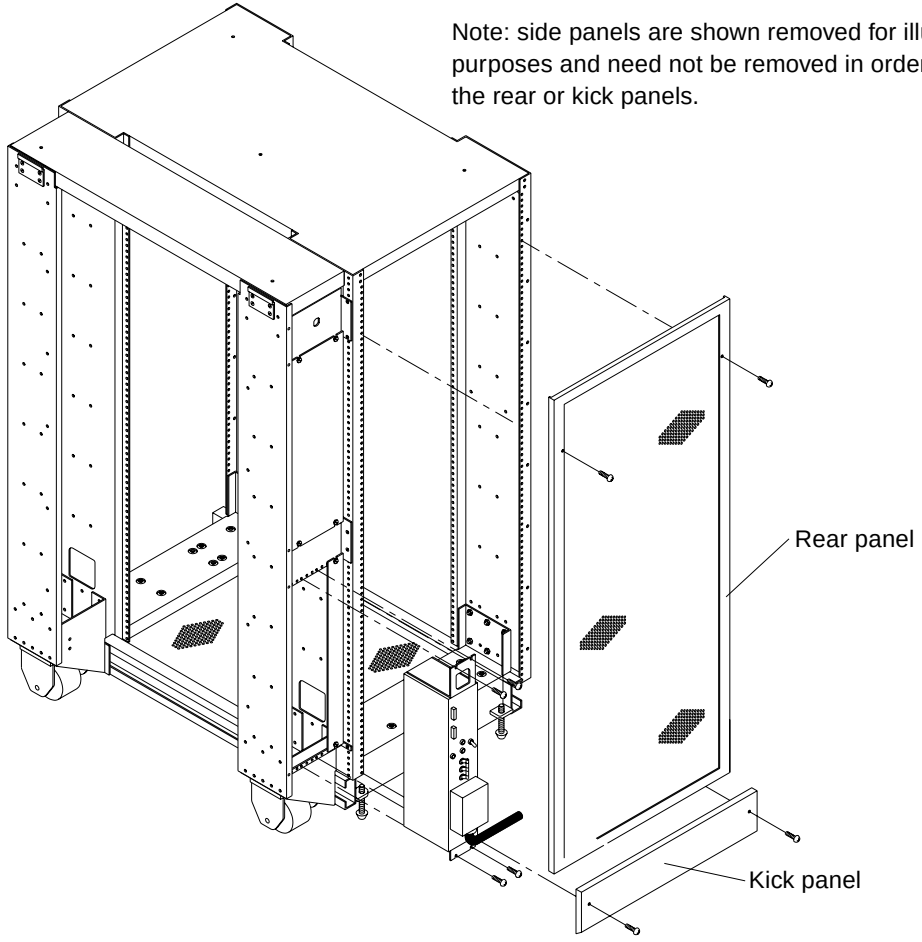


Figure 1-9 Rear Panel and Kick Panel Removal and Replacement

Subassembly Removal and Replacement 2

This chapter supplies information necessary to completely remove and replace all field-replaceable subassemblies for the Sun 56-inch Data Center Cabinet. Also included are procedures for removing and replacing subassemblies in the IPI Disk Drive Tray.

The following list details the subassemblies covered:

- Key switch
- Power sequencer
- Asynchronous line multiplexer-2
- IPI tray subassemblies
- Differential SCSI disk tray subassemblies
- Multi-tape backup tray subassemblies

There are systems in the field that differ from the majority of production units in several minor details. When these differences affect the remove-and-replace procedures, this text covers both the standard and the variation.

2.1 Key Switch Removal

1. **Power off the system. Refer to Section 1.4, "Shutting Down the System" for more information.**

Caution – Ensure the main power circuit breaker is switched to the OFF position before proceeding.

2. **Remove the right side panel. Refer to Section 1.5 “Trim Removal and Replacement.”**

2.1.1 Three Piece Key Switch Assembly

▼ Removal

1. **Disconnect the key switch connector leads from the mating power supply connector labeled J7 at the rear of the power sequencer (Figure 2-1).**
2. **Use a pin/socket removal tool to remove the connector on the key switch assembly.**
3. **Remove the five screws securing the door hinge to the frame. Remove the door and key switch assembly from the frame.**
4. **Loosen the nut on the key switch body and then pull the key switch out of the door hinge opening.**

▼ Replacement

1. **Insert the key switch into the door hinge opening.**
2. **Tighten the nut on the key switch body.**
3. **Install the door assembly while feeding key switch wires through the opening in the frame.**
4. **Install wires into the key switch assembly connector.**
5. **Connect the key switch connector leads from the mating power supply connector labeled J7 at the rear of the power sequencer.**
6. **Replace the side panel. Refer to Section 1.5, “Trim Removal and Replacement.”**

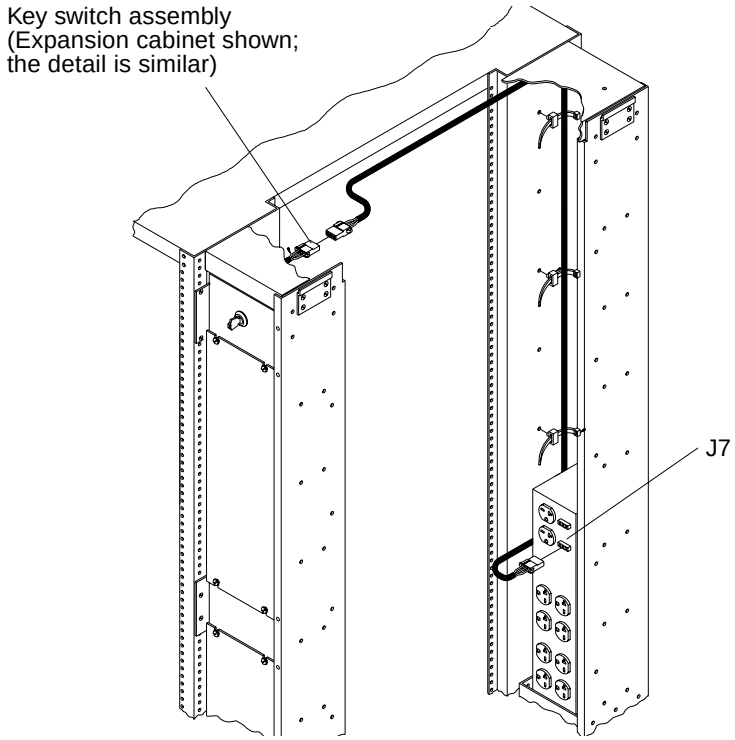


Figure 2-1 Disconnecting the Key Switch Power Connector — Three Piece Assembly

2.1.2 One Piece Key Switch Assembly

▼ Removal

1. **Disconnect the key switch connector leads from the mating power supply connector labeled J7 at the rear of the power sequencer (Figure 2-1).**
2. **Remove the retaining clip on the key switch body and then pull the key switch out of the door hinge opening.**

▼ Replacement

1. **Insert the key switch into the door hinge opening.**
2. **Install the retaining clip on the key switch body.**

3. **Connect the key switch connector leads from the mating power supply connector labeled J7 at the rear of the power sequencer.**

4. **Replace the side panel. Refer to Section 1.5, "Trim Removal and Replacement."**

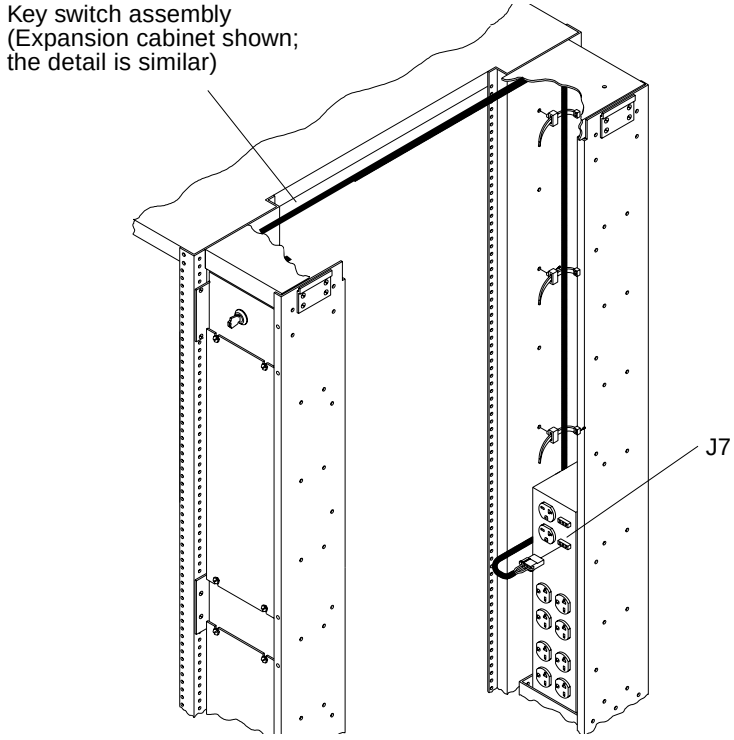


Figure 2-2 Disconnecting the Key Switch Power Connector — One Piece Assembly

2.2 Power Sequencer

▼ Removal

1. **Refer to Chapter 1 and shut down the system, then unplug the main power cord from the wall receptacle.**

2. **Refer to Chapter 1 and remove the right side panel and kick panel.**

3. **Disconnect the key switch power connector from the mating power supply connector labeled J7 (rear of the power sequencer, Figure 2-1).**
4. **Disconnect any power cords and ground strap (if applicable).**
5. **Remove four screws securing the sequencer to the chassis frame. Pull up and remove the sequencer from the opening at the rear of the frame.**

▼ Replacement

1. **Push the power sequencer through the opening in the rear of the chassis, and replace the four screws securing the sequencer to the chassis frame.**
2. **Reconnect the key switch power connector to the mating power supply connector labeled J7 at the rear of the power sequencer.**
3. **Reconnect any power cords and ground straps previously disconnected.**
4. **Refer to Chapter 1 and replace the right side panel and kick panel.**
5. **Plug the main power cord into the receptacle. Power up the system.**

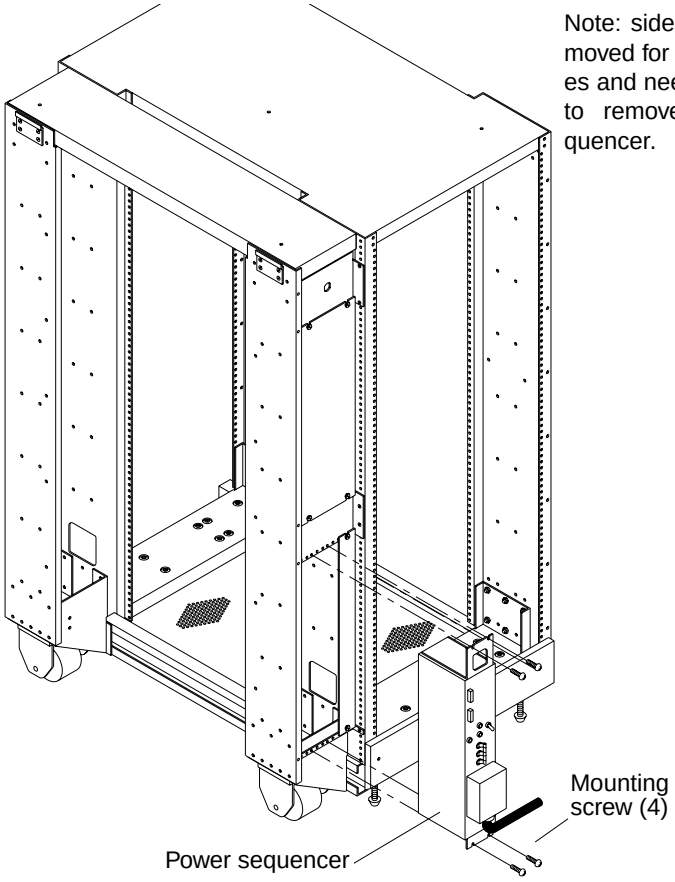


Figure 2-3 Power Sequencer Removal and Replacement

2.3 Asynchronous Line Multiplexer-2 (ALM-2)

▼ Removal

1. **Refer to Chapter 1 and remove the right-side panel. Refer to Section 1.5.7 where "Side Panel" removal is covered.**
2. **Disconnect data cables mated to the device connector assembly (DCA).**
3. **Remove four Phillips screws securing the DCA to the cabinet (Figure 2-4).**

Note – Some locations require kepnuts.

▼ Replacement

1. **Using four 8 mm M3 screws, attach the long brackets to the DCA as shown in Figure 2-5.**
2. **Attach the cable clip to the right bracket.**
3. **Remove the right-side panel by loosening the two captive screws at the bottom. Then, lift the panel off of the top clips.**
4. **Using four 10-32 Phillips screws, secure the DCA to the cabinet.**
5. **Connect a 50-pin data cable from connector labeled SYSTEM CONN A on the DCA to connector labeled SYSTEM CONN A on the controller board.**
6. **Connect a 50-pin data cable from the connector SYSTEM CONN B on the DCA to connector SYSTEM CONN B on the controller board.**
7. **Repeat Steps 1-6 listed above for each additional DCA.**
8. **Replace the side panels. Refer to Section 1.5.7, "Side Panel."**
9. **Refer to the** *ALM-2 Installation and Configuration Manual*, **P/N 813-1029-xx, for information regarding additional software set up procedures that are required.**

Note – Route all ALM-2 terminals, modem, and printer cables down the left side of the cabinet. Remove the kick panel at the base of the vented rear panel to facilitate cable routing.

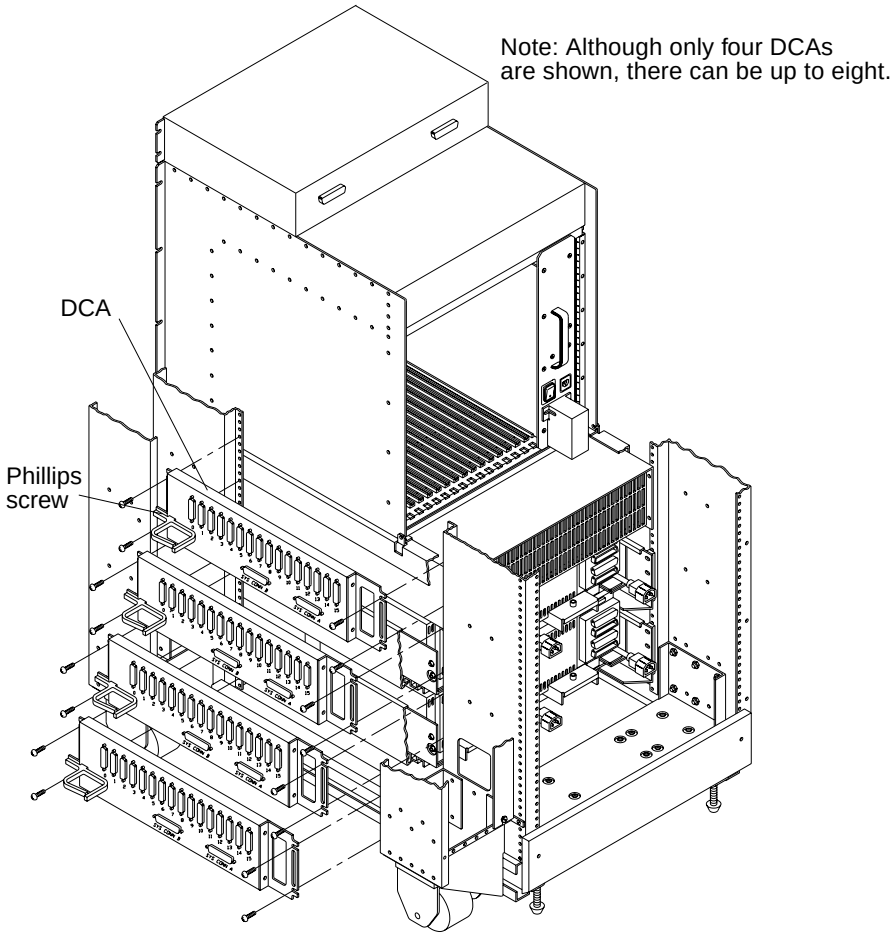


Figure 2-4 Asynchronous Line Multiplexer-2 Removal and Replacement

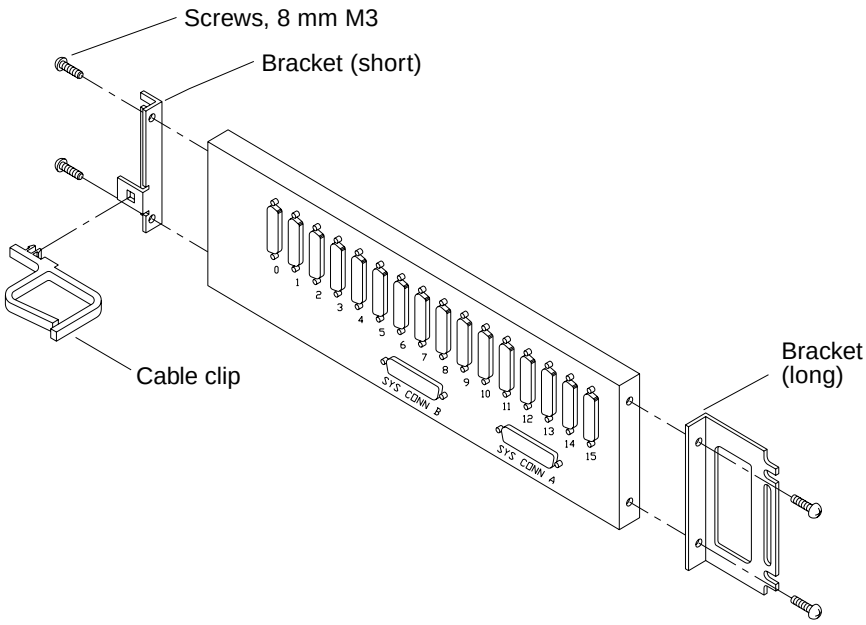


Figure 2-5 Device Connector Assembly Mounting

2.4 IPI Disk Drive Tray

▼ Tray Extension and Cover Removal

Extend the tray assembly from the cabinet. Remove the top cover as follows:

1. **Ensure that the system is shut down as indicated in Chapter 1 and the Cabinet power cable is disconnected.**
2. **Extend the anti-tilt bar.**
3. **Move to the cabinet rear. Disconnect the power and data cables from the rear of the tray.**
4. **Loosen two captive screws securing the tray cover at the rear of the unit.**
5. **Unscrew four (2 each side) screws securing the tray to cabinet slide rails.**
6. **At the Cabinet front, unscrew two screws securing the tray to the Cabinet.**

Warning – A four drive tray can weigh more than 70 pounds. Ensure the anti-tilt bar is extended as indicated in step 2 before proceeding.

7. **Slide the tray out to the fully extended latched position.**

Warning – To accomplish the next step of removing the cover, you may need to extend the tray past the latched position. Press the slide rail lock mechanism. If the tray is extended past the tray latched locking point use extreme caution.

8. **Loosen the remaining eight top cover captive screws (three each side and two in the front) and remove the cover.**
9. **Ensure you are grounded with a grounding wrist strap.**
10. **Proceed to one or more of the following procedures as applicable:**

2.4.1 *Tray Subassembly*

This section covers removal and replacement of parts within the IPI Disk Drive Tray. Exception: disk drives are covered in Chapter 3, “Mass Storage Device Removal and Replacement.”

2.4.1.1 *Power Supply*

Extend the tray and remove the top cover as described in the preceding text, then refer to Figure 2-6 and proceed as follows:

1. **Remove the three connector DC harness from the end of the power supply.**
2. **Loosen the two power supply bracket mounting nuts securing the unit to the bottom of the tray. The power supply mounting bracket can then be positioned so the power supply can be removed from the tray.**
3. **To replace the power supply, reverse the preceding steps.**

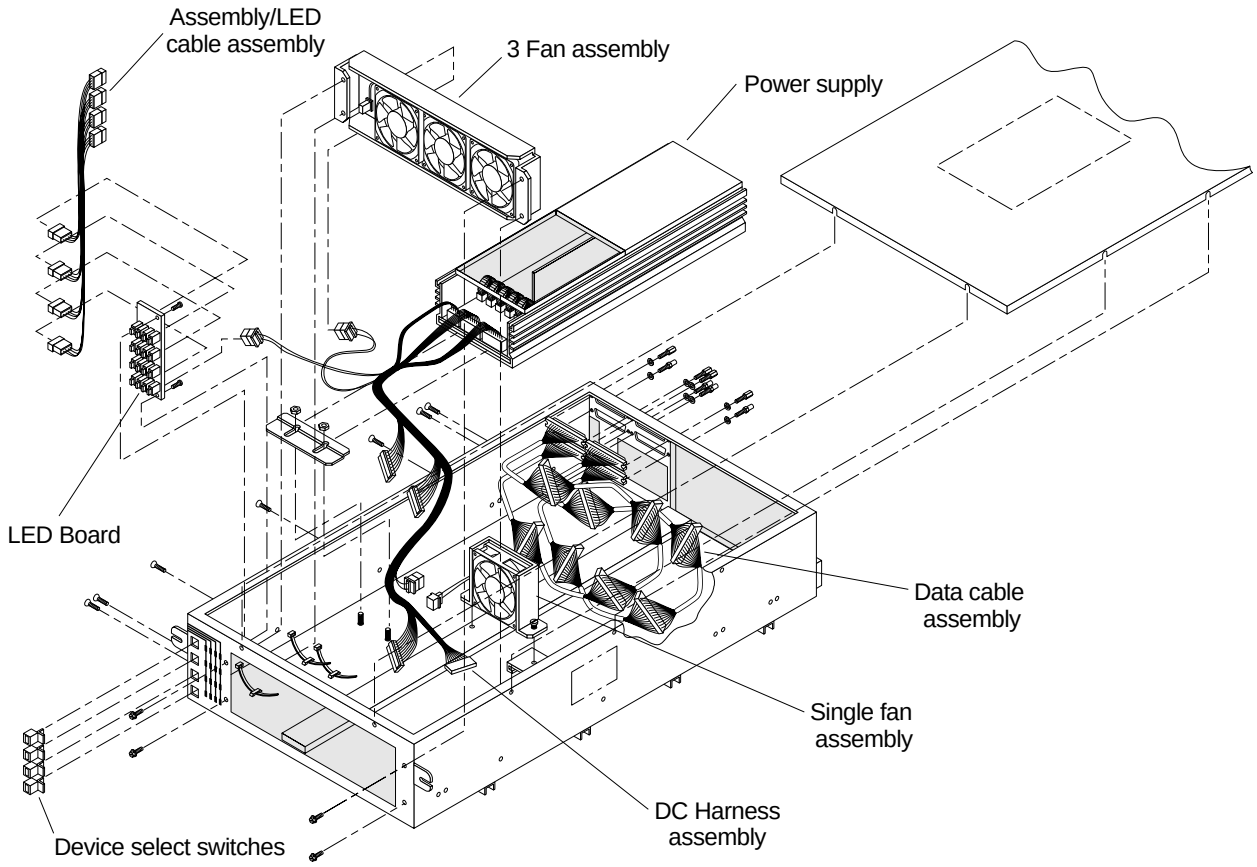


Figure 2-6 Disassembly of IPI Disk Drive Tray

2.4.1.2 DC Harness

Extend the tray and remove the top cover as described in the preceding text, then refer to Figure 2-6 and proceed as follows:

1. **Remove the 3 connector DC harness from the end of the power supply.**
2. **Remove the remaining DC harness connections to the ID board, both fan assemblies and each of the drives, free the harness and remove it.**

3. **Replacement is the reverse of removal except, refer to Refer to Chapter 3, Figure 3-8, "DC Harness Cabling in the Tray" for proper DC harness routing.**

2.4.1.3 Fan Assemblies

There are two fan assemblies used in the tray, one is a single fan unit and the other is a 3-unit assembly. Both are described in the procedures that follow:

Extend the tray and remove the top cover. Refer to "Tray Extension and Cover Removal" then follow the appropriate procedure below:

Single (Center) Fan

Remove the fan after removing the DC power connector and loosening two captive mounting screws (Figure 2-6). Replacement is the reverse of removal.

Triple Fan

Refer to Figure 2-6. Remove the triple fan DC power connector and four screws securing the unit to the front of the tray. Replacement is the reverse of removal.

2.4.1.4 LED Board

1. **Extend the tray and remove the cover. Refer to "Tray Extension and Cover Removal" which covers this.**

Note – When removing the DC harness connection from the Address/LED board, care must be taken to first depress the plastic locking mechanism on top of the connector prior to removing or damage to wiring may result.

---

2. **Remove the triple fan assembly. Refer to Section 2.4.1.3 "Triple Fan."**
3. **Refer to Figure 2-6 and remove the four connector Address/LED cabling as well as the DC harness connection from the rear of the board.**
4. **Loosen and remove the two inside screws securing the unit to the tray then remove the unit.**
5. **Replacement is the reverse of removal except: refer to Figure 3-9, for proper routing when replacing the cable to the LED board.**

2.4.1.5 Address/LED Cable

To remove the Address/LED cable first extend the tray and remove the cover. Refer to "Tray Extension and Cover Removal." Refer to Figure 2-6 and remove the four connector cabling from each of the disk drives as well as the four connector cabling from the LED board.

Replacement is the reverse of removal with one exception: refer to Chapter 3, Figure 3-9, "LED/Address Cabling in the Tray," for proper routing when replacing the cable to the disk drives and the LED board.

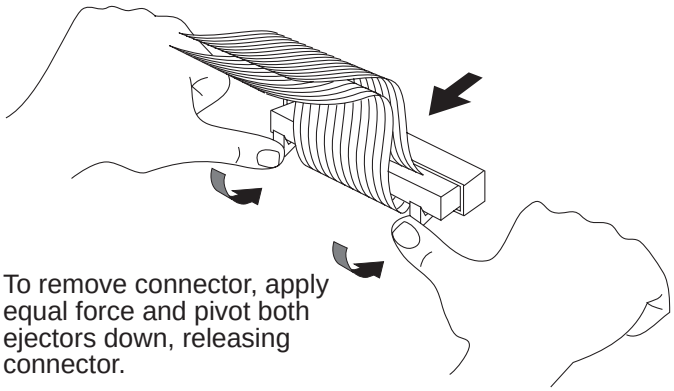
2.4.1.6 Device Select Switch

1. **Extend the tray and remove the cover. Refer to "Tray Extension and Cover Removal."**
2. **Remove the LED Board as described in the Section 2.4.1.4.**
3. **The rear portion of the switches should now be accessible to do the following: integral to the sides of each switch are two plastic tab locking mechanisms. As viewed from the front, release the right-hand one first, after which the switch can be positioned so the left-hand one may be released easily and the switch removed from the tray.**
4. **Replacement is the reverse of removal.**

2.4.1.7 IPI Data Cable

1. **Extend the tray and remove the cover as described in "Tray Extension and Cover Removal."**

Note – See the figure which follows when removing IPI disk drive data connectors:



2. **Remove each of the IPI disk drive data cable connectors (two each drive) as well as the two connected to the tray at the inside rear of the unit.**

Replacement is the reverse of removal except, refer to Chapter 3, Figure 3-6, "Data Cabling in the Tray," for proper cable routing to disk drives and tray.

2.5 *Differential SCSI Disk Tray Subassembly*

▼ Tray Extension and Cover Removal

1. **Locate the tray with the subassemblies you will replace.**
2. **Face the rear of the cabinet and disconnect the power cord from the power receptacle at the rear of the Differential SCSI disk tray (see Figure 2-7).**

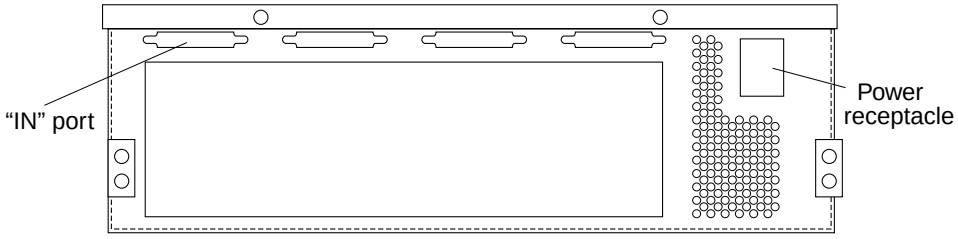


Figure 2-7 Drive Tray Power Receptacle and Ports

3. **Disconnect the SCSI data cable from the left-most "IN" port at the rear of the Differential SCSI disk tray (see Figure 2-8).**

4. **Unscrew four screws securing the tray to the left and right slide rails (Figure 2-8).**

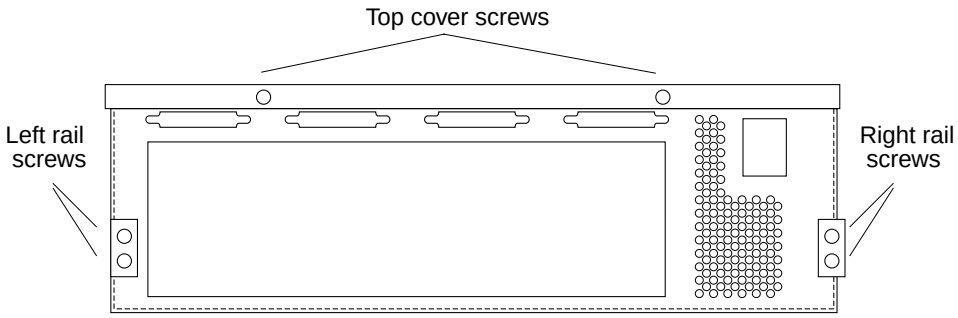


Figure 2-8 Removing the Screws at the Rear of the Tray

5. **Loosen 2 screws (tray rear) securing the top cover to the tray (Figure 2-8).**

6. **Face the cabinet front. Unscrew two Phillips head screws securing the side brackets at the front of the tray to the cabinet (Figure 2-9).**

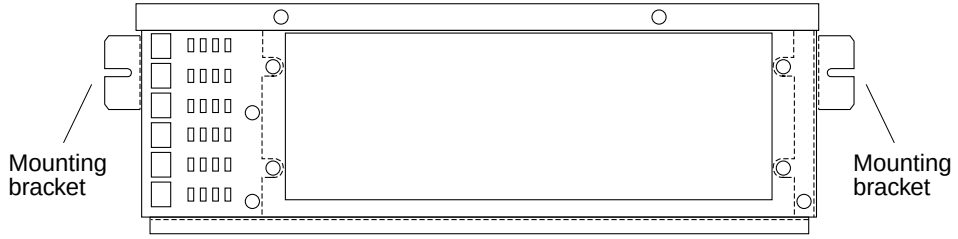


Figure 2-9 Removing the Tray Assembly in the Cabinet

7. **Extend the tray fully until the slide rail button clicks.**

8. **Loosen the remaining 8 top cover screws (3 at each side and 2 at the front).**

9. **Remove the cover from the tray and set it aside.**

2.5.1 Tray Subassembly

2.5.1.1 Power Supply

1. **Remove the three DC harness cables from the end of the power supply (Figure 2-10).**

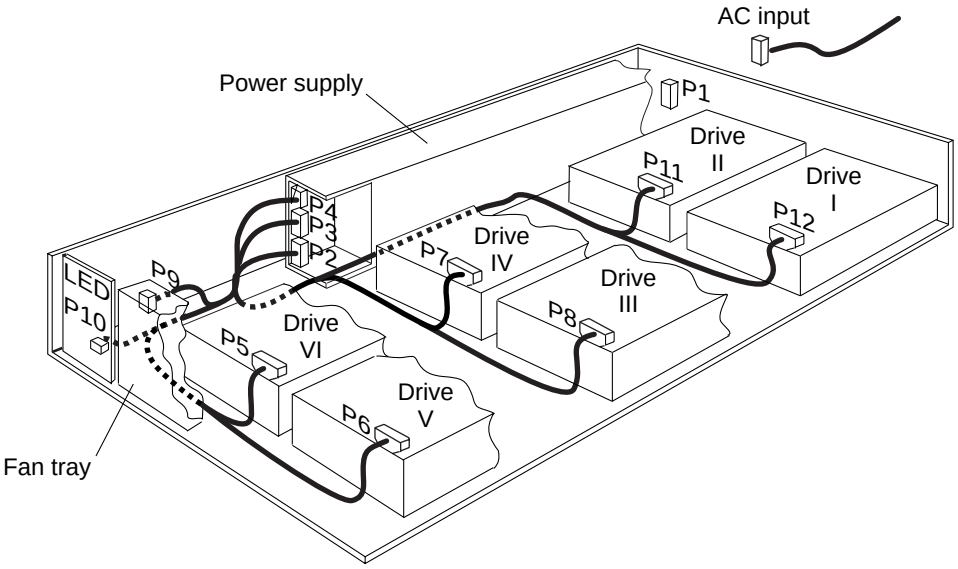


Figure 2-10 Unplugging the DC Harness Cable from the Power Supply

2. **Loosen four captive screws securing the power supply to the tray side.**
3. **Remove the power supply from the tray.**

Reverse the preceding steps to replace the power supply.

