12-Slot Office Pedestal Service Manual

Warning – Qualified Technicians Only – See Preface for Details.
Avertissement – Réservé au technicien – Voir détails en préface.
Warnung – Nur qualifiziertes technisches Personal– Einzelhelten slehe Vorwort.
Avviso– Solo tecnici qualificati – Vedere la Prefazione per dettagli.
Adverntencia – Tecnicos Calificados Unicamente – Veanse Los Detalles Contenidos en el Prefacio.
Varning – Endast kvalificerade tekniker – Förordet innehåller ytterligare detaljer.

警告—取扱いは資格を有する技術者に限られています。
詳細は序文参照のこと。

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

Removal of the shrink wrapping from this manual signifies that you will read and agree to comply with the notes, cautions, and warnings found in the Preface of this manual.

Sun Microsystems, Inc.
2550 Garcia Avenue
Mountain View, CA 94043
U.S.A.

Part No: 800-3255-17
Revision A, August 1993

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Preface

This manual provides information on servicing the 12-Slot Office Pedestal. Included are trim, board, subassembly and mass storage removal and replacement procedures.

Organization

Chapter 1

Preparing the System for Service— provides instructions for preparing the system for servicing.

Chapter 2

Board Removal and Replacement— provides instructions for removing and replacing printed circuit boards.

Chapter 3

Subassembly Removal and Replacement—provides instructions for subassembly removal and replacement.

Chapter 4

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

Chapter 5

Illustrated Parts Breakdown—provides illustrated part breakdowns to be used when ordering parts.

Appendix A

*Configuring SCSI Devices in the SPARCsystem 670MP p*resents configuration, tray position and target assignment rules and procedures for SCSI devices installed in this system.

Appendix B

SPARCsystem 670 Card Cage Slot Assignments presents rules governing cardcage slots to install each PCB into.

Scope

The 12-Slot Office Pedestal is the enclosure for the SPARCsystem 370, SPARCsystem 470 and SPARCsystem 670MP. All the above systems are covered in this manual.

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:

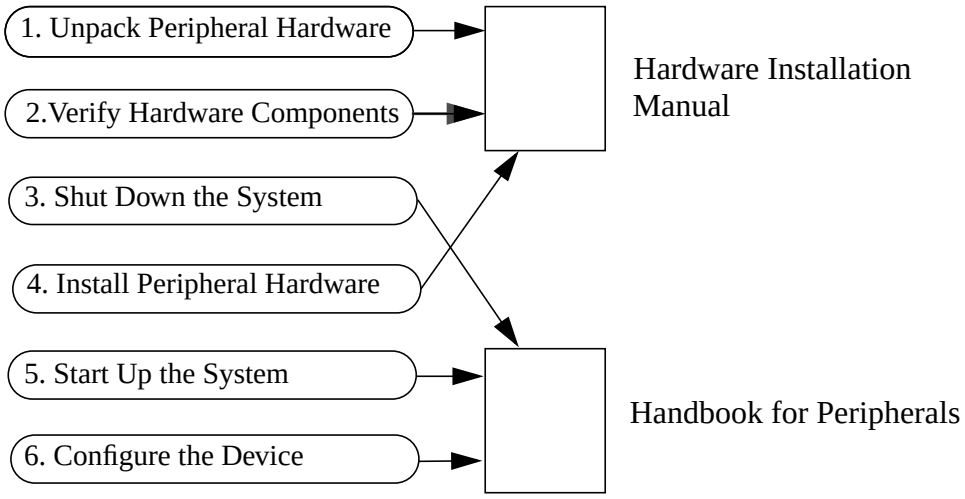
- Shutting down the system
- Configuring devices
- Other software procedures

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

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.

There are systems in the field that 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 12-Slot Office Pedestal:

- Sun ESD mat, PN 250-1088-xx
- ESD Grounding Strap
- M4 (7mm) Hex Socket
- Flat Blade Screwdriver
- 3/16 Inch Hex Socket
- No. 2 Phillips Bit
- Voltmeter (to test power supply)
- 2 mm Allen wrench (5/64" is an acceptable substitute)

1.2 Safety Precautions

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

Only use properly-grounded power outlets as described in the *Sun Site Preparation Guide*.

Caution – DO NOT make mechanical or electrical modifications to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

Caution – Power off the cabinet and all equipment attached to it before proceeding with any of the following procedures as described in Section 1.6, “Shutting Down the System”.

Wear ESD wrist straps when removing printed circuit boards (PCBs) or disk drives as described in the Section 1.3, “Electrostatic Discharge Precautions.”

1.3 Electrostatic Discharge 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 provide
- Use a grounding strap and Sun ESD mat, PN 250-1088-01, whenever you work on a board (instructions are printed on the mat)

1.4 Slot Assignment Precautions

When you reconfigure the VMEbus boards in a system, you must consider the impact that 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 PC boards.

Caution – Always wear a suitable grounding device when you handle printed circuit boards. Printed circuit boards contain components that can be damaged by electrostatic discharge. Proper use of a grounding device reduces the risk of damage to the boards by discharging static electricity.

