Sun StorEdge™ MultiPack-FC Installation, Operation, and Service Manual

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) - Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICES-003 Class B Notice - Avis NMB-003, Classe B

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

VCCI 基準について

クラス A VCCI 基準について

クラス A VCCI の表示があるワークステーションおよびオプション製品は、クラス A 情報技術装置です。これらの製品には、下記の項目が該当します。

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

クラス B VCCI 基準について

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この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻 干擾，在這種情況下，使用者 會被要求採取某些適當的對策。

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

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

On – Applies AC power to the system.

Depending on the type of power switch your device has, one of the following symbols may be used:

Off - Removes AC power from the system.

Standby – The On/Standby switch is in the standby position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

The following caution applies only to devices with a Standby power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

Ein – Setzt das System unter Wechselstrom.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

Wartezustand (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Achtung – Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70Db(A) oder weniger.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

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

Attention: – risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

Attention: – surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

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

MARCHE – Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

ARRET - Votre système est hors tension (courant alternatif).

VEILLEUSE – L'interrupteur Marche / Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

Attention: – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Attention: – Le niveau de pression acoustique au poste de travail s'élève selon la norme DIN 45 635 section 1000, à 70 dB (A) ou moins.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d’alimentation.

Attention: – les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d’un conducteur neutre mis à la terre. Pour écarter les risques d’électrocution, ne pas brancher de produit Sun dans un autre type d’alimentation secteur. En cas de doute quant au type d’alimentation électrique du local, veuillez vous adresser au directeur de l’exploitation ou à un électricien qualifié.

Attention: – tous les cordons d’alimentation n’ont pas forcément la même puissance nominale en matière de courant. Les rallonges d’usage domestique n’offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d’ordinateurs. Ne pas utiliser de rallonge d’usage domestique avec votre produit Sun.

Attention: – votre produit Sun a été livré équipé d’un cordon d’alimentation à trois fils (avec prise de terre). Pour écarter tout risque d’électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

Attention: – le commutateur d’alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C’est la prise d’alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d’une prise murale facilement accessible. Ne connectez pas la prise d’alimentation lorsque le châssis du système n’est plus alimenté.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

Precaución – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

Precaución – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Encendido – Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

Apagado - Elimina la alimentación de CA del sistema.

En espera – El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Precaución – De acuerdo con la norma DIN 45 635, Parte 1000, se admite un nivel de presión acústica para puestos de trabajo máximo de 70Db(A).

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

Precaución – Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

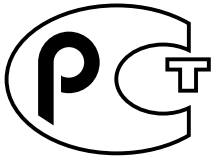
Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

GOST-R Certification Mark



Declaration of Conformity

Compliance ID: FC-711

Product Name: Sun StorEdge™ MultiPack-FC

This product has been tested and complies with the following rules and requirements.

EMC

USA—FCC Class B

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

European Union—EC

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

EN55022/CISPR22 (1985)		Class B
EN50082-1	IEC801-2 (1991)	4 kV (Direct), 8 kV (Air)
	IEC801-3 (1984)	3 V/m
	IEC801-4 (1988)	1.0 kV Power Lines, 0.5 kV Signal Lines
EN61000-3-2/IEC1000-3-2 (1994)		Pass

Safety

This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

EN60950/IEC950 (1993)

EN60950 w/Nordic Deviations

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark (when connected to a Sun workstation or server).

/S/

Dennis P. Symanski DATE
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Contents

Preface

The *Sun StorEdge MultiPack-FC Installation, Operation, and Service Manual* provides information and procedures about installing, operating, and servicing the Sun StorEdge™ MultiPack-FC hard drive array.

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

Typographic Conventions

Typeface	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail`.
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`%` **`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename.*

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

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http://docs.sun.com
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http://www.fatbrain.com/documentation/sun
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docfeedback@sun.com
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Please include the part number (806-3960-10) of your document in the subject line of your email.

CHAPTER 1

Installation

This chapter consists of the following sections:

1.1 Product Description

The Sun StorEdge MultiPack-FC is a high performance hard drive data storage system with a Fibre Channel interface. It supports a maximum of six hard drives of the 25.4-mm (1.0-in.) x 88.9-mm (3.5-in.) form factor. The system has one high speed serial data connection (HSSDC) connector and one gigabit interface converter (GBIC) connector.