2.5.1.2 DC Harness Cable

1. **Remove the three DC harness cables from the end of the power supply (Figure 2-10).**
2. **Disconnect the DC harness cable from the LED/address board (Figure 2-10).**

3. **Disconnect the DC harness cable from the fan assembly.**
4. **Disconnect the DC harness cable from the "DC In" connector at the rear of the disk drive (see Figure 2-11).**

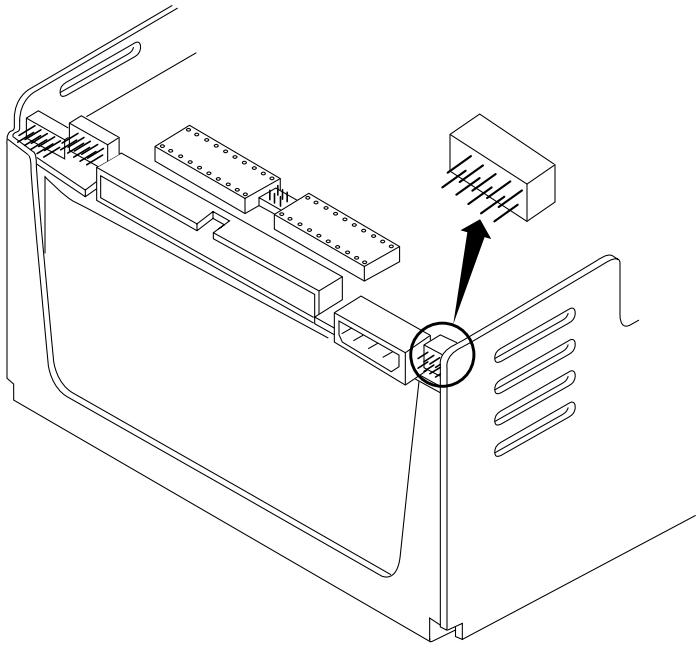


Figure 2-11 Location of Connectors on the 2.1 Gbyte Disk Drive

5. **Free DC harness cables from any cabling restraints. Remove the cables.**

Reverse the preceding steps to replace the DC harness cables. Refer to Figure 2-10 for the proper routing when reconnecting the DC harness cables to the drives and power supply.

2.5.1.3 Fan Assembly

1. **Disconnect the DC harness cable from the fan assembly (Figure 2-10).**
2. **Unscrew the four screws securing the fan assembly to the front of the tray.**
3. **Remove the fan assembly.**

Reverse the preceding steps to replace the fan assembly.

2.5.1.4 *LED/Address Board*

1. **Remove the fan assembly as described in Section 2.5.1.3, "Fan Assembly."**
2. **Disconnect the six LED/address cables from the rear of the LED/address board (Figure 2-12).**

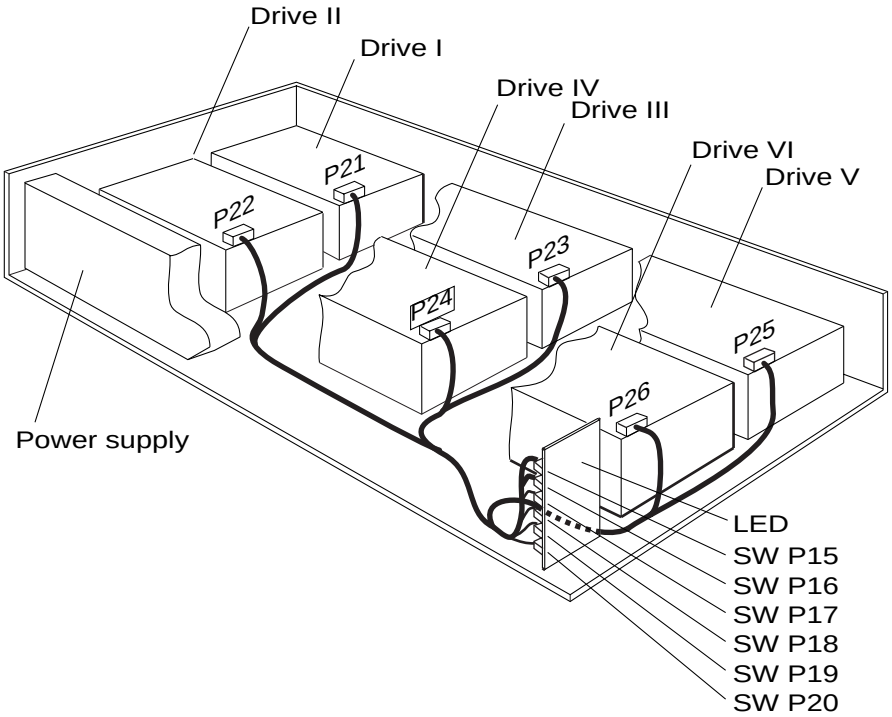


Figure 2-12 Disconnecting the LED / Address Cables

3. **Disconnect the DC harness cable (LED/address board rear — Figure 2-10).**

Caution – When removing the DC harness cable from the LED / address board, take care to first depress the plastic locking mechanism on top of the connector before removing the connector or you may damage the wiring.

4. **Unscrew three outside screws securing the LED/address board to the tray.**
5. **Remove the LED/address board by sliding it sideways away from the address switches.**
6. **Remove the standoffs from the LED/address board.**

Reverse steps above to replace the LED / address board. See Figure 2-12 for the routing when reconnecting LED / address cables to the LED / address board.

2.5.1.5 LED/Address Cable

1. **Disconnect the LED/address cable from the "LED/Address" connector on the 2.1 Gbyte disk drive (see Figure 2-11).**
2. **Separate the LED/address cable from the LED/address board (Figure 2-12).**

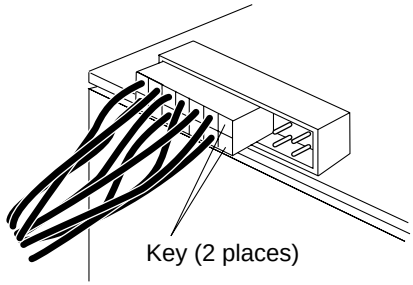


Figure 2-13 Disconnecting the LED / Address Cables

3. **Remove the LED/address cable.**

Reverse steps above to replace the LED / address board. See Figure 2-12 for the routing when reconnecting LED / address cables to the LED / address board.

Note – When reconnecting the LED / address cable to the disk drive, ensure the cable is positioned at the far left side of the LED / address connector and the keyed portion of the cable is on the right side (see Figure 2-13).

2.5.1.6 *Device Select Switch*

1. **Remove the LED/address board. Refer to Section 2.5.1.4, "LED/Address Board."**
   The rear portion of the switches should now be accessible.
2. **Remove the bottom two nylon sleeves.**
3. **As viewed from the front, release the plastic tab locking mechanism on the right-hand side of the device select switch.**
   The switch can now be positioned so the plastic tab locking mechanism on the left-hand side can be released easily.
4. **Release the plastic tab locking mechanism (device select switch, left side).**
5. **Remove the device select switch.**

Reverse the preceding steps to replace the device select switch.

2.5.1.7 *SCSI Data Cable*

1. **Locate the "SCSI Data" connector (2.1 Gbyte disk drive rear, Figure 2-11).**

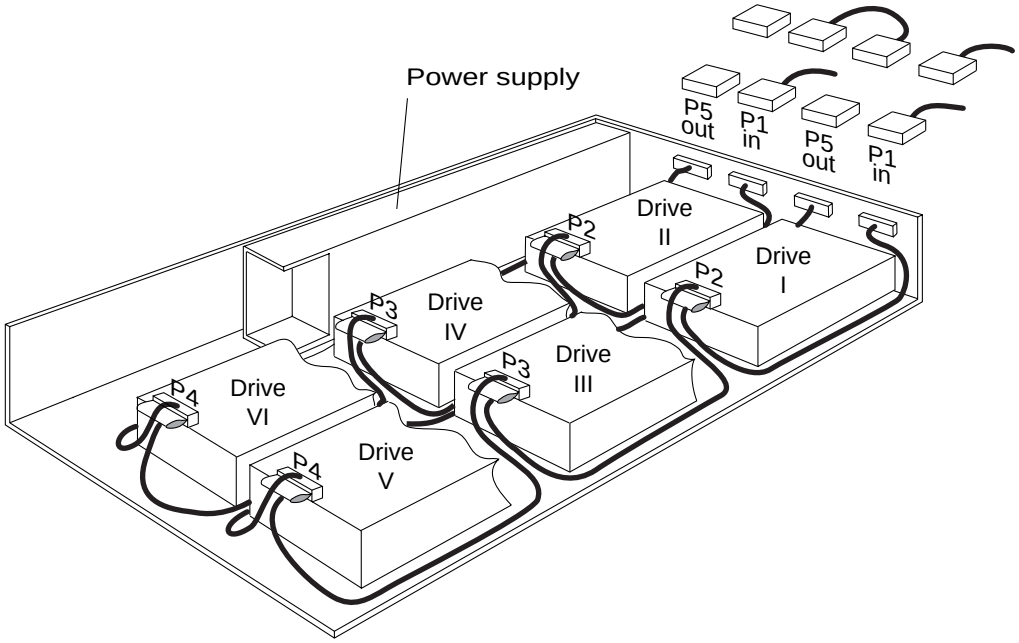


Figure 2-14 "SCSI Data" Connector Location on the Drive

2. Grasp the sides of the white plastic tab and slowly pull the SCSI data cable away from the disk drive (see Figure 2-15).

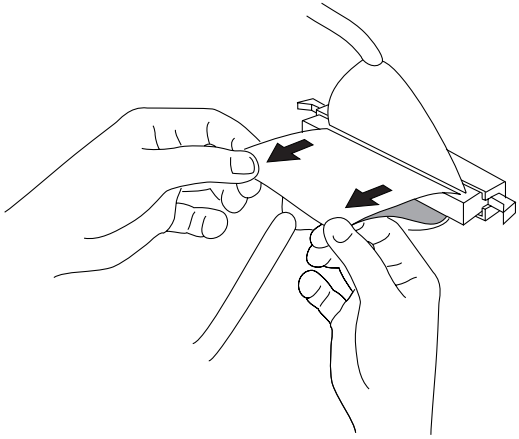


Figure 2-15 Disconnecting the SCSI Data Cable

3. **Unscrew two Phillips screws at the tray-rear securing the SCSI connector.**

4. **Remove the SCSI data cable.**

Reverse the preceding steps to replace the SCSI data cable. Refer to Figure 2-14 for the proper routing of the cable to the disk drives and the tray.

2.6 *Multi-tape Backup Tray Subassembly*

▼ Tray Extension and Cover Removal

1. **Face the rear of the cabinet and disconnect the power cord from the power receptacle at the rear of the Multi-Tape Backup Tray (see Figure 2-7).**

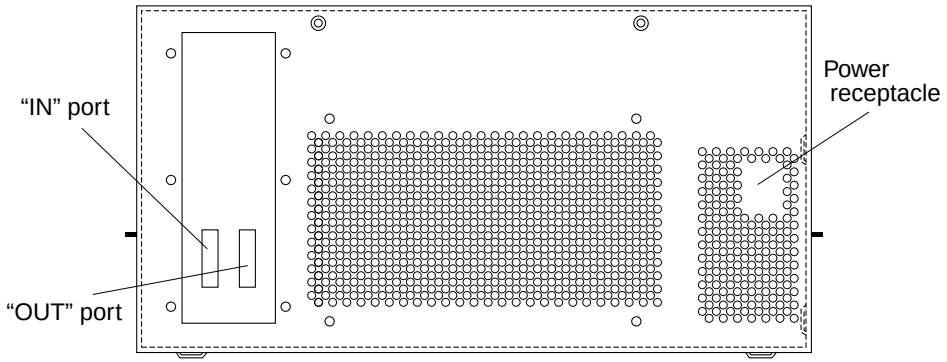


Figure 2-16 Multi-Tape Backup Tray Power Receptacle and Ports

2. **Disconnect the SCSI data cable from the IN port (tray rear — Figure 2-7).**

3. **Face the cabinet front. Unscrew two Phillips screws securing the side brackets at the tray front to the cabinet (Figure 2-9).**

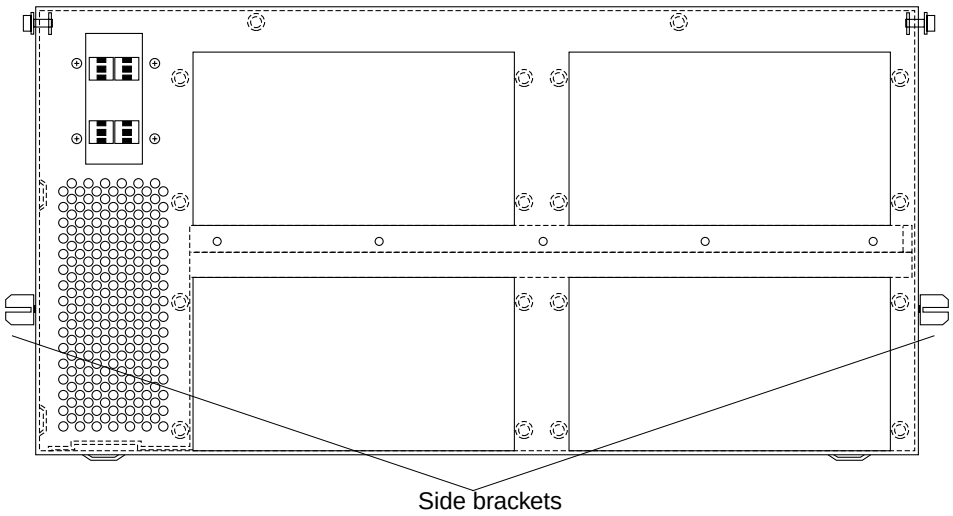


Figure 2-17 Removing the Tray Assembly in the Cabinet

4. **Fully extend the tray until the slide rail button clicks.**
5. **Use the flat-head screwdriver to loosen the ten top cover screws (three at each side and two at the front and back).**
6. **Remove the cover from the tray and set it aside.**

2.6.1 Tray Subassembly

2.6.1.1 Power Supply

1. **Face the front of the tray and push the SCSI ID select switches through the tray from the front.**
   This will allow you to remove the power supply.
2. **Unscrew four Phillips-head screws securing the power supply to the side of the tray (Figure 2-18).**

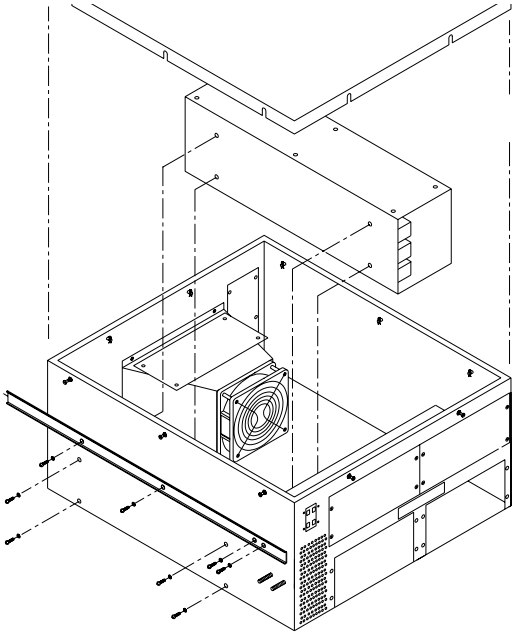


Figure 2-18 Replacing the Power Supply

3. Remove the power supply from the tray.

4. Disconnect 3 DC harness cables from the power supply end (Figure 2-19).

Reverse the preceding steps to replace the power supply.

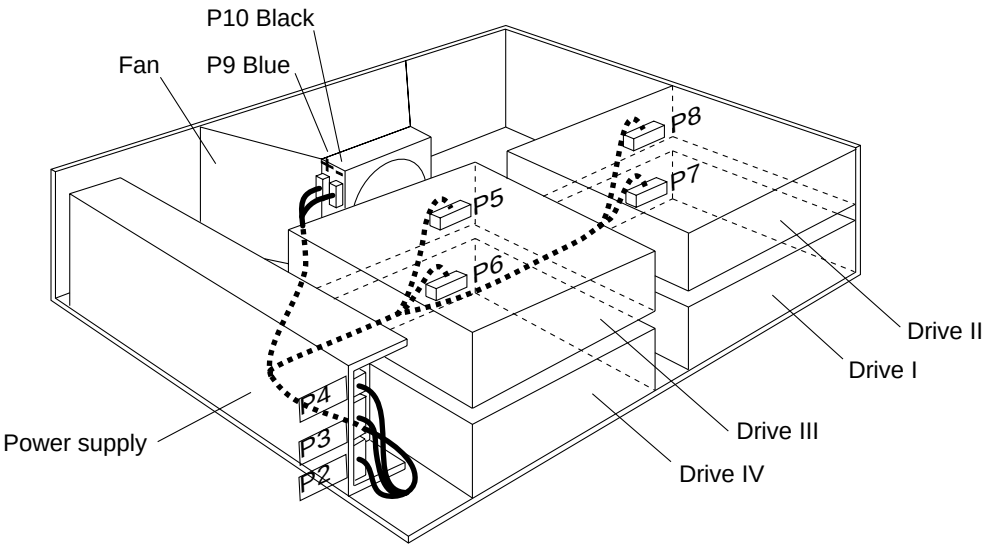


Figure 2-19 Disconnecting the DC Harness Cable from the Power Supply

2.6.1.2 DC Harness Cable

1. **Disconnect the DC harness cable from the power connector on the 5.0 Gbyte 8 mm tape drives (see Figure 2-20).**

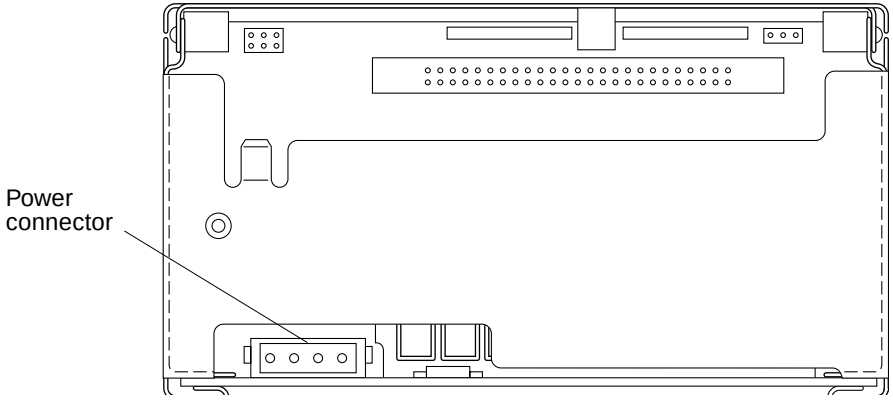


Figure 2-20 Power Connector Location on the Drive

2. **Disconnect the DC harness cables from the fan assembly (see Figure 2-21).**

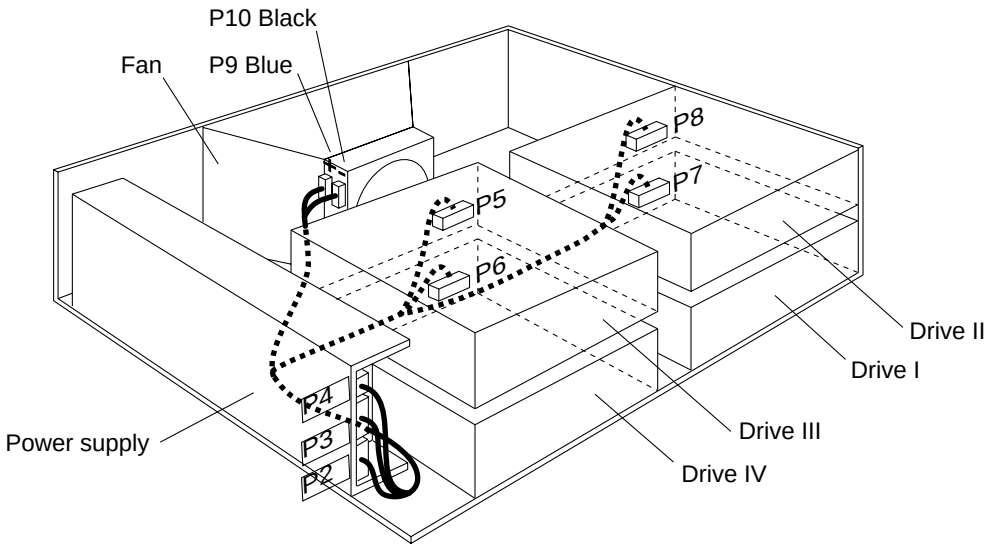


Figure 2-21 Power Cabling in the Tray

3. **Release the DC harness cables from the tie wraps at the base of the tray.**
4. **Remove the power supply. Refer to Section 2.6.1.1, "Power Supply."**
5. **Disconnect the DC harness cable from the power supply end (Figure 2-21).**

Reverse the preceding steps to replace the DC harness cables. Refer to Figure 2-21 for the proper routing when reconnecting the DC harness cables to the drives and power supply.

2.6.1.3 Fan Assembly

1. **Unplug the DC harness cables from the fan assembly (see Figure 2-21).**
2. **Use the 9 mm hex-head screwdriver to unscrew four screws securing the fan assembly to the tray rear (Figure 2-22).**

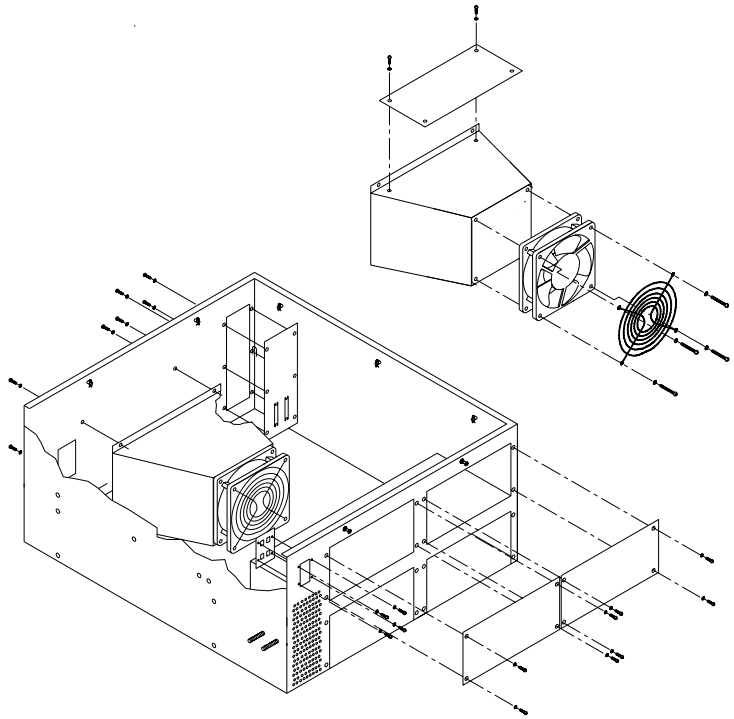


Figure 2-22 Replacing the Fan Assembly

3. **Remove the fan assembly from the tray.**
4. **Unscrew four Phillips screws securing the fan to the fan assembly (Figure 2-22).**
5. **Remove the fan from the fan assembly.**

Reverse the preceding steps to replace the fan assembly.

2.6.1.4 Address Cable and Device Select Switch

Note – If replacing the left address cable and device select switch, first remove the right address cable / device select switch to permit removing the left one.

1. **Disconnect the address cable from the SCSI ID connector on the 5.0 Gbyte 8 mm tape drive (see Figure 2-23).**

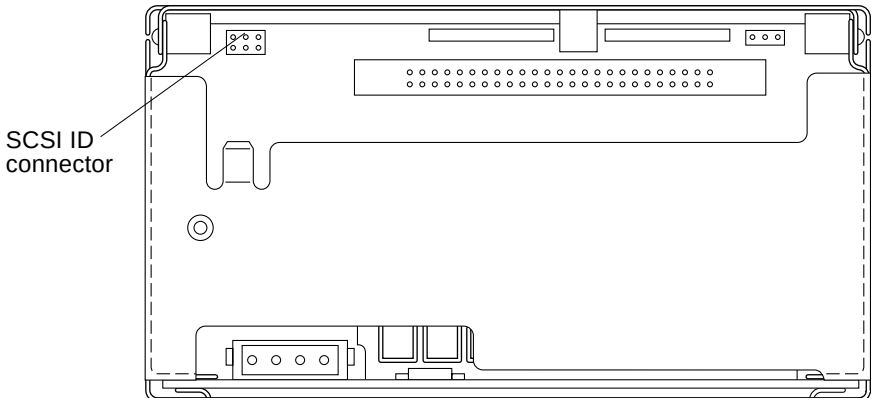


Figure 2-23 SCSI ID Connector Location on the Drive

2. Release the address cable from the tie wrap.

3. Face the tray-front. Push the switch through the face of the tray.

4. Remove the address cable from the tray.

Reverse steps above to replace the address cable and device select switch. Refer to Figure 2-24 for routing when connecting address cables to drives/switches.

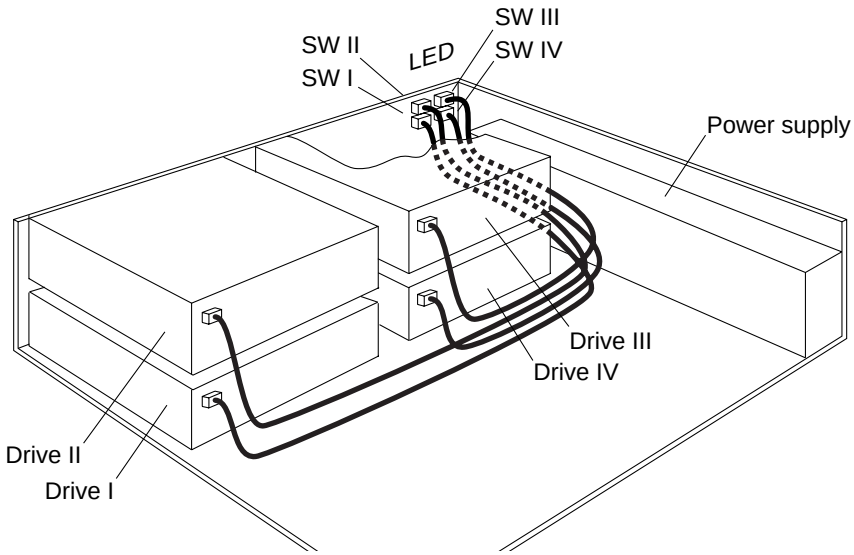


Figure 2-24 Address Cabling in the Tray

Note – When reconnecting the address cable, ensure the black wire is positioned in the lower right corner of the SCSI ID connector (Figure 2-25).

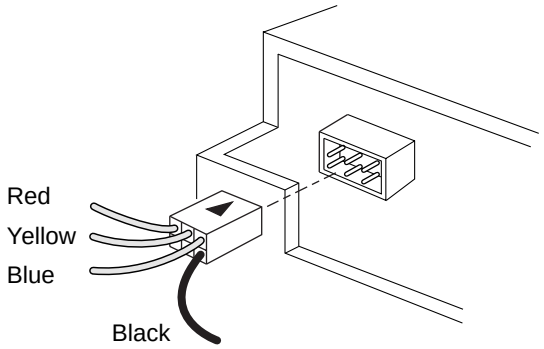


Figure 2-25 Positioning the Address Cable

2.6.1.5 SCSI Data Cable

1. Locate the SCSI connector (rear of the 8 mm tape drive, Figure 2-14).

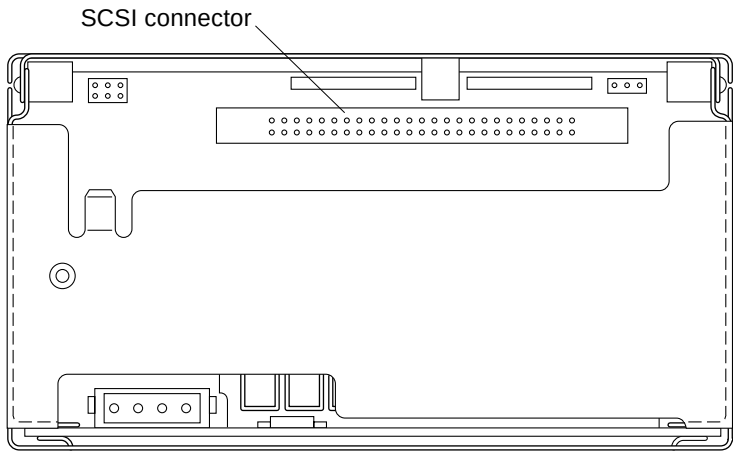


Figure 2-26 SCSI Connector Location on the Drive

2. Press out on the ejectors at the sides of the SCSI connector on the tape drive to release the SCSI data cable from the drive (see Figure 2-27).

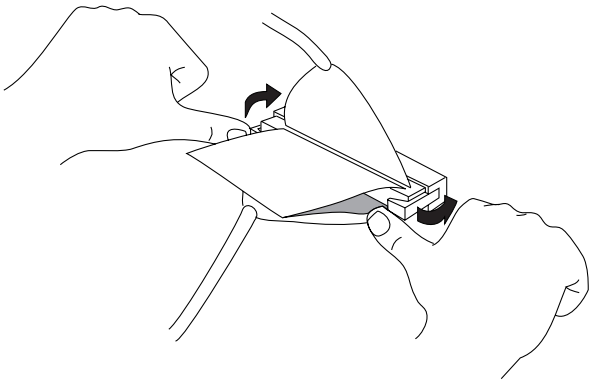


Figure 2-27 Releasing the Ejectors

3. Grasp the sides of the white plastic tab and slowly pull the SCSI data cable away from the tape drive (see Figure 2-15).

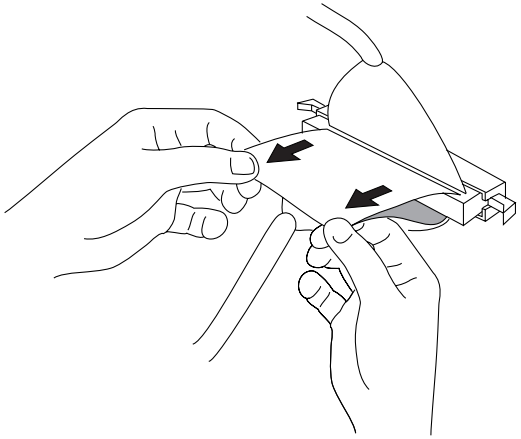


Figure 2-28 Disconnecting the SCSI Data Cable

4. Release the SCSI data cable from the tie wrap.

5. Use the Phillips screwdriver to unscrew the four screws at the rear of the tray that hold the two SCSI connectors to the tray.

6. Remove the SCSI data cable.

Reverse the preceding steps to replace the SCSI data cable. Refer to Figure 2-29 for the proper routing of the SCSI data cable to the tape drives and the tray.

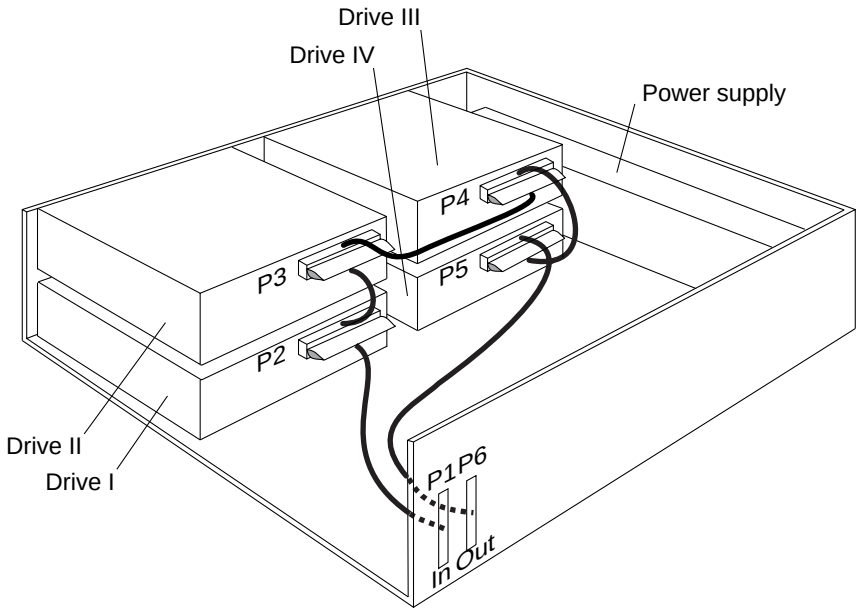


Figure 2-29 Data Cabling in the Tray

Mass Storage Device Removal and Replacement 3

Use this chapter to remove and replace existing mass storage devices. Refer to Appendix A for configuring 690MP SCSI devices in the SCSI tray (top of the cabinet); refer to Appendix B for configuring IPI disk drives. Devices covered are:

- Front load 1/2-inch tape
- IPI disk drives of the type
  - 1 Gbyte or 911 Mbyte
  - 1.3 Gbyte
- 1.0 Gbyte SCSI disk drives
- 2.1 Gbyte differential SCSI disk drives
- 8mm 5.0 Gbyte tape drives
- SCSI drives (SunCD supported tray)
- SCSI drives (SunCD not supported in tray)

As noted above, two types of IPI disk drive are currently used in the Data Center Cabinet. One type is the 1 Gbyte or 911 Mbyte drive configured two to a tray; the other is the 1.3 Gbyte drives configured up to four to a tray. Both types are included in the procedures that follow.

There are two types of SCSI tray:

- one type must be removed prior to servicing SCSI drives, and does not support SunCD
- the other type need not be removed to service drives and does support SunCD

3.1 Front-load 1/2-inch Tape Drive

▼ Removal

Caution – Always extend the cabinet anti-tilt bar when extending the tape drive on the slide rails.

1. **Ensure the system is gracefully shut down as described in Chapter 1.**
2. **Extend the anti-tilt bar.**
3. **Remove the rear panel. Refer to Chapter 1, Section 1.5.8 “Rear Panel.”**
4. **Disconnect the power cord(s) plugged into the power sequencer.**
5. **Disconnect any cables attached to the drive.**

Warning – The Front-load 1/2-inch Tape Drive weighs over 85 pounds. Two or more people are needed to lift the drive to prevent personnel injury or equipment damage.

6. **Open the door and pull the release handle on the front of the tape drive.**
7. **Push the detents along the sides of the drive tray and remove the drive from the unit.**

Note – The Phillips screws can be removed from the drive tray. Then, the drive can be rotated upwards to service it.

▼ Replacement

1. **The tape drive is provided with recessed built-in slides along the right and left sides of the unit. Slip the drive onto the slide rails until the rails engage with the catches on the drive’s slides. Once the drive is fully engaged on the side rails, it will slide easily back into the cabinet.**

2. **Verify the drive can slide completely forward. The drive extends in two stages. When pulled fully forward the drive latches in place. To release it, depress the center button on the side rails (use care not to catch your finger). Push on the drive, and it retracts.**

3. **Verify the terminating connector is correctly installed in the SCSI OUT port (rear of the drive). Push the pins in firmly and secure the latches.**

Note – The terminating connector must be installed on the drive to correctly terminate the SCSI cable in the cabinet. This action minimizes reflection and enables proper SCSI bus operation. Order external terminating connectors from the Sun Microsystems Spare Parts Price List (P/N 150-1407-01).