1.5 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
```

1.6 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 12-Slot Office Pedestal).**
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.**

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.

4. **Open the SPARCsystem 670MP front panel.**

To open the front panel, place your hand in the top vent of the front panel and lift upward on the release latch (Figure 1-1).

5. Turn off the system power in this order:

- External drives (if connected)
- System unit
- Monitor

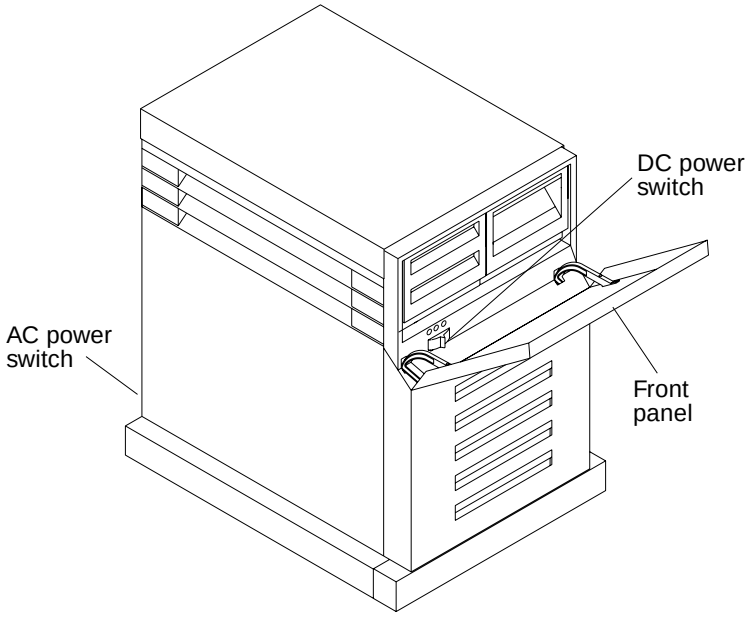


Figure 1-1 AC and DC Power Switch Locations

1.7 Trim Removal and Replacement

The 12-Slot Office Pedestal trim, depicted in Figure 1-2, consists of

- Top cover
- Left side panel
- Right side panel
- Remote switch
- Peripheral bezels
- Front panel
- EMI cover

- Front bumper (part of the front panel on later systems)
- Rear bezel
- Rear bumper

The top cover, front panel, left and right side panels, rear bezel, and rear bumper snap on and off. The front bumper on earlier systems snaps on and off; on later systems the front bumper is a part of the front panel. The top cover must be removed prior to removing the side panels. The front panel and the rear bezel and bumper can be removed without removing other panels.

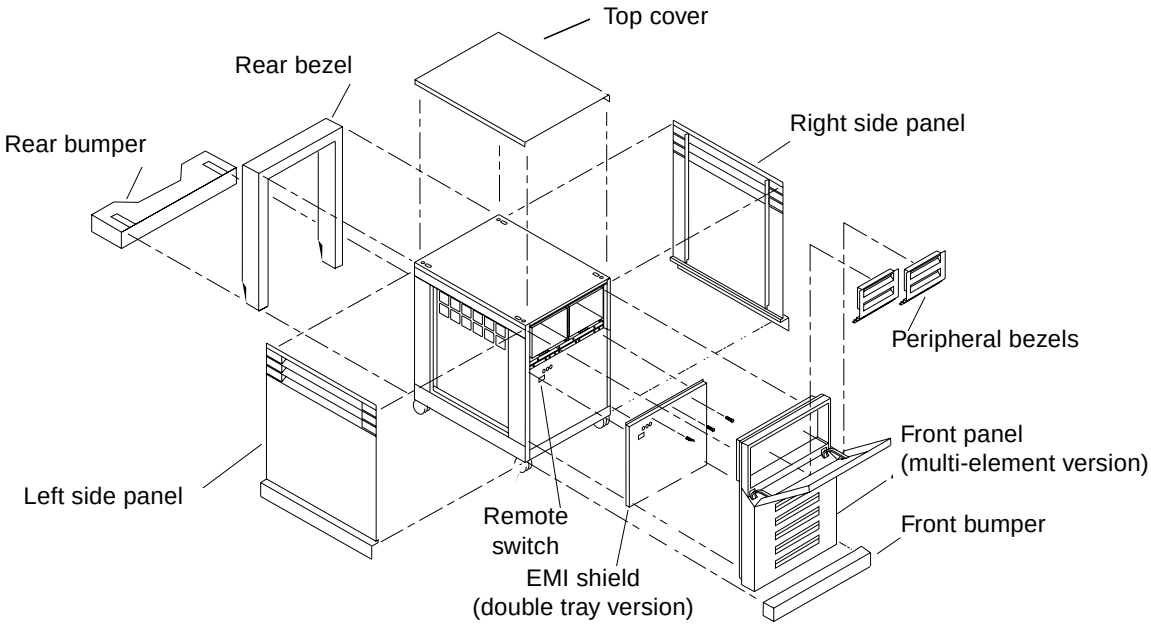


Figure 1-2 Trim Removal and Replacement

Caution – Do not remove trim panels by grasping the sides, top or bottoms and twisting off. This may result in breakage of panels or fasteners. Always support panels during removal and replacement operations.

1.7.1 Top Cover

Remove the top cover as shown in Figure 1-3 as follows:

1. **Grasp both sides of the top cover at the front of the unit and lift it off the two front ball studs.**
2. **Grasp both sides of the top cover at the rear of the unit and lift it off the two rear ball studs.**
3. **To replace top cover, carefully position cover so front and rear ball studs are engaged when cover is pressed down on top of pedestal.**

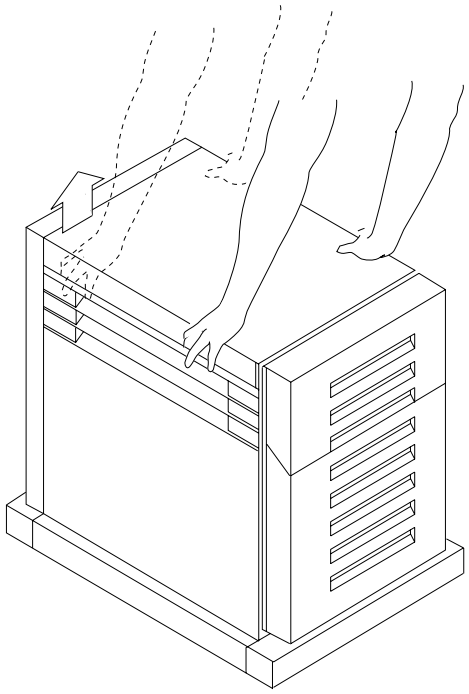


Figure 1-3 Removing the Top Cover

Note – At this point, side panels can be removed (Figure 1-4), however, it is not necessary to remove the side panels to remove the front panel.

1.7.2 Side Panel

Remove the side panels as depicted in Figure 1-4 as follows:

1. **With a flat blade screwdriver pry outward at the top areas of the side panels to disengage the two upper ball studs.**
2. **Pull out at side panel — lower outside areas to disengage lower ball studs.**
3. **Remove the side panels.**
4. **To replace each side panel, carefully position panel such that the upper and lower ball studs are engaged when side panel is pressed to pedestal.**

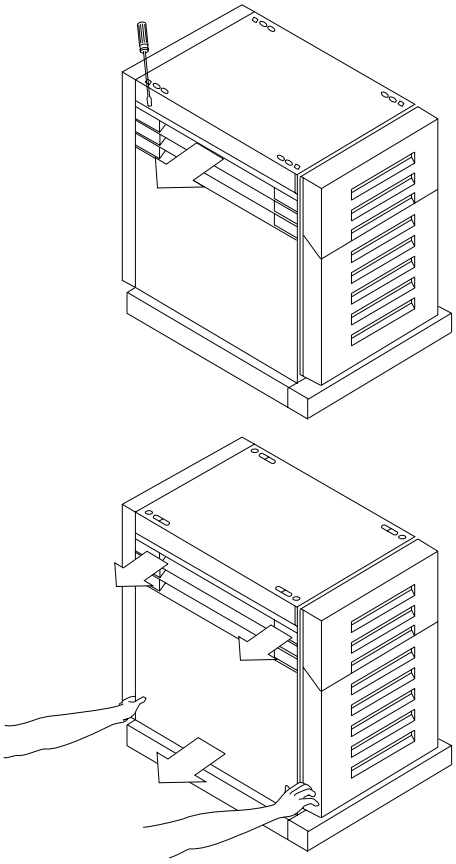


Figure 1-4 Removing the Side Panels

1.7.3 Front Bumper

Note – On later systems the front bumper is a part of the front panel. If ball studs do not disengage easily, refer to Section 1.7.4, Front Panel.

Remove the front bumper, as shown in Figure 1-5, by pulling sharply on one side and then the other to disengage the ball studs.

To replace, front bumper, carefully position bumper so end ball studs are engaged when bumper is pressed to the front of the pedestal.

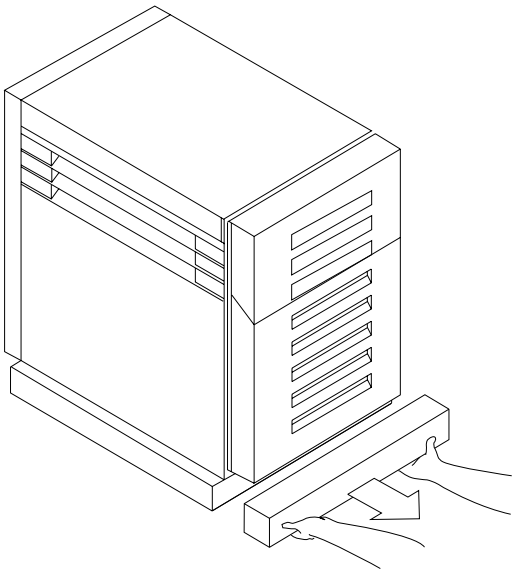


Figure 1-5 Removing the Front Bumper (Multi-element Version)

1.7.4 Front Panel

Remove the front panel as shown in Figure 1-6 as follows:

1. **With a flat blade screwdriver pry the upper area of the front panel away from the two upper ball studs.**
2. **Pull top of front panel away from chassis to locate the middle ball studs.**
3. **Disengage the panel from these ball studs with the screwdriver.**
4. **Repeat step 1 for the lower ball studs and remove the front panel (on versions with the integrated front bumper, grasp underneath front bumper and pull sharply to remove panel).**
5. **To replace front panel, carefully position panel so upper, middle, and lower ball studs are engaged when panel is pressed to front of pedestal.**

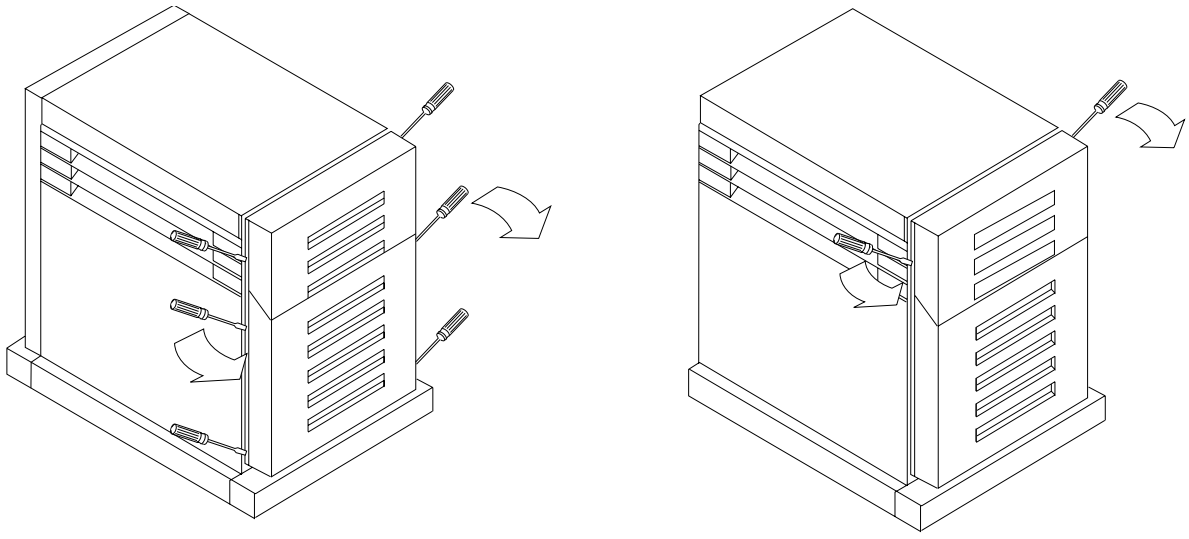


Figure 1-6 Removing the Front Panel

1.7.5 Rear Bumper and Rear Bezel

Remove the rear bumper as shown in Figure 1-7 as follows:

1. **With a flat blade screwdriver at the center of the rear bumper, pry the ball stud brackets away from the frame and remove the rear bumper.**
2. **To replace rear bumper, carefully positioning the bumper ends so ball studs are engaged when the bumper is pressed to the pedestal.**

Remove the rear bezel as shown in Figure 1-7 as follows:

1. **With a flat blade screw driver, pry the two upper edges of the bezel away from the frame to disengage the ball studs.**
2. **Repeat step 1 for the two lower ball studs.**
3. **Remove the rear bezel.**
4. **Replace the rear bezel by carefully positioning the bezel such that the ball studs are engaged when the bezel is pressed to the pedestal.**

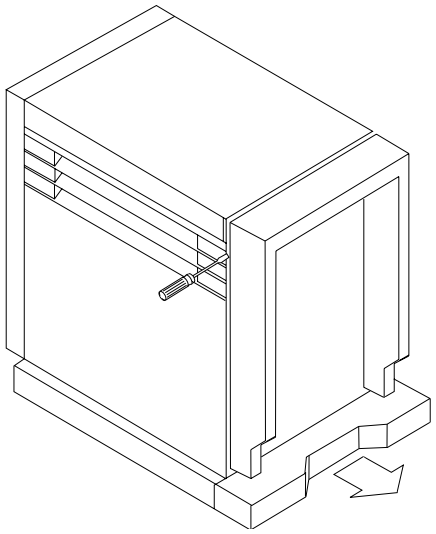


Figure 1-7 Removing the Rear Bumper and Bezel

1.7.6 EMI Cover

Two types of EMI cover exist; a full face and a partial face version (full face is depicted in Figure 1-8). Refer to the following procedures as applicable.

1.7.6.1 Partial Version

Remove the front panel as described in Section 1.7.4, Front Panel. Proceed as follows:

1. **Remove the three securing screws located at the top of the EMI cover.**
2. **Pull the cover out at the top about three inches.**
3. **Pull the cover up to clear the lower tabs and remove the EMI cover.**
4. **To replace the EMI cover, reverse this procedure.**

1.7.6.2 Full Face Version

Remove the front panel as described in Section 1.7.4, Front Panel. Proceed as follows:

1. **Remove the six screws securing the cover to the chassis (Figure 1-8).**
2. **Pull the cover out at the top about three inches.**
3. **Pull the cover up to clear the lower tabs and remove the EMI cover.**
4. **To replace the EMI cover, reverse this procedure.**

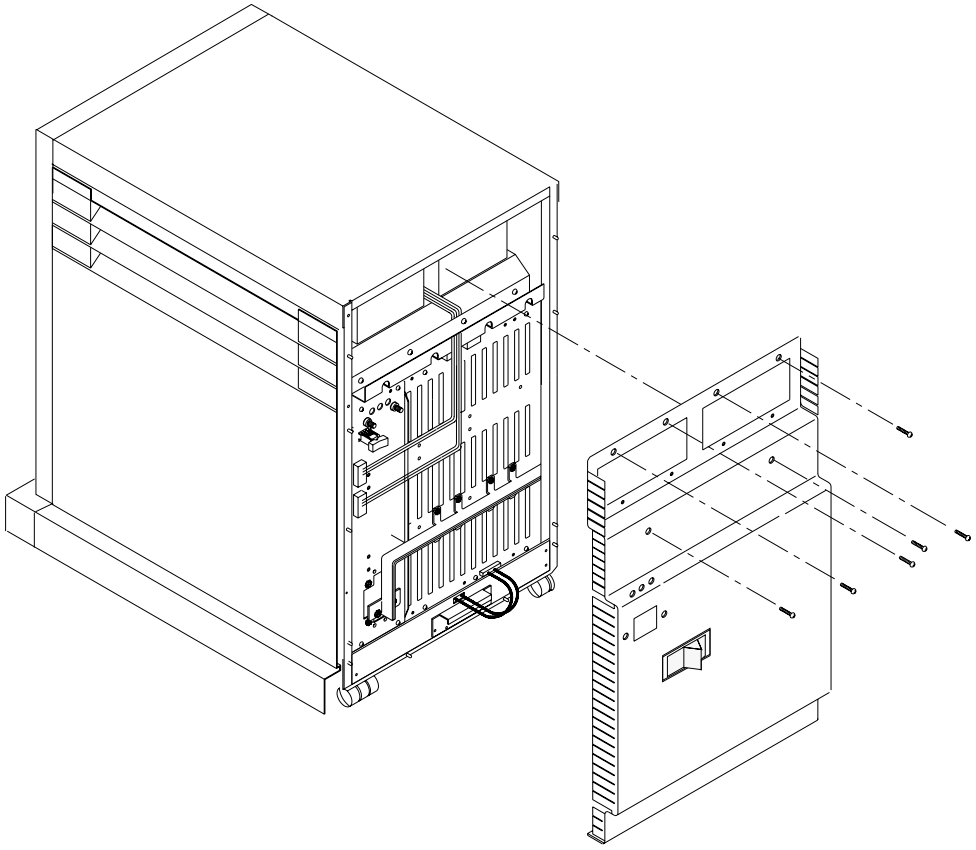


Figure 1-8 Removing the EMI Shield — Full Face Version

Printed Circuit Board Removal and Replacement

2

Use this chapter to configure, install and remove and replace printed circuit boards (PCBs). All PCBs (except for some SCSI subsystem's tape and disk interface boards) reside in a card cage and are removed from the pedestal rear.

Allow only technically qualified personnel to perform the configuration and installation procedure.

2.1 Electrostatic Discharge 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 causes. *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 **Sun ESD kit P/N 250-1088 (or equivalent)** when working on the 600MP System Board or the 600MP Expansion Memory Board. Sun ESD kit P/N 250-1088 contains the Sun approved Sun ESD mat which has 0.25" of cushioning to protect underside components, prevent board flexing, and provide ESD protection. Instructions for use are printed on the mat.

Do **NOT** use ESD kit P/N 560-1302 when installing SPARCsystem 600MP boards. ESD kit P/N 560-1302 does not provide adequate protection for SPARCsystem 600MP boards.

2.2 Slot Assignment Precautions

When you reconfigure the VMEbus boards in a system, you must consider the impact that 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.

Caution – Always wear a suitable grounding device when you handle printed circuit boards. Printed circuit boards contain components that can be damaged by electrostatic discharge. Proper use of a grounding device reduces the risk of damage to the boards by discharging static electricity.