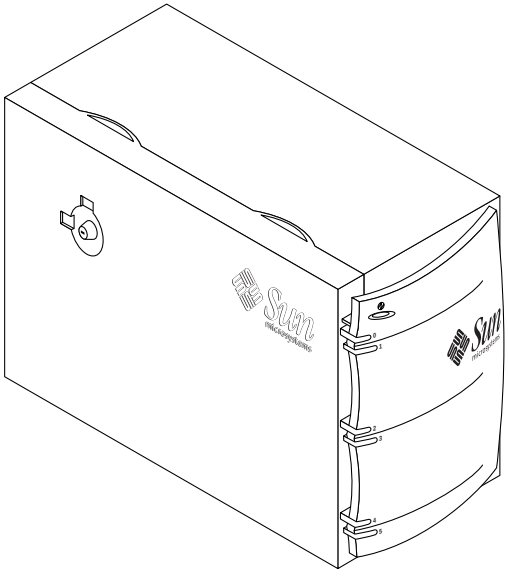


FIGURE 1-1 MultiPack-FC, Front View

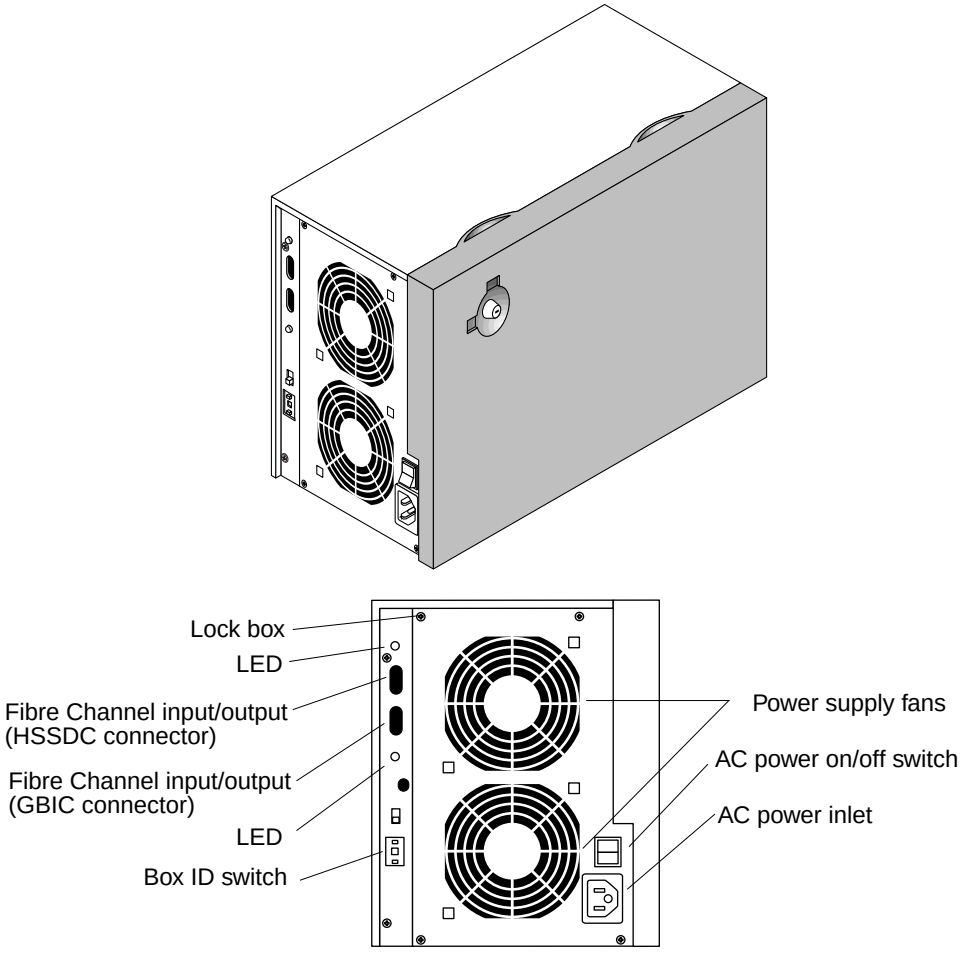


FIGURE 1-2 MultiPack-FC, Back Panel Details

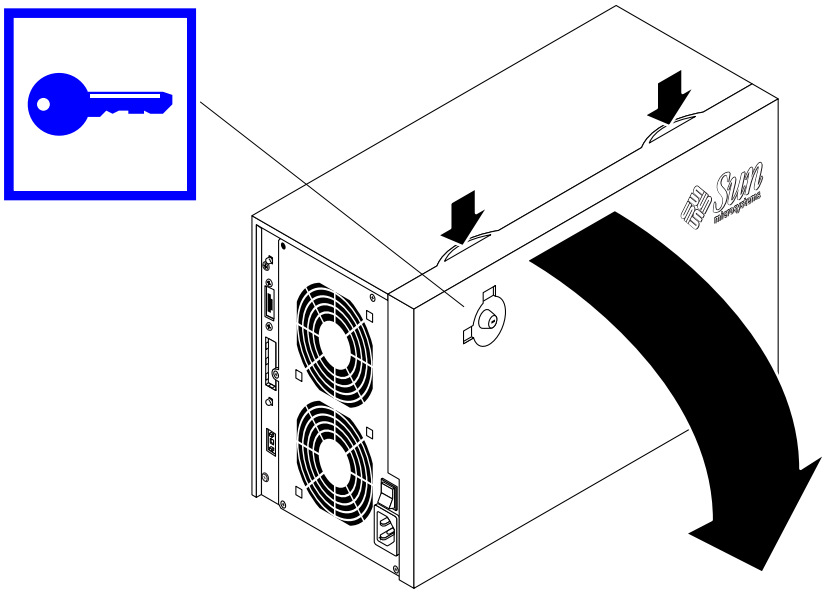


FIGURE 1-3 MultiPack-FC Locking Drive Access Panel

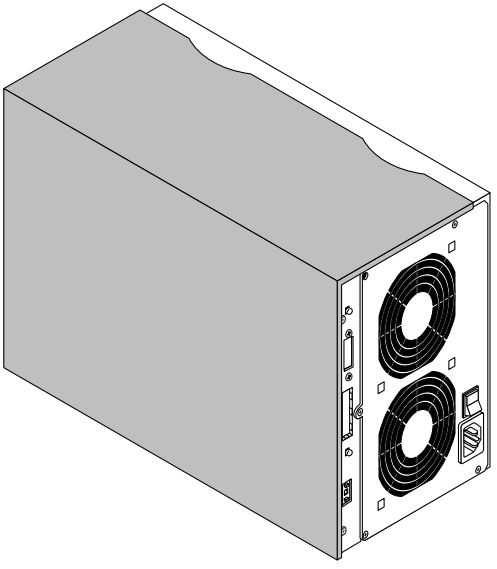


FIGURE 1-4 MultiPack-FC Stationary Side Panel

Note – For Fibre Channel functionality, the host or host adapter to which you connect your MultiPack-FC unit must use the Fibre Channel interface.

1.2 Physical Placement

The MultiPack-FC unit weighs from 12.7 to 14.7 kg (28.0 to 32.5 lb.) when fully equipped with six disk drives. Choose a location that is relatively permanent.

Keep cable lengths in mind if you use the HSSDC connector. For Fibre Channel operation, the cable you connect to the on-board host port of your computer must be no longer than 10 meters.

Because the drive access panel opens at the left side of the unit, place the MultiPack-FC unit (with the front facing you) at the left side of your computer, or where the panel can open freely. Place the MultiPack-FC unit on its feet (FIGURE 1-5).

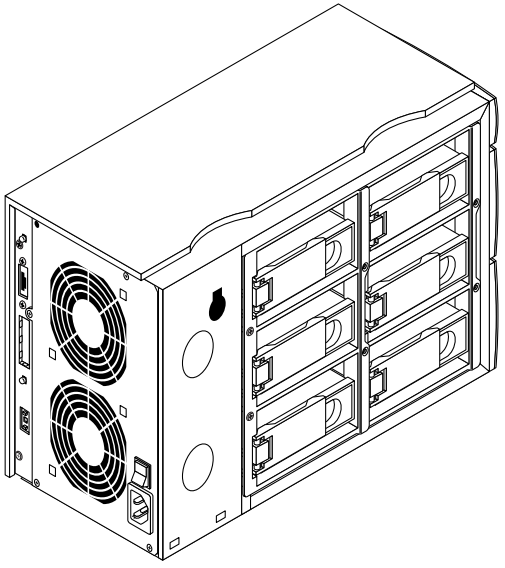


FIGURE 1-5 MultiPack-FC With Drive Access Panel Opened and Removed

1.3 Types of Connection

1.3.1 Box IDs