Note – Termination must be provided for the last device in a chain of SCSI devices. In the 56-inch Data Center Cabinet, the Front-load 1/2-inch Tape Drive is always the last device in a SCSI chain, so it must be terminated.

---

4. **Having ensured devices in the SCSI daisy chain are properly terminated, go to "Making SCSI Connections" and continue from there.**

3.1.1 Connecting Tape Drives in Data Center Cabinet

▼ Making SCSI Connections

Note – The single-ended SCSI requires a shielded cable, terminated and grounded to the shielded cable connector. The total cable length in a configuration, both external and internal, must not exceed six meters.

Caution – The tape drive is provided with a protective ground terminal. Always use a grounding type, 3-wire power cord. Power the drive from the power sequencer only, using the power cord provided.

---

1. **Determine the source for the SCSI cable connected to the Front-load 1/2-inch Tape Drive as follows:**

2. **For a 490:**

   a. **If only one tape drive is in the SCSI tray or the Front-load 1/2-inch Tape Drive is the only tape drive in the Data Center Cabinet, connect the first (or only) SCSI connector in the logic enclosure to the SCSI IN connector of the SCSI tray, then connect a cable between the tray SCSI OUT connector to the tape drive SCSI IN connector.**

   b. **If two tape drives are in the SCSI tray, connect the *second* SCSI connector (the one furthest from the CPU in the logic enclosure) to the Front-load 1/2-inch Tape Drive's SCSI IN connector.**

3. **For a 390 or 690MP, connections are the same with one exception, a terminator must be placed on the FLT's SCSI OUT connector.**

4. **Ensure all data cables are bundled together where possible, and that power cables are bundled together.**

Note – Route power and data cables separately to ensure FCC compliance as well as to prevent possible data errors from occurring.

---

5. **Connect one end of the AC power cord into the power inlet on the Front-load 1/2-inch Tape Drive rear; the other end into the power sequencer.**

6. **Apply power to the tape drive. Turn on the AC power switch located in the center of the back panel (*0* is off, *1* is on).**

7. **If replacing an FLT in SPARCserver 690MP, refer to Appendix A "SCSI Device Configuration in the SPARCserver 690MP" to set the SCSI address.**

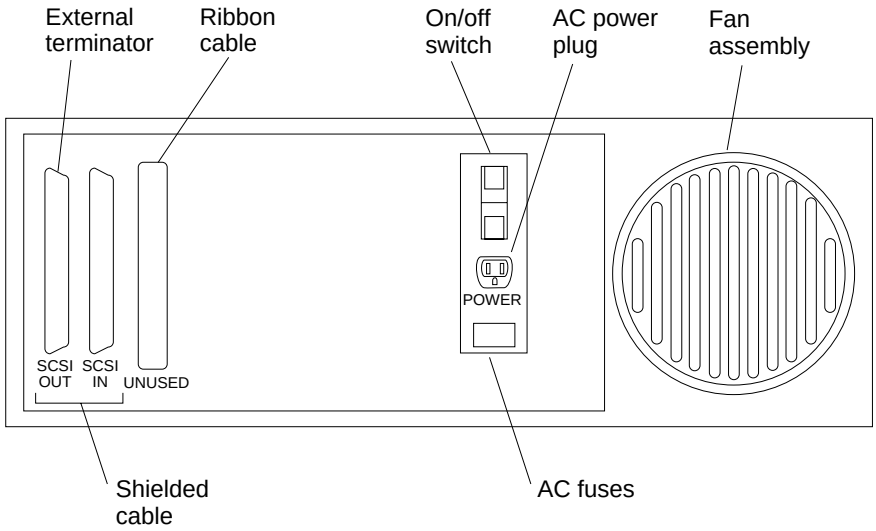


Figure 3-1 Back View of Front–Load 1/2–Inch Tape Drive

3.2 1 Gbyte and 911 Mbyte IPI Disk Drive

Note – These devices are contained in the 390, 490, or upgrades to 690MP only.

The 1 Gbyte and 911 Mbyte IPI disk drive assemblies include a drive, power supply, and a tray (sometimes referred to as the inner tray) in which the drive and power supply are mounted. This assembly is installed inside a selected mounting tray (sometimes referred to as the outer tray) inside the cabinet. The drive is installed in the mounting tray in the cabinet by sliding the drive assembly into the left or right half of the mounting tray (Figure 3-2).

Warning – The drives are extremely heavy, so you may want to remove them as single drives rather than as part of the two-drive tray. Ensure the anti-tilt bar is extended before attempting to remove the trays or drives.

▼ Removal

1. **Fully extend the anti-tilt bar.**

2. **Gracefully power down the system as described in Chapter 1.**
3. **Remove the front panel and bezels. Refer to Chapter 1, Section 1.5.3, "Vented Front Panel."**
4. **Remove the rear panel. Refer to Section 1.5.8, "Rear Panel."**
5. **Refer to Figure 3-3 and locate two cables connected to the drive assembly; the power- and signal cables. Carefully unplug both cables from the drive assembly. If the drive being removed is not being replaced, secure the freed power cable to a vertical bar on the power bus side of the cabinet.**

Caution – Take great care if moving a drive while still connected to its power and signal cables. Cables are short and must not be stretched or pinched.

6. **The inner tray's rear securing mechanism includes a spring-loaded pin as depicted in Figure 3-4. While holding up this pin, slowly push the drive assembly out of the securing mechanism.**
7. **To avoid an instability problem, do not push the drive more than four inches away from the mechanism. It is not secured in any way to the outer tray, and can fall out if the cabinet becomes unbalanced.**
8. **From the cabinet front, carefully slide the drive assembly out the front of the outer tray. Carefully set the assembly on a workbench or strong table.**

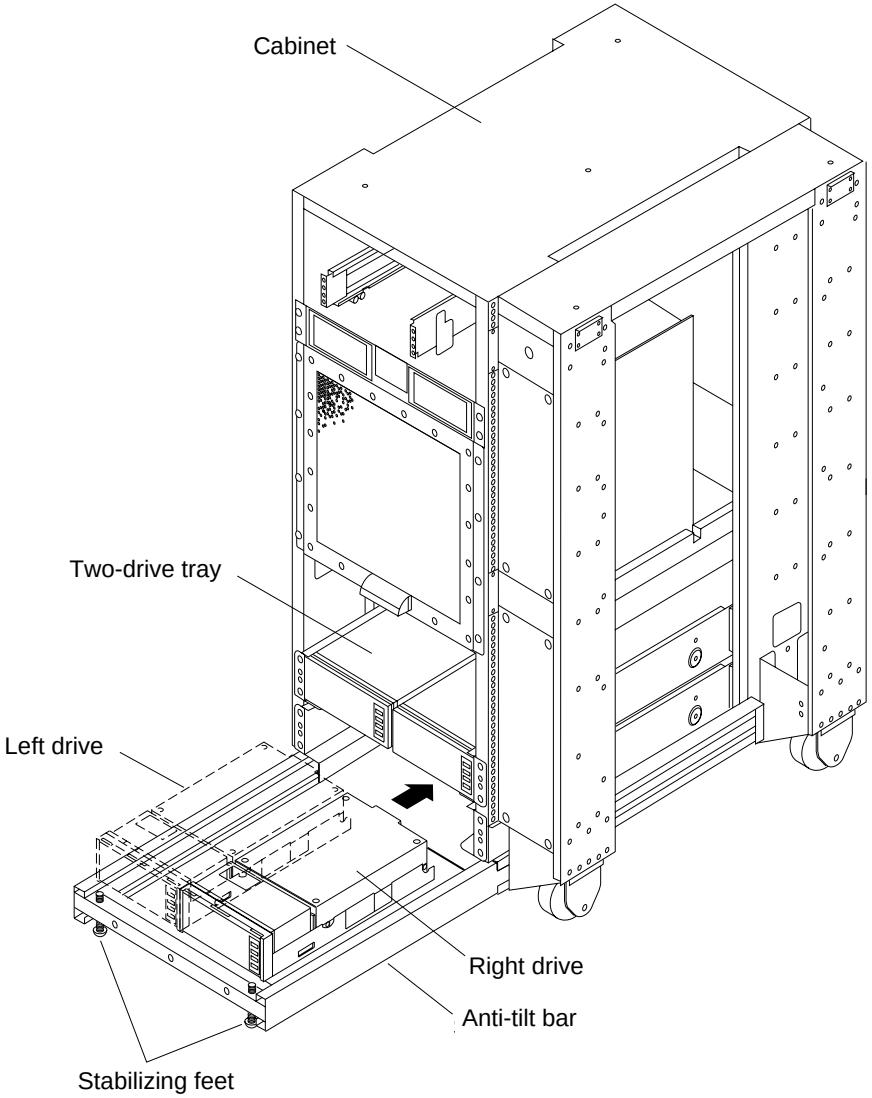


Figure 3-2 1 Gbyte & 911 Mbyte IPI Disk Drive Removal and Replacement

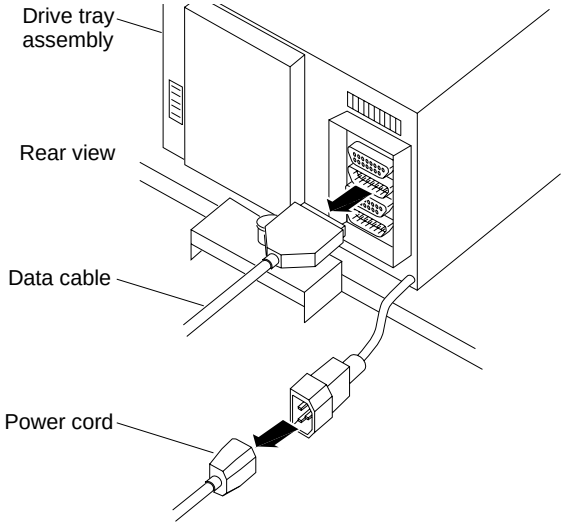


Figure 3-3 1 Gbyte and 911 Mbyte IPI Disk Drive Data and Power Connection

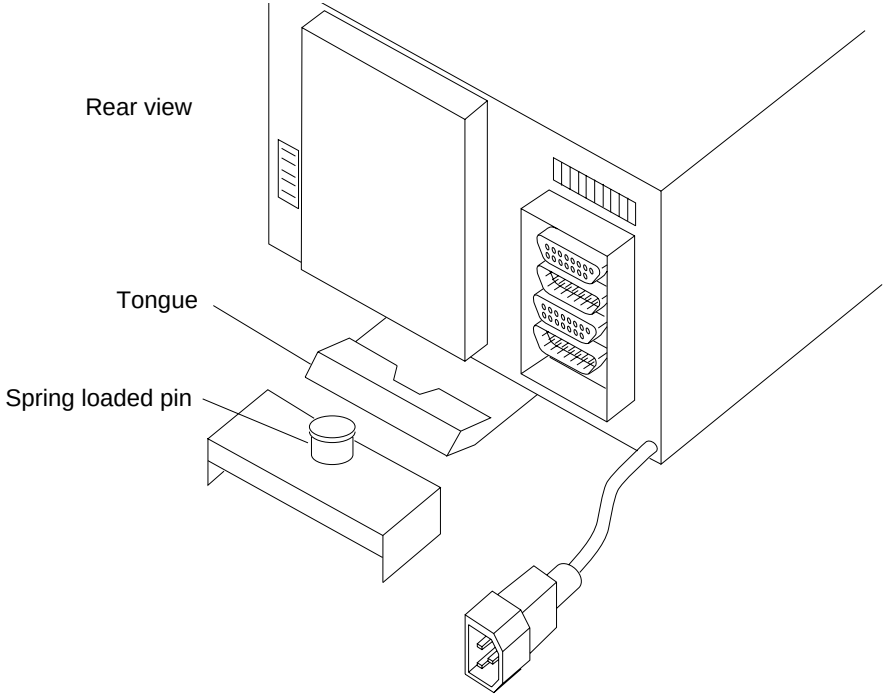


Figure 3-4 1 Gbyte and 911 Mbyte IPI Disk Drive Parts

▼ Replacement

1. **Ensure the tray anti-tilt bar is extended.**
2. **Verify the assembly power supply voltage select switch is set to 230 V.**
3. **Carefully lift one disk drive assembly until level with the selected tray.**
4. **Slowly slide the drive assembly into the selected outer tray. When the drive assembly is nearly in, you will feel a resistance to further sliding.**
5. **Ensure the drive assembly is set fully against either the right or left side of the outer mounting tray. Slide the drive assembly the rest of the way in. When the drive assembly is fully in, you will normally hear a click. This is the outer tray's rear lock engaging the notch in the rear of the inner tray.**
6. **Verify the folded metal on the front bottom of the inner tray has fully engaged the metal lip on the front of the mounting tray. Tug on the drive to verify the rear lock is properly engaged.**
7. **Repeat Steps 2-6 for each drive to be installed.**
8. **Rotate the feet supporting the anti-tilt bar counterclockwise until fully retracted. Slide the anti-tilt bar back into the cabinet.**

3.3 1.3 Gbyte IPI Disk Drive

Use this section to remove and replace existing disk drives.

▼ Removal

1. **Ensure the system is gracefully shut down as covered in Chapter 1 and that the cabinet power cable is disconnected.**
2. **Extend the anti-tilt bar.**
3. **Remove the front panel & bezels. See Section 1.5.3, "Vented Front Panel."**
4. **Remove the rear panel. Refer to Section 1.5.8, "Rear Panel."**
5. **Move to the cabinet rear. Disconnect power and data cables from the tray.**
6. **Loosen the two captive screws securing the tray cover at the unit rear.**

7. **Unscrew the four (two each side) screws securing the tray to the cabinet slide rails as depicted in Figure 3-5, Detail A, Rear View.**

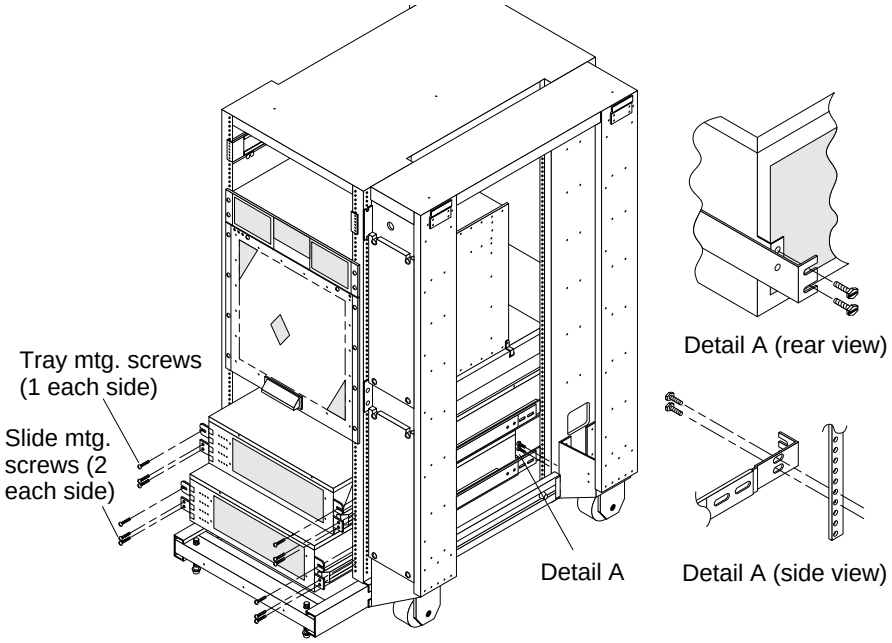


Figure 3-5 Securing the Slide Rails and Tray Assembly in the Cabinet

8. **Move to the front of the cabinet and unscrew the two screws securing the tray to the cabinet (see Figure 3-5).**

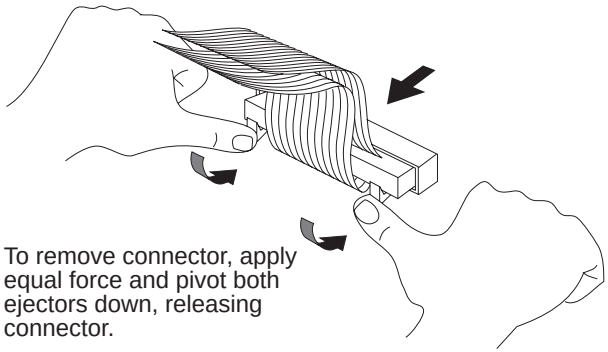
Warning – A four drive tray can weigh more than 70 pounds.

9. **Slide the tray out to the fully extended latched position.**

Caution – To accomplish the next step of removing the cover it may be necessary to extend the tray past the latched position by depressing the slide rail locking mechanism. If the tray is so extended, use extreme caution.

10. **Loosen the remaining top cover captive screws and remove the cover.**

Note – See the figures below when removing drive data connectors.



11. **Remove the data, power, and address switch cables from the drive.**
12. **Loosen the two captive screws securing the drive to the bottom of the tray.**
13. **Ground yourself with a wrist strap. Prepare to remove the drive; slide it towards the power supply to free the opposite end from lip-retainers.**
14. **Using the handle, raise drive free and remove from tray.**

▼ Replacement

1. **Use the drive handle located at the middle of the unit to position the 1.3 Gbyte IPI drive in the tray such that the two captive screws can be tightened to secure the drive to the bottom of the tray.**
2. **Connect the data cables to the drive (see Figure 3-6).**

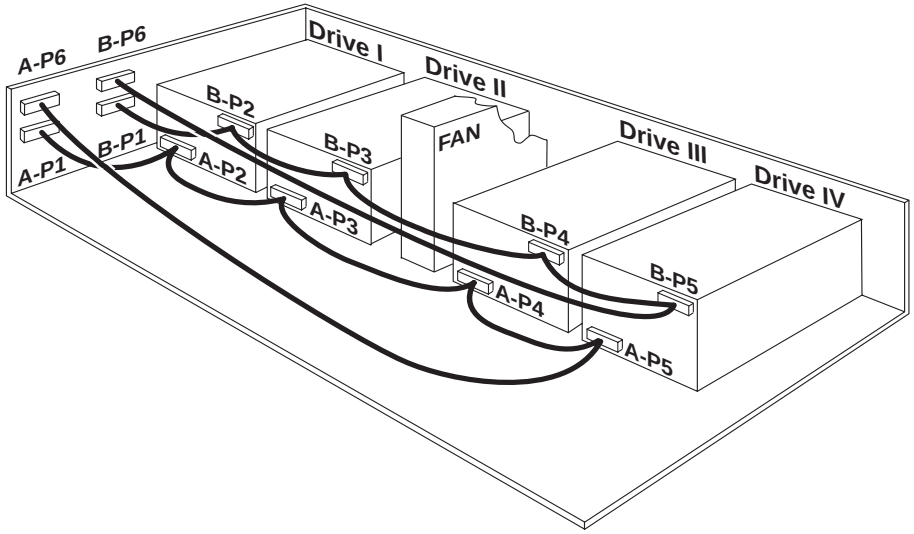


Figure 3-6 Data Cabling in the Tray

Note – To connect the cables to the drive, pivot the connector latches up to lock the connector into place (see Figure 3-7).

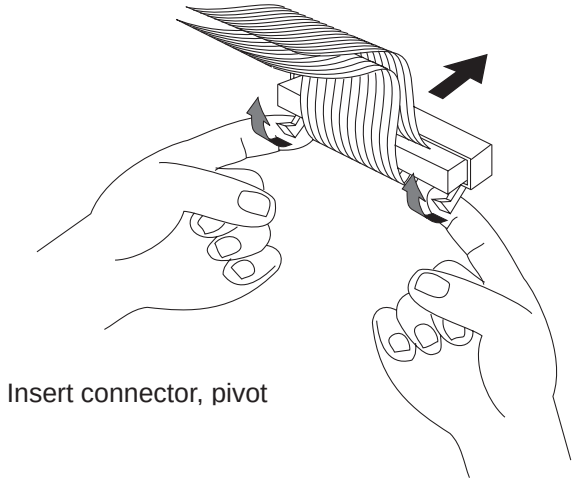


Figure 3-7 Proper Connecting Procedure

3. Connect the power cable to the drive (see Figure 3-8).

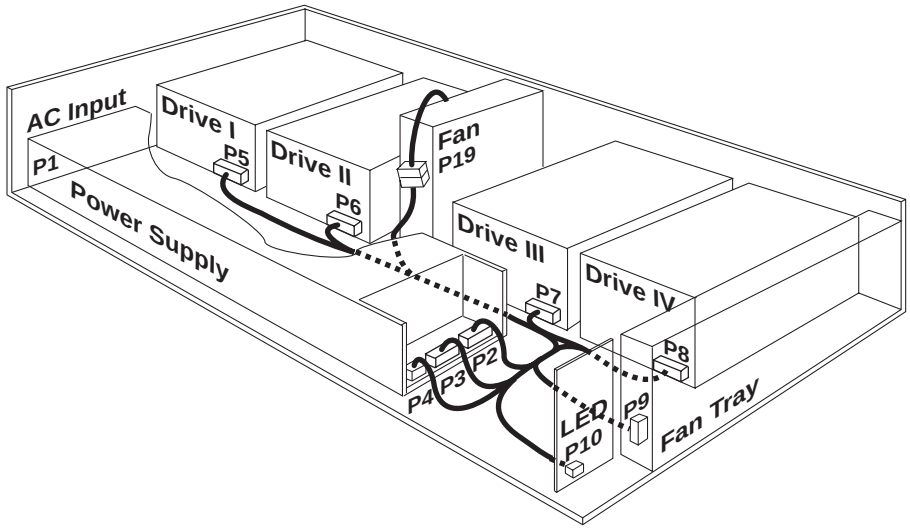


Figure 3-8 DC Harness Cabling in the Tray

4. Connect the address switch cables to the drive (see Figure 3-9).

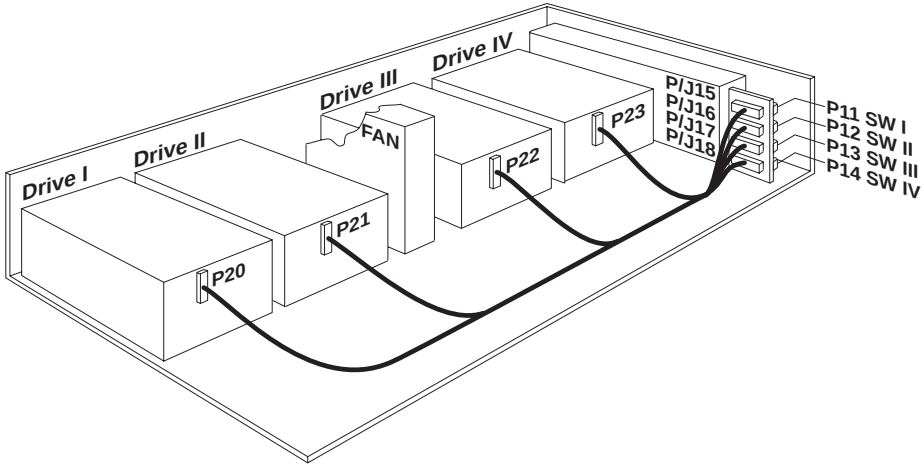


Figure 3-9 LED / Address Cabling in the Tray

5. Replace the top cover.

6. **Screw in the eight top cover screws accessible from the front of the tray.**
7. **Fully slide the tray back into the cabinet.**
8. **Screw in the two screws that secure the front of the tray to the cabinet.**
9. **At the cabinet rear, screw in two screws securing the top cover at the tray rear.**
10. **Screw in the four screws that secure the back of the tray to the slide rail.**
11. **Connect power cables to the power receptacle at the tray rear (Figure 3-10).**
12. **Connect the data cable to the IN connector on Port A at the tray rear (Figure 3-10).**

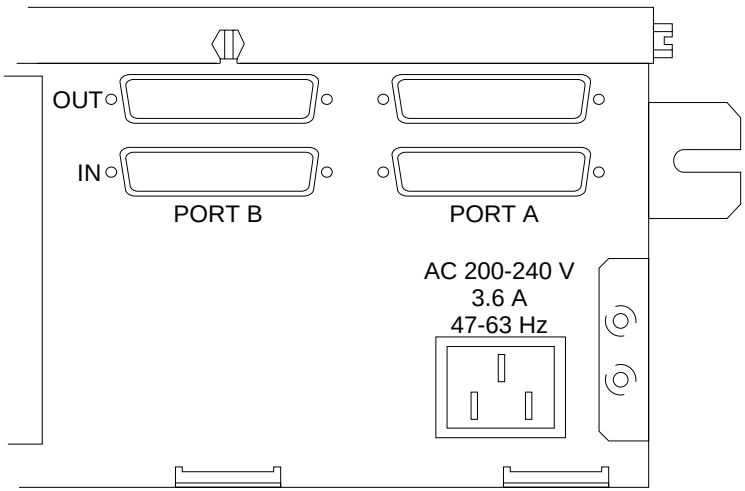


Figure 3-10 I.3 Gbyte IPI Tray Power and Data Connectors

13. **Refer to Appendix B, "1.3 Gbyte IPI Device Configuration in the SPARCserver 690MP" to set the IPI address for the drive.**

3.4 Tray — SCSI Drive

Note – Two types of SCSI tray available. One has a terminating connector holder at the center of the rear of the tray, and supports SunCD; the other has no holder and does not support SunCD. In addition, drive removal and replacement differs for each tray type. Ensure you refer to the appropriate section for the SCSI tray type installed in the server system you are servicing.

▼ Checking the Tray for Terminating Connector Holder

1. **Remove the cabinet rear panel. First, remove two screws securing the panel to the frame. Then pull the panel away from the cabinet.**
2. **Look at SCSI tray rear. See if it has a holder for a terminating connector at the center. This holder consists of two standoffs labeled Terminator Storage. (If the terminator connector is in its holder, the label is covered.)**

Note – If the SCSI tray lacks this holder, follow alternative instructions covered in the Section 3.4.2 “SCSI Drive (No Terminating Connector Holder)” for the procedure. If the tray has this holder, continue with the next section.

3.4.1 SCSI Drive (Terminating Connector Holder Present)

1. **At the cabinet front, remove the higher vented panels (the lowest vented panel can remain). Grasp the panel outer edge and pull towards yourself.**
2. **Open the door panel which covers the Front-load 1/2-inch Tape Drive.**
3. **Proceed to the procedure below that applies to the drive being replaced.**

3.4.1.1 SunCD or Combined 1/4-inch/SunCD

Note – There are four possible configurations for the right hand bay of the SCSI tray: 1/4-inch / lower blank filler panel, combined 1/4-inch / SunCD, SunCD / upper blank filler panel, or two Sun CDs.

1. **For a drive/blank panel refer to Figure 3-11; for a combined drive refer to Figure 3-12. Remove four slotted mounting screws that secure one of the configurations listed in the preceding note, to the front of the SCSI tray. Retain any blank filler panel for replacement with the new drive.**
2. **Slide the drive(s) from the tray such that the DC harness and drive ribbon cable(s) can be disconnected from the drive(s) inside the SCSI tray.**

Note – Always mount the 1st SunCD drive (or SunCD / 1/4-inch tape combined module) **on the right side of the tray with the CD on the bottom.**

---

3. **Disconnect the SunCD ground connection from the mounting bracket.**
4. **Remove four screws (two each bracket) securing the drive mounting brackets to the drive being replaced.**
5. **Configure the drive as indicated in Appendix A, "SCSI Device Configuration in the SPARCserver 690MP."**
6. **Mount the replacement drive to the drive mounting brackets using screws removed in Step 3. When attaching the drive mounting brackets ensure:**

- The short portion of the bracket faces forward and outward on each side of the drive.
- Each bracket's top and bottom edge is flush with the drive top and bottom.
- You use two screws per side, per drive, to attach each mounting bracket.

7. **Connect the SunCD ground to the drive mounting bracket.**
8. **Extend the ribbon cable from inside the SCSI tray and attach it to the drive(s) data connector(s). The red stripe on the ribbon cable must be on the same side as pin 1 of the connector on the drive(s).**
9. **Connect the DC harness inside the tray to the power connectors on drives.**
10. **Slide the drive(s) into the SCSI tray.**
11. **Attach the drive(s), and if required, the blank filler panel, to the SCSI tray by fastening four M4 slotted screws. The vented panel in the middle of the front of the SCSI tray goes under the screw flange of the drive.**

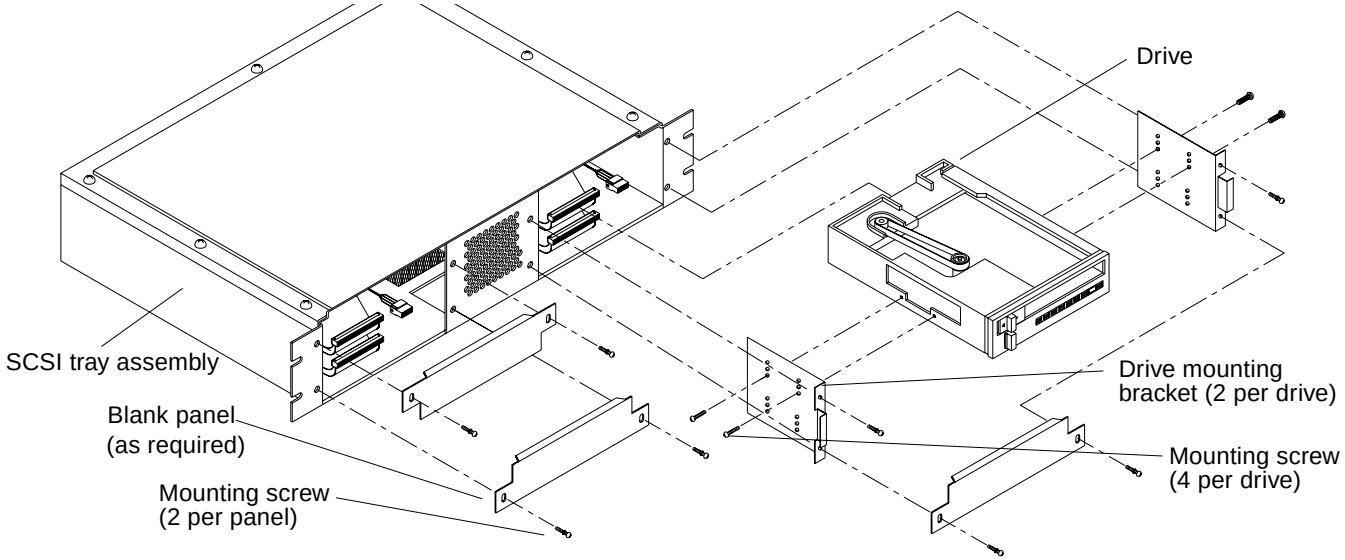


Figure 3-11 Drive/Blank Panel Removal and Replacement

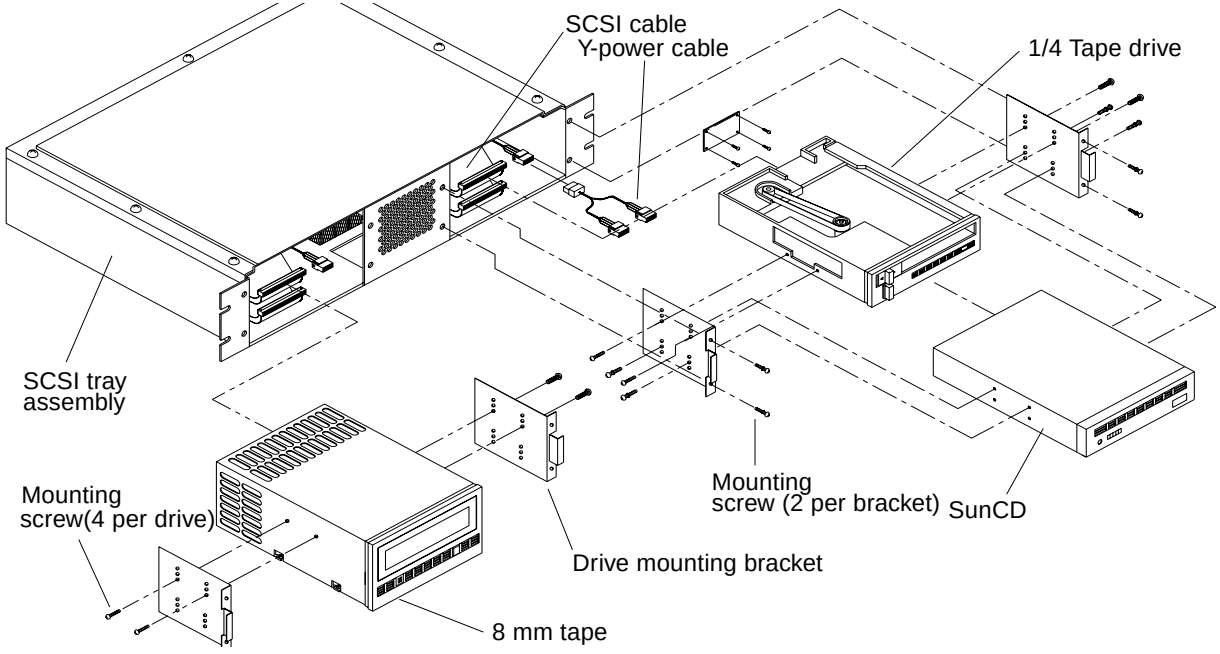


Figure 3-12 Combined Drive/ 8 mm Tape Removal and Replacement

3.4.1.2 8 mm Tape

Note – If there are two 8 mm drives they may be placed in the left and right bays of the SCSI tray. However, if there is only one drive and a 1/4-inch tape drive then the 8 mm Tape must go in the left bay of the tray.