2.2.1 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.

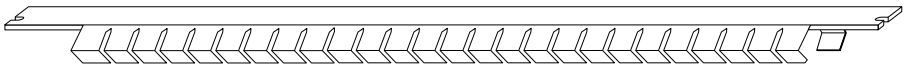


Figure 2-1 Springfingers

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

Figure 2-2 Insulator Strip

When a board is shipped, removable insulator *shields* are provided on all 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 and removal information is printed on each insulator shield.

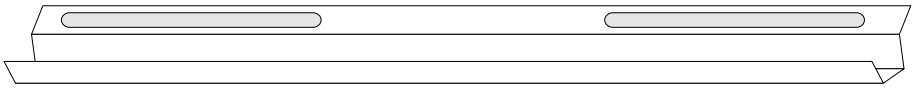


Figure 2-3 Insulator Shield

When removing and replacing boards having springfingers, check the condition of the insulator strip. If it is damaged, replace it. The part number for the insulator strip is 330-1100-01. The insulator strip and insulator shield are included in kit number 560-1183-02. If you need to obtain additional insulator strips or insulator shields, call your Sun service hotline number.

Figure 2-4 illustrates the relative positions of the springfingers and insulators with respect to a board and the outer panel.

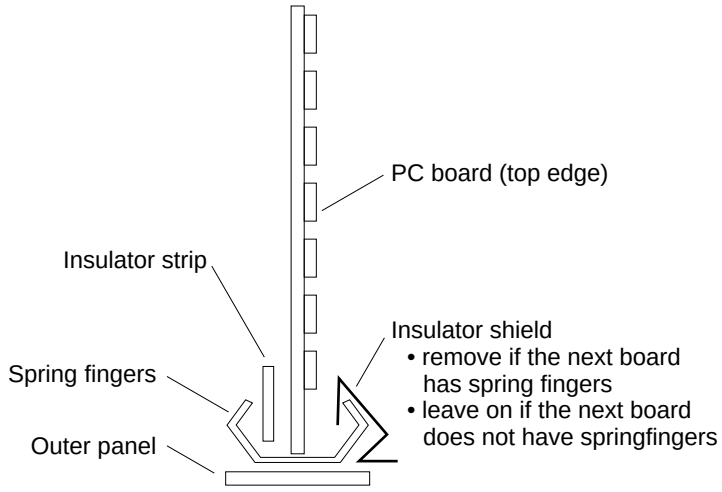


Figure 2-4 Springfingers and Insulators

2.2.2 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.

2.2.2.1 Installing Boards with Springfingers Next to Boards without Springfingers

Since not all VMEbus boards have springfingers, you must take special precautions when you have to install a board with springfingers next to a board that does not have 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 regulatory 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.

2.2.3 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 backplates with springfingers that are installed in unused slots. Filler panels also affect airflow and can affect RFI emissions. Use the same guidelines to install filler panels with springfingers that you would use for VMEbus boards. (Refer to Section 2.2.2, Installing Boards with Springfingers.)

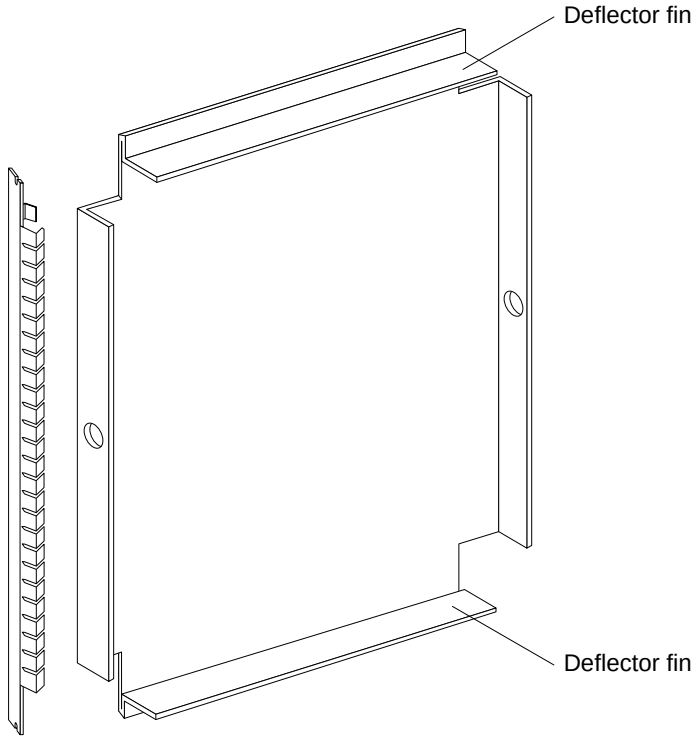


Figure 2-5 Air Restrictor Panel and Filler Panel

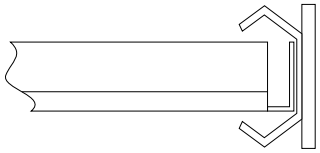


Figure 2-6 Installing an Air Restrictor Panel and a Filler Panel

2.2.4 SBus Cards and Springfingers

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.

In some SBus card installations, SBus cards are mounted very close to springfingers. If springfingers make contact only with a grounded connector shell on the SBus card, no insulator shield is required. Otherwise, ensure sufficient space exists between springfingers and SBus card components. Note, springfingers may be compressed (closer to the SBus card) when the board is installed. If possibility of contact exists, install an insulating shield on the SBus card. A strip of insulating material and installation directions should be provided with the card.

2.3 Back Plane Jumper Overview

Ensure all backplane jumpers are configured as described in Appendix B.

2.4 Printed Circuit Board Removal and Replacement

Caution – Use Sun ESD kit P/N 250-1088 (or equivalent) when installing integrated circuits, printed circuit boards, and drives in a SPARCsystem 600MP-series system. Follow instructions printed on the ESD mat. Refer to the section, “Electrostatic Discharge Precautions” for a description of the ESD mat. Do **NOT** use ESD kit P/N 560-1302 when working on SPARCsystem 600MP boards.

2.4.1 Removal

Follow these steps to remove boards from the card cage:

1. **Power off the system using the instructions given in Section 1.6, “Shutting Down the System”.**
2. **Move the enclosure to afford access to the 12-Slot Office Pedestal rear.**
3. **Label and remove any cables leading from the board. Set cables aside.**
4. **Use an Allen wrench to remove the hex-head screws located at the top and bottom of the board. Set the screws aside.**
5. **Move the extraction levers on the board to the outward position to release the board from the card cage connector.**
6. **Gently remove the board, sliding it out of the card cage.**

7. **Place the board in an ESD bag.**
8. **Repeat steps 4 through 7 to remove additional boards.**

Note – If PCB is not being replaced, install air restrictor and blank filler panel to ensure proper system cooling.

2.4.2 Replacement

Note – Board Configuration: For board in question, refer to the board installation manual to determine if configuration is required. Perform such configuration as instructed.

Note – If installing a PCB for the first time, remove air restrictor and blank filler panel from card cage to create a vacant slot.

Follow these steps to install 9U boards in the card cage:

1. **Refer to Chapter 1 sections 1.6 and 1.7 to power down the unit and remove rear trim.**
2. **Remove the board from the antistatic bag.**
3. **Move the extraction levers to the inward position.**
4. **Gently slide the board in the card cage slot guide.**
5. **Ensure board connectors are firmly seated against card cage connectors.**
6. **Use an Allen wrench and hex-head screws to secure board to the card cage.**

Note – Double-height boards, (like the system board) occupy two slots. Double-height boards have four hex-head screws—two each at the top and bottom. Single boards have one hex-head screw each at the top and bottom.

---

7. **Repeat these steps to install additional boards.**
8. **Connect cables.**

Subassembly Removal and Replacement

This chapter provides information necessary to completely remove and replace 12-Slot Office Pedestal assemblies and subassemblies with the exception of the PCBs and the peripheral tray which are covered in Chapter 4.

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.

Caution – Use Sun ESD kit P/N 250-1088 (or equivalent) when installing integrated circuits, printed circuit boards, and drives in a SPARCsystem 600MP-series system. Follow instructions printed on the ESD mat. Refer to the section, “Electrostatic Discharge Precautions” for a description of the ESD mat. Do **NOT** use ESD kit P/N 560-1302 when working on SPARCsystem 600MP boards.

3.1 Testing Power Supply Function

Test the power supply under normal load conditions with all boards installed.

1. **Power down the system. Refer to Section 1.6, “Shutting Down the System,” for more information.**
2. **Remove the front panel. Refer to Section 1.7 “Trim removal and Replacement.”**
3. **Power on the system.**

4. **With a voltmeter, check voltage levels on back plane test points** (Figure 3-1). See Table 3-1 for output specifications. With the reference probe grounded, verify all voltages are within tolerance.

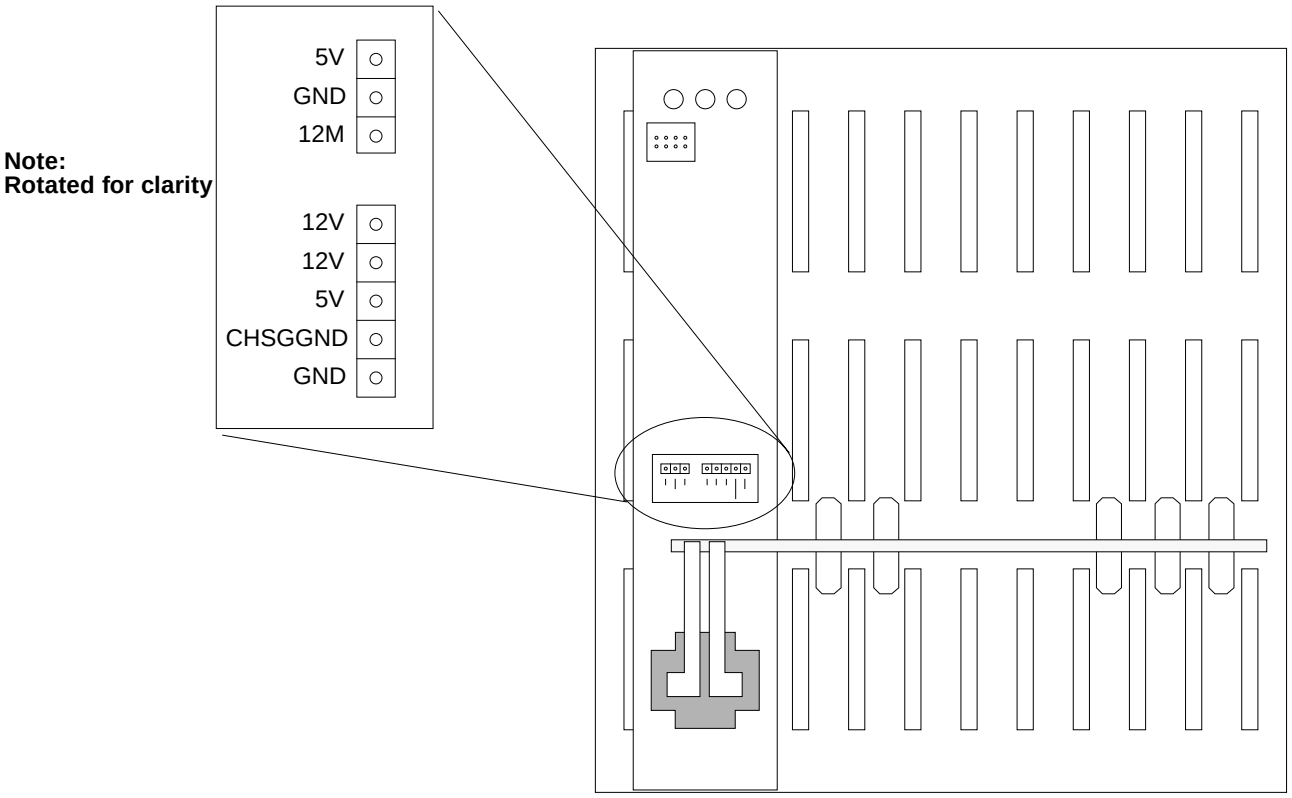


Figure 3-1 Back Plane Power Supply Test Points

Table 3-1 Power Supply Output Voltages

Voltage VDC	Tolerance	@Amps Continuous
+5	+/– 1%	10.0 – 150A
–5.2	+/– 2%	0.4 – 15A
+12 (Analog)	+/– 2%	0.0 – 15A
+12M (Motor)	+ 4% – 2%	2.0 – 15A
–12	+/– 2%	0.0 – 10A

3.2 Power Supply

To remove the power supply see Figure 3-2 and proceed as follows:

1. **Refer to Section 1.6, "Shutting Down the System," and Section 1.7, "Trim Removal and Replacement," to power down the unit and remove rear trim.**
2. **Remove the two screws securing the ESD cover to the chassis, then remove the ESD cover (earlier versions only).**
3. **Remove four screws securing power supply at the rear (card side) of the enclosure.**
4. **Loosen the jack screw on the front of the power supply.**
5. **Withdraw the power supply from the enclosure.**
6. **Replace the power supply by reversing the above steps.**

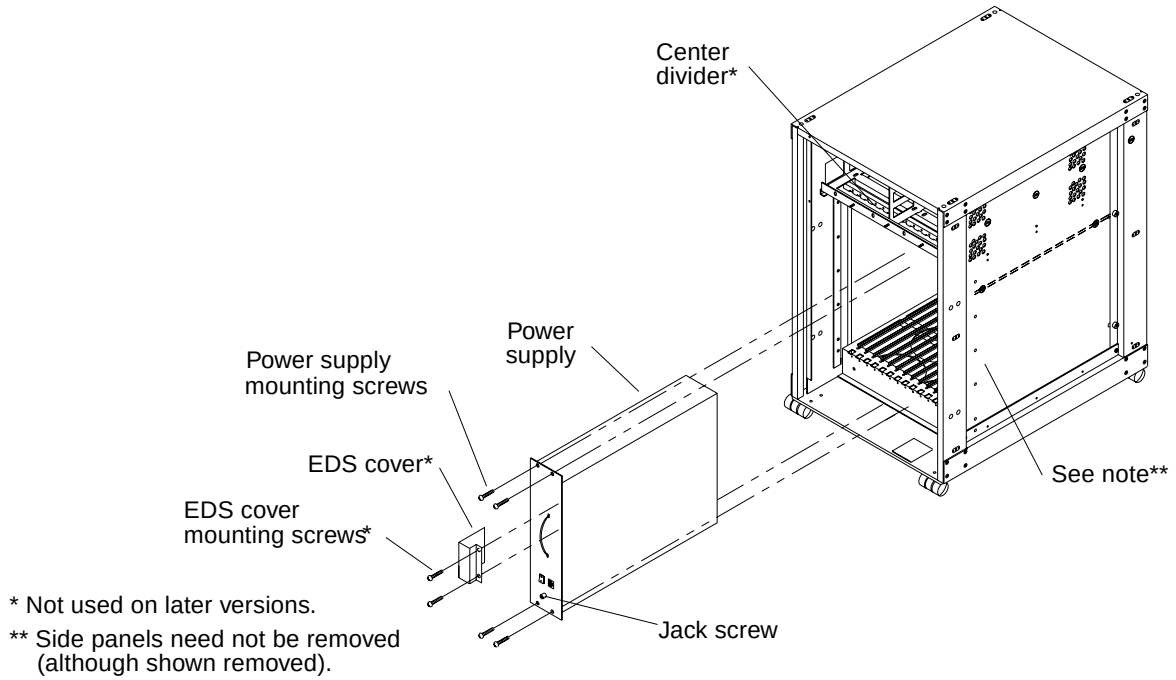


Figure 3-2 Power Supply Removal and Replacement

3.3 *Fan Assembly*

The fan assembly consists of nine fans mounted to a tray (Figure 3-3). Find the assembly at the bottom of the pedestal, below the card cage. To access the fans:

1. **Refer to Chapter 1 and remove the front panel and EMI cover.**
2. **Disconnect the cable that supplies +12VDC to the fan assembly.**
3. **Withdraw the fan tray from the front of the pedestal.**

Note – A good "stiff" pull is required to loosen the grounding fingers.

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4. **To replace the fan tray, perform steps above in reverse order.**

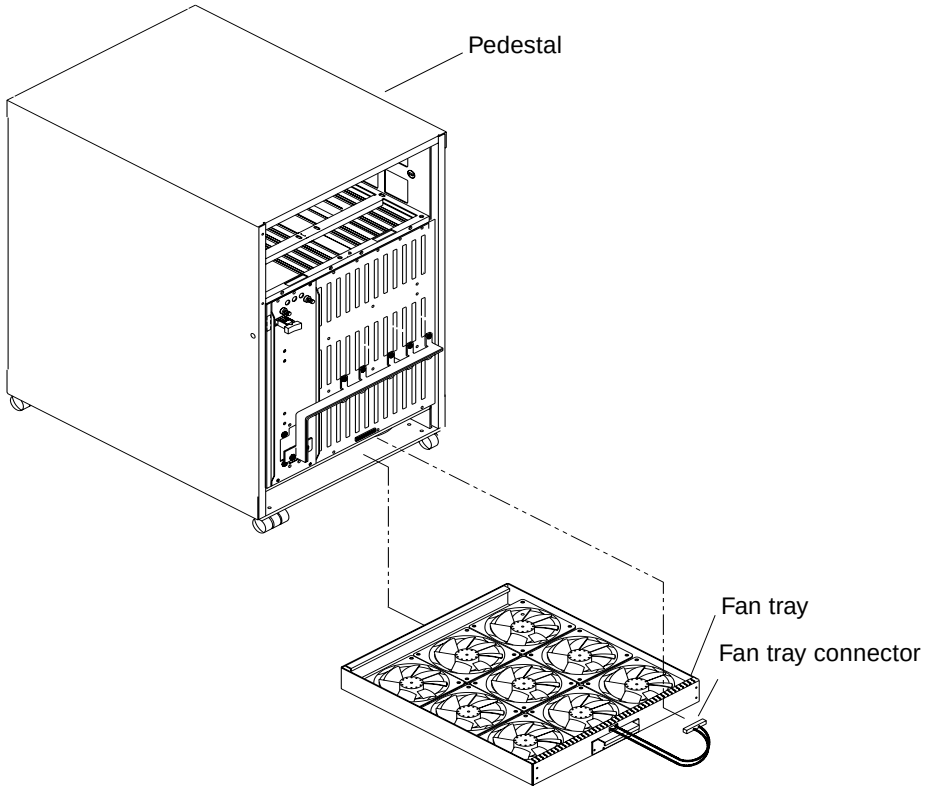


Figure 3-3 Fan Tray Removal and Replacement

3.3.1 Fan Tray Preventive Maintenance

12-Slot Office Pedestal preventive maintenance is limited to cleaning the Fan Tray screen. Do this at nine month intervals (or less) as described below.

3.3.1.1 Fan Tray Cleaning

To access the fan tray screen, first remove the Fan Tray as described in Section 3.3, “Fan Assembly” and then proceed below:

1. **Invert the fan tray assembly on the bench (Figure 3-4).**
2. **Remove ten countersunk screws securing the tray to the fan mounting plate (Figure 3-4).**
3. **Lift the tray off of the fan mounting plate; see Figure 3-4:**
   a. **Slide the tray rearward slightly (away from handle) until you feel the rear edge of the tray clear the fan mounting plate.**
   b. **Lift the rear edge of the tray, raising it free of the fan mounting plate.**
   c. **Slide the tray forward slightly and lift the tray front so it clears the front edge of the fan mounting plate.**
   d. **Slowly lift the entire tray clear of the fan plate.**

Note – Use care when feeding the power cable/connector through the pass-through cutout in the tray face. Do not allow the connector to catch on the tray edge, possibly damaging it.

---

4. **Clean the screen.**
5. **Reassemble the fan tray to fan mounting plate.**
   a. **Hold the tray over the fan mounting plate and feed the power cable/connector through the cutout in the tray face.**

Note – Carefully feed the power cable/connector back through the pass-through cutout in the tray face. Draw the cable fully through so no loop remains inside to snag or bind between the tray and mounting plate.

---

   b. **Follow steps 2 and 3 above in reverse order.**

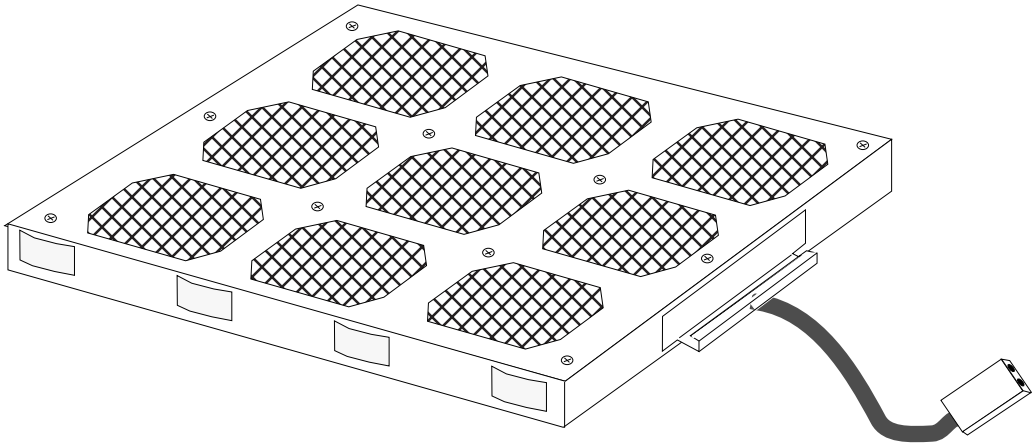


Figure 3-4 Fan Tray Cleaning — Serviceable Fan Tray Version

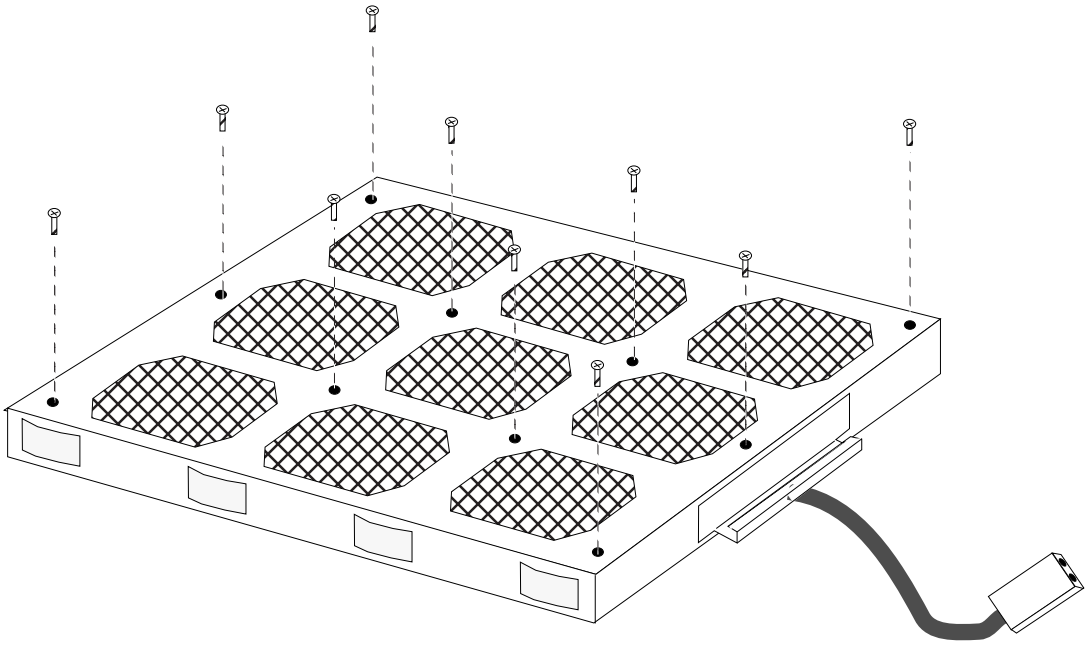


Figure 3-5 Fan Tray Inverted Showing Screw Removal

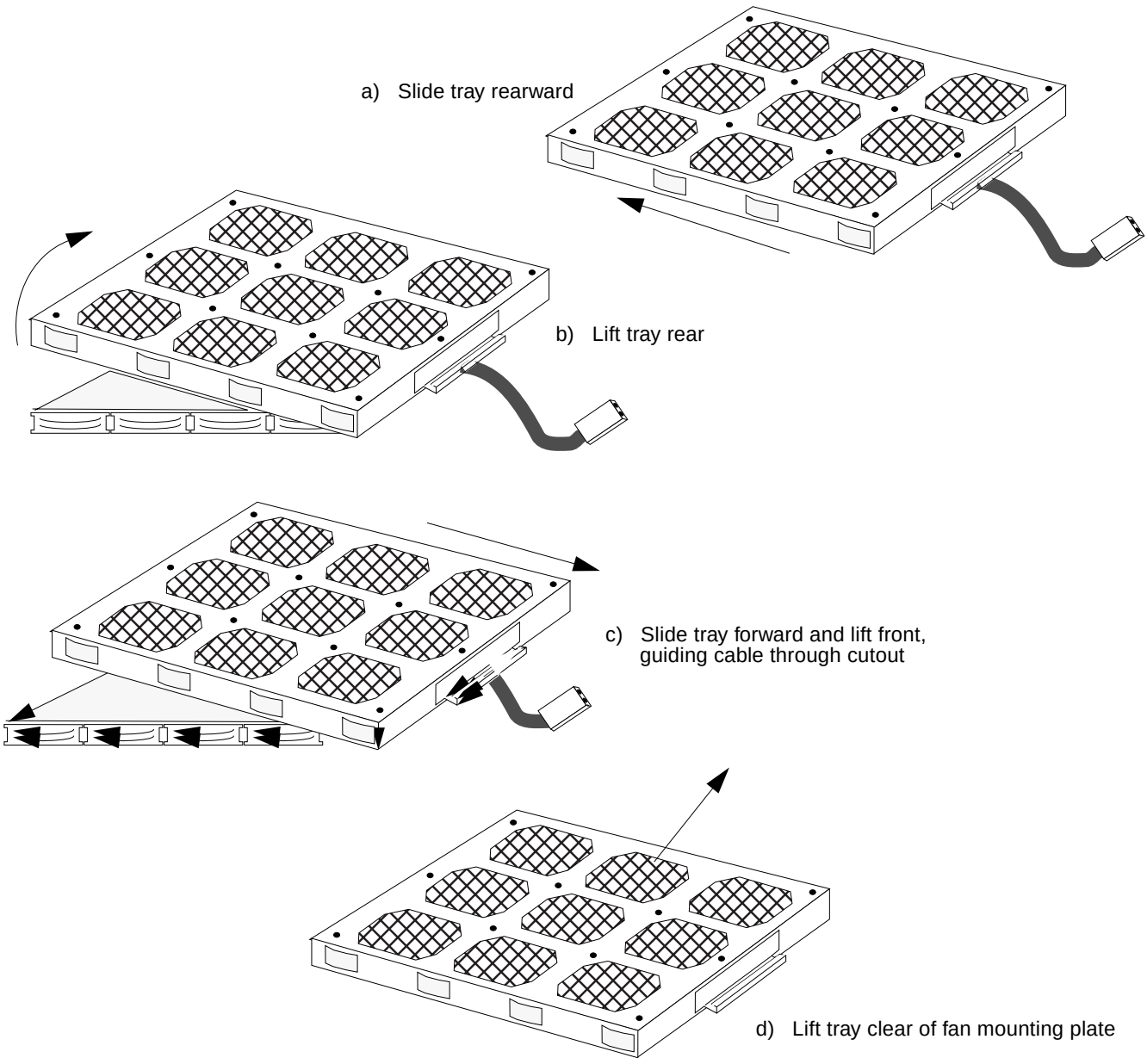


Figure 3-6 Fan Tray Separation From Fan Mounting Plate

3.4 SCSI Board Assembly (Double Tray Only)

Remove the SCSI Board Assembly as follows:

1. **Disconnect the SCSI cable from the SCSI board assembly.**
2. **See Figure 3-7 and remove the seven nuts securing the SCSI Board Assembly to the pedestal.**
3. **Remove all cables from the assembly, then remove the assembly.**
4. **Replace the SCSI Board Assembly by reversing the above steps.**

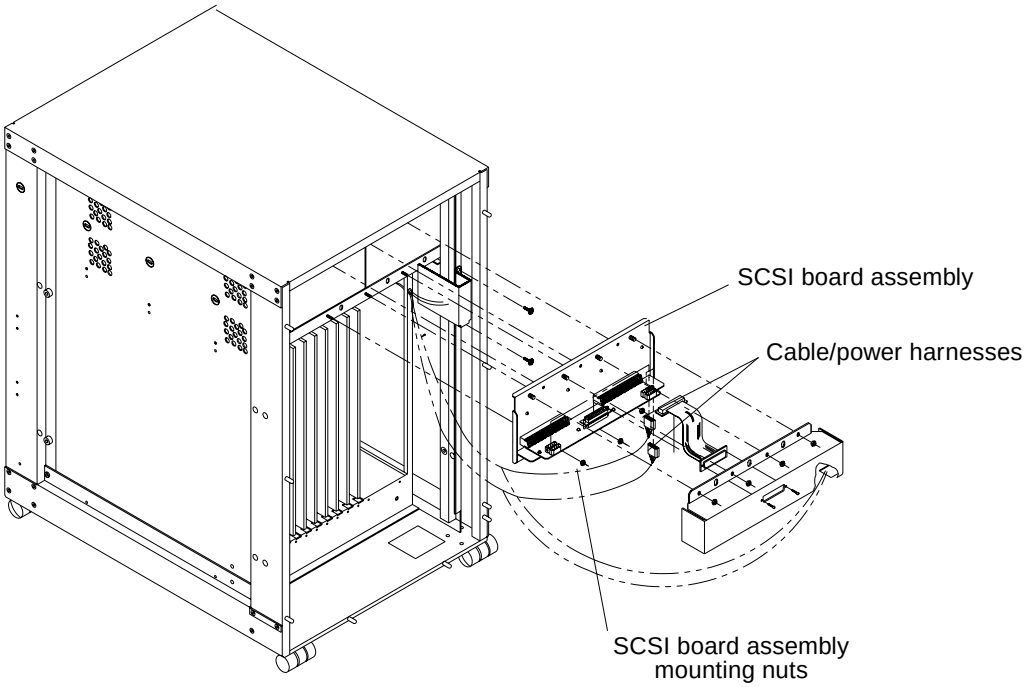


Figure 3-7 SCSI Board Assembly Removal and Replacement (Double Tray Only)

3.5 Card Cage and Back Plane

3.5.1 Back Plane

Two back plane versions exist, an older unnotched, and newer, notched version (accommodates single SCSI tray). Generally, the card cage need not be removed. Remove the back plane using to the appropriate procedure below:

Unnotched Back Plane

To remove and replace an unnotched back plane (Figure 3-8), proceed below:

1. **Remove the rear bezel and power supply. Refer to Section 3.2, "Power Supply."**
2. **Unseat all PC boards from the back plane as described in Chapter 2.**
3. **Remove the front panel and EMI cover as described in Chapter 1.**
4. **Label and remove all cables from the back plane.**
5. **Remove 30 screws securing the back plane to the card cage. Remove the back plane.**
6. **Replace the back plane by reversing the above steps.**

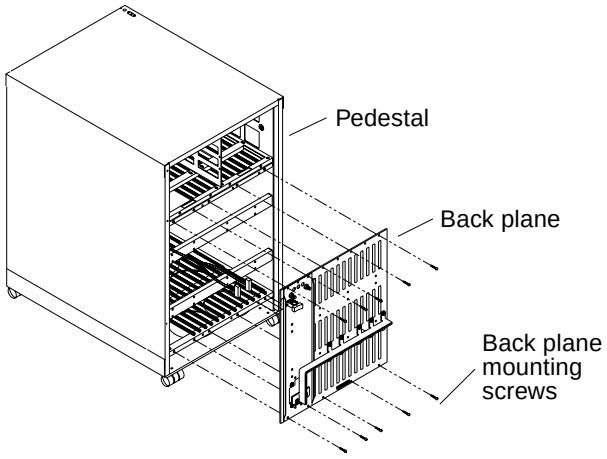


Figure 3-8 Back Plane (Unnotched)-to-Card Cage Mounting

Notched Back Plane

To remove a notched back plane, see Figure 3-9.

1. **Perform the procedure for the Unnotched Back Plane, above. See the note below.**

Note – The EMI gasket (not shown) is secured to the back plane top-outer face by back plane screws. Reinstall it correctly when replacing the back plane.

---

2. **To replace back plane**:
   a. **Reverse the steps for the Unnotched Back Plane above.**
   b. **While installing the back plane, route the cables through the notch in the back plane. Use care not to compress the cables between mating surfaces.**

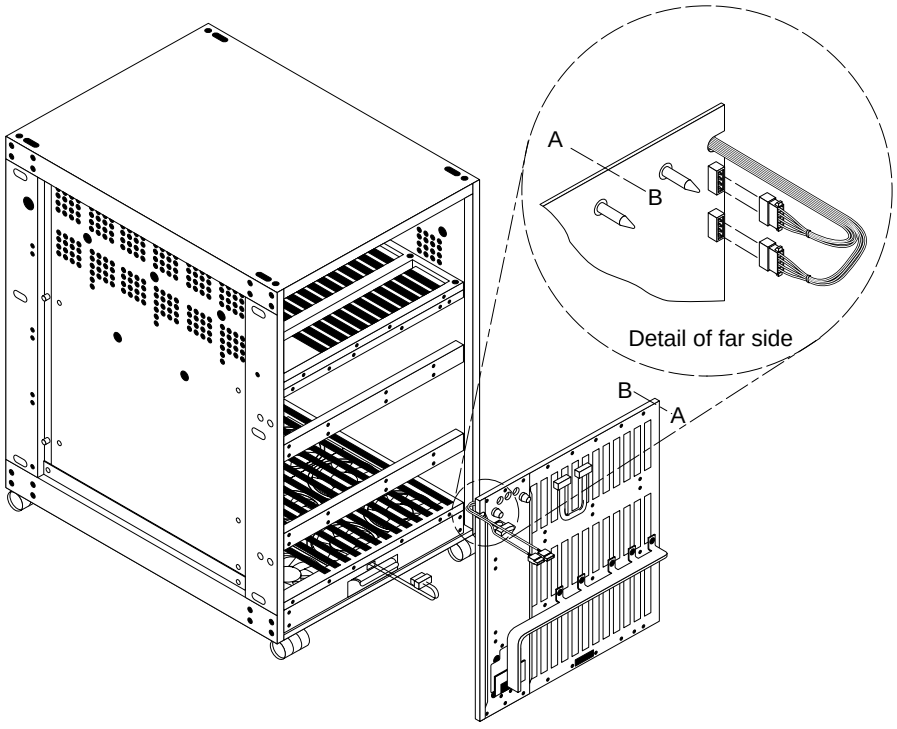


Figure 3-9 Back Plane(Notched)-to-Card Cage Mounting

3.5.2 *Card Cage*

1. **Remove all trim as described in Chapter 1.**
2. **Remove the power supply. Refer to Section 3.2, "Power Supply."**
3. **Label and disconnect the connector providing +12VDC to the fan assembly.**
4. **Remove the fan tray. Refer to Section 3.3, "Fan Assembly."**
5. **Unseat all PCBs from the card cage as described in Chapter 2.**
6. **Label and disconnect any cables going to PCBs.**
7. **Loosen four or six screws (double or single tray version respectively) securing sub-chassis to the frame. Withdraw the sub-chassis (Figure 3-10).**
8. **To install the sub-chassis, reverse this procedure.**

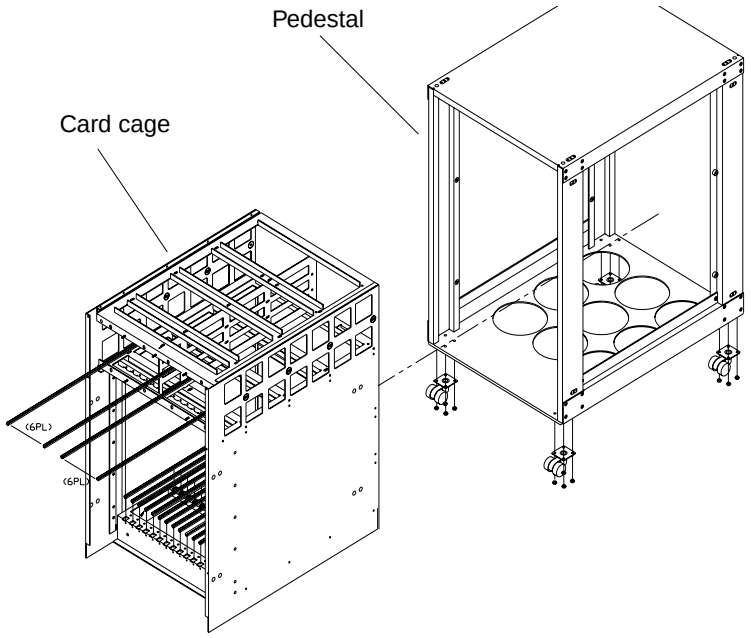


Figure 3-10 Card Cage Mounting

Mass Storage Removal and Replacement

4.1 Introduction

Use information in this chapter to remove and replace SCSI mass storage devices in the 12-Slot Office Pedestal. Procedures found here apply to half- and full-height devices, whether installed in SPARCsystem 370, SPARCsystem 470 or SPARCsystem 670MP.

4.1.1 Preparation and Tips

Before removing or installing a device, do the following:

- Power down the system. Refer to Section 1.6, “Shutting Down the System” for more information.
- Remove the rear bezel to expose the peripheral tray. Refer to Section 1.7 "Trim Removal and Replacement."
- Verify SCSI termination is correct when installing additional devices. See Section A.4 "SCSI Bus Termination" for details.
- Configure the device to be installed in the peripheral tray. Set device jumpers to the correct SCSI ID.

Observe tips below to make installation easier:

- Match the arrow on the device SCSI receptacle with the arrow on the SCSI ribbon cable mating to it.
- Fold the device sector flaw record such that it does not interfere with ventilation holes on the device top. Ensure the record is not inserted between the enclosure and device-vents or it will obstruct air circulation.

4.2 Peripheral Tray(s)

Caution – Use Sun ESD kit P/N 250-1088 (or equivalent) when installing integrated circuits and printed circuit boards in a SPARCsystem 600MP. Follow the instructions printed on the ESD mat. Refer to the Section 1.3, "Electrostatic Discharge Precautions" for a description of the ESD mat. Do **NOT** use ESD kit P/N 560-1302 when working on SPARCsystem 600MP boards.

This Chapter provides information necessary to remove and replace the peripheral tray assemblies and mass storage drives contained within trays.