1. **Remove four slotted screws securing the drive to the SCSI tray front.**
2. **Slide the drive from the tray such that the DC harness and drive ribbon cable are exposed.**
3. **Disconnect the DC harness and then unsnap the ferrite clamp (if applicable) from the drive ribbon cable. Disconnect the ribbon cable.**
4. **Remove the two screws that secure the drive mounting brackets to the drive being replaced. Save the screws for the new drive.**
5. **Configure the drive as indicated n Appendix A, "SCSI Device Configuration in the SPARCserver 690MP."**
6. **Attach the earred mounting brackets to each side of the new drive. When attaching the mounting brackets, ensure:**

- The short portion of the bracket faces forward and outward on each side of the drive.
- The top and bottom edge of each bracket is flush with the top and bottom of the tape drive.
- Use two conductive screws per side, per drive, to attach each bracket.

Note – The replacement drive has a ferrite bracket assembly mounted on the rear. Ensure it is properly attached to the drive ribbon cable per steps below.

7. **Open the ferrite clamp on the replacement drive. Then extend the drive ribbon cable from inside the tray so the ribbon connector can be grasped and both connector input and output cabling routed through the clamp. Do not close clamp at this time.**

Note – The pin 1 orientation on the 8 mm drive is opposite that of the SunCD and the 1/4-inch tape drives.

8. **Connect the drive ribbon cable to the drive and then close the clamp until an audible “click” is heard ensuring positive latching.**
9. **Connect the DC harness cable to the drive power connector.**
10. **Slide the drive into the SCSI tray.**
11. **Attach the drive to the SCSI tray by fastening four M4 slotted screws. The vented panel in the middle of the front of the SCSI tray goes under the screw flange of the drive mounting brackets.**

3.4.2 SCSI Drive (No Terminating Connector Holder)

▼ Removal

1. **Remove the SCSI tray from the cabinet. Refer to Chapter 4, Section 4.2, “SCSI Tray (No terminating Connector Holder).”**
2. **Inside the SCSI tray, disconnect the ribbon and DC harness cables from the rear of the drive.**
3. **Remove four screws securing the tape drive to the SCSI tray.**
4. **Remove the drive from the SCSI tray.**

▼ Replacement

1. **Configure the drive according to the instructions in Appendix A.**
2. **Align the four mounting holes in the bottom of the drive with the corresponding holes in the bottom of the SCSI tray.**
3. **Use four screws to fasten the drive to the SCSI tray.**
4. **Connect the ribbon cable inside the SCSI tray to the drive’s data connector. The red stripe on the ribbon cable must be on the same side as pin 1 of the connector on the tape drive.**
5. **Connect the DC harness to the drive inside the drive tray.**

Install the SCSI tray into the cabinet as indicated in Chapter 4 in Section 4.2, “SCSI Tray (No Terminating Connector Holder).”

3.5 2.1 Gbyte Disk Drive

▼ Removal

1. **Ensure the system is gracefully shut down as covered in Chapter 1 and that the cabinet power cable is disconnected.**
2. **Extend the anti-tilt bar.**
3. **Remove the rear panel. Refer to Chapter 1, Section 1.5.8 “Rear Panel.”**
4. **Remove the front panel and bezels. Refer to Chapter 1, Section 1.5.3, “Vented Front Panel.”**
5. **Face the cabinet rear. Detach the power cord from the tray (Figure 3-13).**

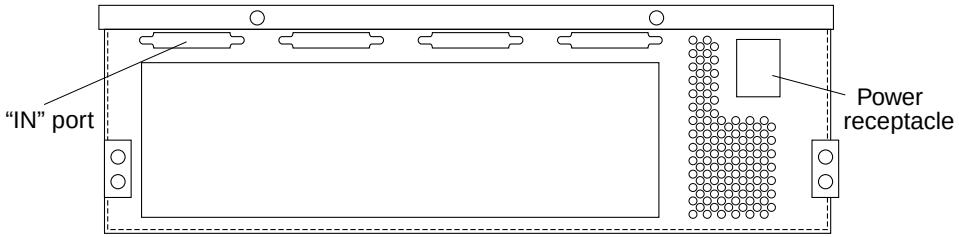


Figure 3-13 Drive Tray Power Receptacle and Ports

6. **Disconnect the SCSI cable from the left-most “IN” port (Figure 3-14).**
7. **Unscrew 4 screws securing the tray to left & right slide rails (Figure 3-14).**

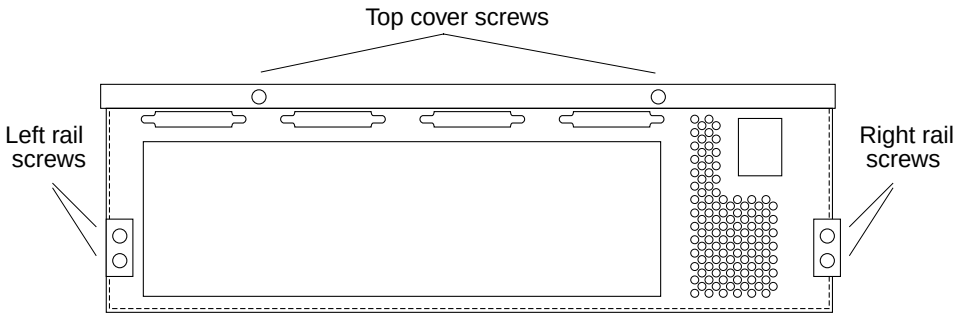


Figure 3-14 Removing the Screws at the Rear of the Tray

8. **Loosen the two screws at the rear of the tray that secure the top cover to the tray (see Figure 3-14).**

9. **At the cabinet front, unscrew two screws flat-head screws securing the mounting brackets at the sides of the tray to the cabinet (Figure 3-15).**

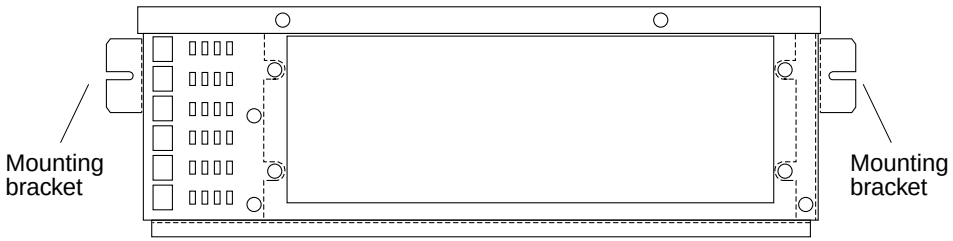


Figure 3-15 Removing the Screws at the Front of the Tray

10. **Extend the tray fully until the slide rail button clicks.**

11. **Loosen the remaining eight top cover screws (3 at each side; 2 at the front).**

12. **Remove the cover from the tray and set it aside.**

13. **Unplug the address cable from the LED/address connector at the rear of the 2.1 Gbyte disk drive (see Figure 3-16).**
    Grasp the address cable connector on both sides and firmly, but gently, pull the cable away from the LED/address connector on the 2.1 Gbyte disk drive.

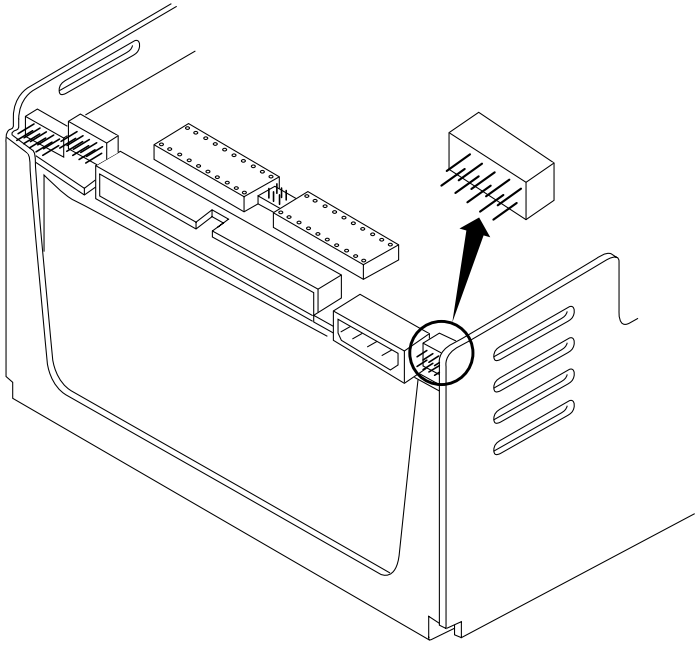


Figure 3-16 Connector Locations on the 2.1 Gbyte Disk Drive

14. **Unplug the SCSI data cable from the SCSI data connector at the rear of the 2.1 Gbyte disk drive (see Figure 3-16).**
    Grasp the SCSI cable connector by the attached strain relief tab. Firmly, but gently, pull the cable away from the drive SCSI data connector (Figure 3-17).

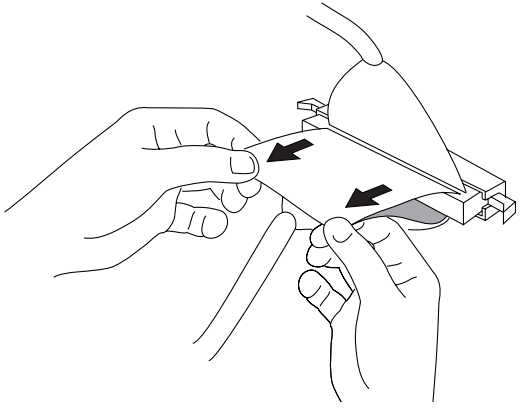


Figure 3-17 Disconnecting the SCSI Data Cable

15. **Unplug the power cable from the DC In connector at the rear of the 2.1 Gbyte disk drive (see Figure 3-16).**
    Grasp the power cable connector on both sides and firmly, but gently, pull the cable away from the DC In connector on the 2.1 Gbyte disk drive.
16. **Loosen three captive screws securing the drive to the bottom of the tray.**
17. **Use the handle to raise the drive free and remove it from the tray.**
18. **Unscrew the four screws that hold the drive and plastic strap to the mounting bracket (see Figure 3-18).**

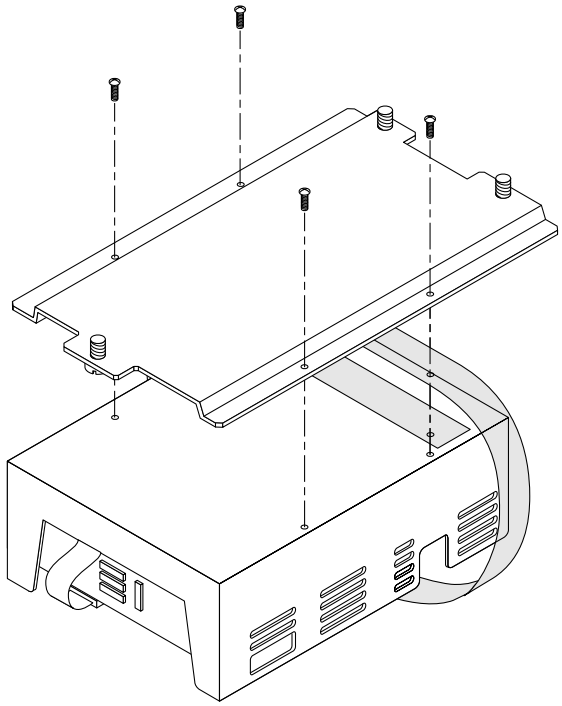


Figure 3-18 Removing the Mounting Bracket from the Drive

▼ Replacement

1. **Get the mounting bracket from the shipping kit.**
2. **Place the 2.1 Gbyte disk drive on top of the mounting bracket, with the drive front facing the mounting bracket area with one lip (Figure 3-19).**

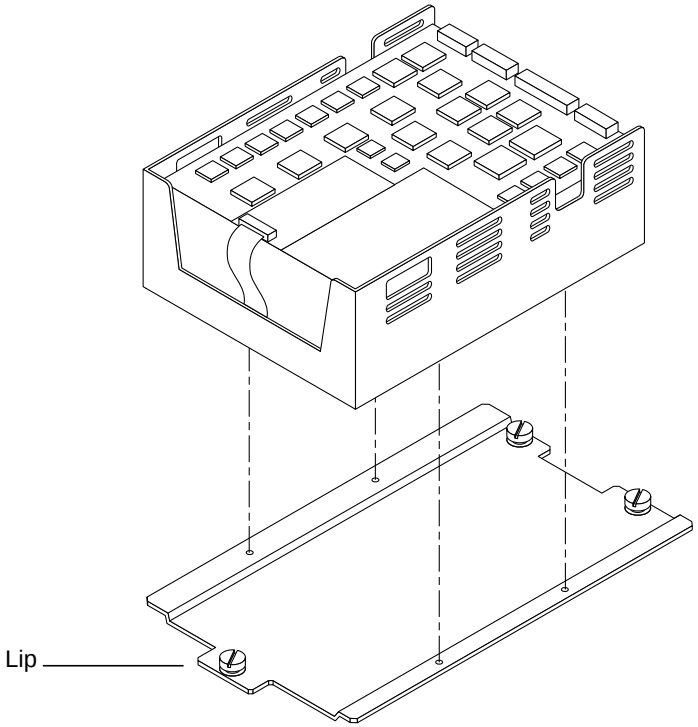


Figure 3-19 Placing the Drive on the Mounting Bracket

3. **Align the mounting holes at the bottom of the drive with those in the mounting bracket (Figure 3-19).**
4. **Get the plastic strap from the shipping kit.**
5. **Form the plastic strap into an oval such that the holes overlap (see F).**

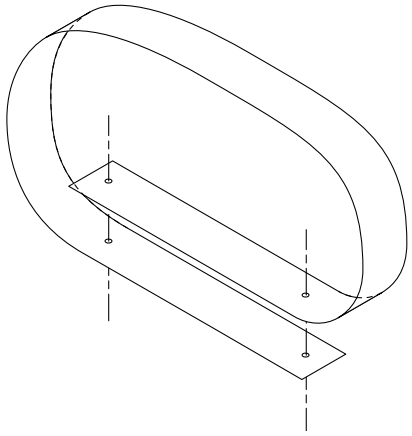


Figure 3-20 Aligning the Holes of the Plastic Strap

6. **Press the strap ends together so strap adhesive maintains hole alignment.**
7. **Slide the strap between the drive and the bracket so the holes of the strap, drive and bracket are all aligned (Figure 3-22).**

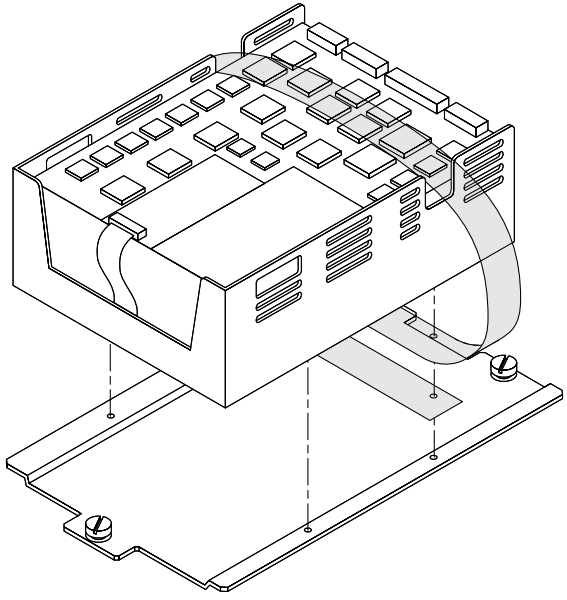


Figure 3-21 Aligning the Holes of the Drive, Strap and Bracket

8. **Align strap holes with holes at the bottom of the drive and mounting bracket closest to the rear of the mounting bracket (see Figure 3-22).**

9. **Use the Phillips screwdriver to screw in the four 6-32 screws to secure the drive and the plastic strap to the mounting bracket (see Figure 3-22).**

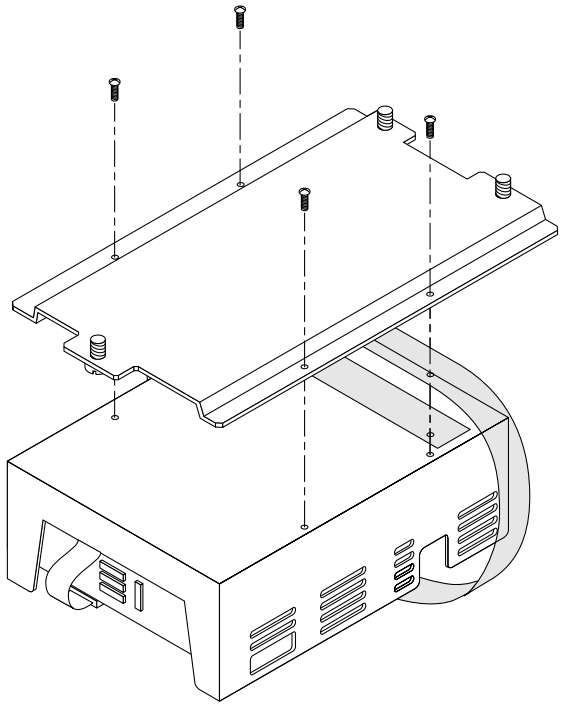


Figure 3-22 Securing the Drive to the Bracket

10. **Determine where you will be placing the 2.1 Gbyte disk drive in the tray.** There are six possible locations for the disk drive in the tray (Figure 3-23).

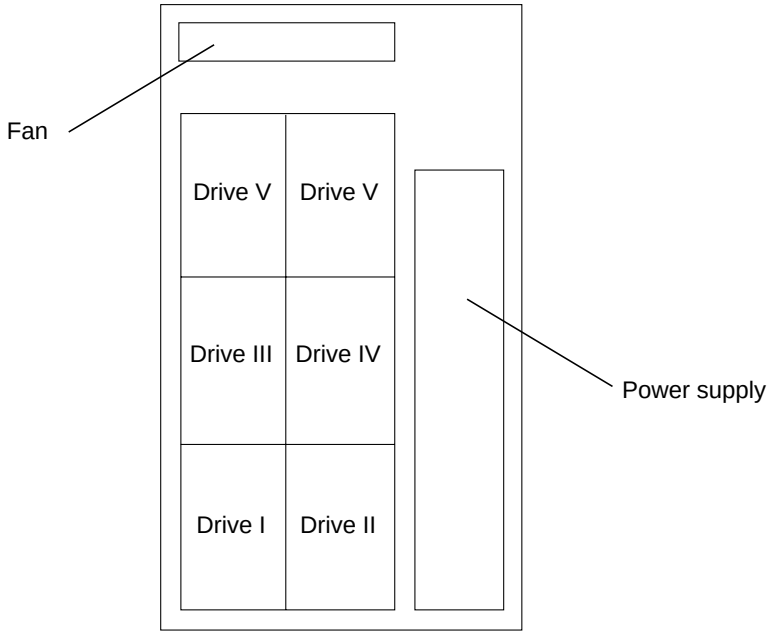


Figure 3-23 Drive Locations in Drive Tray

11. Use the plastic strap to slide the drive in the appropriate location in the Differential SCSI Disk Tray until the front of the mounting bracket rests flush against the two alignments tabs (see Figure 3-24).

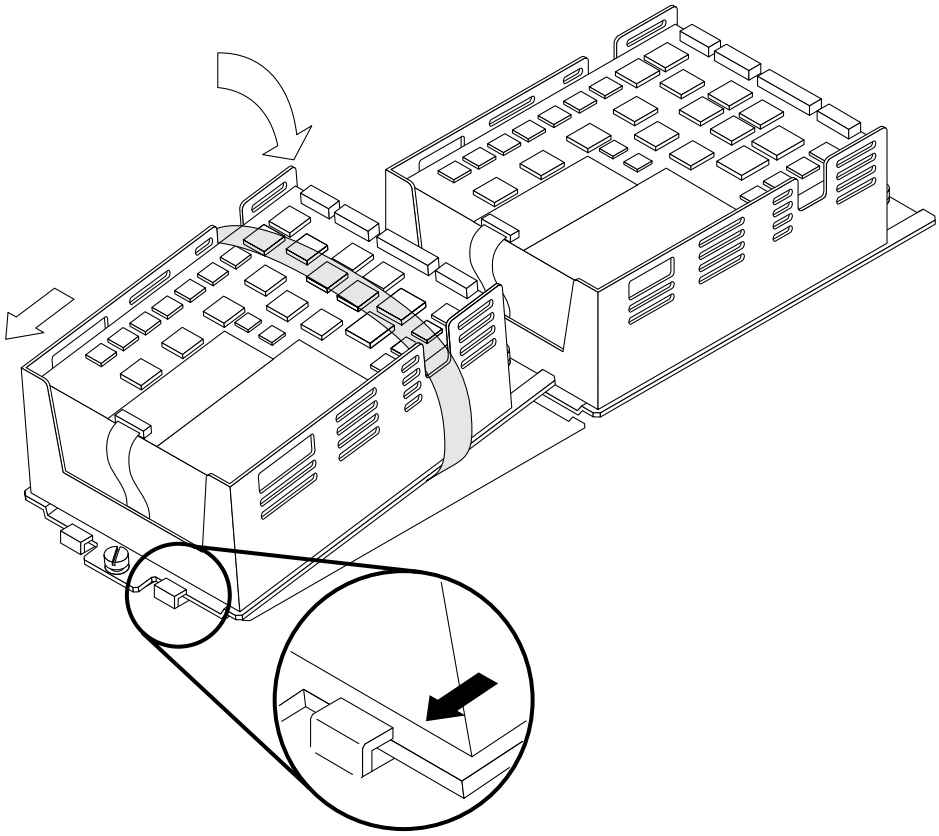


Figure 3-24 Placing the Drive in the Tray

12. **Use the flat-head screwdriver to tighten the three captive screws on the mounting bracket to secure the drive to the tray (see Figure 3-24).**

13. **Connect the power cable to the DC In connector on the drive (Figure 3-25).**

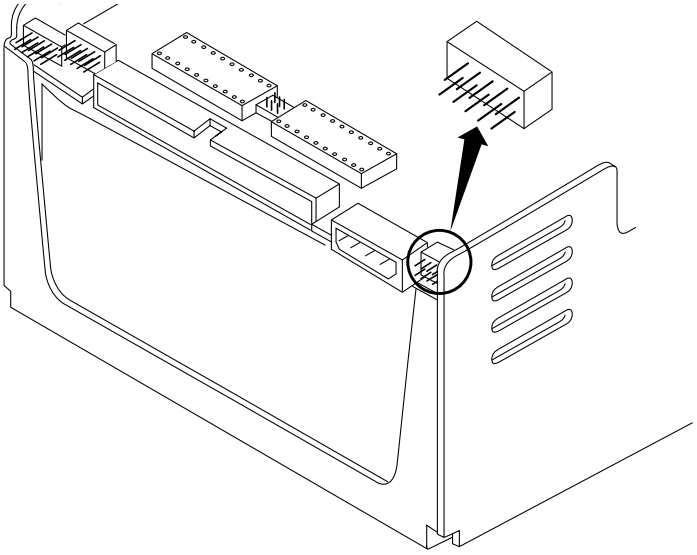


Figure 3-25 Connector Locations on the Drive

14. **Connect the SCSI cable to the drive SCSI data connector (Figure 3-25).**
15. **Connect the SCSI ID cable to the drive LED/address connector.**
16. **Replace the top cover after you have installed all the drives.**
17. **Screw in the eight top cover screws accessible from the front and sides to secure the cover to the drive tray (three at each side and two at the front).**
18. **Press the button in the center rail and push the tray fully in the cabinet.**
19. **Loosely install two 10-32 screws in the mounting brackets at the tray front (one for each mounting bracket at the side of the tray; Figure 3-26).**

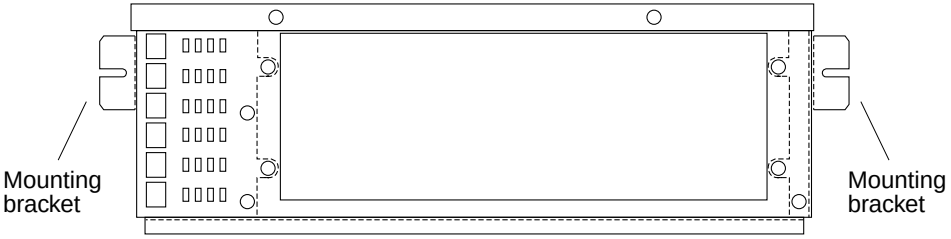


Figure 3-26 Securing the Tray Assembly in the Cabinet — Front View

20. **Face the cabinet rear and loosely install four 10-32 screws on the left and right slide rails at the rear of the tray (two on each side, see Figure 3-27).**

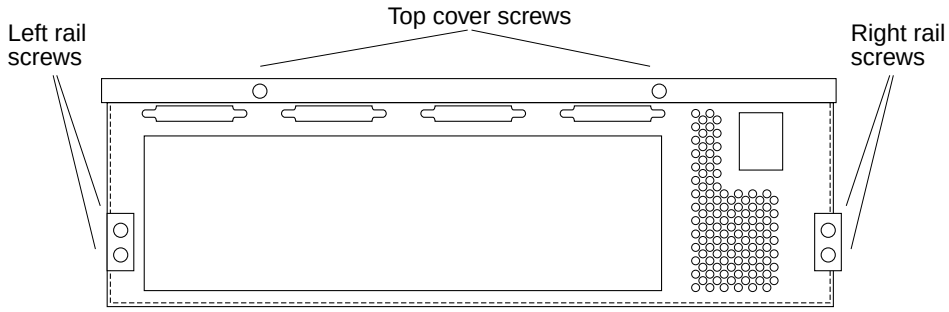


Figure 3-27 Securing the Tray Assembly in the Cabinet — Rear View

21. **Tighten all six screws at the front and rear of the tray securely.**

22. **Face the rear of the cabinet and tighten the two top cover screws at the rear of the tray (see Figure 3-27).**

23. **At the drive tray rear, connect the power cord to the power receptacle (Figure 3-28).**

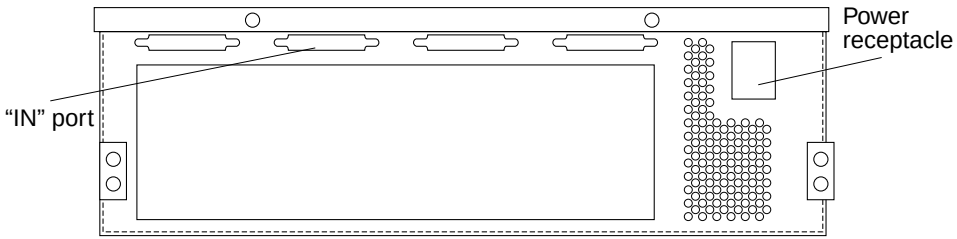


Figure 3-28 Drive Tray Power Receptacle and Ports

24. **At the drive tray rear, connect the SCSI cable to the left-most "IN" port (Figure 3-28).**

25. **Refer to Appendix A, "SCSI Device Configuration in the SPARCserver 690MP" to set the drive SCSI address.**

3.6 5.0 Gbyte 8 mm Tape Drive

▼ Removal

1. **Ensure the system is gracefully shut down as covered in Chapter 1 and that the cabinet power cable is disconnected.**
2. **Extend the anti-tilt bar.**
3. **Remove the rear panel. Refer to Chapter 1, Section 1.5.8 “Rear Panel.”**
4. **Pull on the left side of the upper panel to open the panel.**
5. **Face the rear of the cabinet and disconnect the power cord from the power receptacle at the rear of the Multi-Tape Backup Tray (see Figure 3-13).**

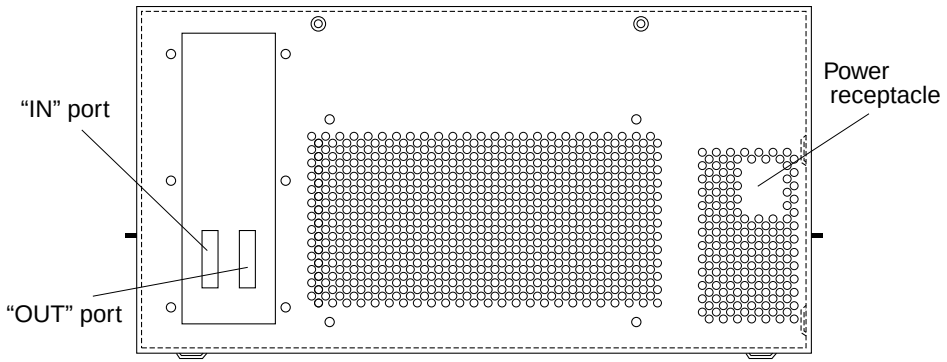


Figure 3-29 Multi-Tape Backup Tray Power Receptacle and Ports

6. **Disconnect the SCSI data cable from the “IN” port at the rear of the Multi-Tape Backup Tray (see Figure 3-13).**
7. **Face the cabinet front unscrew two Phillips screws securing the side brackets at the front of the tray to the cabinet (see Figure 3-15).**

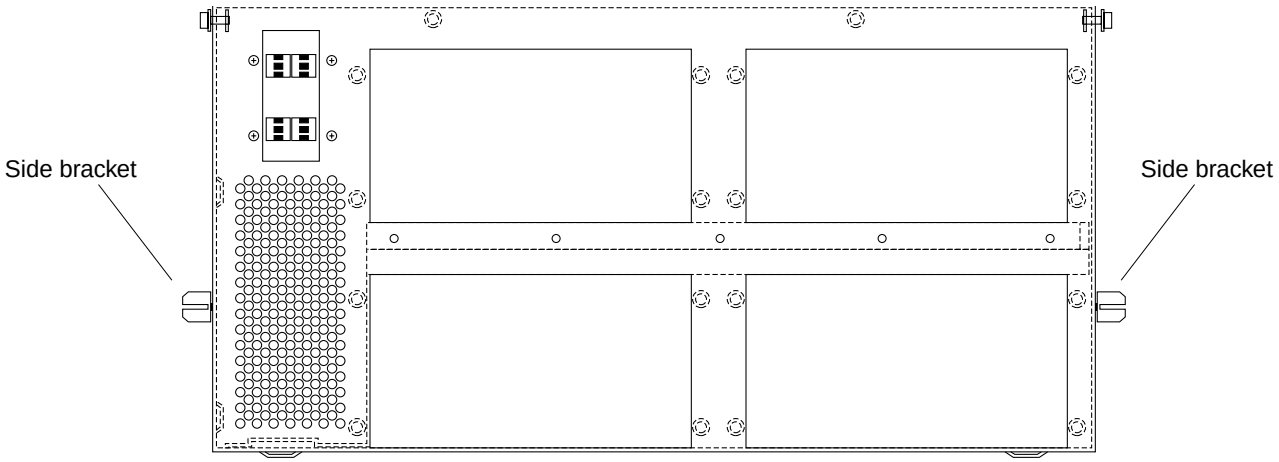


Figure 3-30 Removing the Tray Assembly in the Cabinet

8. **Fully extend the tray until the slide rail button clicks.**
9. **Use the flat-head screwdriver to loosen the ten top cover screws (three at each side and two at the front and back).**
10. **Remove the cover from the tray and set it aside.**
11. **Reach inside the tray from the top and disconnect the DC harness and address cables from the rear of the drive (see Figure 3-31).**
    To unplug the DC harness and address cables, grasp the connectors on both sides and firmly, but gently, pull them away from the power and SCSI ID connectors on the tape drive.
12. **Press out on the ejectors at the sides of the SCSI connector on the tape drive to release the SCSI data cable from the drive (see Figure 3-32).**

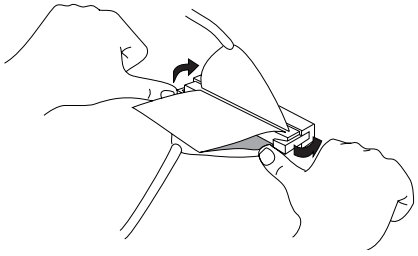


Figure 3-31 Releasing the Ejectors

13. **Grasp the sides of the white plastic tab and slowly pull the SCSI data cable away from the tape drive (see Figure 3-33).**

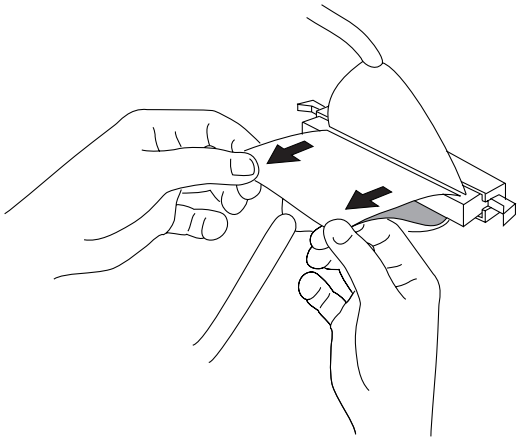


Figure 3-32 Disconnecting the SCSI Data Cable

14. **Use the 9 mm hex-head screwdriver to remove the four screws that secure the mounting brackets and drive to the front of the tray.**

15. **Use the handles on the mounting brackets to pull the drive out of the tray.**

16. **Remove Phillips screws securing the two mounting brackets to the drive (see Figure 3-33).**
    Save the two screws for the new drive.

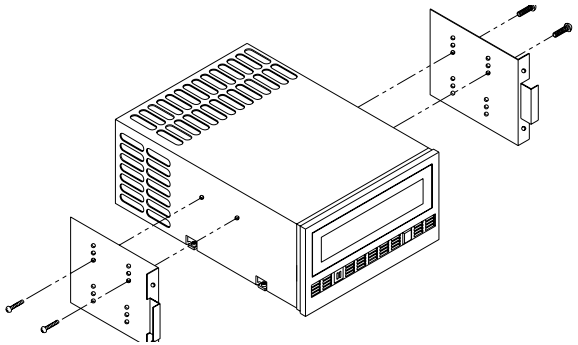


Figure 3-33 Removing the Mounting Brackets from the Drive

17. **Determine if you will be replacing the new drive.**
    - If you are replacing the drive, go to the Replacement procedure in Section 3.6.
    - If you are not replacing the drive, follow these instructions to install a filler panel over the empty drive bay:

    a. Locate the filler panel attached to the top of the fan assembly inside the tray (see Figure 3-34 for the location of the fan assembly).