The peripheral tray(s) house the disk and tape subsystems that are located in the upper half of the pedestal. The peripheral tray arrangement may be one of two types: the older double tray version or the newer single tray. To remove and replace either peripheral tray version, or to remove a tray in order to replace one of the mass storage drives, first follow power down procedures as described in Section 1.6, “Shutting Down the System”.

4.2.1 Single Tray

1. **Remove the entire front cosmetic panel as described in Chapter 1.**
2. **Remove the terminator from the rear of the peripheral tray and then remove the data cable.**
3. **Remove six screws securing the front EMI panel and then remove the panel by first lifting it up and then away from the chassis.**
4. **See Figure 4-1 and remove two power connectors from the peripheral tray front. Then reposition them so they are clear when the tray is removed.**
5. **Remove the four screws securing the peripheral tray to the sub-chassis.**
6. **Gently pull the tray straight out from the enclosure.**

Warning – To avoid injury, have a second person help you lift the tray. The tray is very heavy when loaded with devices.

7. **Replace the tray by reversing the above procedure. Ensure that all four rear tray alignment pins are evenly engaged when the tray is replaced.**

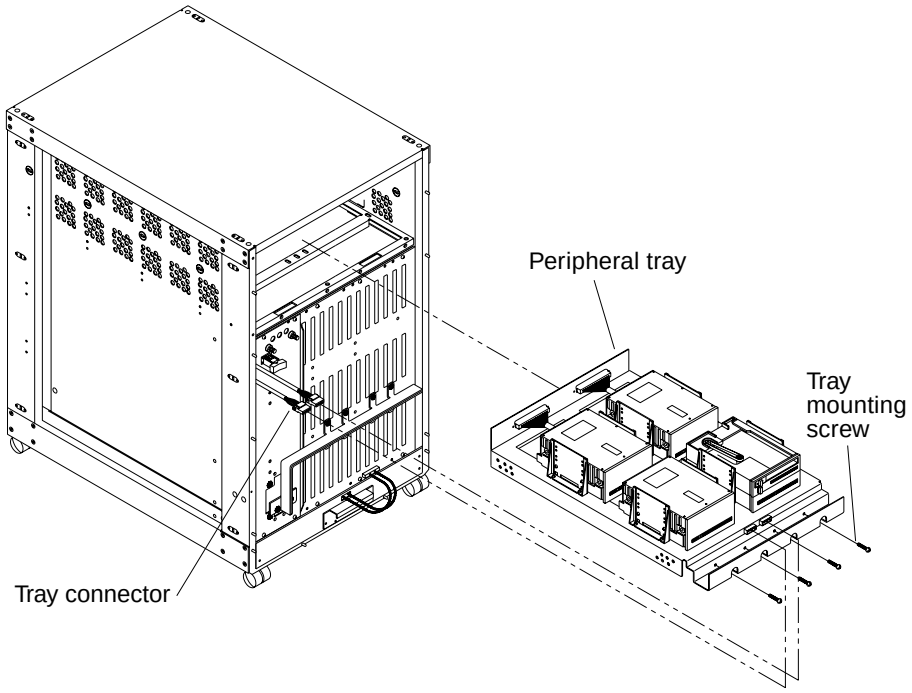


Figure 4-1 Single Peripheral Tray Removal and Replacement

4.2.2 Double Tray

1. **Remove the entire front panel as described in Chapter 1.**
2. **Disconnect SCSI and power cable — rear of tray assembly.**
3. **See Figure 4-2 and remove four screws securing each peripheral tray.**
4. **Pull each tray straight out from the enclosure.**
5. **Replace each tray by reversing this procedure.**

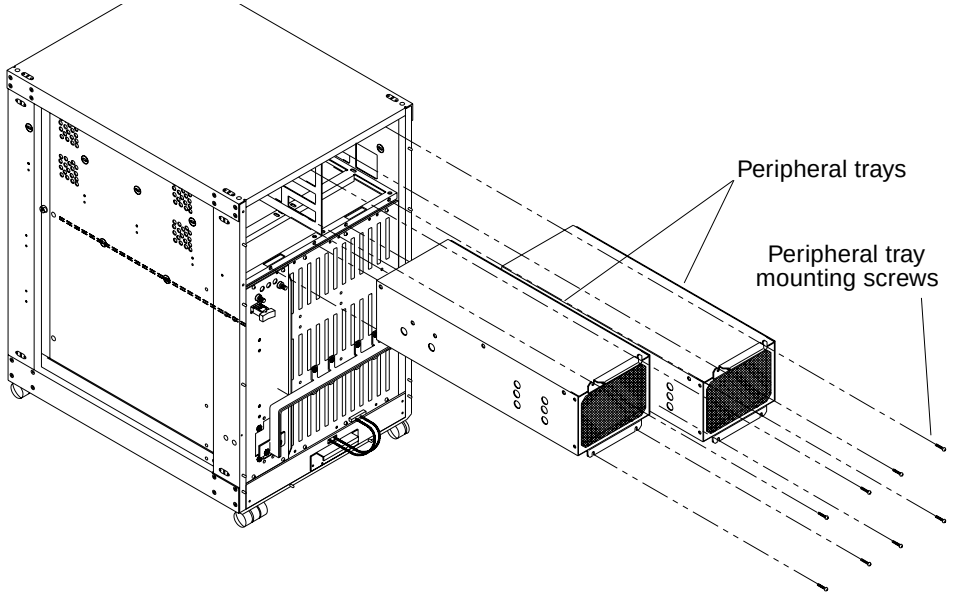


Figure 4-2 Double Peripheral Tray Removal and Replacement

4.3 Drive

The peripheral tray may be the older, double tray, or the newer single tray. The content of peripheral trays may differ, depending upon original system configuration / option (Sun-3 / 470, SPARCsystem370, SPARCsystem 470 or SPARCsystem 670MP) as well as whether the system has been upgraded.

To remove a drive from a particular peripheral tray type, follow the appropriate procedure(s) below.

4.3.1 Single Tray

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, “Peripheral Tray(s)”.**
2. **Loosen inner mounting bracket screws (mounting brackets are slotted so a drive may be removed without removing inner mounting bracket screws).**
3. **Remove two outer bracket mounting screws. Position drive so the power and data connectors may be removed — freeing the drive for replacement.**

4. **Remove mounting brackets from the old drive and install on new drive. If drive to be replaced is half-high (1/4-inch tape or SunCD) remove old unit from mounting brackets and replace with new unit (refer to Figure 4-3).**

5. **Set device jumpers in accordance with instructions found in Appendix A.**

6. **Replace the drive by reversing this procedure.**

Note – For SunCD: install ground strap P/N 530-1842 on the lug at the drive rear. Secure the other end (with the hole) under the mounting bracket screw for the drive behind SunCD.

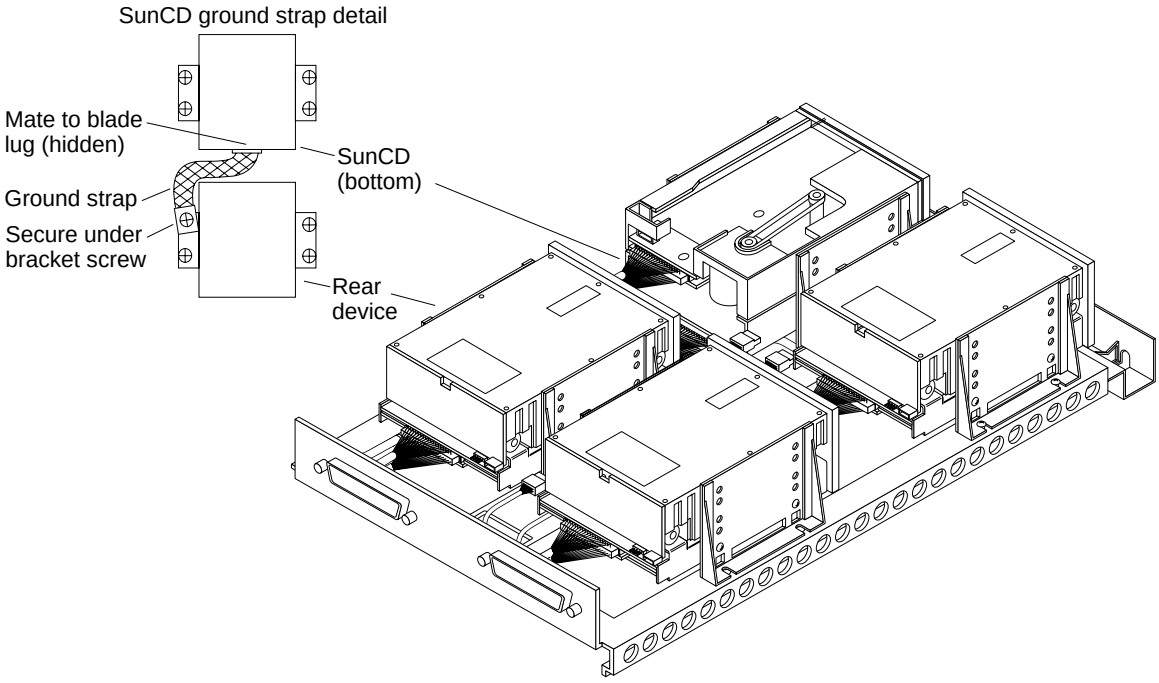


Figure 4-3 Single Tray — Drive Removal and Replacement

4.3.2 1/4-Inch Tape Drive — Double Tray

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, "Peripheral Tray(s)."**

2. **Remove six screws securing the tape drive bezel to the end of the tray and two screws securing the bezel to the top cover of the tray (see Figure 4-4).**
3. **Remove six screws securing top cover to the tray. Remove the cover.**
4. **Unplug the cables from the keyed connectors on the drive.**
5. **Remove four screws securing the drive to the tray. Remove the drive.**
6. **To install a tape drive, reverse this procedure, taking care to replace the ribbon cable properly to ensure that pin 1 is properly oriented.**

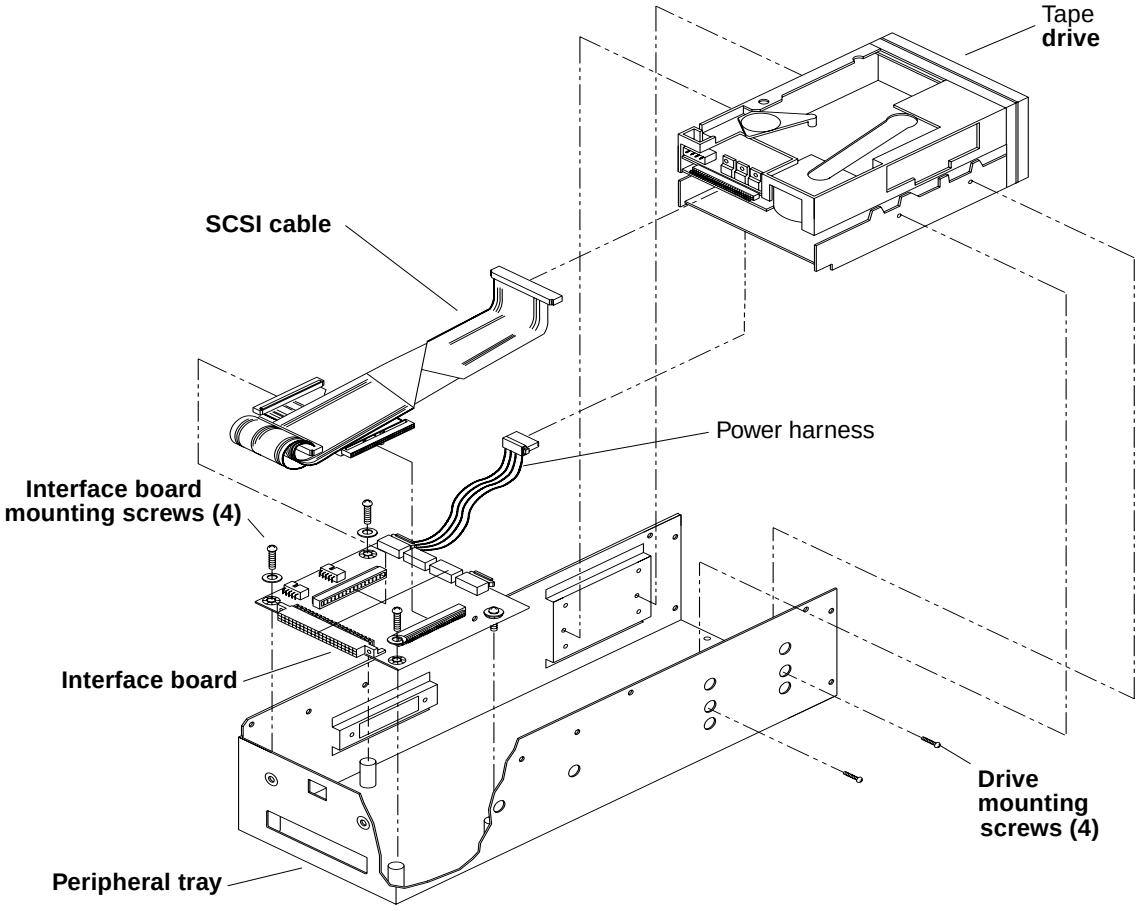


Figure 4-4 Double Tray — 1/4-Inch Tape Drive Removal and Replacement

4.3.3 1/4-Inch Tape Drive — Double Tray

1. **Remove peripheral tray from the pedestal as described in Section 4.2, Peripheral Tray(s) (refer to Figure 4-5).**
2. **Remove eight screws securing peripheral tray front bezel. Remove bezel.**
3. **Remove six screws securing the top cover to the tray. Remove the cover.**
4. **Unplug cables from keyed connectors on the drive and interface board.**
5. **Remove four screws securing drive to the tray. Remove drive from tray.**
6. **To install a tape drive, reverse this procedure, taking care to replace the ribbon cable properly to ensure that pin 1 is properly oriented.**

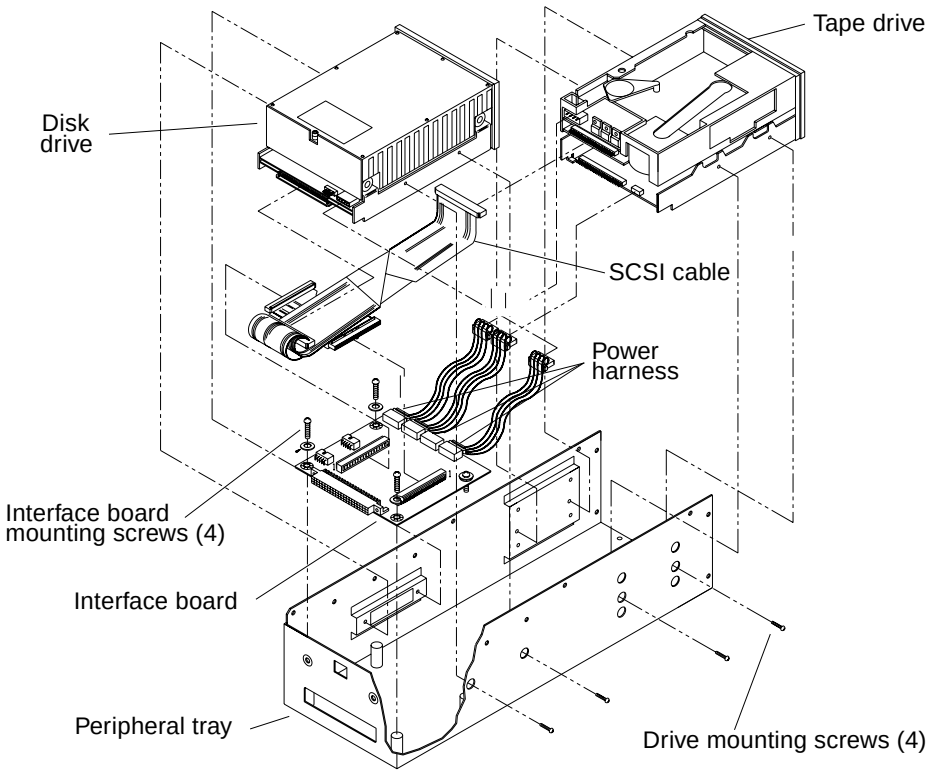


Figure 4-5 Double Tray — 1/4-Inch Tape Drive Removal and Replacement

4.3.4 Disk Drive/1/4-Inch Tape Drive — Double Tray

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, Peripheral Tray(s) (refer to Figure 4-6).**
2. **Remove eight screws securing peripheral tray front bezel. Remove bezel.**
3. **Remove six screws securing the top cover to the tray. Remove the cover.**
4. **Remove four screws securing the tape drive to the tray.**
5. **Remove four screws securing the disk drive to the tray.**
6. **Remove SCSI cables/power harnesses from interface boards to the drives.**
7. **Remove the drives from the tray.**
8. **Replace the tape and/or disk drive by reversing the above steps.**

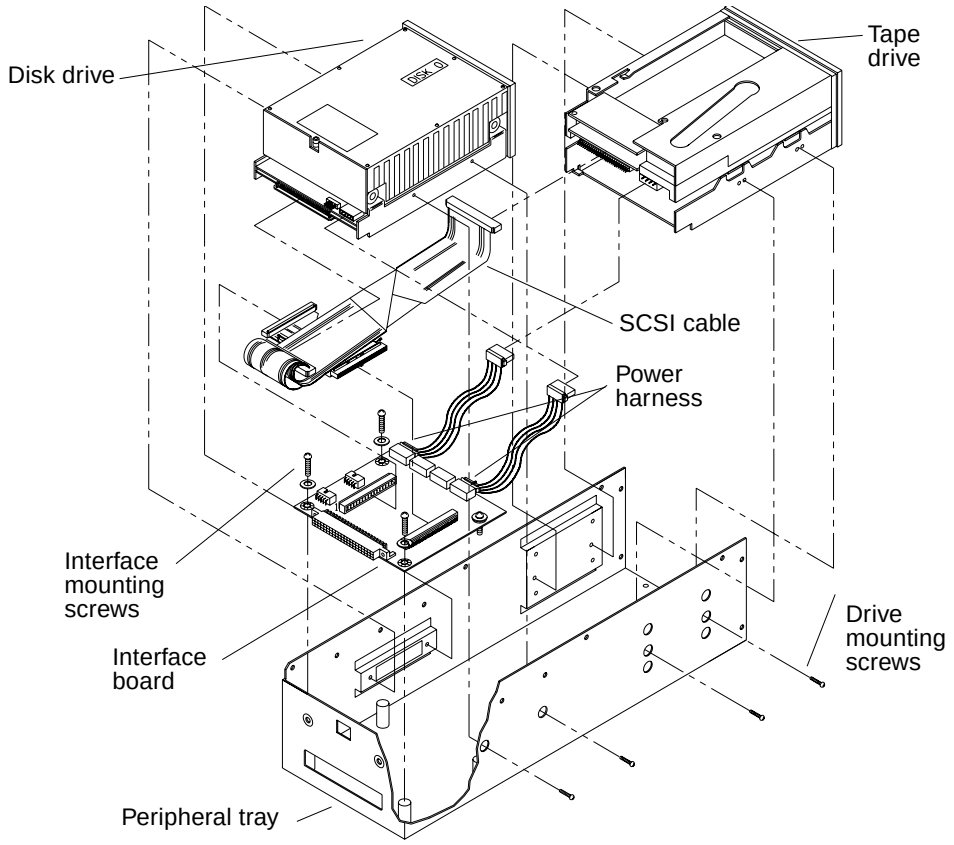


Figure 4-6 Double Tray — Disk Drive and 1/4-Inch Tape Drive Removal and Replacement

4.3.5 Single Disk Drive Without Tape Drive — Double Tray

1. **Remove peripheral tray from pedestal as described in Section 4.2, Peripheral Tray(s) (refer to Figure 4-7).**
2. **Remove eight screws securing the tray front bezel. Remove the bezel.**
3. **Remove six screws securing the top cover to the tray. Remove the cover.**
4. **Unplug the cables from the drive to the interface board.**
5. **Remove four screws securing the drive to the tray and remove the drive.**

6. **Reverse this procedure to install a single disk drive.**

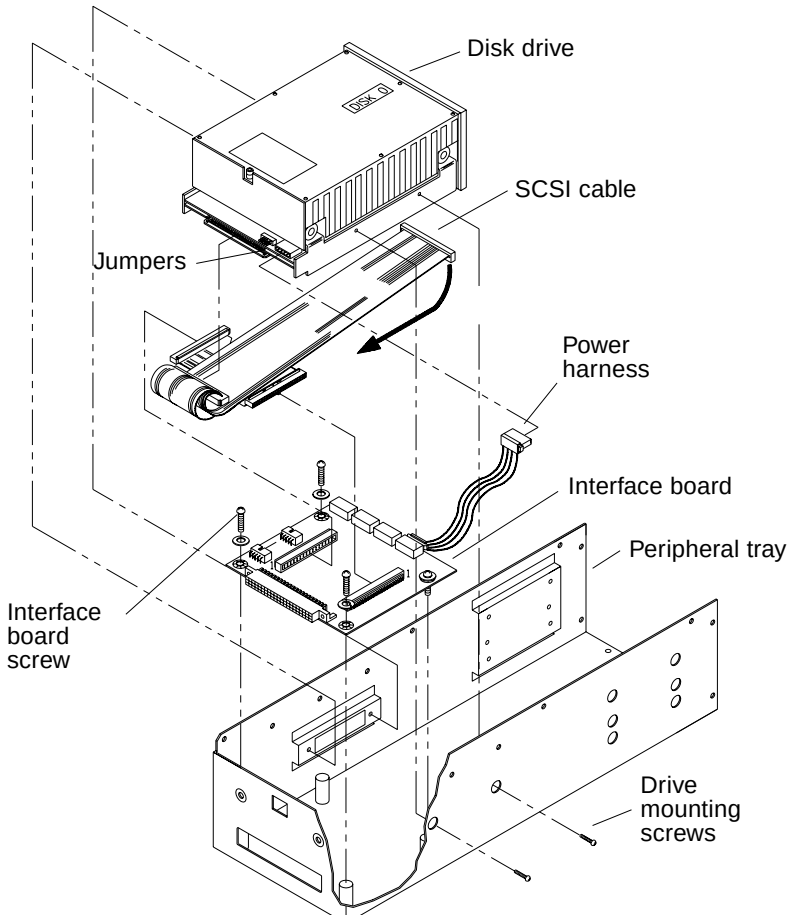


Figure 4-7 Double Tray — Single Disk Drive Removal and Replacement

4.3.6 Dual Disk Drive Removal — Double Tray

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, Peripheral Tray(s) (see Figure 4-8).**
2. **Remove eight screws securing the tray front bezel. Remove the bezel.**
3. **Remove six screws securing the top cover to the tray. Remove the cover.**

4. **Remove the four screws securing the second disk drive (located the furthest from the interface board) to the tray.**
5. **Remove the SCSI cables and power harnesses from the second drive.**
6. **Remove the second drive from the tray.**
7. **Remove four screws securing the first drive to the tray. Remove the drive.**
8. **To install dual disk drives, reverse this procedure.**

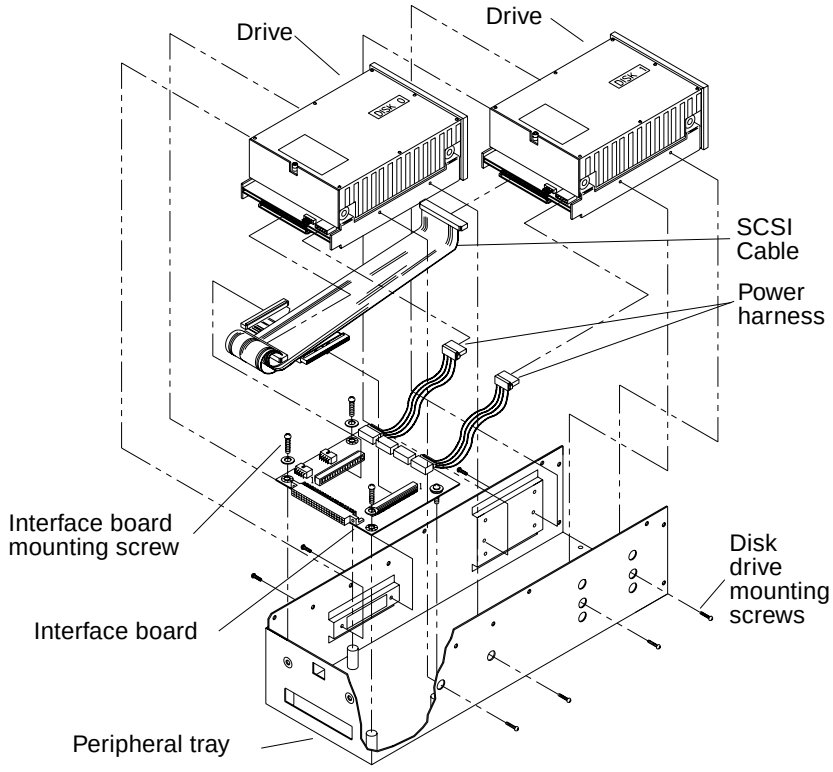


Figure 4-8 Double Tray — Dual Disk Drive Removal and Replacement

4.3.7 SunCD/Tape — Double Tray

To remove and replace either device in a combined SunCD /tape drive configuration, within a double tray, see Figure 4-9 and proceed as follows:

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, Peripheral Tray(s).**
2. **Remove eight screws securing the tray front bezel. Remove the bezel.**
3. **Remove six screws securing the top cover to the peripheral tray and remove the cover.**
4. **Remove four screws securing SunCD or the tape drive to the tray.**