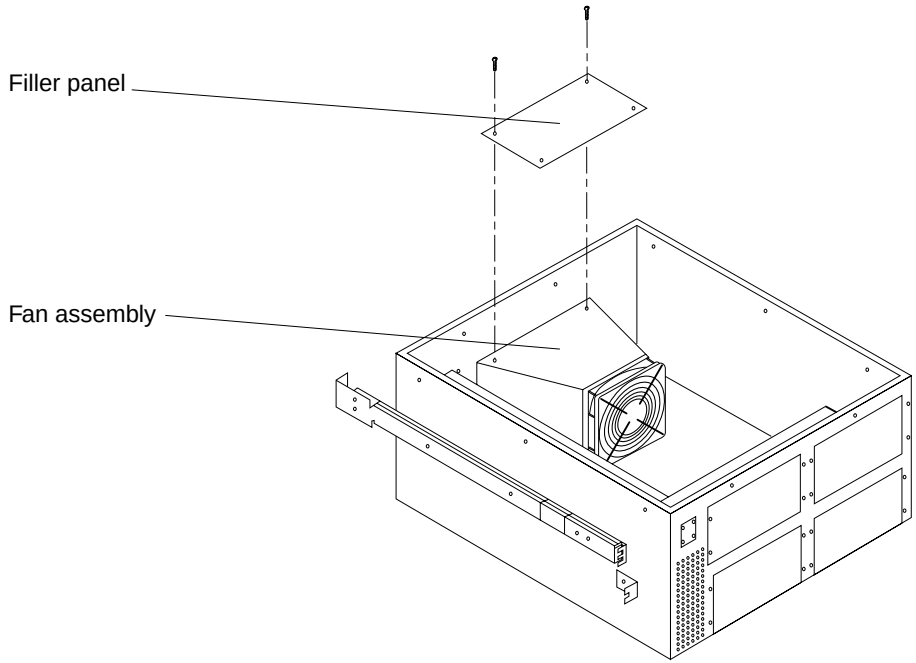


Figure 3-34 Location of the Fan Assembly in the Multi-Tape Backup Tray

    b. Use the 9 mm hex-head socket to unscrew the four screws that secure the panel to the fan assembly.

    c. Place the panel in front of the drive bay that you just removed the tape drive from and align the holes on the sides of the panel with the holes in the front of the drive bay.

    d. Use the same four screws to secure the panel to the Tray.

▼ Replacement

1. **Get the mounting brackets for the tape drive from the shipping kit.**

2. **Use the Phillips screwdriver to secure the mounting brackets to the sides of the tape drive (see Figure 3-35).**
   When installing mounting brackets, observe the following details correctly:

   - the short portion of the bracket faces forward and outward on each side of the drive
   - the top and bottom edge of each bracket is flush with the top and bottom of the tape drive
   - two conductive screws are used per side, per drive, to attach each mounting bracket

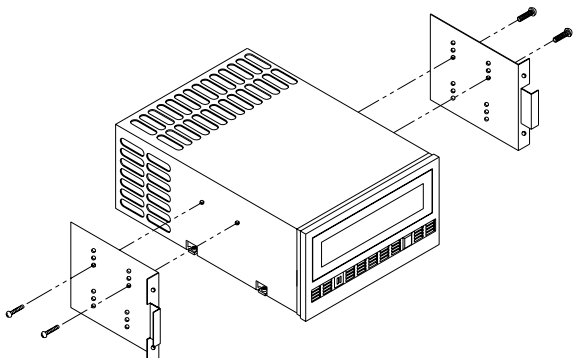


Figure 3-35 Installing Mounting Brackets to a 5.0 Gbyte 8mm Tape Drive

3. **Determine which drive bay you will be installing the drive into.**
   The 5.0 Gbyte 8 mm tape drive can be installed in any of the four drive bays in the tray (see Figure 3-23). The drive bays are labelled on the tray.

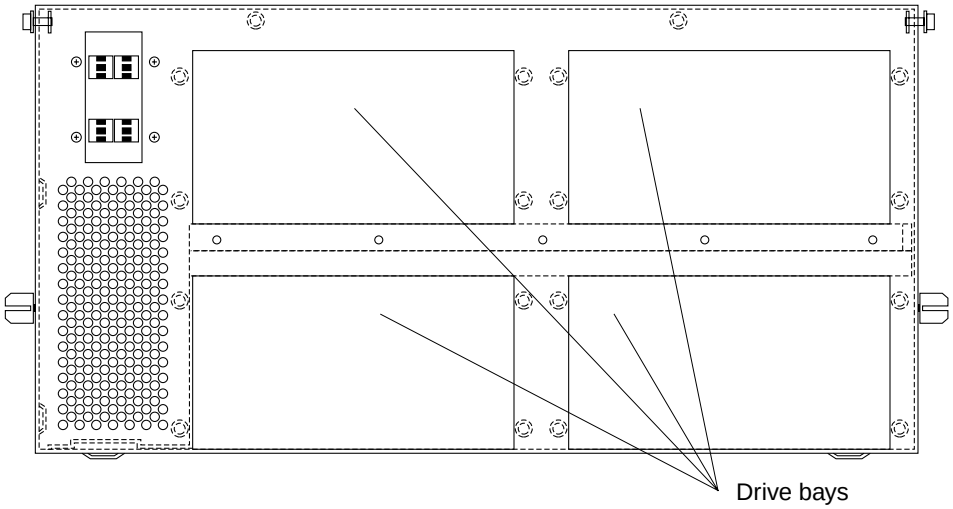


Figure 3-36 Drive Bays in Multi-Tape Backup Tray

4. **Determine if there is a cover plate covering the selected drive bay.**
   - If there is no cover plate covering the selected drive bay, skip to Step 5
   - If a cover plate covers the selected drive bay, use the 9 mm hex-head socket to unscrew screws securing the plate to the tray and remove the plate. Secure the cover plate to the top of the fan assembly within the tray using 9 mm hex-head screws (see Figure 3-34 for fan assembly location).
5. **Using the handles on the mounting brackets, slide the 5 drive into the bay until the mounting brackets rest flush against the front of the tray.**
6. **Use the 9 mm hex-head socket to screw in the four screws at the front of the mounting brackets to secure the drive to the tray.**
7. **Locate the power connector on the drive (see Figure 3-25).**

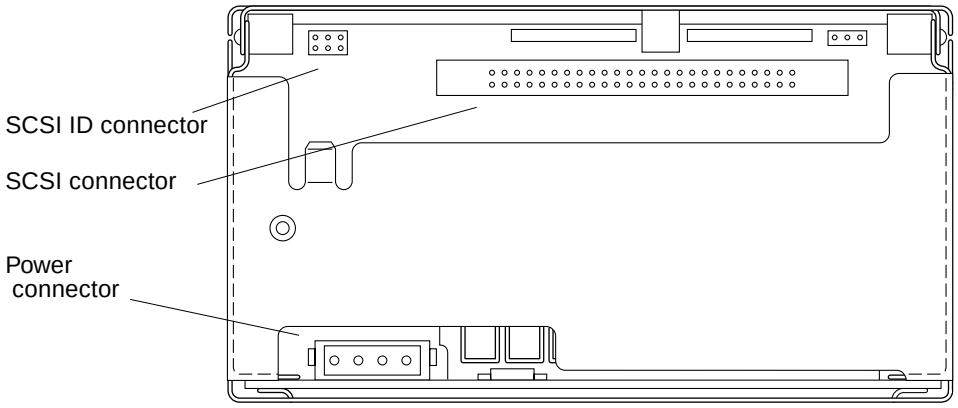


Figure 3-37 Power, SCSI, and SCSI ID Connector Locations on the Drive

8. Reach inside the tray from the top and connect the DC harness cable to the power connector on the drive.
Figure 3-38 shows how the DC harness cables should be connected to the 5.0 Gbyte 8 mm tape drives in the Multi-Tape Backup Tray.

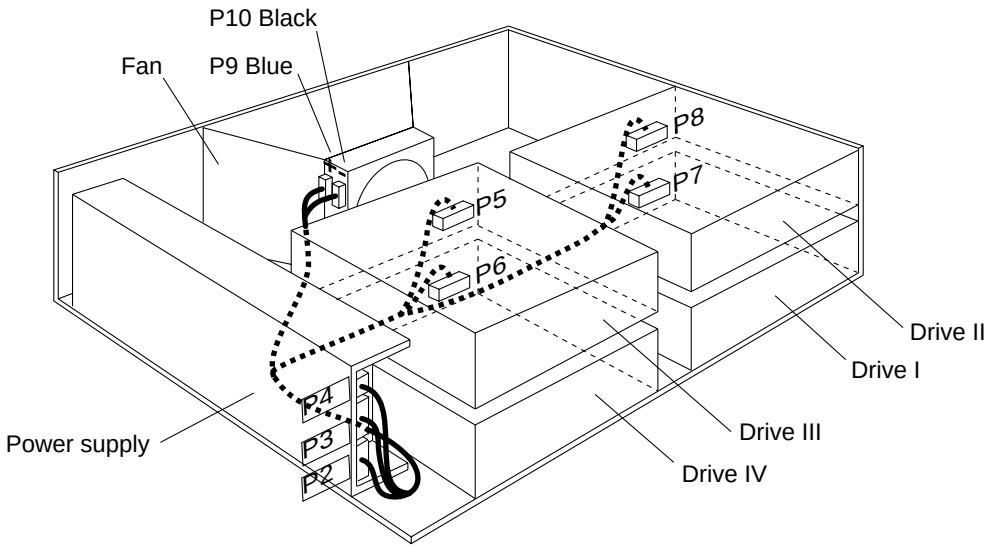


Figure 3-38 Connecting the DC Harness Cable

9. Locate the SCSI connector on the drive (see Figure 3-25).

10. **Connect the SCSI data cable to the SCSI connector on the drive.**
    Figure 3-39 shows how SCSI data cables connect to drives in the tray. The connector is keyed; the connector cannot be incorrectly installed.

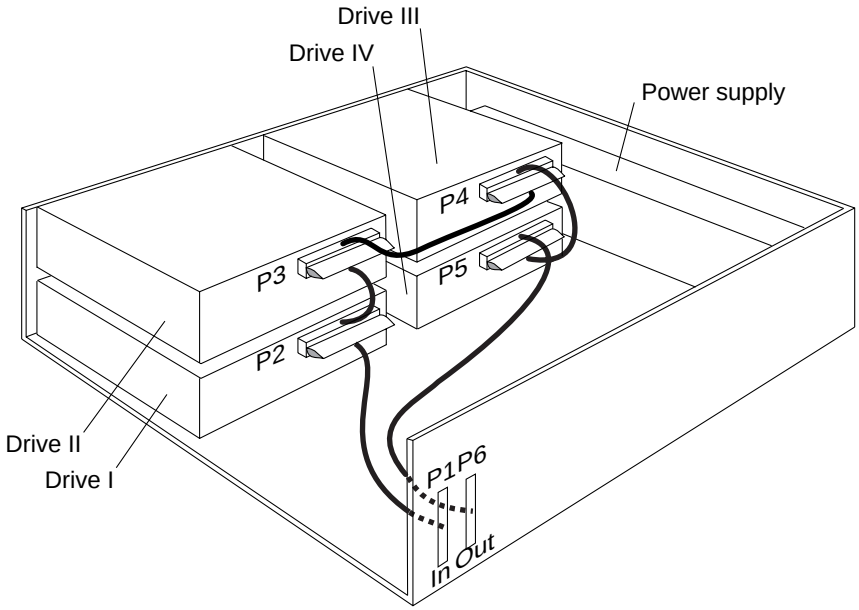


Figure 3-39 Connecting the SCSI Data Cable

11. **Locate the SCSI ID connector on the drive (see Figure 3-25).**

12. **Connect the address cable to the SCSI ID connector on the drive.**
    Figure 3-40 shows how address cables connect to drives in the tray. Position the address cable so the black cable is located at the lower right corner of the SCSI ID connector (see Figure 3-41).

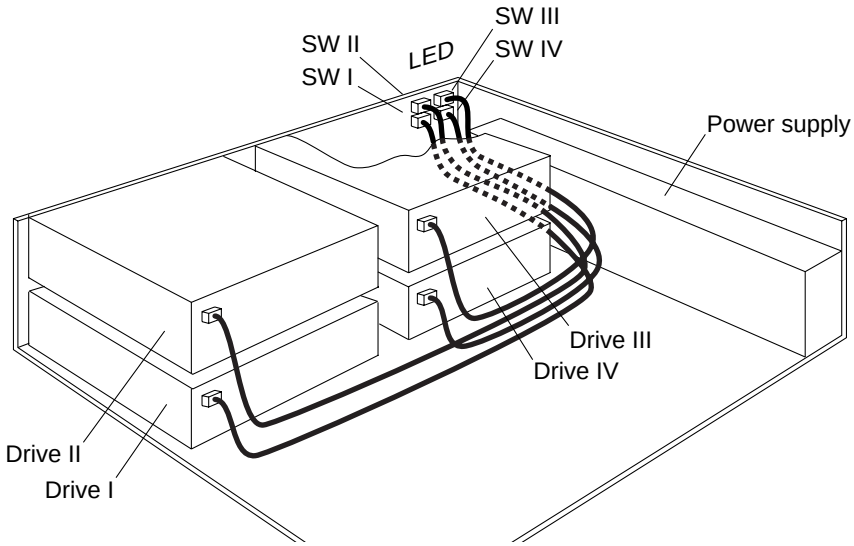


Figure 3-40 Connecting the Address Cable

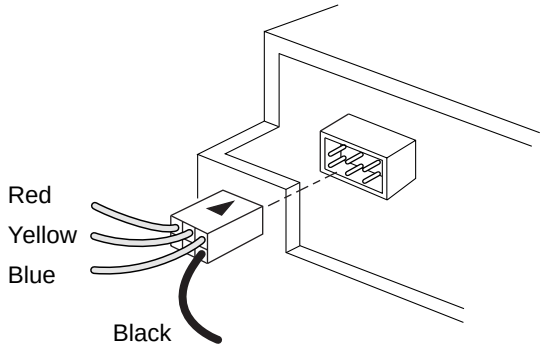


Figure 3-41 Positioning the Address Cable

13. **Replace the top cover after installing or removing the tape drive(s).**
14. **Install ten top cover screws to secure the cover to the Tray.**
15. **Press the button in the center rail and push the tray fully in the cabinet.**
16. **Use the Phillips screwdriver to install and securely fasten the two 10-32 screws in the side brackets at the front of the tray (one for each side bracket at the side of the tray, as shown in Figure 3-26).**

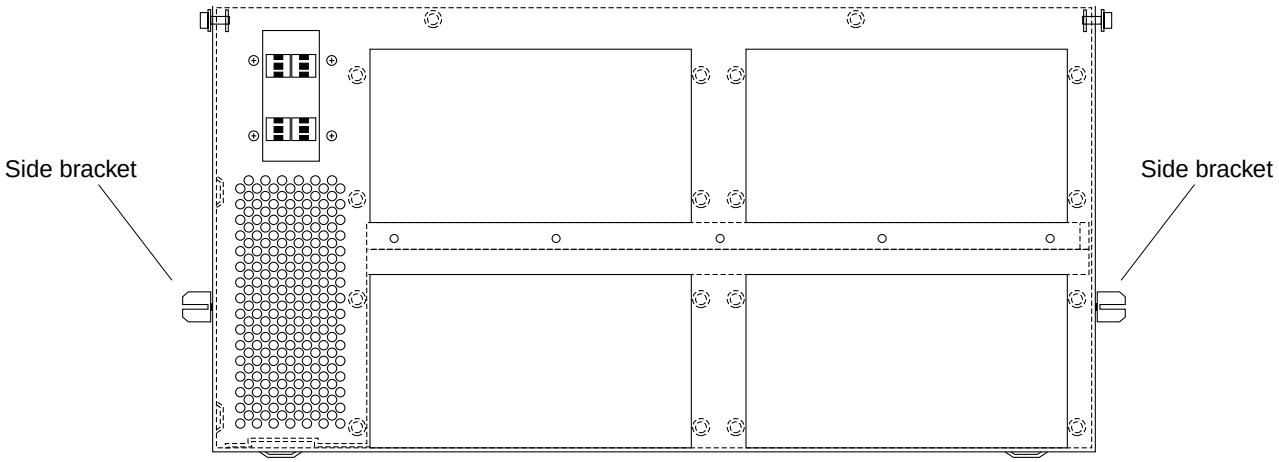


Figure 3-42 Securing the Tray Assembly in the Cabinet

17. **Face the rear of the cabinet and connect the power cord to the power receptacle at the rear of the Multi-Tape Backup Tray (see Figure 3-43).**

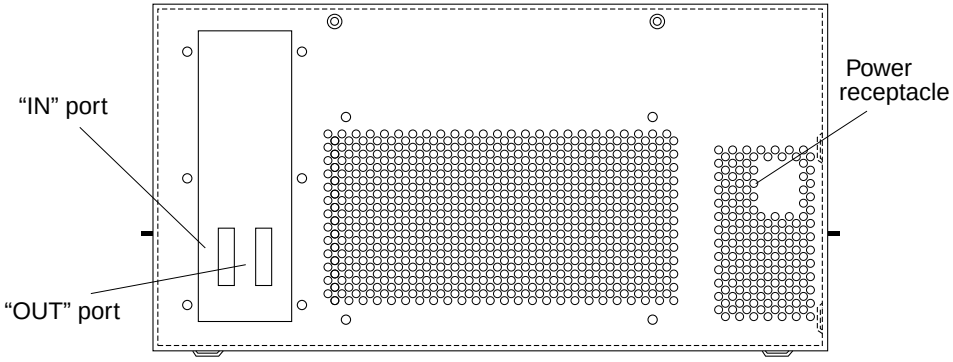


Figure 3-43 Location of the Power Receptacle on the Tray

18. **Connect the SCSI data cable to the "IN" port at the rear of the Multi-Tape Backup Tray (see Figure 3-43).**

19. **Refer to Appendix A, "SCSI Device Configuration in the SPARCserver 690MP" to set the drive SCSI address.**

Logic Enclosure Assembly Removal and Replacement 4

This chapter supplies the information necessary to completely remove and replace field-replaceable units for the 16-slot Logic Enclosure.

4.1 Logic Enclosure Assembly

The logic enclosure (also called the main chassis), is composed of assemblies:

- SCSI tray Assembly
- Logic Enclosure Subassembly
- Blower Box Assembly

Instructions for removing and replacing each of the assemblies follow.

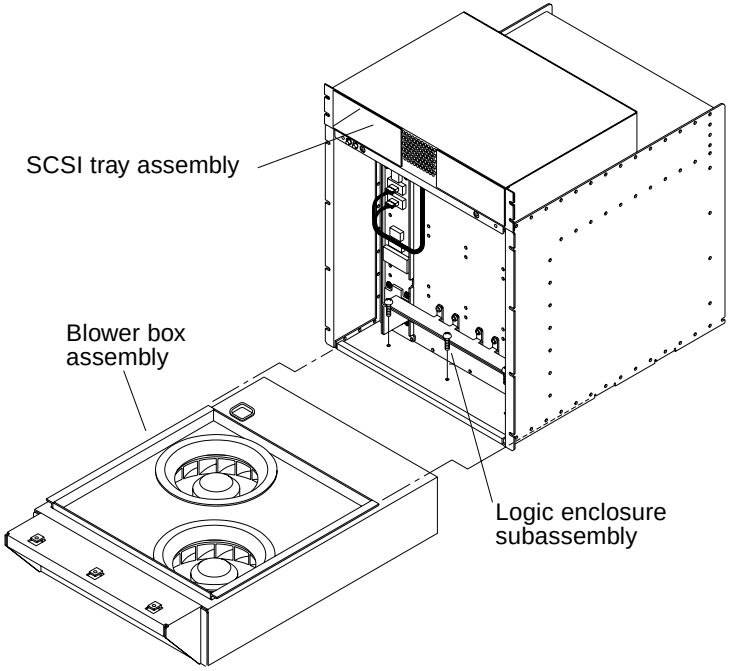


Figure 4-1 Logic Enclosure Key Assemblies

4.2 SCSI Tray

Note – There are two types of SCSI trays available. One type has a holder for a terminating connector at the center of the rear of the tray, this type supports the SunCD; the other type of SCSI tray does not have a holder and does not support the SunCD. Make sure that you refer to the appropriate section for the type of SCSI tray installed in the server system you are servicing.

▼ Checking the Tray for Terminating Connector Holder

To verify whether or not the SCSI tray has a terminating connector holder:

1. **Remove the rear panel from the cabinet. Remove two screws securing the panel to the cabinet frame. Pulling the panel away from the cabinet.**

2. **Check the SCSI tray rear. See if a terminating connector holder for exists at the center. This holder consists of two standoffs labeled Terminator Storage. (If the terminator connector is in its holder, the label is covered.)**

Note – If the SCSI tray lacks this holder, follow alternative instructions covered in Section 4.2, "SCSI Tray (No Terminating Connector Holder)." If the tray has this holder, continue with the next section.

4.2.1 SCSI Tray (With Terminating Connector Holder)

▼ Removal

1. **Remove the cabinet vented front and rear panels as well as the left side panel (refer to Chapter 1, Section 1.5.3, "Vented Front Panel").**
2. **Remove seven screws securing the SCSI tray top cover. Remove the cover.**
3. **Remove four inside screws (one each corner) securing the bottom of the SCSI tray to the data cabinet.**
4. **Disconnect external SCSI data and DC power harness cables (Figure 4-2).**
5. **Slide the tray out of the cabinet.**

▼ Replacement

1. **Slide the tray into the cabinet. Take care to not shear off the cables.**
2. **Reconnect the SCSI data and power cables.**
3. **Secure the inside bottom corners of the SCSI tray with four screws.**
4. **Secure the top cover to the tray using seven screws.**
5. **Secure the tray to the front of the data cabinet using four screws.**
6. **Refer to Chapter 1, Section 1.5, "Trim Removal and Replacement," and replace any panels that you removed.**

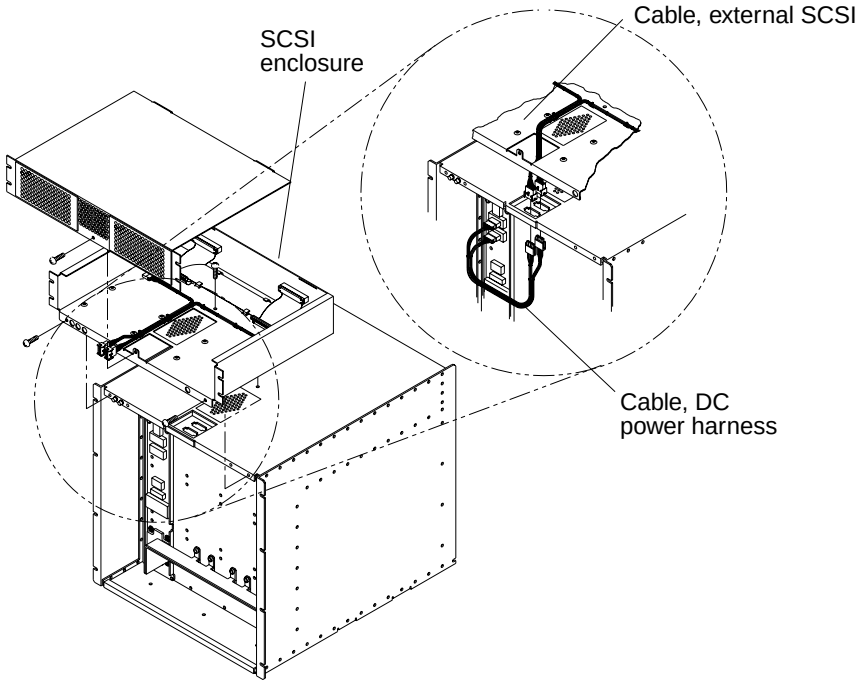


Figure 4-2 SCSI Tray Removal and Replacement

4.2.2 SCSI Tray (No Terminating Connector Holder)

▼ Removal

1. **Remove the vented rear panel from the cabinet by grasping the outer edges of the panel and then pulling it towards yourself.**
2. **Disconnect any cables connected to the SCSI "IN" and SCSI "OUT" connectors on the back of the SCSI tray.**
3. **Refer to Section 1.5, "Trim Removal and Replacement" and remove the higher vented front panels (the lowest vented front panel can remain attached during this installation).**
4. **At the cabinet top, open the Front-load 1/2-inch Tape Drive door panel (if installed).**

5. **Remove the RFI shield. First remove any panels blocking access to the logic enclosure. Then remove screws securing the RFI shield. Pull out on the shield top handle. Lift the shield up and remove it from the enclosure.**

Caution – Before you pull out the Front-load 1/2-inch Tape Drive, extend the stabilizer bar at the bottom of the cabinet.

6. **Pull out the 1/2-inch front-load tape drive far enough that you can access the top of the SCSI tray cover from the rear of the cabinet.**
7. **Remove the nine screws on top of the SCSI tray Cover. Push the Front-load 1/2-inch Tape Drive (if any) into place.**
8. **Detach the SCSI tray cover by removing one slotted screw and two Phillips screws at the front of the cover, and pull the cover forward until it is clear of the SCSI tray.**
9. **Slide the Front-load 1/2-inch Tape Drive (if any) far enough forward that you can reach the interior of the SCSI tray from the rear of the cabinet.**
10. **In the center of the interior of the SCSI tray, remove the single screw that connects the tray to the top of the logic enclosure.**
11. **Push the Front-load 1/2-inch Tape Drive (if any) back into the cabinet.**
12. **At the SCSI tray front, remove two screws securing the tray to the logic enclosure. Also, remove two screws securing the SCSI tray to the cabinet.**
13. **Disconnect the SCSI power harness cables at the front of the SCSI tray by snapping out the two bulkhead power connectors mounted to the tray.**
14. **Pull the SCSI tray from the cabinet.**

▼ Replacement

1. **Insert the SCSI tray in its area at the front of the cabinet.**
2. **From the rear of the cabinet, fasten the single screw in the center of the interior of the SCSI tray.**
3. **Snap two bulkhead power connectors into holes in the logic enclosure.**
4. **Reconnect the SCSI power harness cables at the logic enclosure front.**

5. **Fasten the two pairs of screws that attach the front of the SCSI tray to the logic enclosure and to the cabinet.**
6. **Slide the SCSI tray cover above the SCSI tray.**
7. **Attach the front of the SCSI tray Cover to the tray with one slotted and two crosshead screws. Do not tighten screws until the screws indicated in step 8 are fastened to the top of the SCSI tray cover inside the cabinet.**
8. **Fasten nine screws to the top of the SCSI tray cover to attach it to the SCSI tray inside the cabinet and then tighten the screws fastened in step 7.**
9. **If there is still an empty slot in the SCSI tray, cover it with a blank panel. Attach the blank panel with four screws.**
10. **Connect the CPU's SCSI interface cable from the logic enclosure to the SCSI "IN" connector at the back of the SCSI tray.**
11. **At the SCSI "OUT" connector, reconnect cables to the Front-load 1/2-inch Tape Drive (FLT) that were attached — *unless* your system contains three tape drives. If three tape drives are installed, connect the SCSI cable from the FLT to the second SCSI host adapter in the logic enclosure.**
12. **Slide in the Front Load 1/2-inch Tape Drive (if any).**
13. **Replace the RFI shield. Refer to Section 4.3.1, "RFI Shield."**
14. **Replace the vented front panels and rear panels. Refer to Chapter 1, Section 1.5, "Trim Removal and Replacement."**
15. **Refer to the power-up and operational checkout procedure in the installation manual for the Data Center Cabinet.**

4.3 Logic Enclosure Subassembly

The logic enclosure subassembly consists of

- RFI Shield
- Backplane
- Power Supply
- Printed Circuit Boards

A description of removal and component replacement procedures follows.

4.3.1 RFI Shield

▼ Removal

1. **Refer to Chapter 1 and remove any panels blocking access to the logic enclosure assembly; see Section 1.5, “Trim Removal and Replacement.”**
2. **Remove the screws securing the RFI shield to the logic enclosure.**
3. **Pull up on the RFI shield and remove it from the logic enclosure.**

▼ Replacement

1. **Insert the RFI shield into the groove on the logic enclosure.**
2. **Replace the screws that attach the RFI shield to the logic enclosure.**
3. **Replace any panels removed. Refer to Section 1.5, “Trim Removal and Replacement.”**

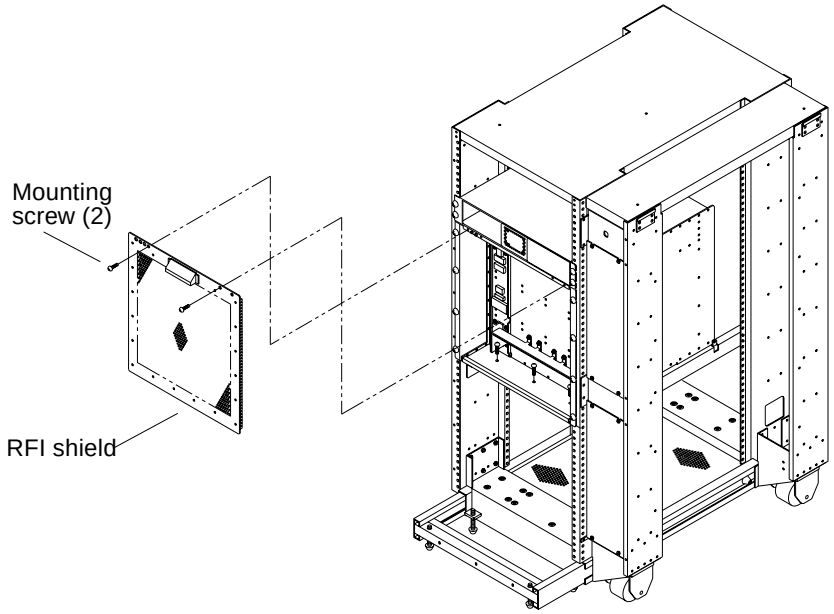


Figure 4-3 RFI Shield Removal and Replacement

4.3.2 Back Plane

▼ Removal

1. **Refer to Chapter 1 and remove any vented panels blocking access to the logic enclosure. Refer to Section 1.5, "Trim Removal and Replacement."**
2. **Remove the RFI shield as described in Section 4.3.1, "RFI Shield."**
3. **Remove the power supply. Refer to Section 4.3.3, "Power Supply."**
4. **Unseat all boards from the backplane as indicated in Chapter 5.**
5. **Disconnect each SCSI power cable from the SCSI connectors on the backplane and tuck the cables above the card cage frame.**
6. **Disconnect the LED cable connector from the backplane and tuck the cable above the card cage frame.**
7. **If a 925 watt power supply is installed, disconnect the load resistor connector and remove the load resistor assembly. Refer to Figure 4-4.**
8. **Remove the screws that secure the backplane to the card cage and remove the backplane. Refer to Figure 4-4.**

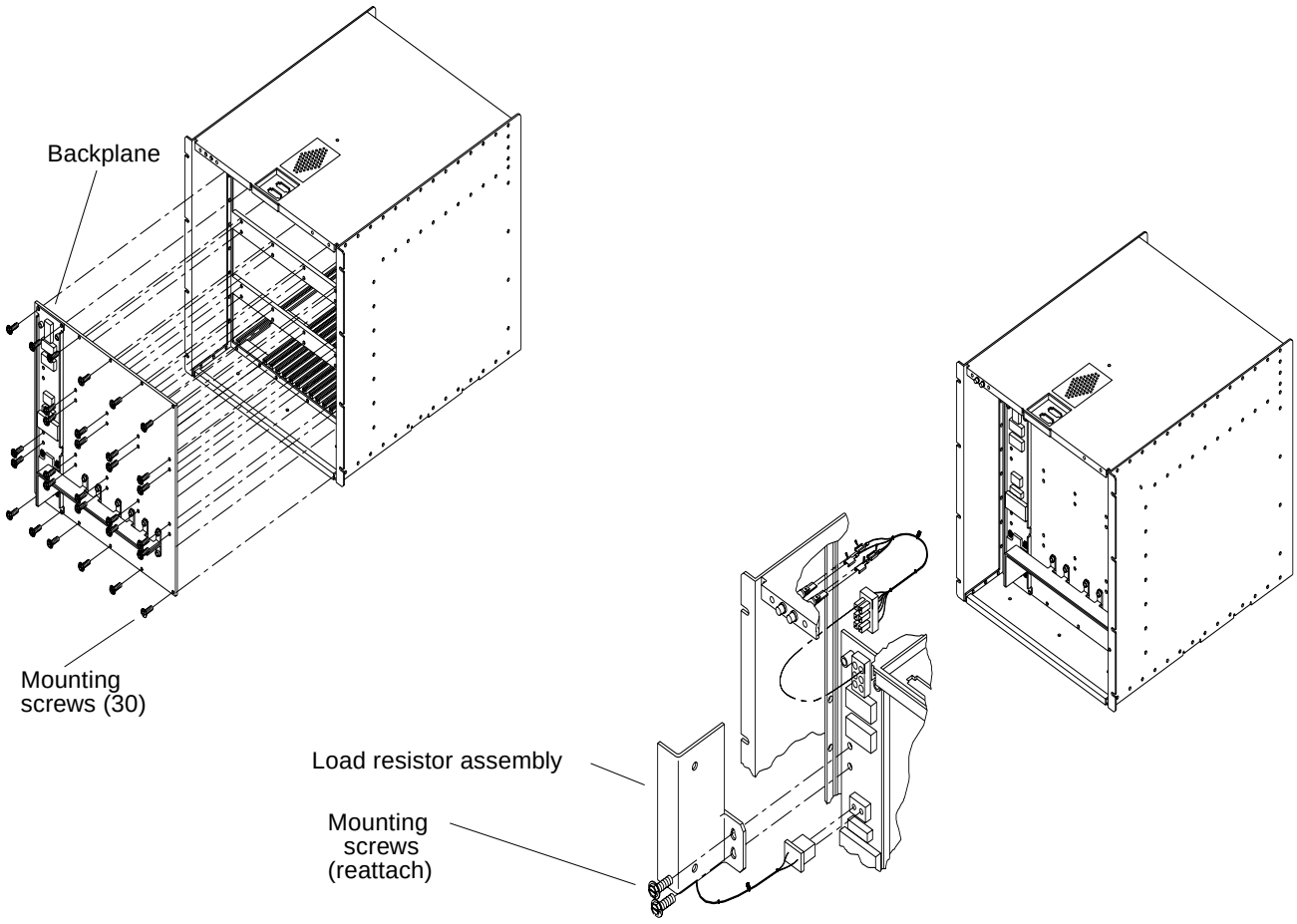


Figure 4-4 Backplane Connectors and Backplane Removal and Replacement

▼ Replacement

1. Install securing screws with partial engagement.

2. **Reconnect the LED assembly. Proper LED hookup is shown in Table 4-1.**

Table 4-1 LED Connection

Jx	Wire	Tab	Indicator LED	Status
J7	Black	Brass	Left	Power On
J8	Grey	Tin	Left	Power On
J9	White	Tin	Right	Power Good
J10	Black	Brass	Right	Power Good

3. **Replace the load resistor assembly, if supplied, and attach its connector to the backplane.**
4. **Reconnect each SCSI cable to the connectors on the backplane.**

Note – PCB's are used in the following step for alignment. If the configuration being serviced does not have PCB's in slots 1 and 16, temporarily install them at this time for alignment purposes.