5. **Disconnect the SCSI ribbon and Y-power cables from the rear of the unit and then remove the SunCD or the tape drive.**
6. **To replace the SunCD or tape drive, reverse this procedure. If SunCD is replaced, replace the ribbon cable ensuring pin 1 is properly oriented.**

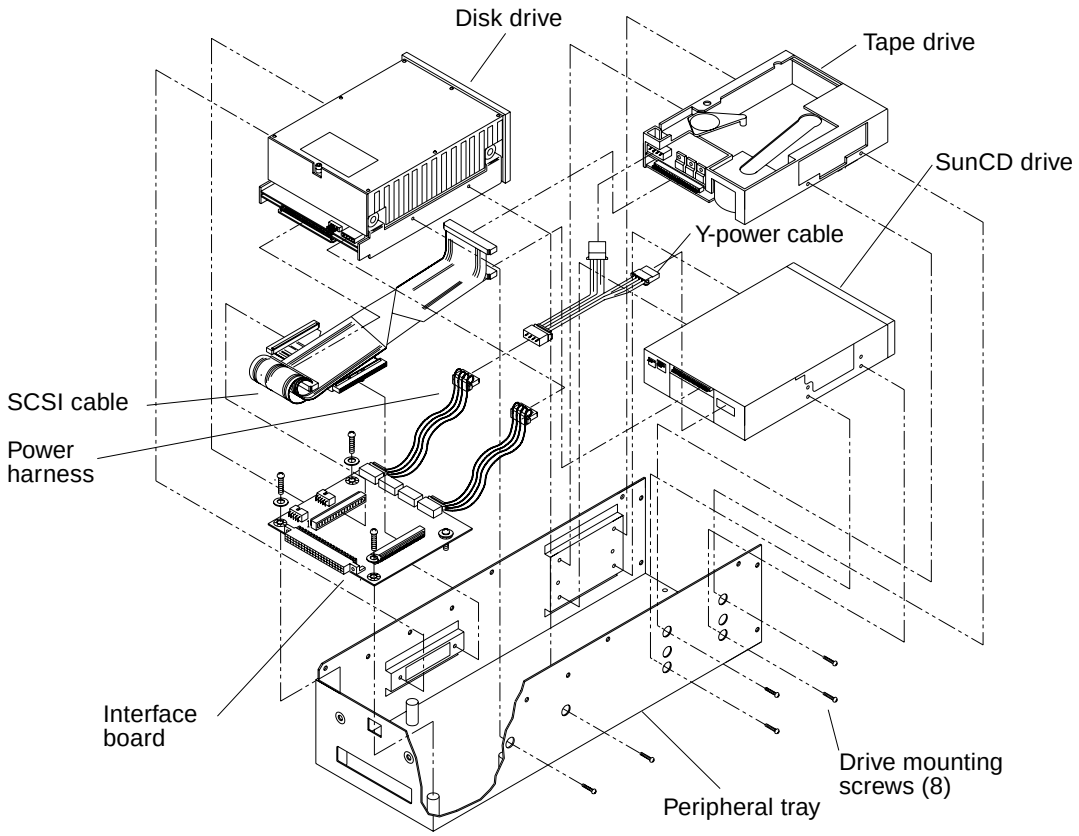


Figure 4-9 Double Tray — SunCD / Tape Removal and Replacement

4.3.8 8mm Tape Drive — Double Tray

Refer to Figure 4-10 and proceed as follows:

1. **Remove the peripheral tray from the pedestal as described in Section 4.2, Peripheral Tray(s).**
2. **Remove eight screws securing the tray front bezel. Remove the cover.**
3. **Remove six screws securing the top cover to the tray. Remove the cover.**
4. **Remove the SCSI and power cables from the rear of the tape drive.**
5. **Remove four screws securing the drive to the tray. Remove the tape drive.**
6. **To replace the tape drive, reverse this procedure, taking care to replace the ribbon cable properly to ensure correct pin 1 orientation.**

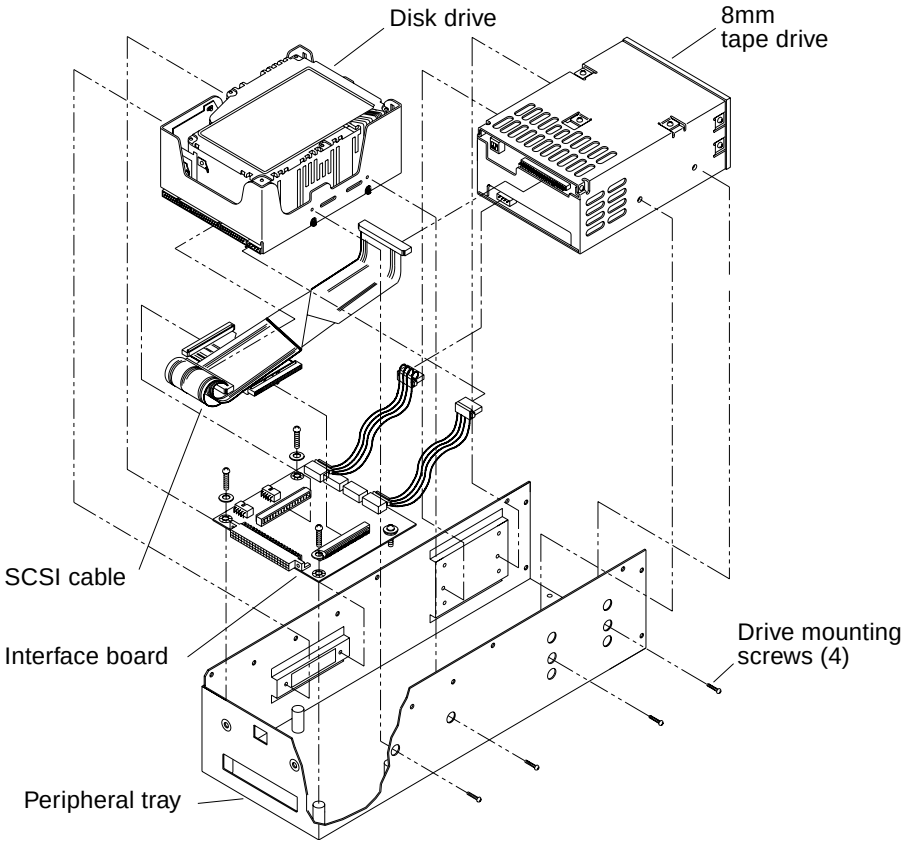
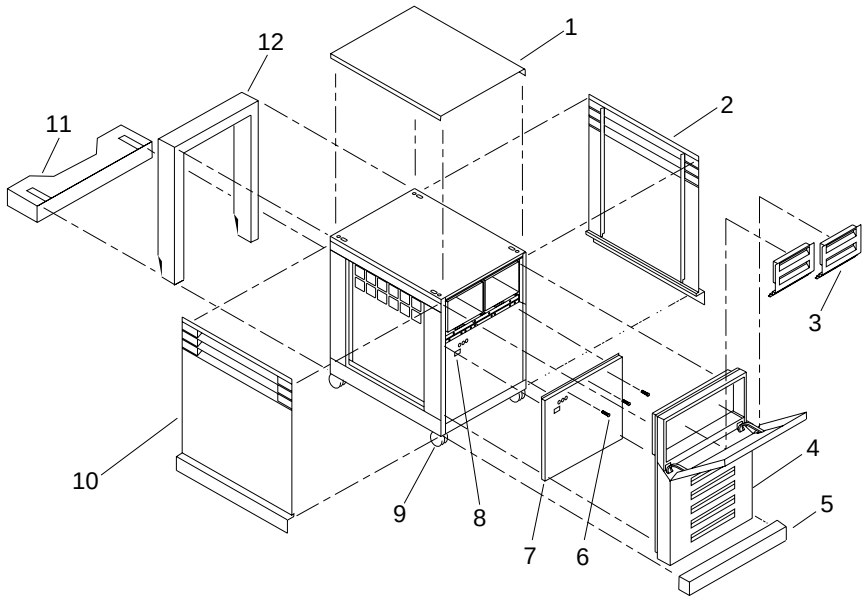


Figure 4-10 Double Tray — 8mm Tape Removal and Replacement

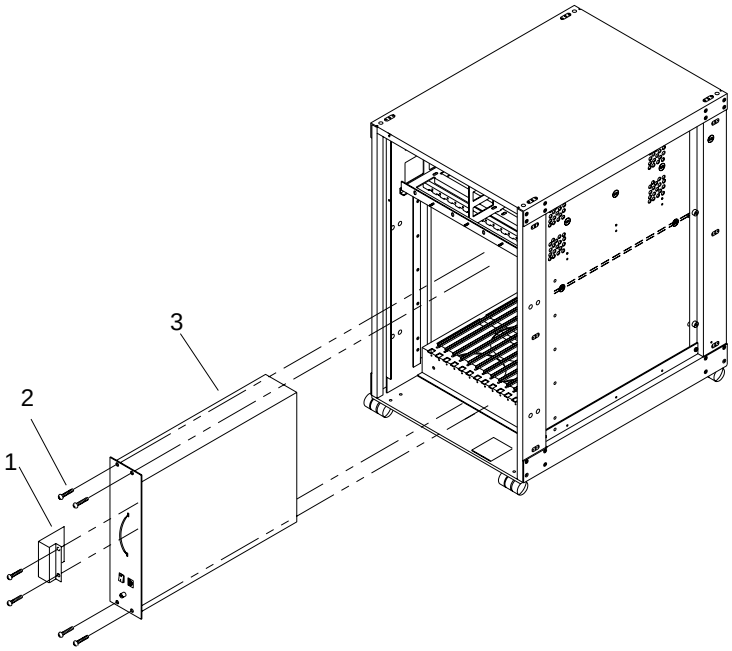
Illustrated Parts Breakdown

The illustrations and tables on the following pages are intended to supplement the remove and replace procedures in previous Chapters.



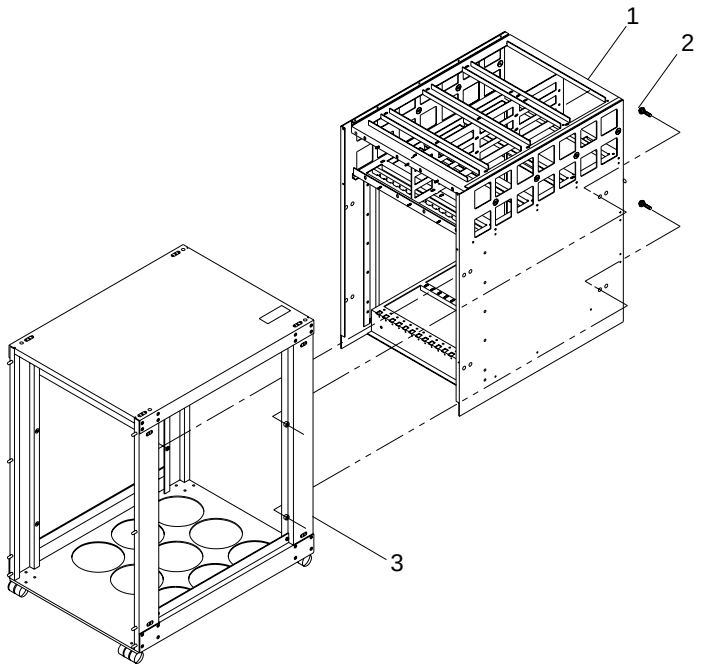
Key	Description	Part Number
1	Top Cover	340-1898
2	Side Panel (right)	540-1846
3	Peripheral Bezel (2)	
	(blank, no access)	330-1192
	(half high access)	330-1210
	(full high access)	330-1284
4	Front Panel	540-1847
5	Front Bumper (removable earlier systems only)	540-1731
6	EMI Cvr Mtg Screw (3, old; 6 new)	240-1372
7	EMI Cover	340-1871
8	Remote DC Switch	540-2136
9	Swivel Casters (4)	240-1806
10	Side Panel(left)	540-1846
11	Rear Bumper	540-1749
12	Rear Bezel	540-1847

Figure 5-1 Cabinet Trim



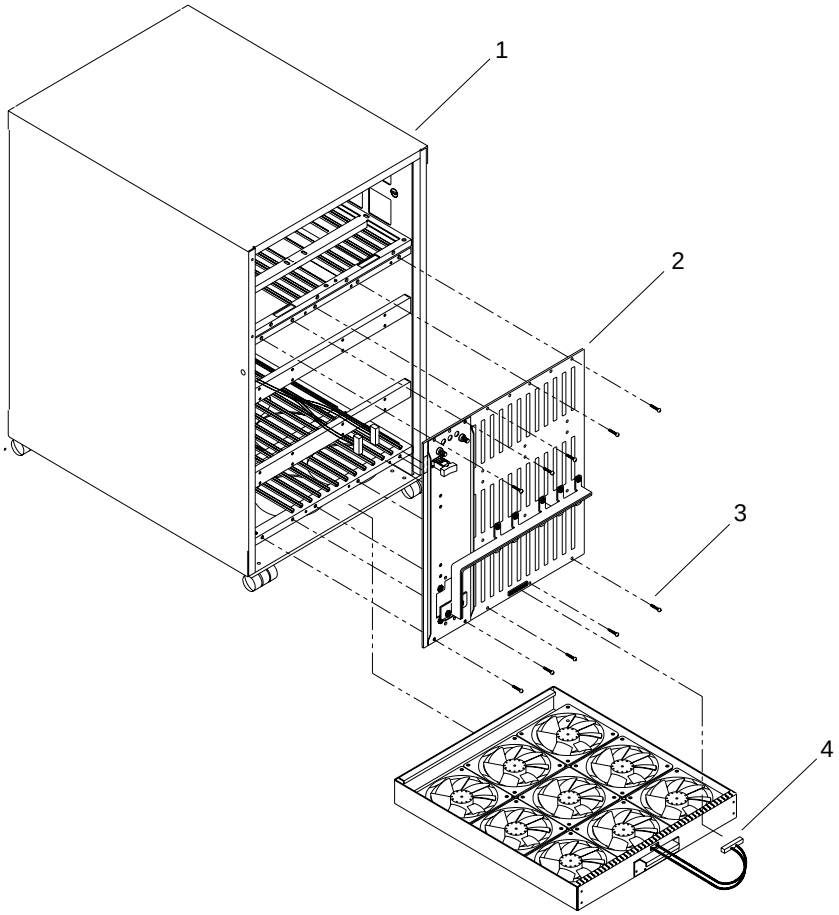
Key	Description	Part Number
1	Power Supply	
	Old	300-1089
	New	300-1047
2	SEM, 4x0.7x10 (6)	240-1372
3	ESD Cover (earlier models only)	340-2004

Figure 5-2 Power Supply in Card Cage



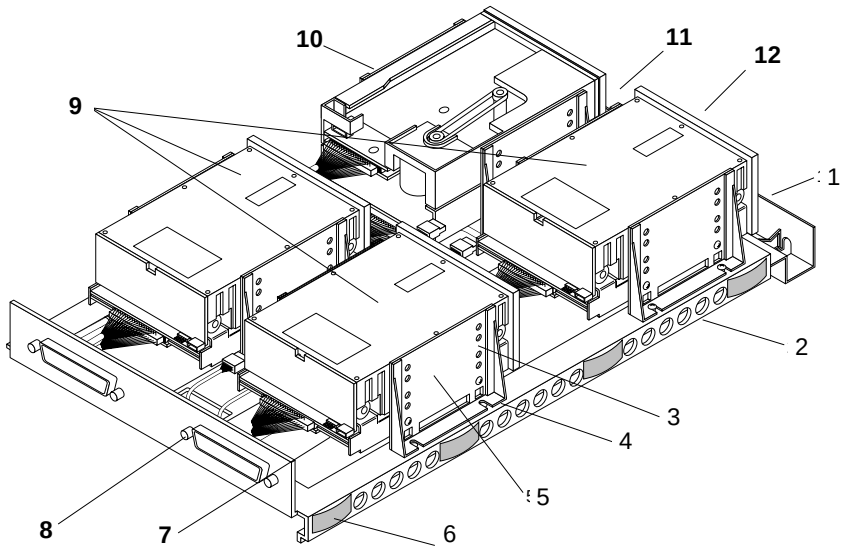
Key	Description	Part Number
1	Card cage	340-1821
2	SEM,M6*1*16	240-1368
3	Frame	340-1819

Figure 5-3 Card Cage and Frame



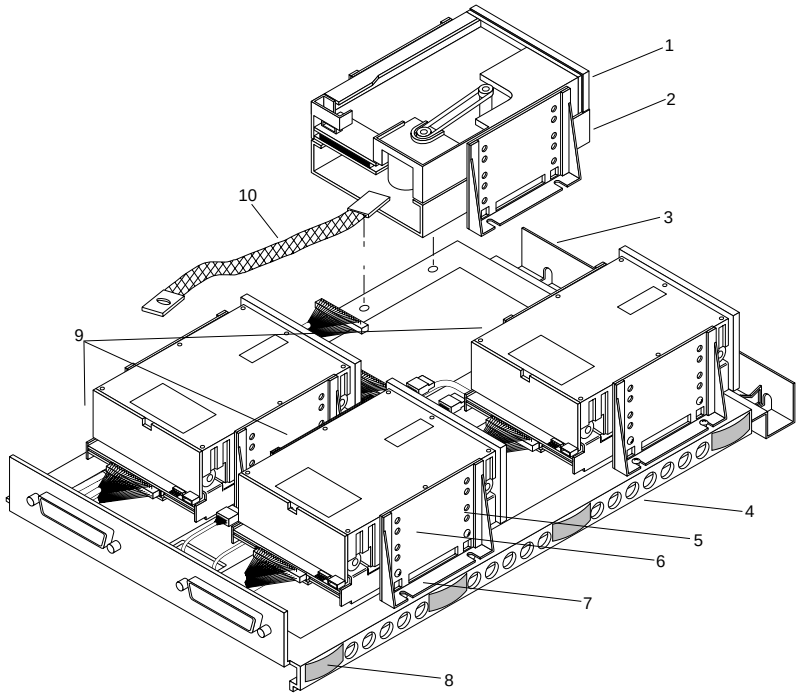
Key	Description	Part Number
1	Frame Assembly	540-1734
2	Back Plane	
	Un-notched	501-1439
	Notched	501-1598
3	Back Plane Mtg Screws (29)	240-1372
4	Fan Tray Assembly	540-1751

Figure 5-4 Fan Tray and Back Plane



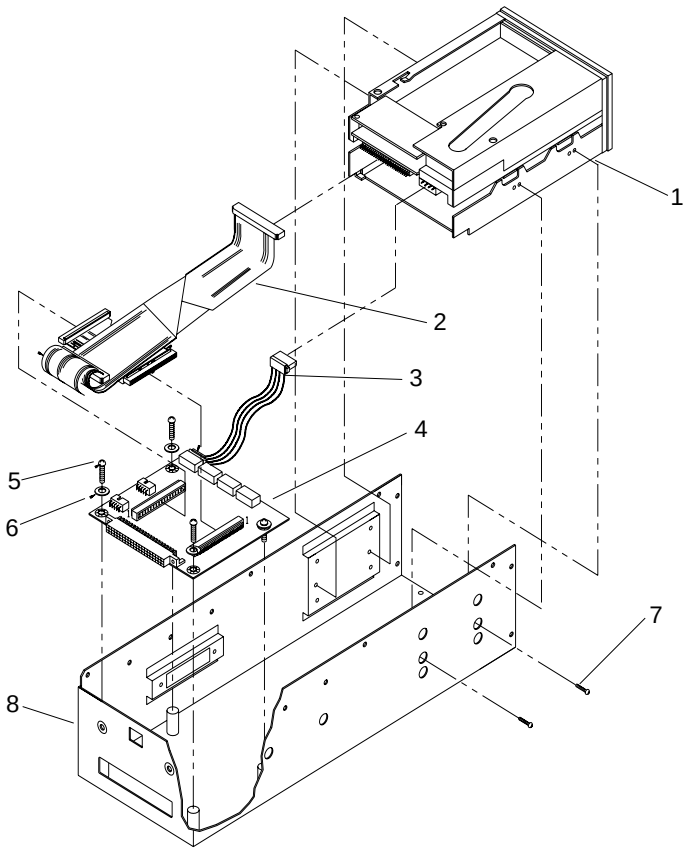
Key	Description	Part Number
1	Tray Mtg Screws (hidden)	240-1372
2	Peripheral Tray	340-2294
3	Drive Mtg Screws	240-1527
4	Mtg Bracket Screws	240-1372
5	Drive Mtg Bracket	340-2444
6	Spring Finger (8 places; part of Peripheral Tray	340-2546 340-2294)
7	ASSY, Harness, Power Peripheral	530-1675
8	ASSY, Cable, Embedded SCSI	530-1676
9	Disk Drive (669 Mbyte) Disk Drive (327 Mbyte) Disk Drive (1.3 Gbyte)	370-1319 or 370-1230 or 370-1377
10 One of:	1/4-Inch, 150 Mbyte Tape SunCD	370-1206 or 370-1205 370-1347
11 (under tape)	SunCD	370-1347
12	ASSY, Harness, Peripheral/ Back Plane (on chassis)	530-1675

Figure 5-5 Single Tray, 3 Disk Drives, SunCD and Tape



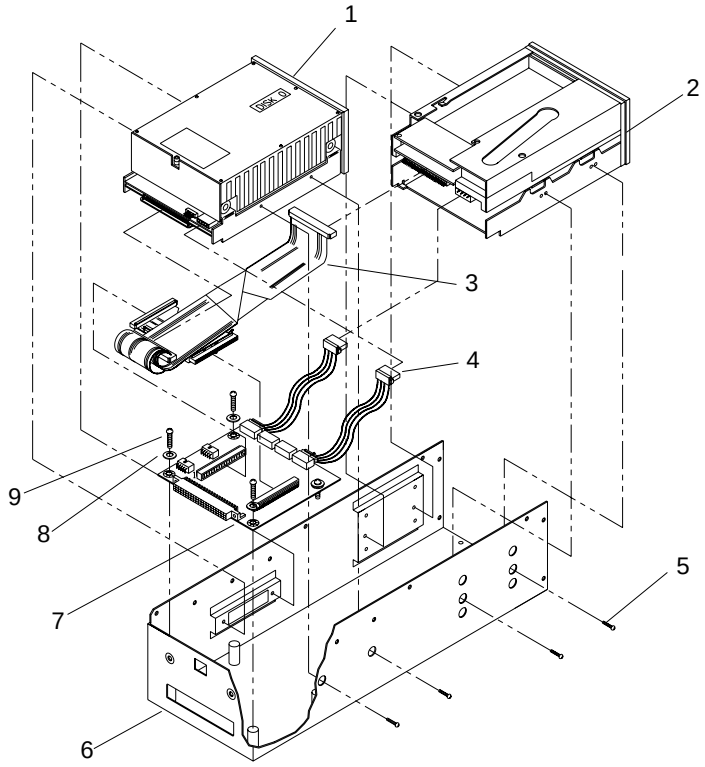
Key	Description	Part Number
1	1/4-Inch, 150 Mbyte Tape	370-1206 or 370-1205
2	SunCD	370-1347
3	Tray Mtg Screws (hidden)	240-1372
4	Peripheral Tray	3402293
5	Drive Mtg Screws	240-1527
6	Mtg Bracket	340-2444
7	Bracket Mtg Screws	240-1372
8	Spring Finger (8 places)	340-2546
9	Disk Drive (669 Mbyte) Disk Drive (327 Mbyte) Disk Drive (1.3 Gbyte)	370-1319 or 370-1230 or 370-1377
10	Ground Strap (for SunCD)	530-1842

Figure 5-6 Single Tray, Disk, SunCD and 1/4-Inch Tape Drives



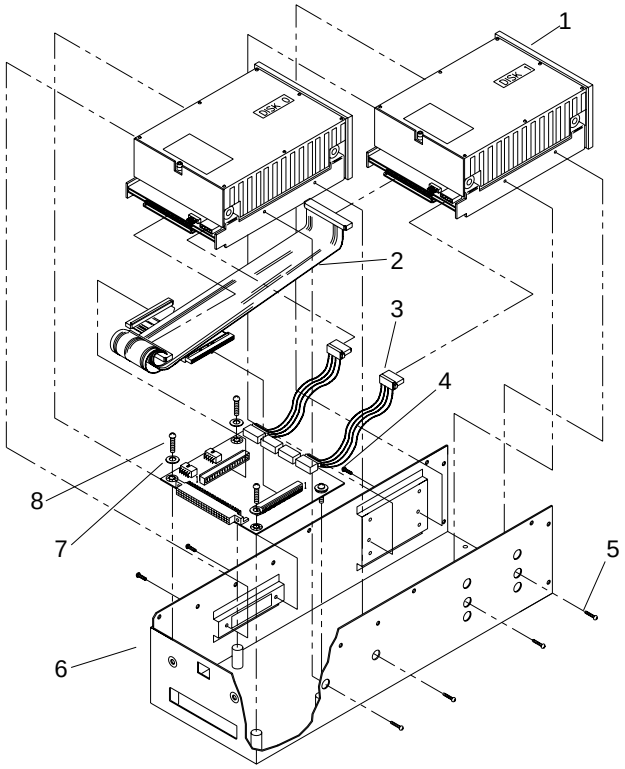
Key	Description	Part Number
1	Tape Drive (1/4-Inch, 150 Mbyte) Tape Drive (60 Mbyte)	370-1206 or 370-1247
2	SCSI Cable	530-1729
3	Power Harness	530-1499
4	Interface Board	501-1496
5	Interface Bd Mtg Screws (4)	240-1291
6	Washers (4)	240-1036
7	Drive Mtg Screws (4)	240-1202
8	Tray	340-1903

Figure 5-7 Double Peripheral Tray With Tape Drive Only



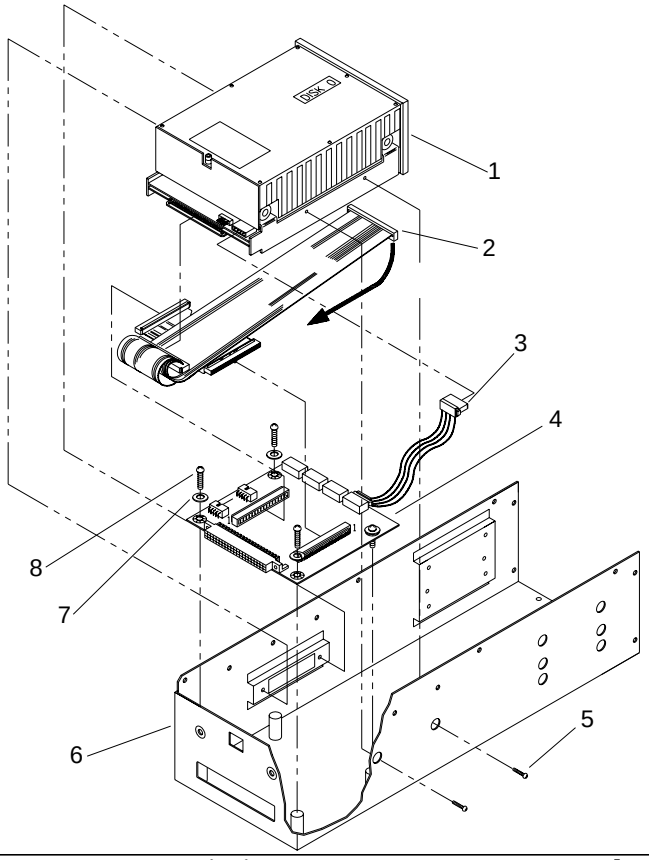
Key	Description	Part Number
1	Disk Drive (327 Mbyte)	370-1230
2	Tape Drive (1/4-Inch, 150 Mbyte)	370-1206
3	SCSI Cable	530-1498
4	Power Harness	530-1499
5	Drive Mtg Screws (8)	240-1527
6	Peripheral Tray	340-1903
7	Interface Board	501-1496
8	Washers (4)	240-1036
9	Interface Bd Mtg Screws (4)	240-1291

Figure 5-8 Double Peripheral Tray With Disk and Tape



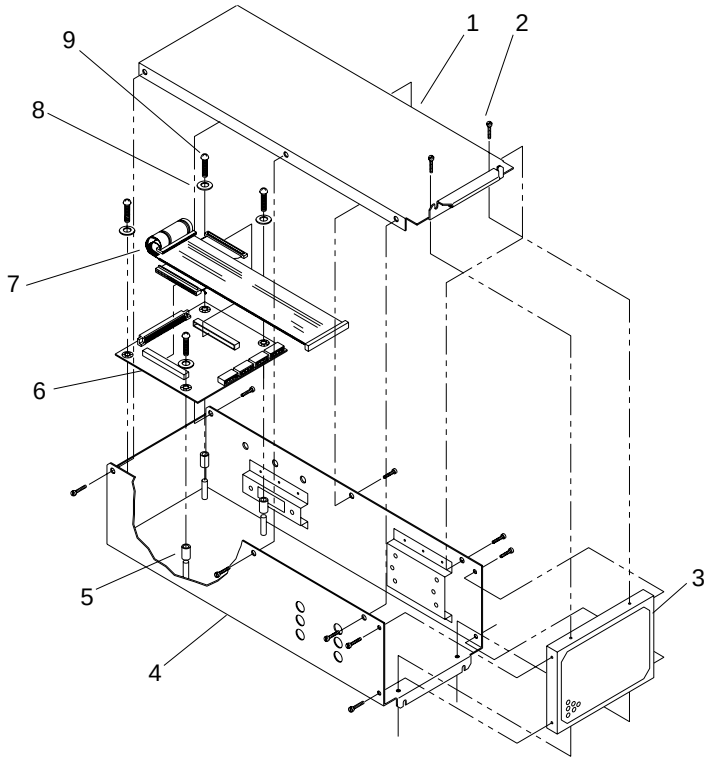
Key	Description	Part Number
1	Disk Drive (327 Mbyte,(2))	370-1230
2	SCSI Cable	530-1500
3	Power Harness (2)	530-1499
4	Interface Board	501-1496
5	Drive Mtg Screws (8)	240-1527
6	Peripheral Tray	240-1036
7	Washers (4)	240-1202
8	Interface Bd Mtg Screws (4)	340-1903

Figure 5-9 Double Peripheral Tray With Dual Disk Drives



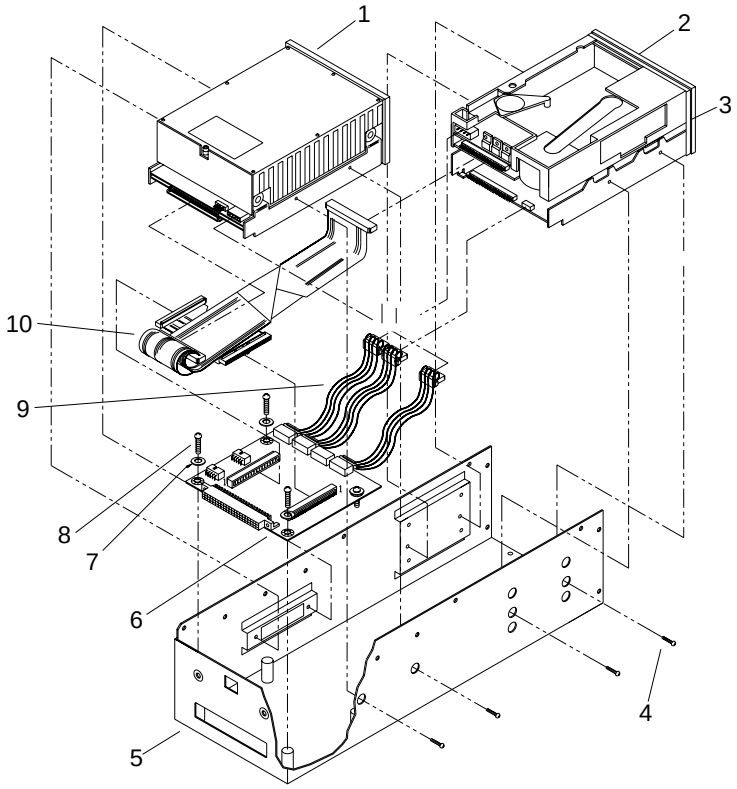
Key	Description	Part Number
1	Disk Drive (327 Mbyte)	370-1230
2	SCSI Cable	530-1500
3	Power Harness	530-1499
4	Interface Board	501-1496
5	Drive Mtg Screws (8)	240-1527
6	Tray	340-1903
7	Washers (4)	240-1036
8	Interface Bd Mtg Screws (4)	240-129

Figure 5-10 Double Peripheral Tray With Single Disk Drive



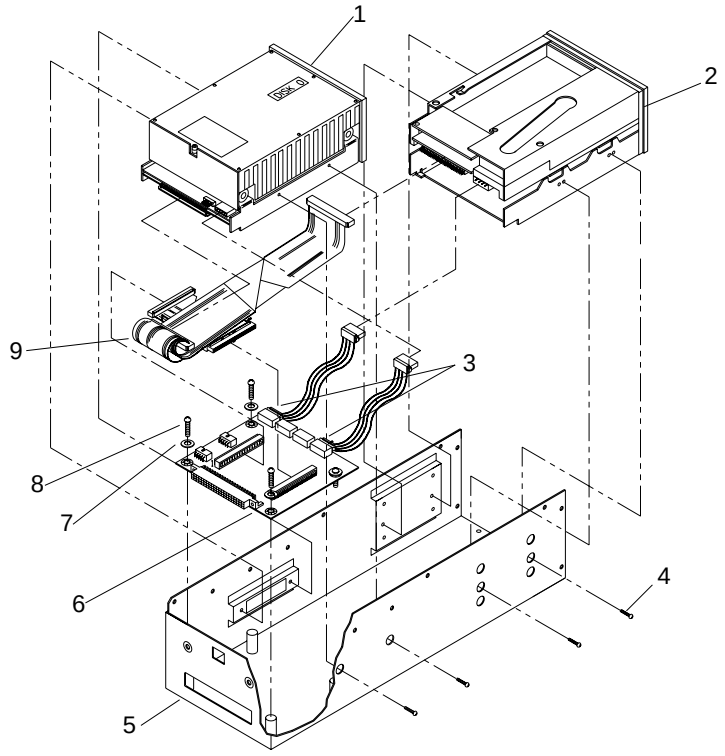
Key	Description	Part Number
1	Cover	340-1904
2	Mounting Screws (14)	240-0258
3	Inner Bezel	340-1902
4	Tray	340-1903
5	Standoff (4)	230-1146
6	Interface Board	501-1496
7	SCSI Cable	530-1500
8	Washers (4)	240-1036
9	Interface Bd Mtg Screws (4)	240-1291

Figure 5-11 Double Peripheral Tray Skeleton Tray



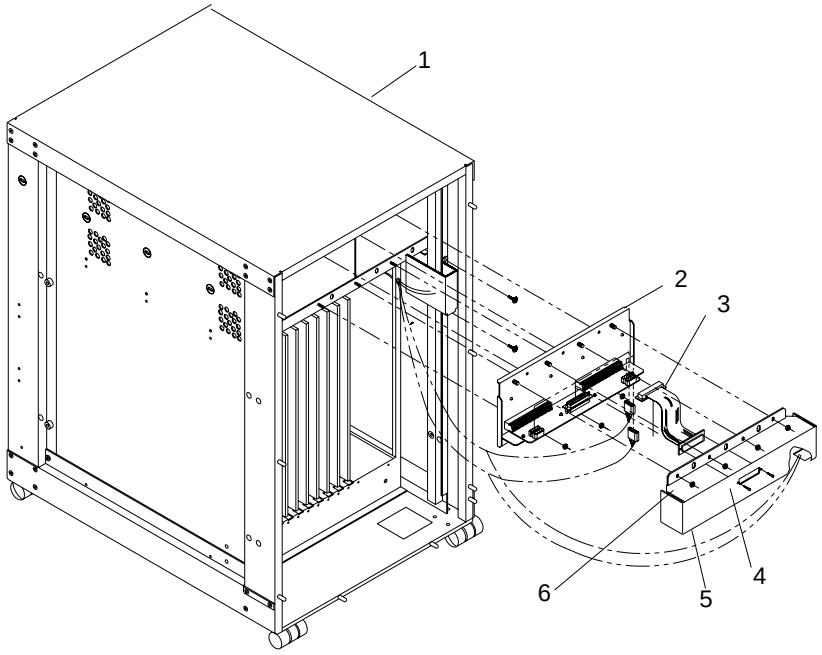
Key	Description	Part Number
1	Disk Drive (327 Mbyte)	370-1230
2	Tape Drive (1/4-Inch, 150 Mbyte)	370-1206
3	SunCD Drive	370-1347
4	Drive Mtg Screws (8)	240-1527
5	Peripheral Tray	340-1903
6	Interface Board	501-1496
7	Washers (4)	240-1036
8	Interface Bd Mtg Screws (4)	240-1291
9	Power Harness	530-1499
10	SCSI Cable	530-1729

Figure 5-12 Double Peripheral Tray With Disk Drive, Tape and SunCD



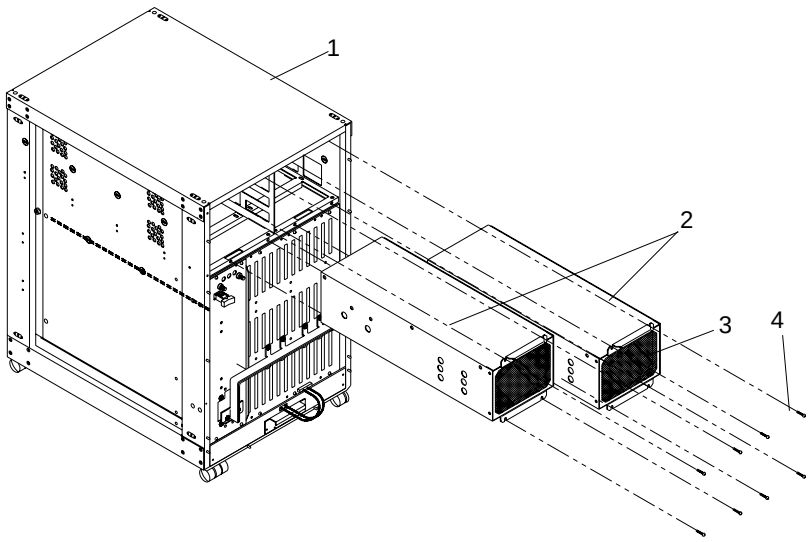
Key	Description	Part Number
1	Disk Drive (669 Mbyte) Disk Drive (327 Mbyte)	370-1319 or 370-1230
2	8 mm Tape Drive, 2.3 Gbyte 8 mm Tape Drive, 5.0 Gbyte	370-1297 370-1415
3	Power Harness	530-1499
4	Drive Mtg Screws (8)	240-1527
5	Peripheral Tray	340-1903
6	Interface Board	501-1496
7	Washers (4)	240-1036
8	Interface Bd Mtg Screw (4)	240-1291

Figure 5-13 Double Peripheral Tray With Disk and 8mm Tape



Key	Description	Part Number
1	Frame	340-1892
2	SCSI Board	130-0486
3	SCSI Cable	240-1373
4	Connector Mtg Screws (2)	530-1494
5	SCSI Board Cover	501-1493
6	Cover Mtg Nuts (7)	540-1733

Figure 5-14 SCSI Board Assembly (Double Tray Models Only)



Key	Description	Part Number
1	Frame	540-1733
2	Peripheral Tray (2)	340-1903
3	Bezel Tray	
	(blank, no access)	340-1902
	(half-high access)	340-1901
	(full high access)	340-2249
4	Mounting Screws (8)	240-1372

Figure 5-15 Double Peripheral Trays

SCSI Device Configuration in the SPARCsystem 670MP

Use the information in this appendix to configure SCSI devices installed in the SPARCsystem 670MP. Before proceeding, refer to Chapter 1, “Preparing the System for Service” to access the peripheral tray. Refer to Chapter 4, “Mass Storage Removal and Replacement” to install the device after configuration.