5. **Replace boards in slots 1 and 16, with boards fully seated in backplane connectors to ensure backplane alignment. Tighten all backplane screws.**
6. **Replace the power supply. Refer to Section 4.3.3, "Power Supply."**
7. **Replace the RFI shield following Section 4.3.1, "RFI Shield."**
8. **Refer to Chapter 1 and replace any panels that were removed as indicated in Section 1.5, "Trim Removal and Replacement."**

4.3.3 Power Supply

Two power supply versions are found in the field; the 925- and 1200-Watt. If replacing a 925 -Watt with a 1200-Watt, remove the load resistor as described in a following procedure.

▼ Removal

1. **Power down the server. Refer to Section 1.4, "Shutting Down the System" for more information.**

2. **Ensure the power supply switch is in the OFF (“0” pressed in) position.**
3. **Remove the vented rear panel. Refer to Chapter 1, Section 1.5.3, “Vented Front Panel.”**
4. **Remove two screws securing the blower box power connector cover box. Remove the box and disconnect the connector for the power supply; then, tuck the cable assembly into the opening.**

Note – Ensure the connector and cable assembly for the power supply are tucked into the blower box connector cover box opening located in a position to prevent them from being sheared off when the power supply is removed.

5. **Remove the four screws securing the power supply at the rear (card side) of the logic enclosure. Refer to Figure 4-5.**
6. **Turn the screw counterclockwise and remove the power supply from the backplane.**
7. **Carefully slide the power supply out of the chassis.**

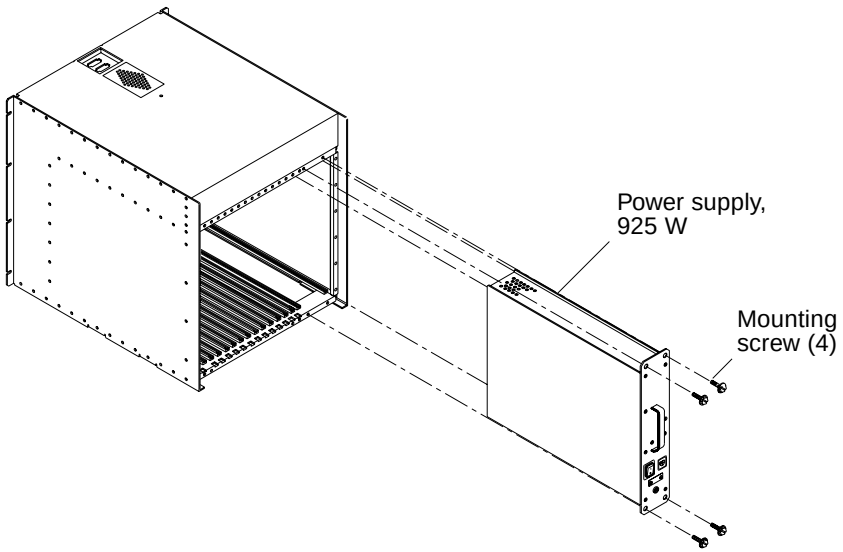


Figure 4-5 Power Supply Removal and Replacement

4.3.3.1 *Replacing a 925-Watt Power Supply with a 1200-Watt Power Supply*

If you are replacing a 925-Watt power supply with a 1200-Watt power supply, you must remove the load resistor assembly from the backplane. To do this:

1. **Remove the front vented panel assembly. Standing in front of the cabinet and firmly grasp the panel outer edges with both hands. Pull the panel towards yourself; it should pull off easily.**
2. **Remove the RFI shield by removing the two SEM screws at its top edge.**
3. **Loosen the two screws that attach the load resistor assembly to the backplane. Refer to Figure 4-6.**
4. **Remove the load resistor connector from the backplane.**
5. **Discard the load resistor assembly.**
6. **Tighten the two screws to the backplane.**
7. **Replace the RFI shield as described in Section 4.3.1, "RFI Shield."**
8. **Replace the vented front panel assembly. Refer to Chapter 1, Section 1.5, "Trim Removal and Replacement."**

▼ Replacement

1. **Slide the power supply into the chassis.**
2. **Turn the mounting screw clockwise to secure the power supply to the backplane.**
3. **Replace four screws securing the power supply to the logic enclosure rear.**
4. **Replace the connector for the blower box, making sure to remove the cable assembly from the opening.**
5. **Replace two screws securing the blower box power connector cover box to the chassis.**
6. **Replace the vented rear panel assembly. Refer to Section 1.5, "Trim Removal and Replacement."**

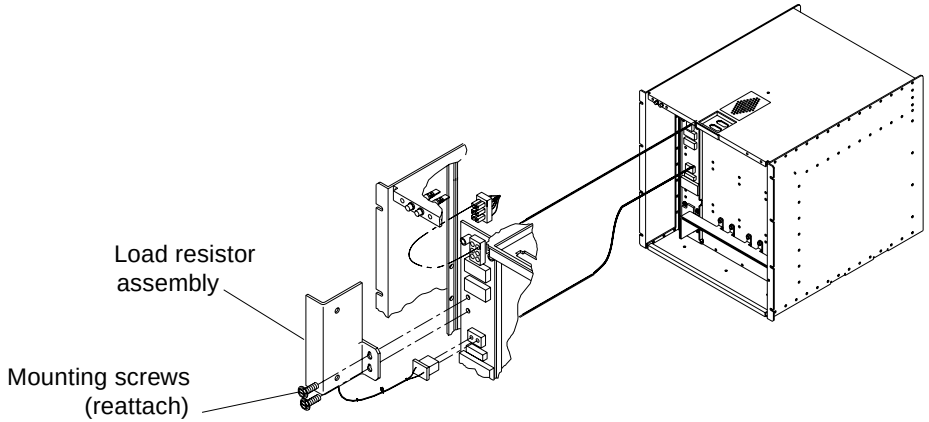


Figure 4-6 Load Resistor Assembly Removal and Replacement

4.3.4 Logic Enclosure

▼ Removal

1. **Remove any panels blocking access to the logic enclosure assembly. Refer to Chapter 1, Section 1.5, "Trim Removal and Replacement."**
2. **Remove the RFI shield as. Refer to Section 4.3.1, "RFI Shield."**
3. **Refer to Chapter 5 and remove PCBs and cables that may block access.**
4. **Remove the power supply. Refer to Section 4.3.3, "Power Supply."**
5. **Label and disconnect the connector providing blower box assembly AC power.**
6. **Remove the blower box assembly. Refer to Section 4.3.5, "Blower Box Assembly."**
7. **Carefully disconnect the SCSI power cable from the PCB connector on the backplane.**
8. **Remove any remaining tie-wraps that secure the DC distribution harness to the logic enclosure and disconnect all cables from the backplane.**

9. **Unfasten eight Phillips-head screws on the front and two screws at the logic enclosure rear securing the subassembly to the cabinet chassis. Withdraw the logic enclosure from the unit. Refer to Figure 4-7.**

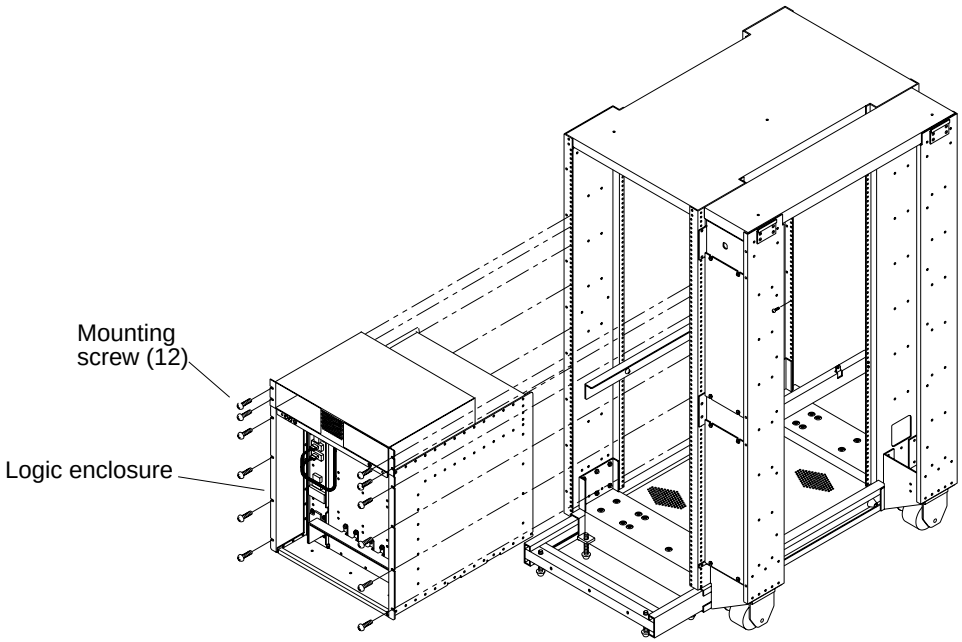


Figure 4-7 Logic Enclosure Removal and Replacement.

▼ Replacement

1. **Insert the logic enclosure into the cabinet.**
2. **Fasten the eight Phillips-head screws on the front of the enclosure and the two screws at the rear of the enclosure.**
3. **Secure the DC distribution harness to the logic enclosure and reconnect all cables to the backplane.**
4. **Reconnect the SCSI power cable to the PCB connector on the backplane.**
5. **Replace the blower box assembly. Refer to Section 4.3.5, "Blower Box Assembly."**
6. **Reconnect the connector providing blower box assembly AC power.**

7. **Replace the power supply. Refer to Section 4.3.3, “Power Supply.”**
8. **Refer to Chapter 5 and replace any PCBs or cables removed to facilitate logic enclosure removal.**
9. **Replace the RFI shield. Refer to Section 4.3.1, “RFI Shield.”**
10. **Refer to Chapter 1 and replace any panels that you removed. Refer to Section 1.5, “Logic Enclosure Subassembly.”**

4.3.5 Blower Box Assembly

▼ Removal

1. **Remove any panels blocking access to both ends of the logic enclosure. Refer to Chapter 1, Section 1.5, “Trim Removal and Replacement.”**
2. **Remove the screws securing the blower assembly power connector cover to the rear of the logic enclosure. Refer to Figure 4-8.**
3. **Disconnect the power cable from the power supply outlet.**
4. **Remove the RFI shield. Refer to Section 4.3.1, “RFI Shield.”**
5. **Remove the three screws on the blower handle that secure the blower box assembly to the logic enclosure.**

Caution – Tuck the cables inside the blower box assembly to prevent them from being sheared off when installing or removing the blower box.

6. **Slide the blower box assembly out of the front of the cabinet.**

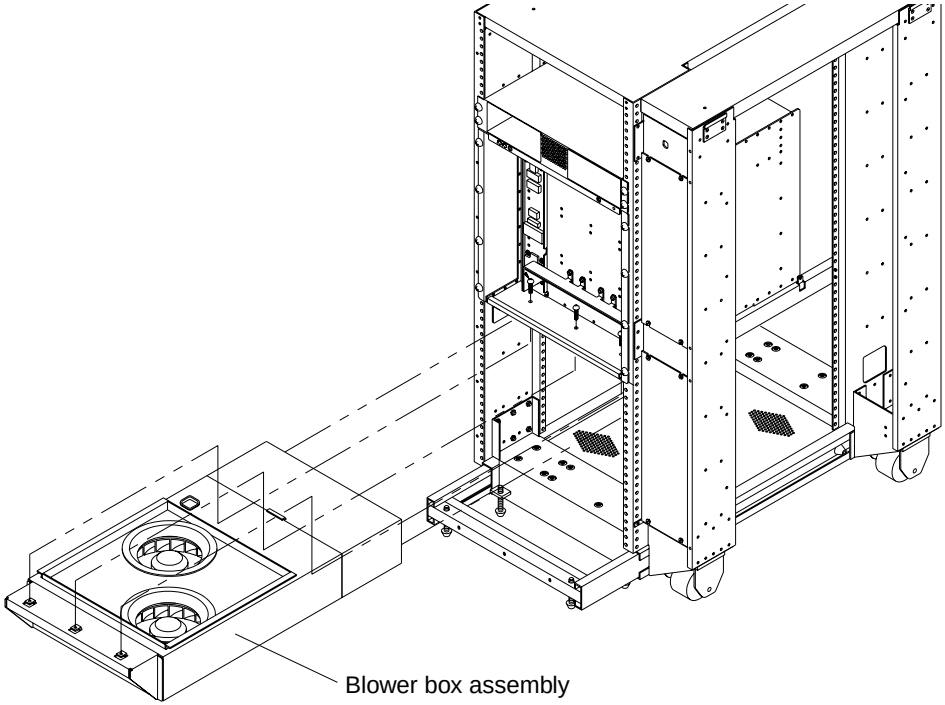


Figure 4-8 Blower Box Assembly Removal and Replacement

▼ Replacement

Caution – Tuck the cables inside the blower box assembly to prevent them from being sheared off when installing or removing the blower box.

1. **Slide the blower box assembly into the logic enclosure slide rails.**
2. **Replace the three screws on the plenum extender that secure the blower box assembly to the logic enclosure.**
3. **Reconnect the blower box power cable to the power supply outlet.**
4. **Replace screws securing the blower box assembly connector cover to the rear of the logic enclosure.**
5. **Replace any panels that you removed. Refer to Chapter 1, Section 1.5, “Trim Removal and Replacement.”**

Printed Circuit Board Removal and Replacement 5

All printed circuit boards (PCBs), with the exception of the SCSI subsystem's tape and disk controller boards, are located in a card cage (16-slot logic enclosure) and can be removed from the rear of the cabinet.

Appendix C contains information on slot assignments and backplane jumper configurations, should you remove boards, add boards, or change the location of boards in the card cage. Ensure boards are Sun-compatible. Such system reconfiguration also requires software procedures that can be found in the network administration manuals for the operating system installed.

5.1 Electrostatic Discharge Precautions

To ensure PCBs are not damaged by electrostatic discharge, observe this caution:

Caution – Circuit board components are vulnerable to damage by electrostatic discharge (ESD). An electrostatic charge can build up on the human body and then discharge when you touch a board. Such discharge can be produced by walking across a carpet and touching a board, or by other similar cause. *Before handling any board,* make sure you dissipate your body's charge. Touch a conductive surface of the chassis or other element connected to common earth ground to discharge the static electricity present in your body.

To minimize risk of ESD damage

- Handle board by edges only
- Store board in antistatic bag provided
- Use a grounding strap and Sun ESD mat, PN 250-1088-01, whenever you work on a board (instructions printed on the mat)

5.2 Slot Assignment Precautions

When you reconfigure system VMEbus boards, consider the impact such a change has on RFI emissions and thermal airflow. The following paragraphs describe materials and procedures that reduce RFI emissions, ensure proper airflow through the system, and protect the boards.

5.2.1 RFI Reduction

To reduce RFI emissions, Sun installs *springfingers* on VMEbus boards. Springfingers are metal strips that wrap around the edge of a board, behind its outer panel. Serrated metal "fingers" protrude from either side of the strip to contact the springfingers on adjacent boards. This provides a shield at the outer edges of all of the boards, which significantly reduces RFI emissions.

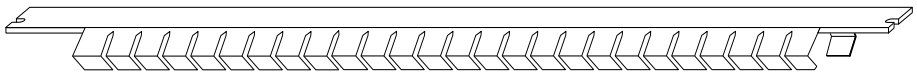


Figure 5-1 Springfingers

Insulator *strips* are installed between springfingers and the board surface. This thin strip of insulating material prevents board springfingers from shorting against the board itself. The strip mounts to the board on two small pads.

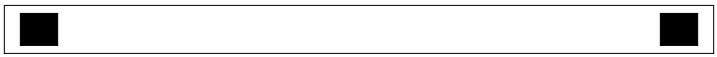


Figure 5-2 Insulator Strip

When boards ship, removable insulator *shields* are provided on springfingers.

- If you install a board with springfingers next to another board with springfingers, you must remove the insulator shield.
- If you install a board with springfingers next to a board without springfingers, you must leave the insulator shields on.

Shields provide electrical insulation between springfingers and the adjacent board. Board installation / removal information is printed on each shield.

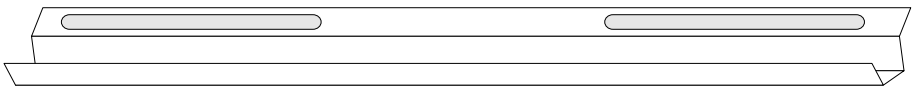


Figure 5-3 Insulator Shield

When removing and replacing boards having springfingers, examine the insulator strip. If damaged, replace it. The strip part number is 330-1100-01. The insulator strip and insulator shield are included in kit number 560-1183-02. To obtain more insulator strips or insulator shields, call your service provider.

Figure 5-4 illustrates the relative positions of the springfingers and insulators with respect to a board and the outer panel.

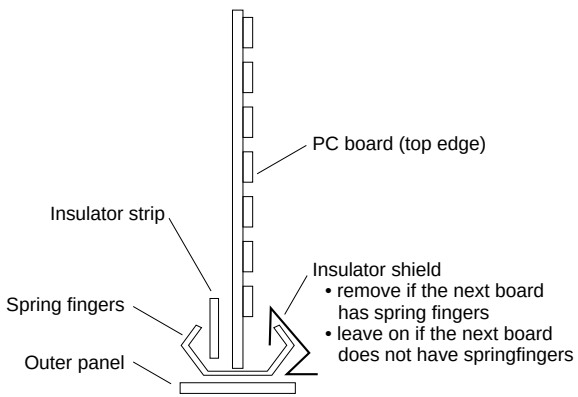


Figure 5-4 Springfingers and Insulators

5.2.2 Installing Boards with Springfingers

If all boards in your system have springfingers, install the appropriate boards in alternate slots first (slots 1, 3, 5, etc.) then install the remaining boards (slots 2, 4, 6, etc.). If you attempt to install the boards sequentially, the springfingers push against each other and make it difficult to seat the last boards installed.

5.2.3 Installing Boards with Springfingers Next to Boards without Springfingers

Not all VMEbus boards have springfingers. Therefore, take special precautions when installing a board with springfingers next to one lacking springfingers.

- You must install and remove the boards in a particular order to avoid damage to adjacent boards by the springfingers.
- You must ensure that the springfingers are properly insulated.

Caution —When you install a board with springfingers next to a board without springfingers, make sure that you install an insulator shield over the springfingers. If no insulator shield is installed, the springfingers can short against the active components on the next board and cause severe damage.

Note – Installation of a board without springfingers may increase RFI emissions and affect regulatory compliance. Sun is not responsible for FCC compliance when boards *without* springfingers are added to a system that was originally shipped *with* springfingers.

When installing boards with springfingers next to boards without them, use the following guidelines:

- Insert boards with springfingers last.
- Remove boards with springfingers first.

5.2.4 Airflow

You must install *air restrictor panels* and *filler panels* in all slots that do not contain boards.

An air restrictor panel is a blank panel with a special air deflector fin to simulate the airflow pattern of an actual board. If air restrictor panels are not installed in blank slots, a condition called a “thermal short” is created. Thermal shorts severely reduce the cooling capability of the system, which can lead to equipment damage.

Filler panels are blank card back plates with springfingers installed in unused slots. Filler panels also affect airflow and can affect RFI emission. Use the same guidelines to install such panels as used for VMEbus boards.

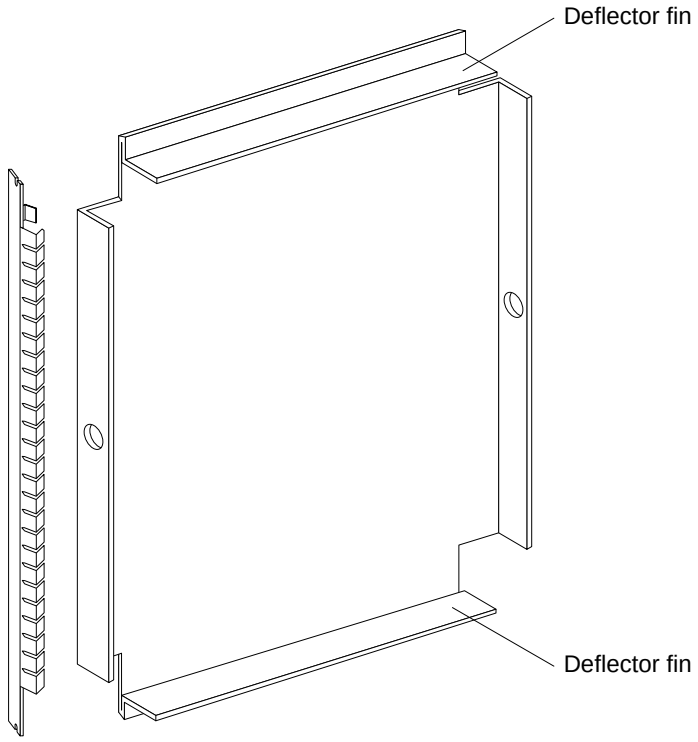


Figure 5-5 Air Restrictor Panel and Filler Panel

Caution – If SBus cards are installed, ensure VMEbus board springfingers are not shorted against ungrounded part of an Sbus card. Shorting active components to springfingers can cause severe damage to the SBus card and / or system

▼ Installing a Filler Panel with Springfingers

1. **Pull out the air restrictor panel far enough to allow the springfingers to lay against the panel.**
2. **Push both units into place simultaneously. Fasten using appropriate fasteners.**

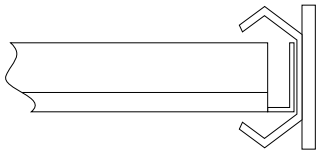


Figure 5-6 Installing an Air Restrictor Panel and a Filler Panel

5.3 *Printed Circuit Board*

Before removing and handling a PCB, read and understand Section 5.1, “Electrostatic Discharge Precautions” and Section 5.2, “Slot Assignment Precautions.”

▼ Removal

1. **Perform a graceful system shutdown as described in Chapter 1.**
2. **Turn the system power off.**
3. **Refer to Chapter 1 and remove any panel blocking access to the card cage as indicated in Section 1.5, “Trim Removal and Replacement.”**
4. **Label and then disconnect cables.**
5. **Unfasten the two recessed hex-head screws (four screws for a double-width board) located at the top and bottom of the PCB to be removed.**
6. **Move the tabs on the extraction levers outward to release the PCB from the backplane connectors.**

If the slot from which the PCB is being removed is to be left vacant, insert an air flow restrictor and filler panel as indicated in Section 5.2, “Slot Assignment Precautions.” If a new or other PCB is to be installed proceed directly to the “Replacement” procedure.

▼ Replacement

Note – When removing a board and installing it into another system, swap the air flow restrictor and blank filler panel removed from the destination system. This provides the system from which the board was removed with an air flow restrictor and blank filler panel in place of the board. If the destination slot has an air flow restrictor and filler panel, remove them. If the slot is vacant continue below.

1. **Insert the PCB into the backplane connectors.**
2. **Fasten the two hex-head screws (four screws for a double board) located at the top and bottom of the PCB to be installed.**

Note – The component side of the PCB should face the right side of the card cage, when viewed from the rear of the system.

3. **Connect any required cabling to the PCB.**
4. **Replace any panel that you removed.**

Illustrated Parts Breakdown 6

Figure 6-2 through Figure 6-15 and Table 6-1 are intended to supplement the remove and replace procedures discussed in Chapters 2 through 4. The data in this Chapter is divided between the Data Center Cabinet and the 16-slot Logic Enclosure. The first part is for the Data Center Cabinet while the second part is for the Logic Enclosure.

6.1 Data Center Cabinet Field-Replaceable Units

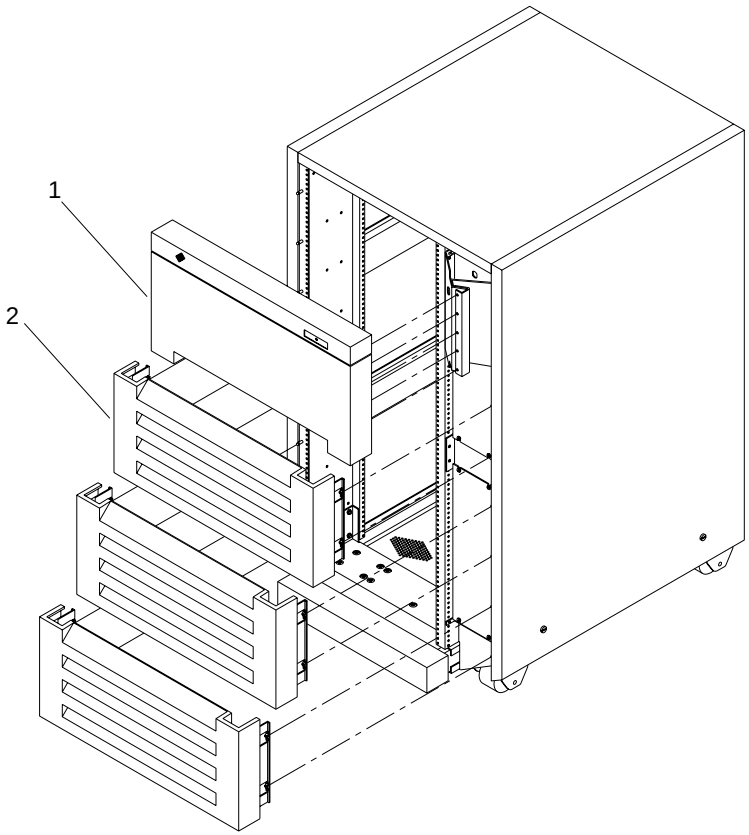
Table 6-1 shows the field replaceable units for the Data Center.

Table 6-1 Field-Replaceable Units *(1 of 2)*

Part Number	Description	Figure
180-1189	Power Cord (230V)	N / A
180-1190	Power Cord (240V)	N / A
230-1166	5" Reusable Tie Wrap	N / A
230-1177	Clip, Cable Tie	N / A
230-1181	Leveling Foot	6-2
240-1678	Clip, Cable (ALM)	6-4
340-1840	Panel, Top	6-2
340-1845	Panel, Rear	6-3
340-1848	Panel, Side	6-2
340-1884	Panel, Anti-Tilt	6-2
340-1886	Bracket, Side Retain	6-2
340-1914	ALM Bracket, Short	6-4
340-1915	ALM Bracket, Long	6-4
340-2047	Panel, Kick	6-3
340-2138	Ballast	6-5
370-1155	Power Sequencer (230V Domestic)	6-3
370-1156	Power Sequencer (240V International)	6-3
370-1210	Caster	6-2
540-1285	Key Switch	N / A
540-1857	Assembly, Panel Vented	6-1
	1.3 Gbyte IPI Disk Drive Tray and Piece Parts	
370-1385	Tray Slides (Both sides, both halves)	N / A
540-2127	Disk Drive Assembly (With mtg bracket)	N / A
300-1085	268 Watt Power Supply	6-6
540-2125	Fan Tray Assembly (Front fan Assembly)	6-6

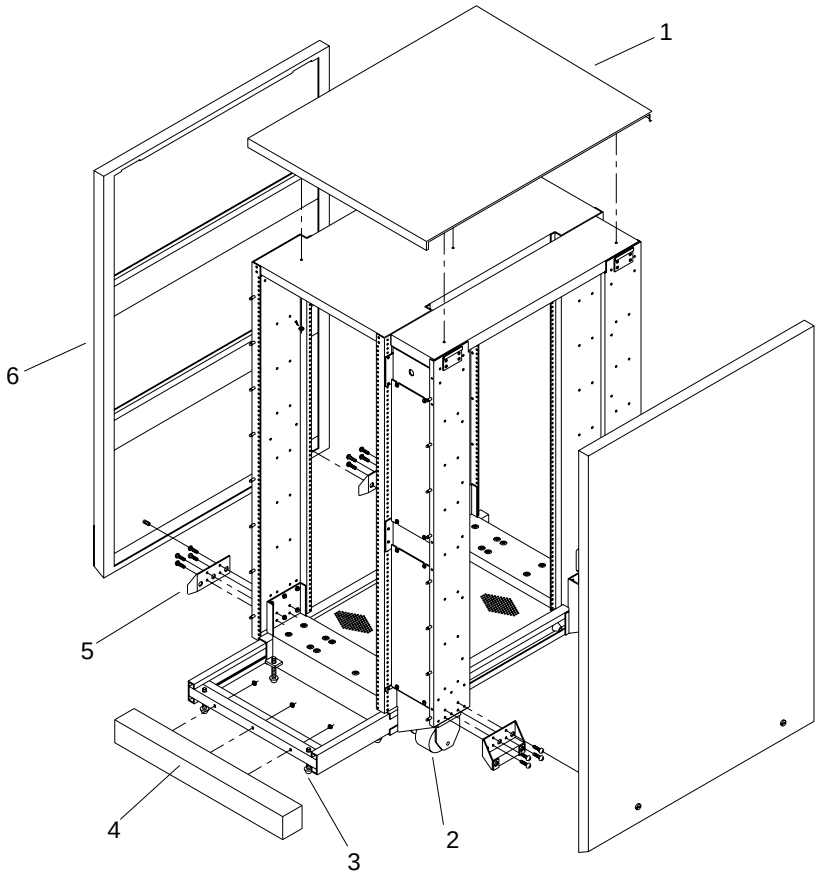
Table 6-1 Field-Replaceable Units *(2 of 2)*

Part Number	Description	Figure
540-2126	Fan (Center)	6-6
501-1827	LED Board	6-6
150-1557	Device Select Switch	6-6
130-1080	Jack Socket Kit	N/A
240-1872	Jack Screw, Fixed	N/A
530-1753	IPI Data Cable Assembly (Internal)	6-6
530-1764	IPI DC Power Cable Assembly (Internal)	6-6
530-1768	IPI Address/LED Cable Assembly (Internal)	6-6
530-1536	IPI Data Cable Assembly (External, .45m)	6-8
530-1788	IPI Data Cable Assembly (External, 2m)	N/A
530-1789	IPI Data Cable Assembly (External, 8m)	6-8
530-1343	AC Line Cord, International	6-7
530-1351	AC Line Cord, Domestic, 1 Gbyte and 911 Mbyte IPI Disk Drives	6-7
540-1770	1 Gbyte Disk Drive and Power Supply with Inner Tray	N/A
540-2005	911 Mbyte Disk Drive and Power Supply with Inner Tray	N/A



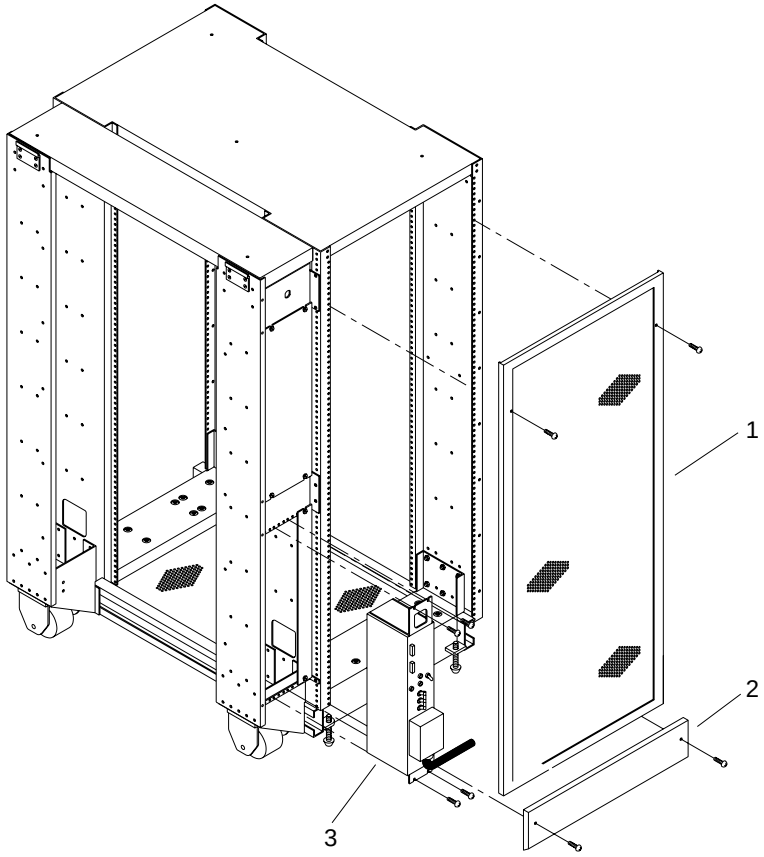
Key	Description	Part Number
1	Upper Panel Assembly	540-1858
2	Vented Panel Assembly	540-1857

Figure 6-1 Data Center with Front-Load Tape



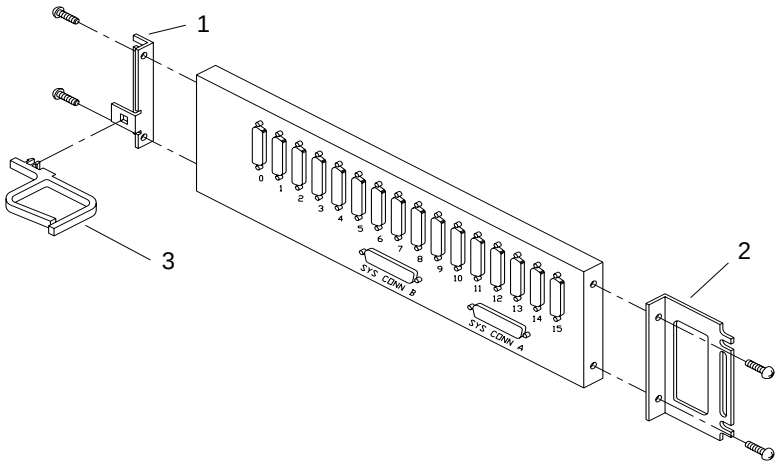
Key	Description	Part Number
1	Top Panel	340-1840
2	Caster	370-1210
3	Leveling Foot	230-1181
4	Anti-Tilt Panel	340-1884
5	Bracket	340-1886
6	Side Panel	340-1848

Figure 6-2 Trim:Front



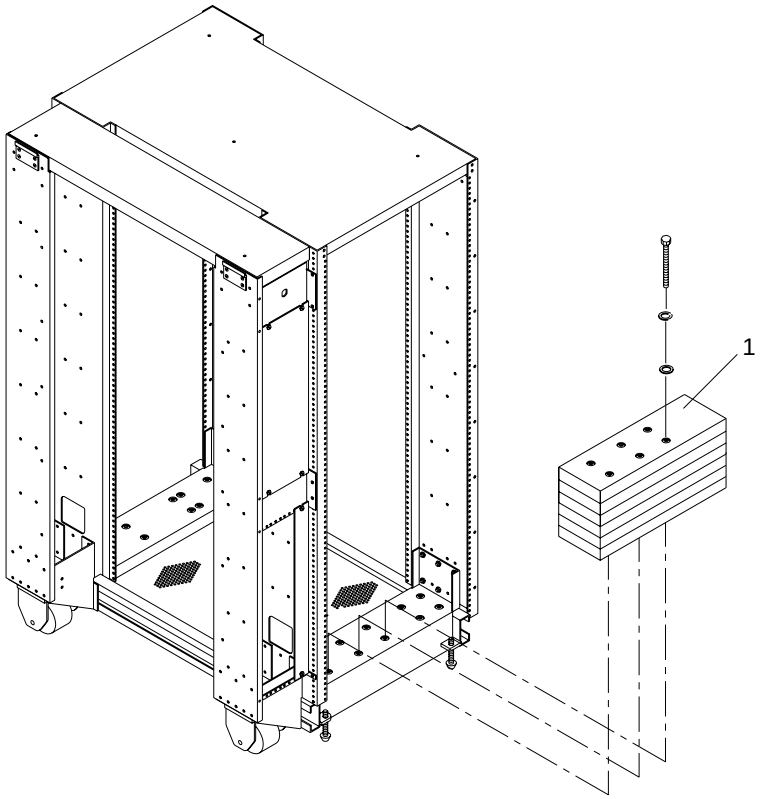
Key	Description	Part Number
1	Rear Panel	340-1845
2	Kick Panel	340-2047
3	Power Sequencer	370-1155 (230V) 370-1156 (240V)

Figure 6-3 Rear View



Key	Description	Part Number
1	DCA Bracket (short)	340-1914
2	DCA Bracket (long)	340-1915
3	Cable Clip	240-1678

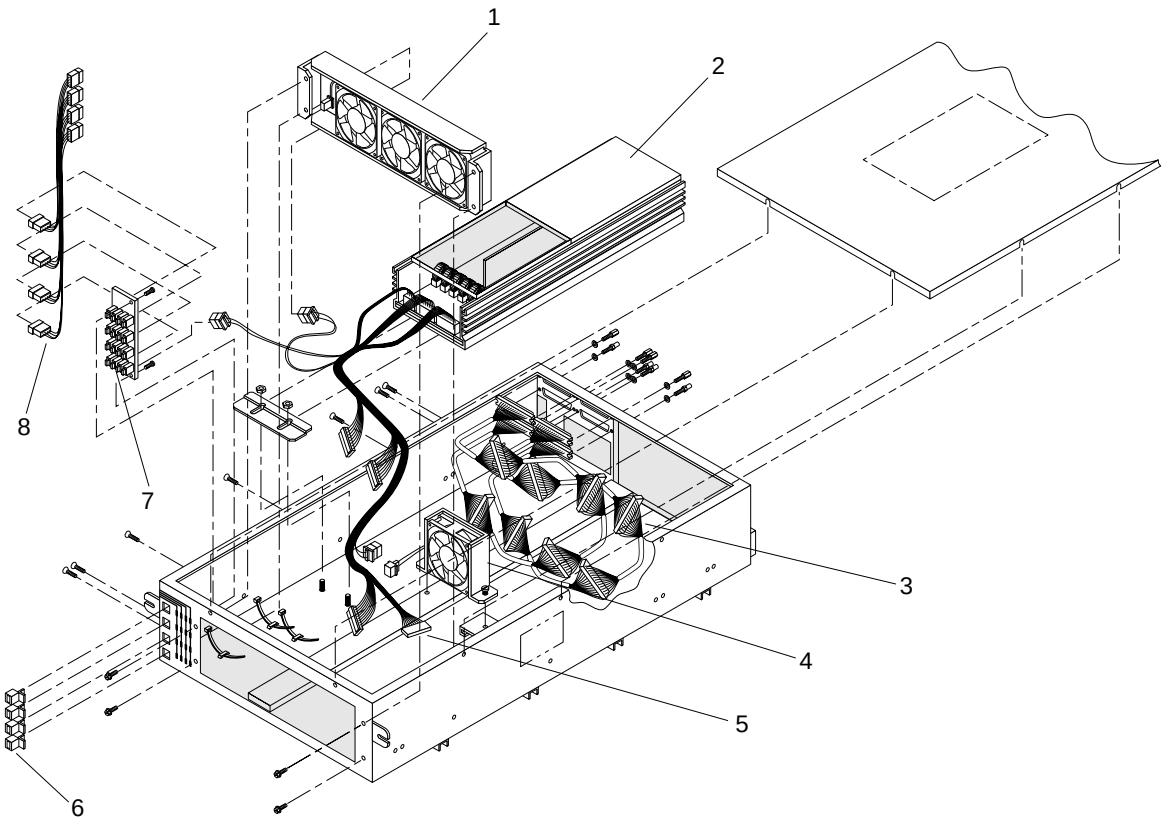
Figure 6-4 Asynchronous Line Multiplexer-2



Key	Description	Part Number
1	Ballast	340-2138

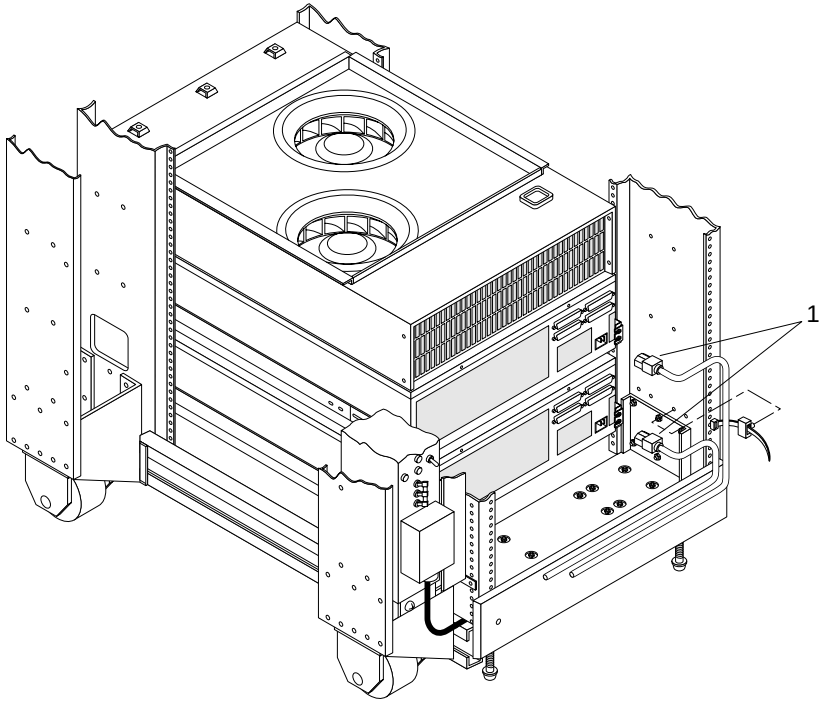
Note – A second ballast is required (use longer screws provided) if more than one front-load tape drive is installed in the cabinet.

Figure 6-5 Ballast



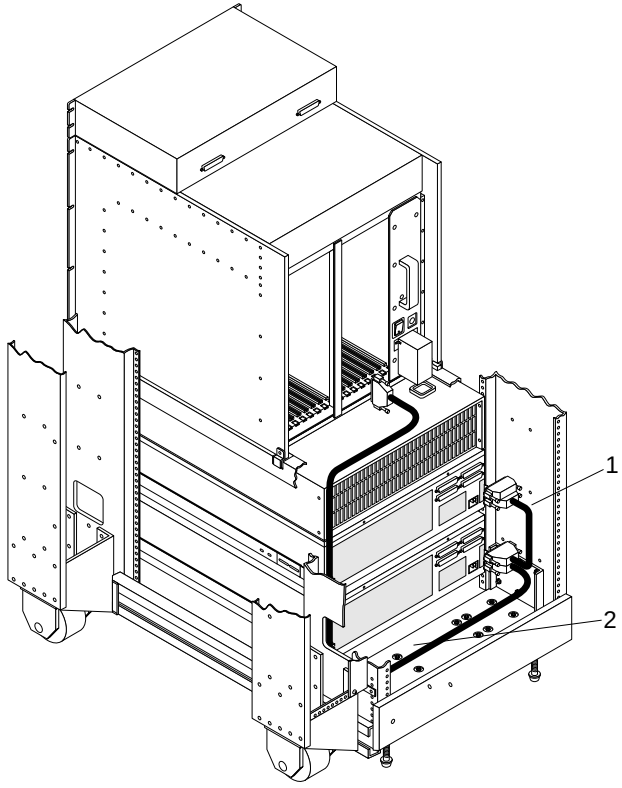
Key	Description	Part Number
1	3 Fan Tray Assembly (Front Fan)	540-2125
2	Power Supply, 268 Watt	300-1085
3	IPI Data Cable Assembly	530-1735
4	Single Fan Assembly (Center Fan)	540-2126
5	IPI DC Power Cable Assembly	530-1764
6	Device Select Switch (0-7)	150-1557
7	LED Board	501-1827
8	Address/LED Cable Assembly	530-1768

Figure 6-6 1.3 Gbyte IPI Disk Drive Tray Assembly



Key	Description	Part Number
1	AC Line Cord, International	530-1343 or
	AC Line Cord, Domestic	530-1351

Figure 6-7 1.3 Gbyte IPI Tray AC Line Cord



Key	Description	Part Number
1	IPI Data Cable Assembly (.45m)	530-1536
2	IPI Data Cable Assembly (2m)	530-1789

Figure 6-8 1.3 Gbyte IPI Tray Data Cables

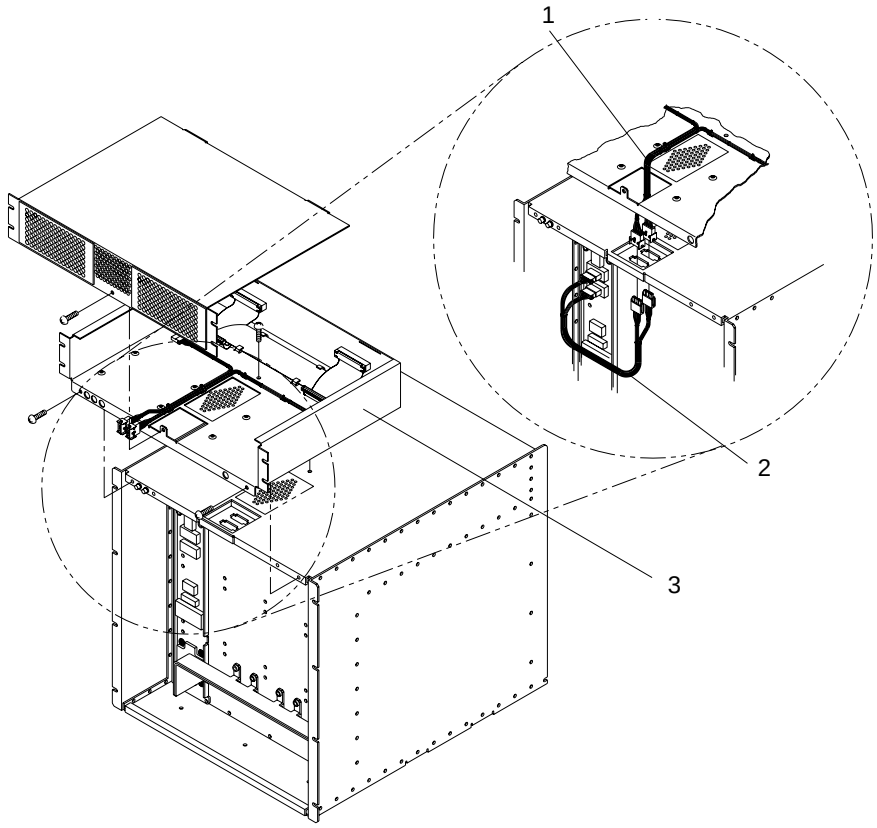
6.2 16-Slot Logic Enclosure Field Replaceable Units

Table 6-2 16-Slot Logic Enclosure Field-Replaceable Units

Part Number	Description	Figure
150-1397	Indicator LED	6-14
180-1189	Power Cord (230V)	N / A
180-1190	Power Cord (240V)	N / A
230-1166	Reusable Tie Wrap	N / A
230-1177	Clip, Cable Tie	N / A
300-1047	Power Supply (925W)	6-13
300-1065	Power Supply (1200W)	6-13
501-1597	Assembly, Backplane	6-14
530-1474	Cable, SCSI Flat	6-10
530-1506	Cable, LED	6-14
530-1507	Cable, SCSI Power Harness Assembly	6-9
530-1534	Cable, SCSI Ext. Power	6-9
530-1560	Cable, Blower	N / A
530-1561	Cable, Blower	N / A
530-1593	Cable, SCSI (1 m)	N / A
540-1719	Assembly, Blower Box	6-15
540-1869	Assembly, Load Resistor	6-14
370-1297	Drive, 2.3-Gbyte 8 mm Tape	6-11
370-1205	Drive, 150 Mbyte	6-10
370-1206	Drive, 150 Mbyte	6-11
370-1347	Drive, SunCD	6-11
530-1638	Cable, Y-Power	6-11
530-1642	Cable, SCSI Flat	6-11
340-2148	Mtg Bracket, Drive	6-11
340-2305	Filler Panel, Half-height	6-10

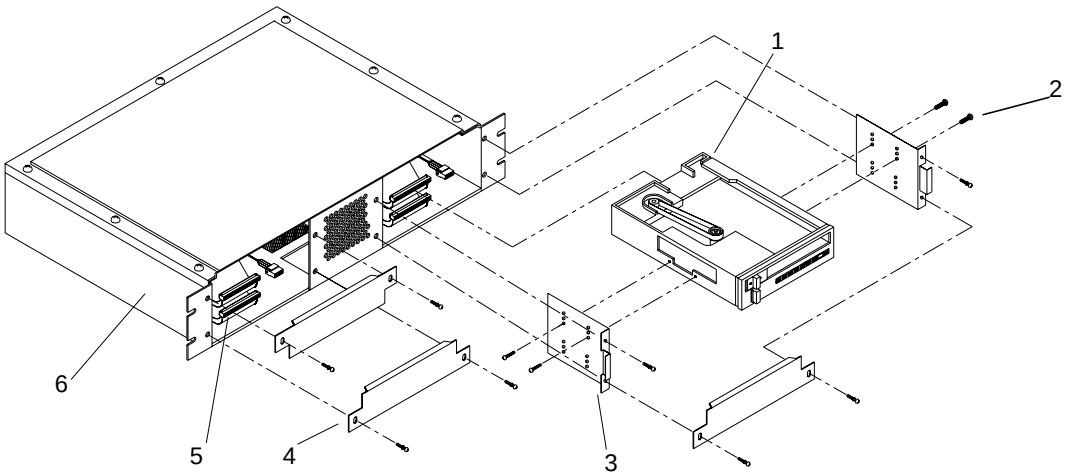
Table 6-2 16-Slot Logic Enclosure Field-Replaceable Units *(Continued)*

Part Number	Description	Figure
340-1407	Restrictor, Air Flow	6-12
540-1443	Panel, Filler	6-12
240-1287	Kit, Screw Lock	6-12



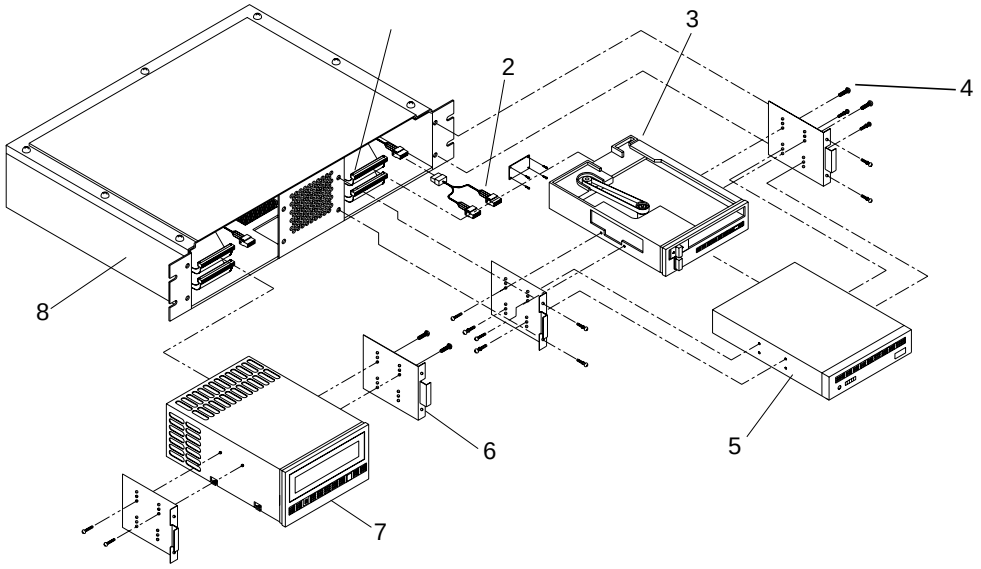
Key	Description	Part Number
1	Cable, SCSI Power Harness	530-1507
2	Cable, External SCSI Power	530-1534
3	Assembly, SCSI Tray	540-1865

Figure 6-9 SCSI Tray



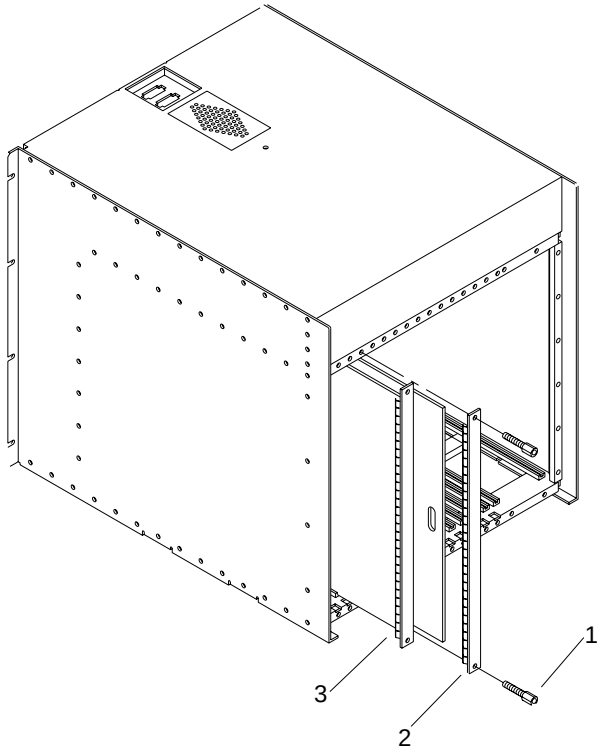
Key	Description	Part Number
1	Drive, 150 Mbyte	370-1206
2	Mounting Screw, Conductive	240-1141
3	Mtg Bracket, Drive	340-2148
4	Filler Panel, Half-height	340-2305
5	Cable, SCSI Flat	530-1642
6	Assembly, SCSI Tray	540-1865

Figure 6-10 SCSI Tray Drive with Blank Panel



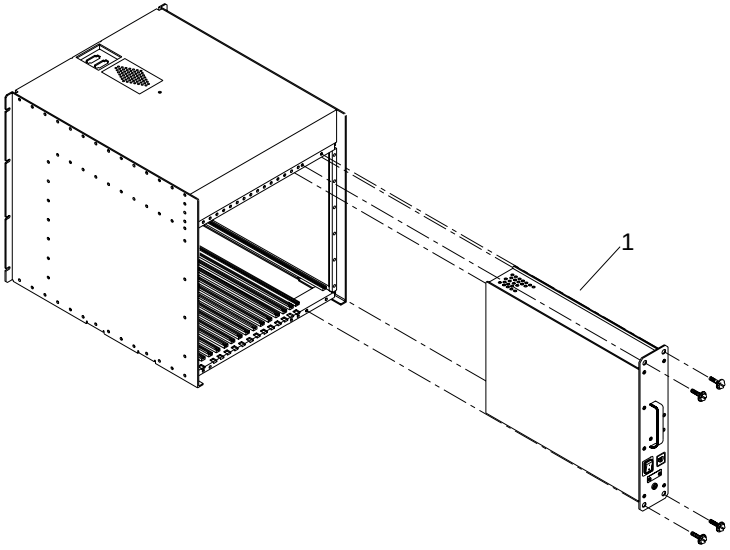
Key	Description	Part Number
1	Cable, SCSI Flat	530-1642
2	Cable, Y-Power	530-1638
3	Drive, 150 Mbyte	370-1205
4	Mounting Screw, Conductive	240-1141
5	Drive, CD-ROM	370-1347
6	Mtg Bracket, Drive	340-2148
7	Drive, 2.3-Gbyte 8 mm Tape	370-1297
8	Assembly, SCSI Tray	540-1865

Figure 6-11 SCSI Tray Combined Drive



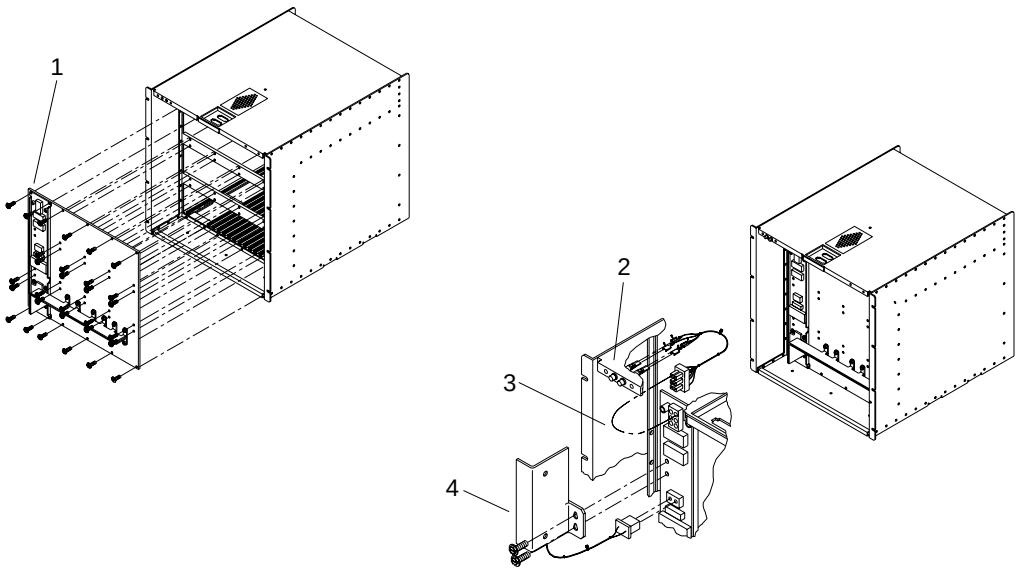
Key	Description	Part Number
1	Screw Lock Kit	240-1287
2	Filler Panel	540-1443
3	Air Flow Restrictor	340-1407

Figure 6-12 Air Flow Restrictor and Filler Panel



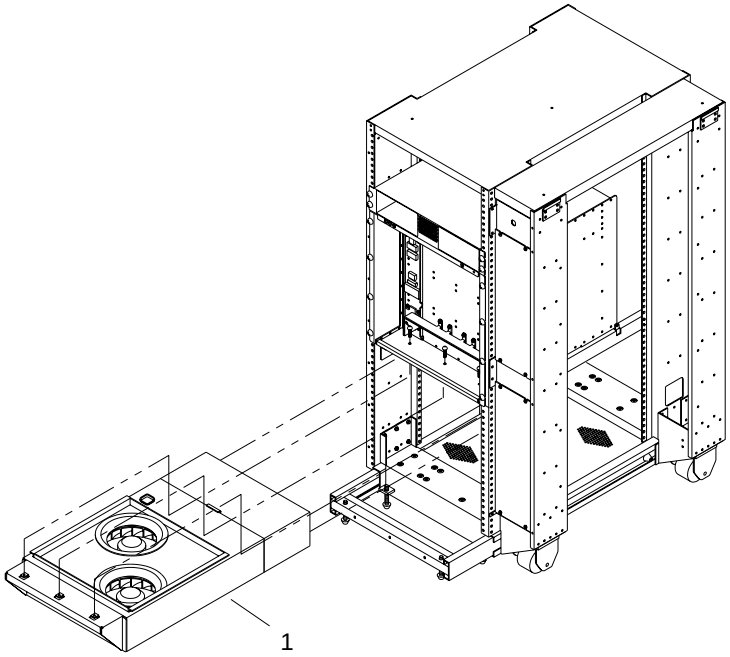
Key	Description	Part Number
1	Power Supply, 925 W	300-1047 or
	Power Supply, 1200 W	300-1065

Figure 6-13 Power Supply



Key	Description	Part Number
1	Backplane	501-1597
2	Indicator LED	150-1397
3	Indicator Cable	530-1506
4	Load Resistor Assembly	540-1869

Figure 6-14 Backplane



Key	Description	Part Number
1	Blower Box Assembly	540-1719

Figure 6-15 Blower Assembly

SCSI Device Configuration in the SPARCserver 690MP

A

Use the information in this chapter to perform tasks required to configure these devices:

- SunCD™
- 1/4-inchTape Drive
- 8 mm Tape Drive
- Front-load 1/2 -inch Tape Drive
- Differential SCSI Disk Tray
- Multi-tape Backup Tray

A.1 Configuration Options

Figure A-1 depicts configuration and option install positions for SCSI devices in the Cabinet. To remove panels and access installation areas, refer to Chapter 1, Section 1.5, “Trim Removal and Replacement.”

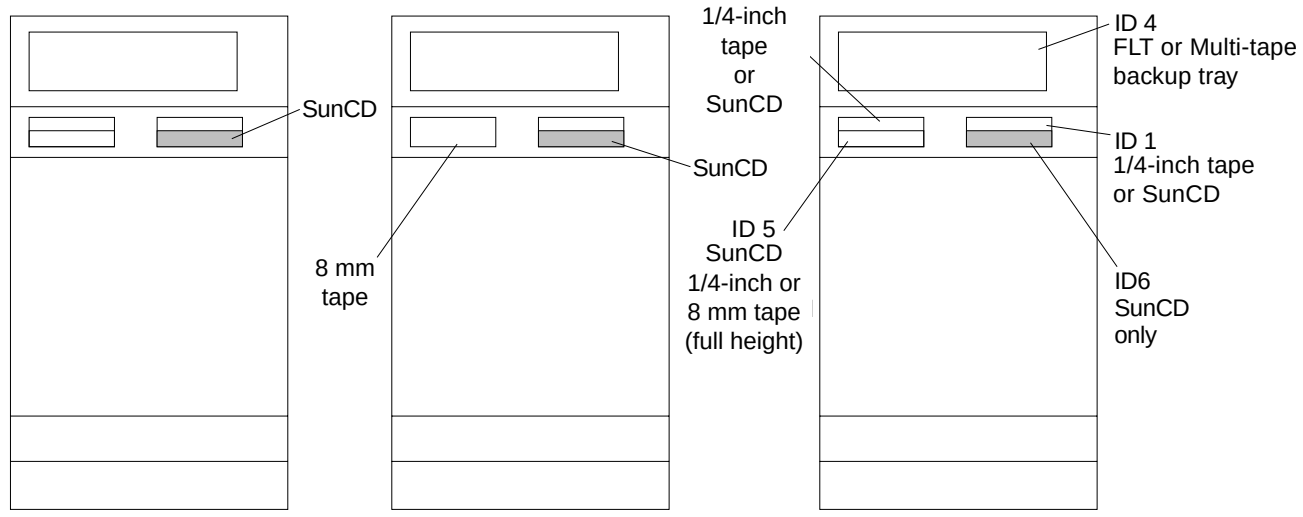


Figure A-1 Standard Configuration and Options Depicting Install Positions

A.2 Configuration Overview

Note – Configure the device SCSI ID *before* installing it in the SCSI tray. The involved connector or switch may not be accessible after installation is complete.

Configure the SCSI ID for the device according to its position in the tray (refer to Figure A-1). The method of configuring the device will differ with device type. Configures the device by performing one of the following operations

- installing jumpers (SCSI devices)
- programming the device while powered up (front load tape)

A.3 Inspection and Handling Precautions

Caution – Circuit board components are vulnerable to damage by electrostatic discharge (ESD). An electrostatic charge can build up on the human body and then discharge when you touch a board. Such discharge can be produced by walking across a carpet and touching a board, or by other similar cause. *Before handling any board,* make sure you dissipate your body's charge. Touch a conductive surface of the chassis or other element connected to common earth ground to discharge the static electricity present in your body.

To minimize risk of ESD damage

- Handle board by edges only
- Store board in antistatic bag provided
- Use a grounding strap and Sun ESD mat, PN 250-1088-01, whenever you work on a board (instructions printed on the mat)

Caution – A SCSI device is an electromechanical device that may be damaged by excessive physical shock. Do not jar this device or drop it. A SCSI device should be handled only by service personnel who are familiar with the correct methods of working with SCSI devices.

After unpacking the device, inspect it for evidence of damage. If damaged, keep all contents and packing materials for the carrier's agent to inspect. Save packing materials for future use.

A.4 SCSI Bus Termination

Follow termination rules below for SCSI devices installed in this system.

- SCSI devices are daisy-chained.
- The last device (and only the last) in the chain is terminated.

Use the information in this section to configure SCSI devices. Make sure you have read Section A.2, "Configuration Overview" before beginning.

A.4.1 SunCD

A.4.1.1 Connector Locations

The SCSI ID, SCSI interface, and power connectors are located on the rear panel of the SunCD. Refer to Figure A-2 for the connector locations.

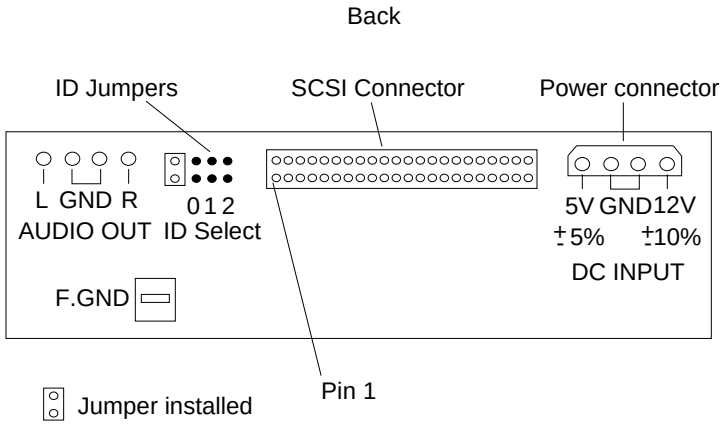


Figure A-2 Connector Locations for the SunCD

A.4.1.2 Configuration

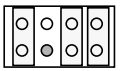
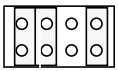
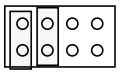
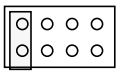
1. **Remove jumpers from the drive SCSI ID receptacle using needle-nose pliers.**

Note – A jumper is a small metal sleeve that slides over two neighboring pins in the SCSI ID receptacle to provide an electrical connection

---

2. **Refer to Table A-1 and arrange the jumpers on the receptacle to assign the desired SCSI ID.**

Table A-1 SCSI ID Settings for the SunCD

SCSI Device	SCSI ID Setting	Jumper Position
SunCD	6	
SunCD	5	
SunCD	1	
SunCD	0	

A.4.2 1/4-inch Tape Drive

A.4.2.1 Connector Locations

The SCSI ID, SCSI interface, and power connectors are located on the rear panel of the 1/4-inch tape drive. Refer to Figure A-3 for connector locations.

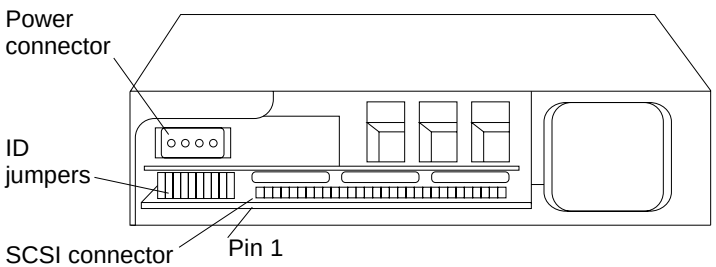


Figure A-3 Connector Locations for the 1/4-inchTape Drive

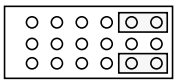
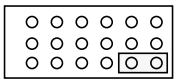
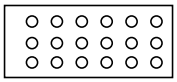
A.4.2.2 Configuration

1. **Remove the jumpers from the jumper block on the drive using the needle-nose pliers. See Figure A-3 for the location of the jumpers.**

Note – A jumper is a small metal sleeve that slides over two neighboring pins in the SCSI ID receptacle to provide an electrical connection.