If installing devices in SPARCsystem 370 or SPARCsystem 470, consult the configuration manual shipped with the device.

A.1 Configuration Options

Configure the disk drives as follows:

1. **Use the information shown in Figure A-1 to determine which of the six combinations of positions for the tape and disk drives you will need.**
2. **Determine the position to mount the device. The office pedestal is always shipped with SunCD™ in the front-bottom-right location.**
3. **Configure each device according to its position within the peripheral tray.**
4. **Set the SCSI device ID number according to Figure A-1.**
5. **Follow instructions in sections that follow to configure the tape or disk drive to the correct ID. Do this b*efore* installing drives in the tray.**

Note – Remove the EMI cover to access the tray. Refer to Chapter 1, Section 1.7.6, “EMI Cover.”

Figure A-1 illustrates allowed positions for full- and half-height devices.

1. Rear locations are disk only (no front-load media devices).
2. Front-right locations (top and bottom) are half-height with SunCD configured on the bottom. No full-height device allowed here. The top location is an optional device location.
3. The left-front location contains one or two half-height devices or one full-height device.

A.2 Configuration Overview

Configuration is defined as the process of *physically* jumpering pins and setting switches on the SCSI device to be installed. This procedure is different for each of the SCSI devices described in this manual. Some of the settings are required and some represent the different options you can choose.

Configure SCSI devices before installing them, since jumpers are readily accessible before installation, not after.

1. **Use information shown in Figure A-1 to determine the appropriate mix of half- and full-height devices.**
2. **Determine the correct device mounting position. SPARCsystem 670MP is factory-configured with SunCD in the right-bottom position. Follow instructions in sections that follow to configure tape or disk drives correctly for the position occupied.**
3. **Follow instructions to verify SCSI termination, in Section A.4 below. Do this before reassembling the system and operating drives.**

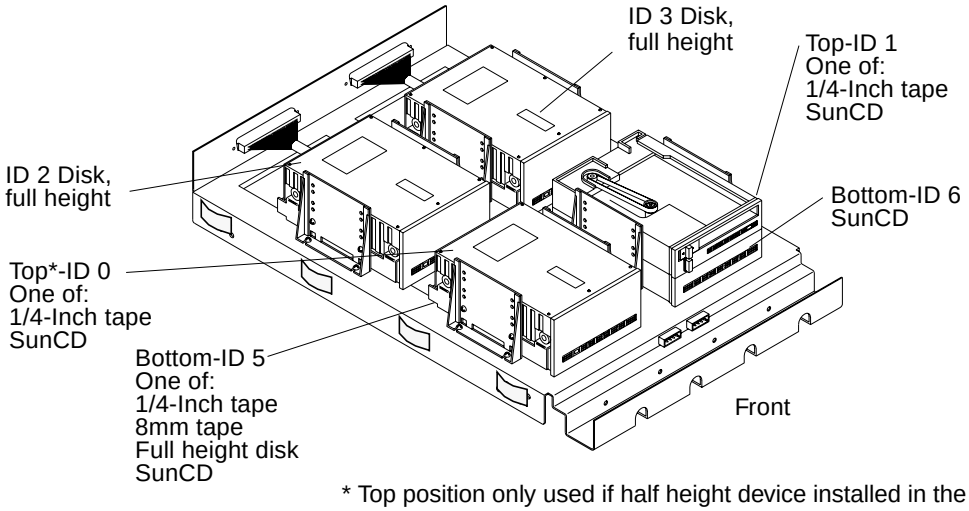


Figure A-1 Mounting Positions in the Peripheral Tray

One type of SCSI ribbon cable is used in the tray; P / N 530-1676-xx. This daisy-chain type cable connects all drives in the tray.

A.3 Inspection and Handling

Caution – Circuit boards are vulnerable to damage by electrostatic discharge (ESD). An electrostatic charge can build in 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 anti-static bag provided
- Use a grounding strap and Sun ESD mat, PN 250-1088-01, whenever working on a board (instructions are 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 be 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

The SCSI bus is terminated by means of an external terminator on the outside of the tray. The SCSI bus begins at the system board card, daisy-chains through the peripheral tray, terminating at the output connector.

Note – Install the terminator plug on the SCSI tray output connector.

Because the SCSI control section of the system board provides bus termination, all SCSI bus termination resistors must be removed from all SCSI controlled devices that are installed in the peripheral tray.

Caution – Ensure the SCSI bus is not terminated at a device. Failure to remove bus termination from installed devices may cause degraded performance, intermittent error, and system failure.

Note – For information on adding external SCSI devices, refer to the *Sun SPARCstation 670MP Installation Manual*.

A.5 SunCD

A.5.1 Connector Location

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

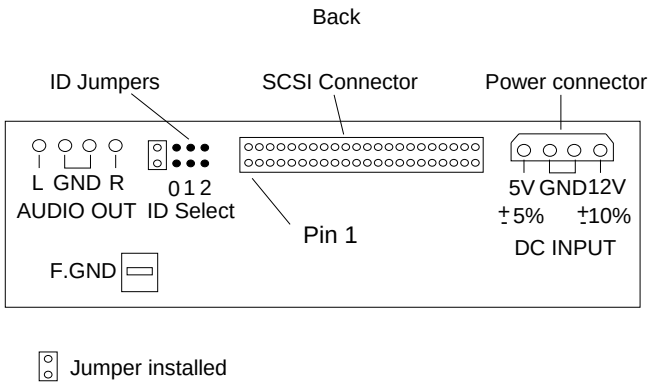


Figure A-2 Connector Locations for the SunCD

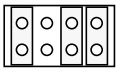
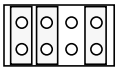
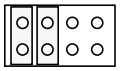
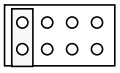
A.5.2 Setting the SCSI ID

1. **Remove jumpers from the SCSI address receptacle on the drive. Use needle-nose pliers. Refer to Figure A-2 for receptacle location.**
2. **Set the drive SCSI address. Install jumpers on the address receptacle.**

Note – The normal SCSI address settings and the jumper arrangements for the SunCD are shown in Table A-1.

Note – SunCD units must be grounded using cable P/N 530-1842.

Table A-1 SCSI Address Settings for the SunCD

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

A.6 1/4-inch Tape Drive

A.6.1 Connector Locations

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

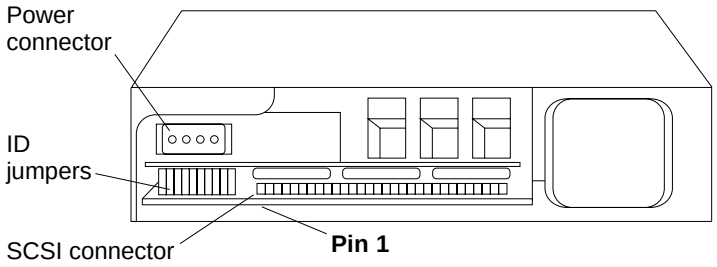


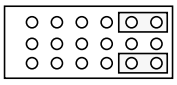
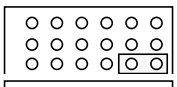
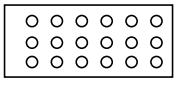
Figure A-3 Connector Locations for the 1/4-Inch Tape Drive

A.6.2 Setting the SCSI ID

1. **Remove the jumpers from the jumper block on the drive using the needle-nose pliers. Refer to Figure A-3 for the location of the address receptacle.**
2. **Set the drive SCSI address by arranging the jumpers on the jumper block.**

Note – Table A-2 lists 1/4-inch tape drive SCSI address jumper settings.

Table A-2 SCSI Address Settings for the 1/4-Inch Tape Drive

SCSI Device	ID	Jumper Position
1/4-Inch Tape Drive	5	
1/4-Inch Tape Drive	1	
1/4-Inch Tape Drive	0	

A.7 8mm Tape Drive

A.7.1 Connector Locations

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

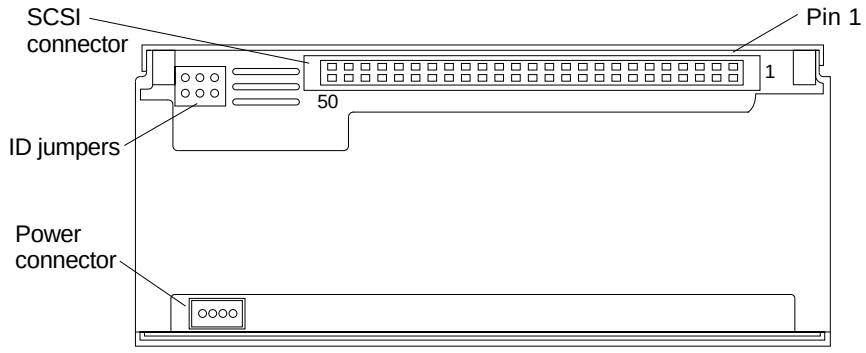


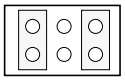
Figure A-4 Connector Locations for the 8mm Tape Drive

A.7.2 Setting the SCSI ID

1. **Remove jumpers from the SCSI address receptacle on the drive using needle-nose pliers. Refer to Figure A-4 for receptacle location.**
2. **Set drive SCSI address by arranging jumpers on the address receptacle.**

Note – Table A-3 lists 8mm tape drive address settings/jumper positions.

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

SCSI Device	ID	Jumper Position
8mm Tape Drive	5	

A.8 5 1/4-Inch SCSI Disk Drive

A.8.1 Connector Locations

The SCSI address, SCSI interface, and power connectors are located on the rear panel of the 5 1/4-inch disk drive. See Figure A-5 for the connector locations.

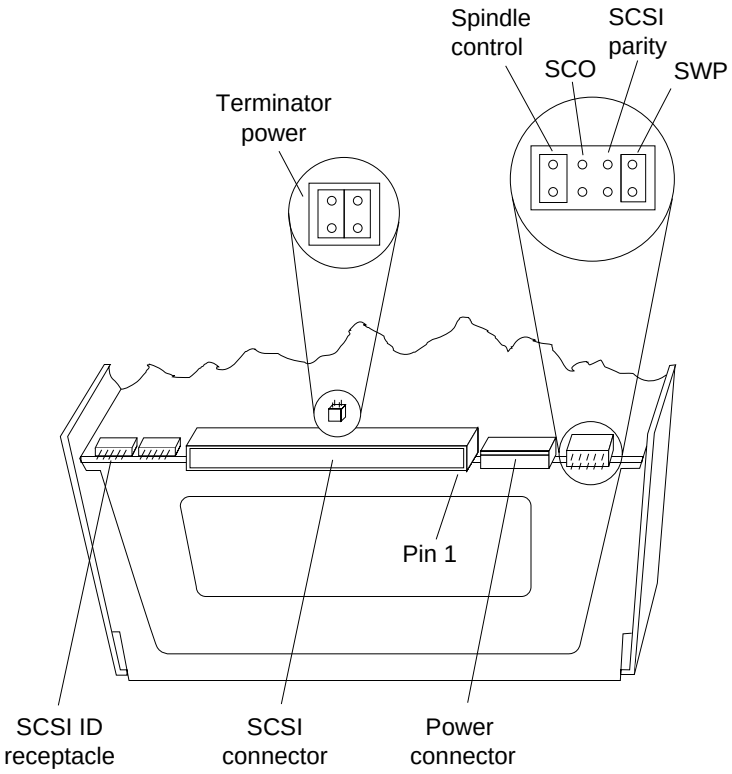


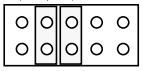
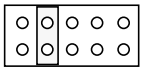
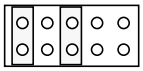
Figure A-5 Connector and Jumper Pin Locations for the 5 1/4-Inch Disk Drive

A.8.2 Setting the SCSI ID

1. **Remove jumpers from the SCSI address receptacle on the drive using needle-nose pliers. Refer to Figure A-5 for receptacle location.**
2. **Set the drive SCSI address. Install jumpers on the receptacle as required.**

Note – The normal SCSI address settings and the jumper arrangements for the 5 1/4-inch disk drive are shown in Table A-4.

Table A-4 SCSI Address Settings for the 5 1/4-Inch Disk Drive

SCSI Device	ID	Jumper Position
		ID2 ID1 ID0
5 1/4-Inch Disk Drive	3	
5 1/4-Inch Disk Drive	2	
5 1/4-Inch Disk Drive	5	

3. **Verify that the 5 1/4-inch disk drive is configured as follows:**
   - SCSI parity is enabled (IN)
   - SCSI bus terminators are configured correctly
   - start command option (SCO) is set to “off” (OUT)
   - spindle control is set so the drive spins-up upon power on with 10-second delay for each SCSI ID in the daisy-chain (IN)
   - SWP option is enabled (IN)

Figure A-5 shows jumper locations and configuration for the 5 1/4-inch disk drive.

Use needle-nose pliers to install and remove jumpers on the drive’s PCB. These jumpers select drive options. Use the ¼-inch screwdriver to remove the SCSI bus termination pack. You will not terminate the SCSI bus at disk drive.

SPARCsystem 670MP Card Cage Slot Assignments and Back Plane Configuration

Table B-1 describes card cage slot assignments for printed circuit boards in SPARCsystem 670MP.

Note – For slot assignment information of other 12-slot systems, refer to

- *SPARCsystem 470 Card Cage Slot Assignment and Back Plane Configuration*
- *SPARCsystem 370 Card Cage Slot Assignment and Back Plane Configuration*
- *Sun Systems Card Cage Slot Assignment and Back Plane Configuration*

The table vertically lists PCB slot priority assignments in order of descending priority. Horizontal slot designations “A”, “B”, “C”, etc., correspond to preferred locations 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; reserved for memory boards only.

Figure B-1 shows SPARCsystem 670MP back plane slot numbering and bus locations. Figure B-2 shows back plane jumper layout. Table B-2 and Table B-2 further describe back plane jumper locations and functions.

Table B-1 SPARCsystem 670MP Card Cage Slot Assignments

Back Plane Jumpers		Board Name	Back Plane Slot Position											
BG3 PX03	IACK PX04		1	2	3	4	5	6	7	8	9	10	11	12
(a)	(a)	600MP System Board (a)				A	A							
N/A	N/A	1st Memory Board (b)		A	A									
IN	IN	2nd Memory Board (b)						A	A					
IN	IN	1st SBus Expansion Subsystem (j)		A	A			A	A	———	———	———	———	A A
IN	IN	2nd SBus Expansion Subsystem (j)								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 (k)						A ———	———	———	———	———	———	A
OUT	OUT	2nd 370-1421 Sun VME Network CoProcessor (k)							B ———	———	———	———	———	B
OUT	OUT	3rd 370-1421 Sun VME Network CoProcessor (k)								C———	———	———	———	C
OUT	OUT	4th 370-1421 Sun VME Network CoProcessor (k)									D ———	———	———	D
OUT	OUT	5th 370-1421 Sun VME Network CoProcessor (k)										E ———	———	E
OUT	OUT	6th 370-1421 Sun VME Network CoProcessor (k)											F —	F
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
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

Table B-1 SPARCsystem 670MP Card Cage Slot Assignments

Back Plane Jumpers		Board Name	Back Plane Slot Position											
BG3 PX03	IACK PX04		1	2	3	4	5	6	7	8	9	10	11	12
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

B.1 Slot Assignment Considerations

These notes refer to parenthesized letters, such as (a) or (b), in Table B-1.

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) The memory board occupies two slots. Install the memory board jumper according to number of memory boards installed. Jumper the board installed in slot 2 as Board **1**, and the one installed in slot 6 as Board **2.** With a second memory board installed in slot 6, jumpers are required in back plane 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 B.3, “ALM-2 and MCP Product Notes,” if using ALM-2 with MCP.

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

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

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

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

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

h) Three ISP-80 Controller Boards are available; Sun Part Numbers 501-1539, 501-1855, 501-1313. 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) 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.

k) The 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.

B.2 Back Plane Jumper Functions

See Table B-2. Each jumper listed (left column) connects

P1_BG0IN*-P1_BG3IN* to P1_BG0OUT*-P1_BG3OUT* and IACKIN* to P!_IACKOUT* on the card cage slot (right column).

Table B-2 shows jumper location on the back plane for each jumper function. Bus termination is provided by the Clock jumpers which must be IN at locations P10, P11, P12, and P13. The +5v standby jumper must be in at P100.

Table B-2 SPARCsystem 670MP Back Plane Jumper Functions

Jumper	Slot
P4XX	4
P5XX	5
P6XX	6
P7XX	7

Table B-2 SPARCsystem 670MP Back Plane Jumper Functions

Jumper	Slot
P8XX	8
P9XX	9
P10XX	10
P11XX	11
P12XX	12

Table B-3 SPARCystem 670MP Back Plane Jumper Locations

Jumper Function	Jumper Location
BG0	PX00
BG1	PX01
BG2	PX02
BG3	PX03
BG4	PX04
+5V STBY	P100
CLOCK	P10, P11, P12, P13

VME Bus:
P1 and row B of P2 (slots 4-12
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 card set Private Bus:
P2 rows A and C and P3 row B (slots 10-12)

Typical pin/row layout for the backplane connectors

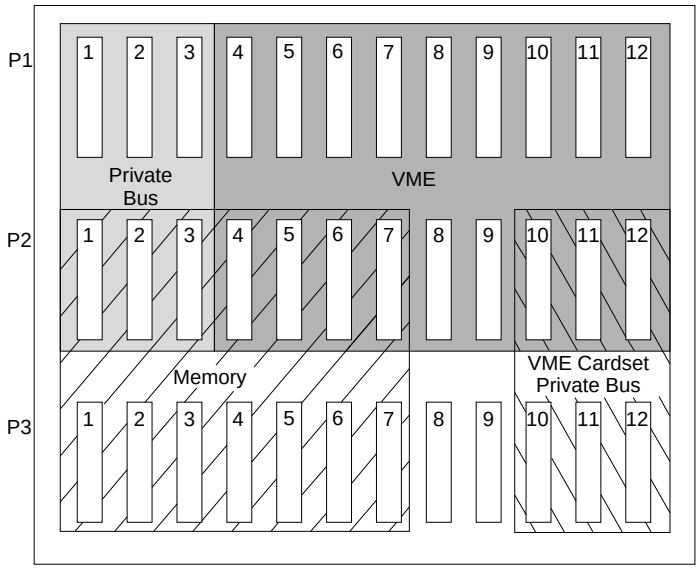


Figure B-1 SPARCserver 670MP Back Plane Layout (Viewed From Cabinet Rear)

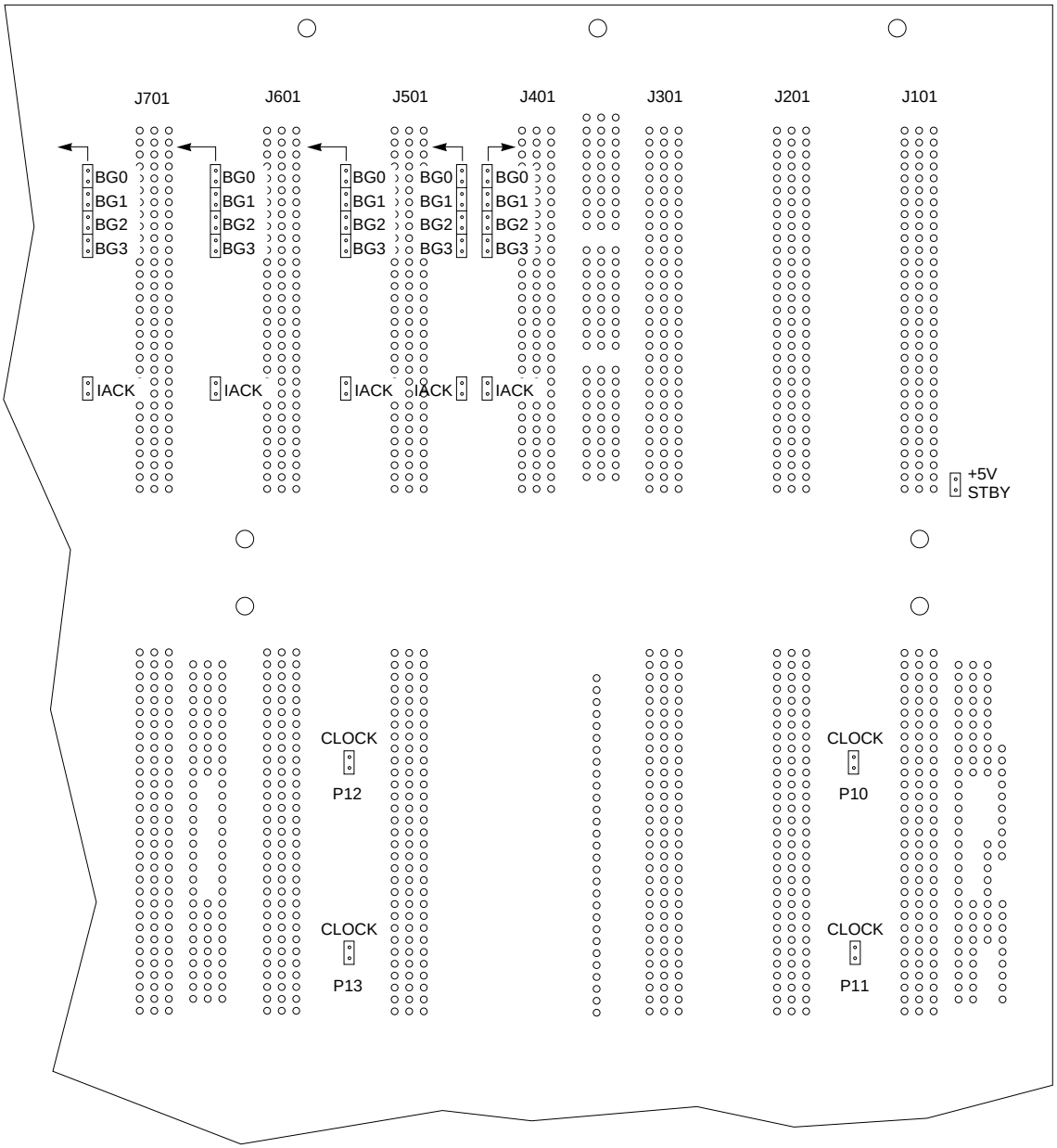


Figure B-2 SPARCsystem 670MP Back Plane Jumpers

B.3 ALM-2 and MCP Product Notes

Six VME based communication boards total (MCP and ALM-2) may reside in the system at one time. Any **combination** of up to four MCP and six ALM-2 options maybe configured for this system.

B.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 B-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)	0x02000000	a0
6th Board (ALM-2)	0x02010000	a1

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.

B.3.2 Board Device Sequence

When installing ALM-2 or MCP, you *must* install them in proper address order. Four VME board address positions exist to accommodate the ALM-2 or MCP board (devices 0-3). Thus, a given address position can accommodate one board type only. MCP or ALM-2 must be installed in proper device sequence.

Table B-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)	Device 4
6th Board (ALM-2)	Device 5

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

For example, if two MCP boards are installed (1st and 2nd MCP boards) and you then wanted to install two ALM-2 boards, you would configure and install the two ALM-2 boards as 3rd and 4th ALM-2 boards respectively.

B.3.3 VME Address Conflict

Do not install ALM-2 and MCP 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 ALM-2 board address (board address selection is identical for the MCP).

ALM-2 and MCP boards occupy identical VME address space and interrupt vectors, and both are known to the system board as **mcpx** (where **x** is a number **0** through **5**). For example, if two MCP boards are present in the card cage and you wish to add ALM-2, the ALM-2 is designated as **mcp2** in VME addressing (with two MCP boards being designated **mcp0** and **mcp1** respectively).

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Revision History

Revision	Dash	Date	Comments
800-3255-10			
800-3255-11			
800-3255-12	-A	December 1991	–12 Release
800-3255-13	-A	December 1991	–13 Release
800-3255-14	-A	August 1992	First revision to FCS
800-3255-15	-A	September 1992	Second revision to FCS
800-3255-17	-A	August 1993	Third revision to FCS

Reader Comments

We welcome your comments and suggestions to help improve the *12-Slot Office Pedestal Service Manual,* part number *800-3255-17*. 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 *12-Slot Office Pedestal 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
❑	❑	❑	❑	❑

Comments _____

■ Do you have additional comments about the *12-Slot Office Pedestal Service Manual*?

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