2. **Refer to Table A-2 and arrange the jumpers on the jumper block to assign the desired SCSI ID.**

Table A-2 SCSI ID Settings for the 1/4-inchTape Drive

SCSI Device	SCSI ID Setting	Jumper Position
1/4-inchTape Drive	5	
1/4-inchTape Drive	1	
1/4-inchTape Drive	0	

A.4.3 8 mm Tape Drive

Connector Locations

The SCSI ID, SCSI interface, and power connectors are located on the rear panel of the 8 mm tape drive. Refer to Figure A-4 for the connector locations.

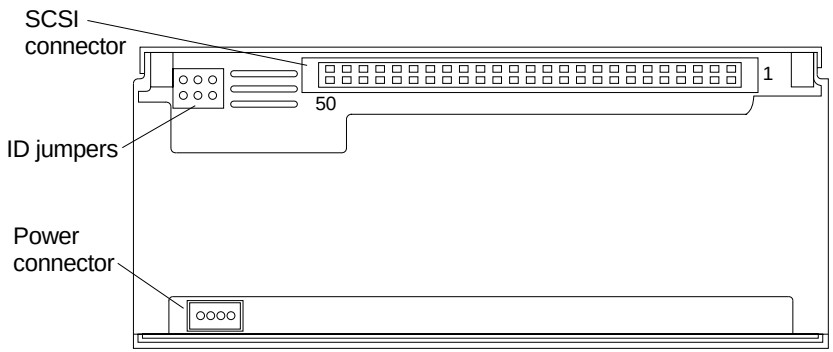


Figure A-4 Connector Locations for the 8 mm Tape Drive

A.4.3.1 Configuration

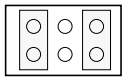
1. **Remove jumpers from the drive SCSI ID receptacle using the needle-nose pliers. Refer to Figure A-4 for the SCSI ID receptacle location.**

Note – A jumper is a small metal sleeve that slides over two neighboring pins in the SCSI ID receptacle to provide an electrical connection.

---

2. **Refer to Table A-3 and arrange the jumpers on the ID receptacle to assign the desired SCSI ID.**

Table A-3 SCSI ID Settings for the 8 mm Tape Drive

SCSI Device	SCSI ID Setting	Jumper Position
8 mm Tape Drive	5	

A.4.4 Front-load 1/2 -inch Tape Drive

A.4.4.1 Connector Locations

The SCSI interface and power connectors are located on the device rear panel. Refer to Figure A-5 for the connector locations.

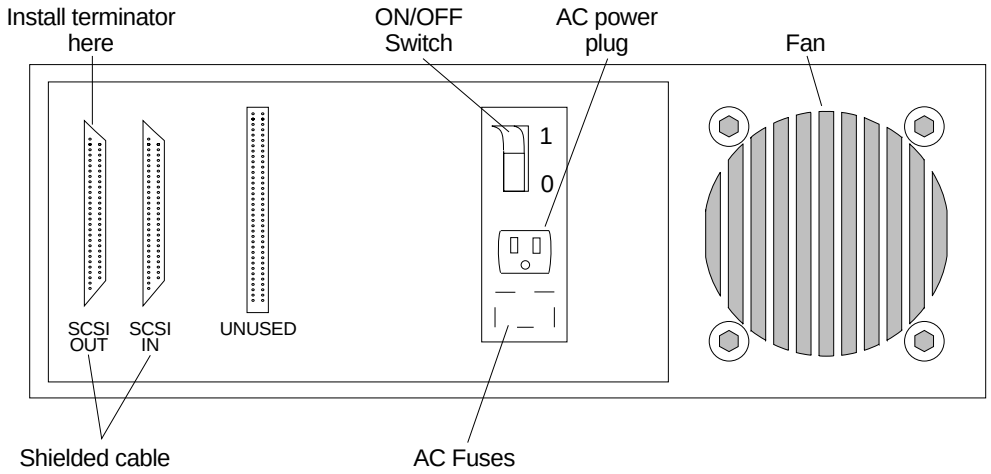


Figure A-5 Front-load 1/2-inch Tape Drive Rear View

A.4.4.2 Configuration

Setting Device ID

If this device was factory installed, the ID was configured at the factory. If installing this unit after cabinet installation, configure the ID as follows:

Caution – The system must be powered on to perform this procedure. Ensure all installation is complete and that all panels are replaced.

1. **Turn system power on:**
   a. **Turn system power key switch to OFF position.**
   b. **Set the LOCAL/Remote switch to REMOTE ON position.**
   c. **Switch the MAIN POWER circuit breakers to ON position.**
   d. **Set the system key switch to ON position.**
2. **Ensure the drive is off-line. If the ONLINE indicator is lit, press the device control panel ONLINE key to extinguish the ONLINE indicator.**
3. **Press the OPTION key to enter the option mode.**

4. **Press the NEXT key until *ID** displays on the front panel display.**
5. **Press the ENTER key to select *ID* mode.**
6. **The message*: ID*, displays. Configure the device ID to 4:**
   a. **Press:**

      NEXT, to increment display by units of 1 (1, 2, 3...)

      DENSITY, to increment display by units of 10 (10, 20, 30...)

   b. **Press:**

      PREV, to decrement display by units of 1 (3, 2, 1...)

      ONLINE, to decrement display by units of 10 (30, 20, 10...)
7. **With 4 displayed, press ENTER. This action configures the device for ID 4. The display shows *SET 4* briefly affirming the value is accepted. Following this, the device ID is displayed.**

A.4.5 Differential SCSI Disk Tray Configuration

1. **Face the tray front and set the SCSI address for the drives in the tray.** Six SCSI address switches are on the tray front, one for each drive within the tray. Figure A-6 shows SCSI address switch locations on the tray.

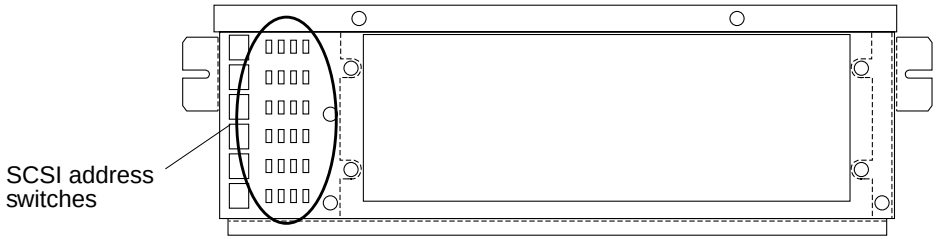


Figure A-6 Location of the SCSI Address Switches on the 2.1 Gbyte Drive Tray

To set the SCSI address for the 2.1 Gbyte disk drive, press the button marked “+” to increment the address shown, or press the “-” button to decrement the address shown until the proper address shows in the window. Addresses range from 0 to 7. Figure A-7 shows the SCSI addresses for the drives within the tray.

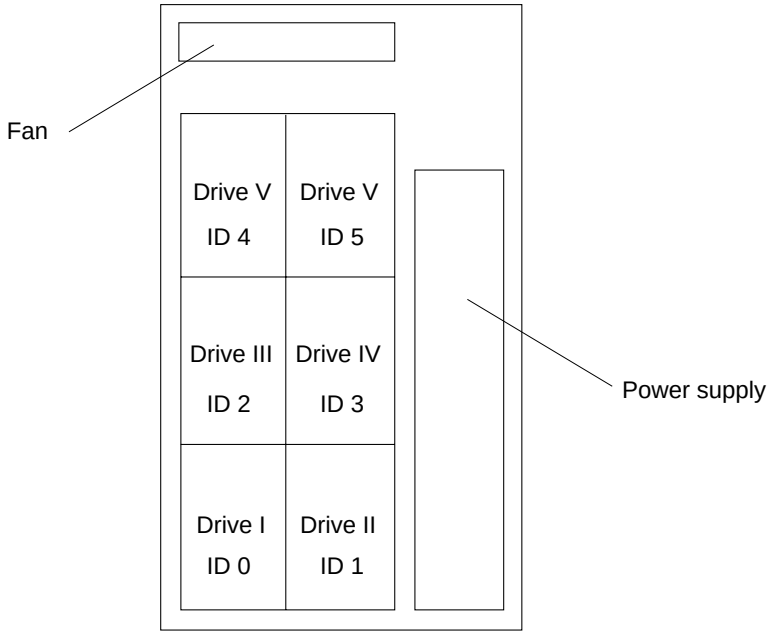


Figure A-7 SCSI Addresses for Drives in the Drive Tray

A.4.6 Multi-tape Backup Tray Configuration

1. **Determine what the SCSI address will be for the 5.0 Gbyte 8 mm tape drive you just installed in the Multi-Tape Backup Tray.**
   The SCSI addresses for the 5.0 Gbyte 8 mm tape drives within the Multi-Tape Backup Tray will vary depending on the location of the tape drive in the tray. Table A-4 shows the SCSI addresses for tape drives in a tray in a SPARCserver 690MP, and Table A-5 shows the SCSI addresses for tape drives in a tray installed in a 56-Inch Data Center Expansion Cabinet.

Table A-4 SCSI Addresses for Multi-Tape Backup Tray Drives in a SPARCserver 690MP

Drive Bay	SCSI Address
I	0
II	3
III	2
IV	4

Table A-5 SCSI Addresses for Multi-Tape Backup Tray Drives in a 56-Inch Data Center Expansion Cabinet

Drive Bay	SCSI Address
I	5
II	3
III	2
IV	4

2. Access the front of the tray and set the SCSI address for the drive.

Four device select switches are at the front of each Multi-Tape Backup Tray, one for each drive within the tray. Addresses range from 0 to 7, but only addresses from 0 to 5 are available for drives within the Tray. Figure A-8 shows the device select switch location on the Multi-Tape Backup Tray.

To set the SCSI address for the 5.0 Gbyte 8 mm tape drive, press the button marked “+” to increment the address shown, or press “-” to decrement the address shown until you see the proper address in the window.

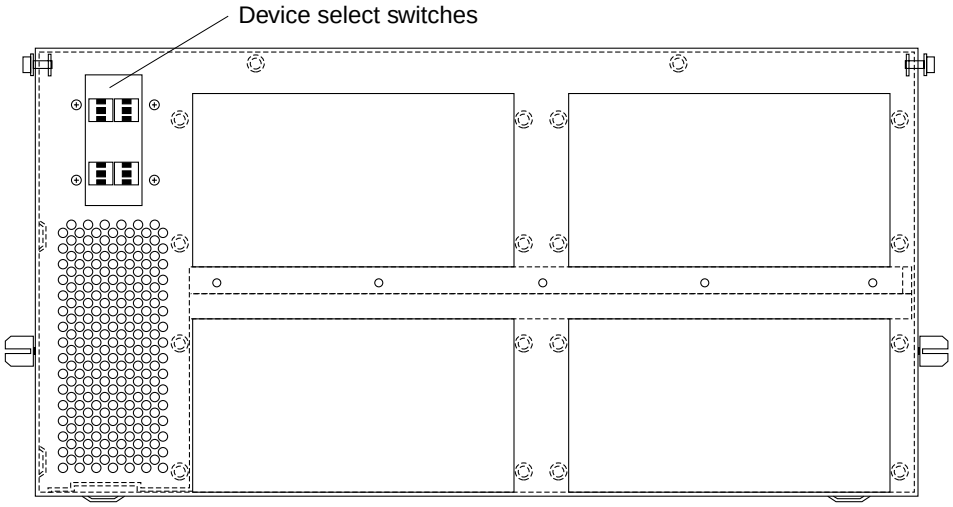


Figure A-8 Location of the Device Select Switches on the Multi-Tape Backup Tray

1.3 Gbyte IPI Device Configuration in the SPARCserver 690MP

B

This system accepts one or two IPI trays. A tray has from two-to-four drives. Address select switches are located on the front of each tray, along with four LED indicators for each drive. The LEDs indicate

- which port (A or B) of a given drive is selected
- if the drive has a fault
- if the drive is ready to accept data

After installation, the address for each drive is assigned by means of front panel address select switches. Each drive is configured according to its position in the tray (I through IV) as well as the position of the tray (bottom or top).

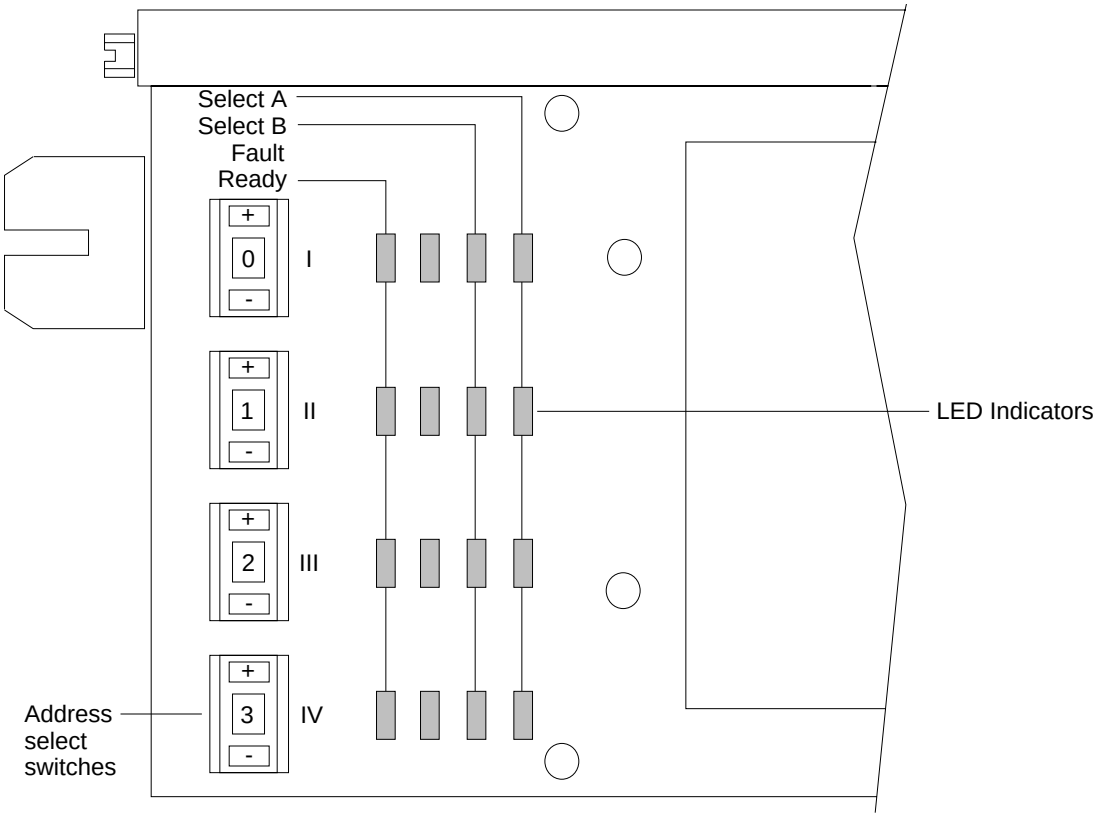


Figure B-1 IPI Tray Front Panel Controls and Indicators

B.1 Configuration

The cabinet can be configured with from two-to eight drives. Front panel address switches are set to 0-to-7 identifying each drive within this array. Configure the IPI address for all drives as follows:

1. Determine the tray configuration for the bottom (first tray).

Note – If the drive configuration is not known, expose drives in the tray and inventory them. Follow the procedure in Section 3.3, “1.3 Gbyte IPI Disk Drive” to access the tray interiors.

Note – Each drive position in the tray is identified by roman numerals I through IV stamped on the top right edge of the tray housing, as viewed from the front and above (with cover removed).

2. **Set the front panel switches according to the listing presented in Table B-1. Each switch assembly has two buttons. Press the top button to increment the address, and the bottom button to decrement the address.**

3. **Repeat steps one and two above for the top (second) tray, if present.**

Table B-1 IPI Address Configuration Settings

Tray	Switch	Drive Designator*	IPI Address**
Bottom (first)	I	I	0
	II	II	1
	III	III	2
	IV	IV	3
Top (second)	I	I	4
	II	II	5
	III	III	6
	IV	IV	7

Notes: * Find designator stamped on top-right edge on tray sheet metal (with tray cover removed).

** Press push-button switch (front panel) until switch display reads this value.

B.1.0.1 Retract the Anti-tilt Bar

Push anti-tilt bar in to the fully-retracted position.

B.2 SELECT A/SELECT B Indicators

These indicators will tell you which port on a corresponding drive is being accessed.

B.3 FAULT Indicators

These indicators will tell you that the tray is having internal or external problems. If you see one of these indicators light up, contact your Sun representative.

B.4 READY Indicators

These indicators will tell you that the corresponding drive is ready to have information written to or read from it.

SPARCserver 690MP Card Cage Slot Assignment and Back Plane Configuration

C

Table C-1 describes the card cage slot assignments for printed circuit boards in the SPARCserver 690MP. The table vertically lists PCB slot priority assignments in order of descending priority. Horizontal slot designations “A”, “B”, “C”, etc., correspond to the preferred location for the specific board, with “A” being the most desirable location. If the only designation is “A”, the board MUST be placed in that slot. Boards must be installed in descending order starting with the system board.

Note – If the boards are not installed in the proper order, the system may lose performance or functionality.

Note – Slots 1 through 3 are non-VME slots; that is, they are reserved for memory boards only.

Table C-1 shows slot numbering and bus locations on the SPARCserver 690MP backplane. Figure C-1 shows the backplane jumper layout on the SPARCserver 690MP and Table C-2 and Table C-2 further describe backplane jumper locations and functions.

Table C-1 SPARCserver 690MP Card Cage Slot Assignments

Backplane Jumpers		Board Name	Backplane Slot Position															
BG3 PX03	IACK PX04		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(a)	(a)	600MP System Board (a)				A	A											
N/A	N/A	1st Memory Board (b)		A	A													
IN	IN	2nd Memory Board (b)						B	B									
IN	IN	1st SBus Expansion Subsystem (k)		A	A			A	A	—	—	—	—	—	—	—	A	A
IN	IN	2nd SBus Expansion Subsystem (k)							B	B	—	—	—	—	—	—	B	B
OUT	OUT	1st 501-1460 SunLink Channel Adapter (d,e)						A	A	—	—	—	—	—	—	—	A	A
OUT	OUT	2nd 501-1460 SunLink Channel Adapter (d,e)								B	B	—	—	—	—	—	B	B
OUT	OUT	1st 501-1276 Fiber Distributed Data Interface (f)						A	—	—	—	—	—	A				
OUT	OUT	2nd 501-1276 Fiber Distributed Data Interface (f)							B	—	—	—	—	B				
IN	IN	501-1847 Prestoserve (g)						A	—	—	—	—	—	—	—	—	—	A
OUT	OUT	1st 370-1421 Sun VME Network CoProcessor(j)						A	—	—	—	—	—	—	—	—	—	A
OUT	OUT	2nd 370-1421 Sun VME Network CoProcessor (j)							B	—	—	—	—	—	—	—	—	B
OUT	OUT	3rd 370-1421 Sun VME Network CoProcessor (j)								C	—	—	—	—	—	—	—	C
OUT	OUT	4th 370-1421 Sun VME Network CoProcessor (j)									D	—	—	—	—	—	—	D
OUT	OUT	5th 370-1421 Sun VME Network CoProcessor (j)										E	—	—	—	—	—	E
OUT	OUT	6th 370-1421 Sun VME Network CoProcessor (j)											F	—	—	—	—	F
OUT	OUT	7th 370-1421 Sun VME Network CoProcessor (j)												G	—	—	—	G

Table C-1 SPARCserver 690MP Card Cage Slot Assignments

Backplane Jumpers		Board Name	Backplane Slot Position															
BG3 PX03	IACK PX04		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
OUT	OUT	8th 370-1421 Sun VME Network CoProcessor (j)													H			H
OUT	OUT	1st ISP-80 Controller (h, i)						A										A
OUT	OUT	2nd ISP-80 Controller (h, i)							B									B
OUT	OUT	3nd ISP-80 Controller (h, i)								C								C
OUT	OUT	4th ISP-80 Controller (h, i)									D							D
OUT	OUT	5th ISP-80 Controller (h, i)										E						E
IN	OUT	1st 501-1221 MCP (c,e)									A							A
IN	OUT	2nd 501-1221 MCP (c,e)										B						B
IN	OUT	3rd 501-1221 MCP (c,e)											C					C
IN	OUT	4th 501-1221 MCP (c,e)												D				D
IN	OUT	1st 501-1203 ALM-2 (c)									A							A
IN	OUT	2nd 501-1203 ALM-2 (c)										B						B
IN	OUT	3rd 501-1203 ALM-2 (c)											C					C
IN	OUT	4th 501-1203 ALM-2 (c)												D				D
IN	OUT	5th 501-1203 ALM-2 (c)													E			E
IN	OUT	6th 501-1203 ALM-2 (c)														F		F
IN	OUT	7th 501-1203 ALM-2 (c)															G	G
IN	OUT	8th 501-1203 ALM-2 (c)																H

C.1 Slot Assignment Considerations

Notes below refer to parenthesized letters, like (a) or (b), in the table

a) The 600MP system board consumes two card cage slots. Slot 4 back plane jumpers; OUT, OUT. Slot 5 back plane jumpers; IN, IN.

   The 600MP system board will support up to four SBus option cards. Consult your sales office for available options and configurations.

b) Move the memory board jumper according to the number of memory boards installed. Jumper the board installed in slot 2 as Board **1**, and the board installed in slot 6 as Board **2.** With a second memory board installed in slot 6, jumpers are required in backplane locations P700-P704.

   Refer to *The 600MP System Board and Expansion Memory Installation and Service Manual*, PN 800-5318 for correct jumper positions.

c) See Section C.3, "ALM-2 and MCP Product Notes," to use ALM-2 with MCP.

d) **Cautions regarding the SunLink Channel Adapter:**

   1. Each SunLink Channel Adapter assembly consumes two slots. The **BG3** and **IACK** backplane jumpers *must be removed for both slots*.

   2. If, after selecting a slot for the Channel Adapter assembly, an unused slot exists between the system board and Channel Adapter, do not install a disk controller in this slot. To do so may degrade Channel Adapter data throughput rate.

e) Consult your sales office concerning software considerations and availability for this unbundled product

f) When installing the Fiber Distributed Data Interface, refer to the *SunNet FDDI/DX Controller Card Configuration and Install Manual*, PN 813-1053.

g) When installing the Sun VME Prestoserve, refer to the *Sun Prestoserve Installation Manual*, PN 813-1112.

h) Three ISP-80 Controller Boards are available: part numbers 501-1313, 501-1539, and 501-1855. Consult your sales office for installation considerations and product availability. When installing the ISP-80 Controller, refer to the *ISP-80 Disk Controller Configuration Procedures Manual*, PN 813-2065.

i) If installing other VME boards, ISP-80 *must* be installed to the left of (in lower-numbered slots to) the 501-1203 ALM-2 and/or 501-1221 MCP.

j) Sun VME Network CoProcessor must be placed to the left of the 501-1203 ALM-2, 501-1539 or 501-1855 ISP-80 Controller Boards. When installing this board, refer to the *Sun VME Network CoProcessor Installation Manual*, PN 800-6881.

k) The SBus Expansion Subsystem board consumes two card cage slots.

This board supports up to four SBus option cards. It connects only to the power bus. Consult your sales office for available options/configurations.

See the *SBus Expansion Subsystem Board Installation Manual*, PN 800-7178 for more details.

C.2 Back Plane Jumper Functions

Each jumper listed in the left column of Table C-2 connects BGO-3IN to BGO-3OUT and IACKIN to IACKOUT on the card cage slot in the right column of the table. Table C-2 shows backplane jumper location for each jumper function.

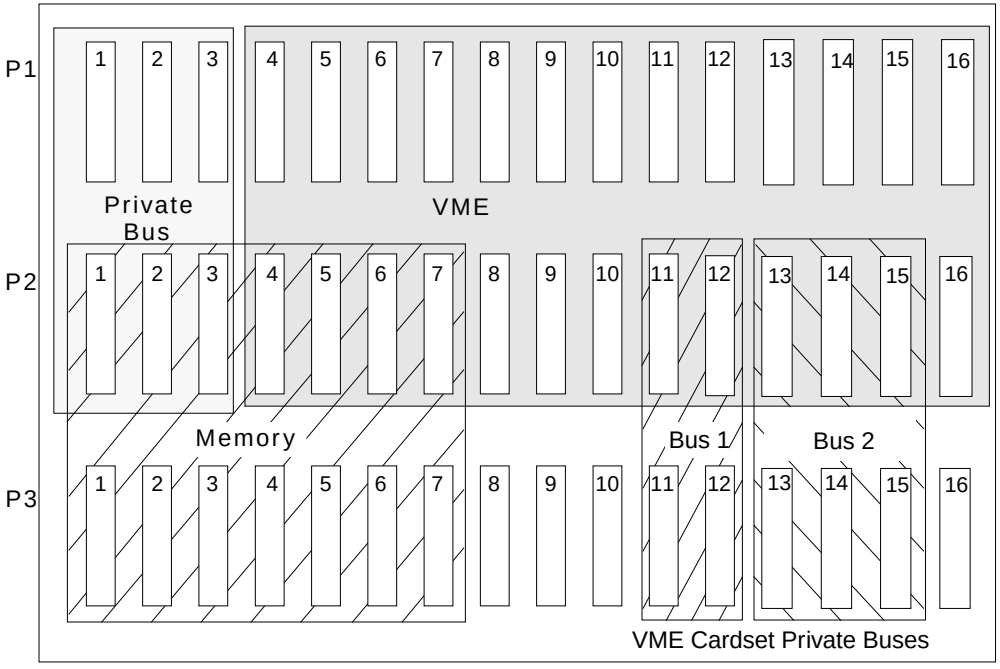
Table C-2 SPARCserver 690MP Backplane Jumper Functions

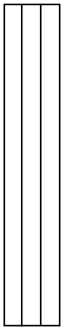
Jumper	Slot
P4XX	4
P5XX	5
P6XX	6
P7XX	7
P8XX	8
P9XX	9
P10XX	10
P11XX	11
P12XX	12
P13XX	13
P14XX	14
P15XX	15
P16XX	16

Note: The +5v standby jumper must be in at P100.

Table C-3 SPARCserver 690MP Backplane Jumper Locations

Jumper Function	Jumper Location
BG0	PX00
BG1	PX01
BG2	PX02
BG3	PX03
BG4	PX04
+5V STBY	P100





Typical Pin/Row Layout for the Backplane Connectors

VME Bus: P1 and Row B of P2 (Slots 4-16)
Private Bus: P1 and Row B of P2 (Slots 1-3)

Memory Bus: P2 Row A and C and P3 Row B (Slots 1-7)
VME Cardset Private Bus: P2 Rows A and C and P3 Row B (Slots 11,12 and 13-15)

Figure C-1 SPARCserver 690MP Backplane Layout (Viewed From Cabinet Rear)

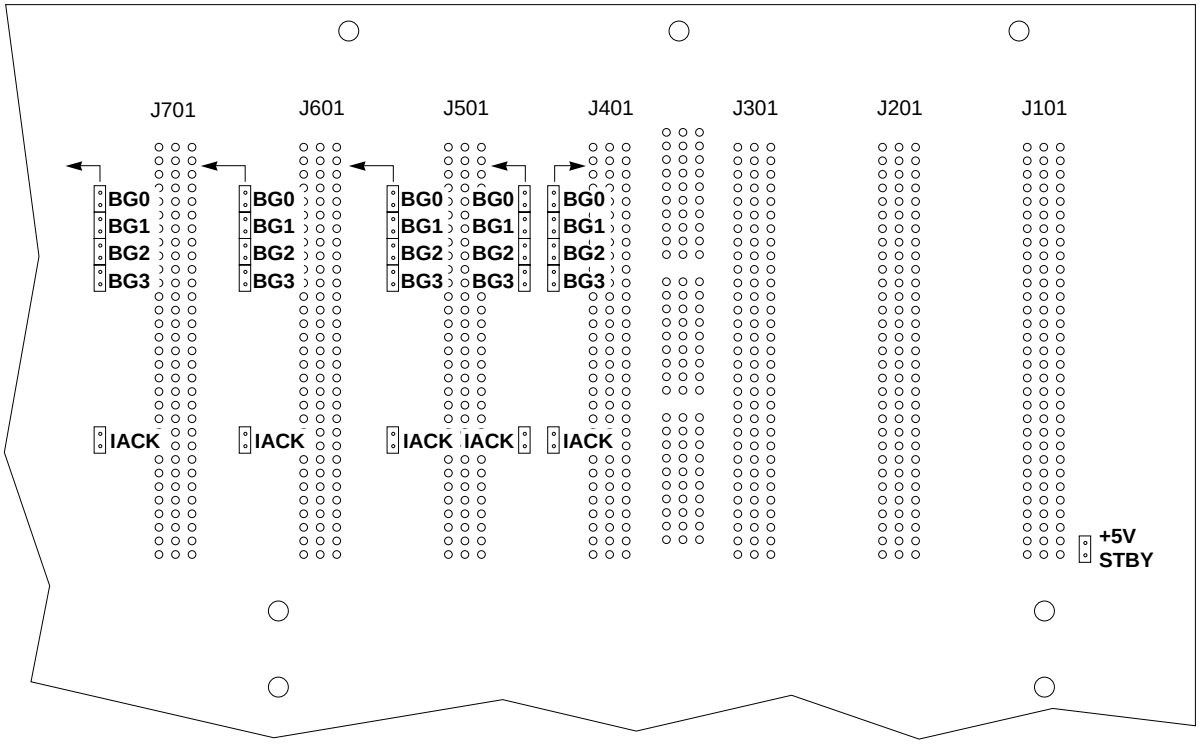


Figure C-2 SPARCsystem 690MP Backplane Jumpers

C.3 ALM-2 and MCP Product Notes

A total of eight VME based communication boards (MCP and ALM-2) may reside in the system at one time. The board types may be mixed, with the constraint that four MCP boards maximum may be installed in the system.

C.3.1 Interrupt Vector Conflicts

The Asynchronous Line Multiplexer-2 (ALM-2) shares VME interrupt vector assignments and address space with the Multiprotocol Communication Processor (MCP). Because of these possible conflicts, and a possible physical space restriction in the Data Center Cabinet, the following must be applied when installing an ALM-2 into a card cage that also contains MCPs.

Table C-4 ALM-2 and MCP Vector Interrupt Assignments

Installed Board	Device Address (Hex)	VME Vector Interrupt Assignment
1st Board (ALM-2 or MCP)	0x01000000	8b
2nd Board (ALM-2 or MCP)	0x01010000	8a
3rd Board (ALM-2 or MCP)	0x01020000	89
4th Board (ALM-2 or MCP)	0x01030000	88
5th Board (ALM-2 or MCP)	0x02000000	a0
6th Board (ALM-2 or MCP)	0x02010000	a1
7th Board (ALM-2 or MCP)	0x02020000	a2
8th Board (ALM-2 or MCP)	0x02030000	a3

As you can see from the table, the vector interrupt assignments of the ALM-2 and the MCP are the same. This makes the following instructions necessary.

C.3.2 Board Device Sequence

When installing the ALM-2 or MCP, the boards *must* be installed in proper address order. Four VME board address positions are available that can accommodate ALM-2 or MCP board (devices 0-3). Therefore, one address position can only accommodate one board type, and any MCP or ALM-2 must be installed in the proper board device sequence.

Table C-5 Board Device Sequence

1st Board (ALM-2 or MCP)	Device 0
2nd Board (ALM-2 or MCP)	Device 1
3rd Board (ALM-2 or MCP)	Device 2
4th Board (ALM-2 or MCP)	Device 3
5th Board (ALM-2 or MCP)	Device 4
6th Board (ALM-2 or MCP)	Device 5
7th Board (ALM-2 or MCP)	Device 6
8th Board (ALM-2 or MCP)	Device 7

Note – Refer to the specific ALM-2 or MCP Configuration Procedure for information on board device addressing.

Example: If two MCP boards are already installed (1st and 2nd MCP boards) and you then want to install two ALM-2 boards, you must configure and install the two ALM-2 boards as the 3rd and 4th ALM-2 boards respectively.

C.3.3 VME Address Conflict

ALM-2 and MCP must not be installed using identical VME addresses (board device numbers).

The ALM-2 board number (VME Address) is hardware selected on the board. If necessary, refer to the *ALM-2 Installation and Configuration Manual*, PN 813-1029 for information on setting/verifying the ALM-2 board address (board address selection is identical for the MCP).

ALM-2 and MCP boards occupy the identical VME address space as well as interrupt vectors, and both are known to the system board as **mcpx** (where **x** is a number **0** through **7**). So, for example, if two MCP boards are already present in the card cage and you wish to add an ALM-2, the ALM-2 would be designated as **mcp2** in the VME addressing (with the two MCP boards being designated **mcp0** and **mcp1** respectively).

Index

Revision History

Revision	Dash	Date	Comments
800-3259-10	-A	September 1991	First customer shipment (FCS)
800-3259-11	-A	December 1991	First revision to FCS
800-3259-12	-A	August 1992	Second revision to FCS
800-3259-13	-A	September 1992	Third revision to FCS
800-3259-14	-A	October 1992	Fourth revision to FCS
800-3259-15	-A	August 1993	Fifth revision to FCS

Reader Comments

We welcome your comments and suggestions to help improve the *56-Inch Data Center Cabinet Service Manual*, part number *800-3259-15*. Please take time to let us know what you think about this manual.

■ The tasks were well documented and easy to follow.

Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
❑	❑	❑	❑	❑

Comments _____

■ The information provided in *56-Inch Data Center Cabinet Service Manual* was complete.

Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
❑	❑	❑	❑	❑

Comments _____

■ The information I needed was easy to find.

Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
❑	❑	❑	❑	❑

Comments _____

■ The manual was useful to me.

Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
❑	❑	❑	❑	❑

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