Box IDs 1–15 are available. Sun suggests that you use box IDs 1 and 2 for daisy-chained units. Box IDs are set on the back panel with a switch (FIGURE 1-2). When connecting multiple units to a host system be sure that each unit has a unique box ID.

1.3.2 Target IDs

Note – For drive slot numbering, see FIGURE 2-3 and FIGURE 2-4.

The formula for target IDs (target addresses) is:

Box ID * 8 + Slot ID = Target ID

TABLE 1-1 Target IDs

Box ID	Drive Slot	Target ID
1	0	t8
	1	t9
	2	t10
	3	t11
	4	t12
	5	t13
2	0	t16
	1	t17
	2	t18
	3	t19
	4	t20
	5	t21

1.3.3 Connectivity Features

- The MultiPack-FC does not require external bus termination.
- A maximum of two MultiPack-FC units can be connected in a daisy chain. You must order optical GBICs and cables separately.

1.3.4 GigaBit Interface Converters

Gigabit interface converters (GBICs) are optional products that can be used with MultiPack-FC units.

TABLE 1-2 Optional GBICs

GBIC	Marketing Part Number
Optical	X6731A

1.3.5 Cables

TABLE 1-3 MultiPack-FC Copper Cables With HSSDC Connectors

Length (Meters)	Application	Marketing Part Number
1.0	Optional	X6760A
3.0	Included with each MultiPack-FC unit for host or daisy-chain connections	
10.0	Optional	X6761A

TABLE 1-4 MultiPack-FC Optical Cables

Length (Meters)	Application	Marketing Part Number
2.0	Optional	X973A
15.0	Optional	X978A

1.3.6 Cabling Applications

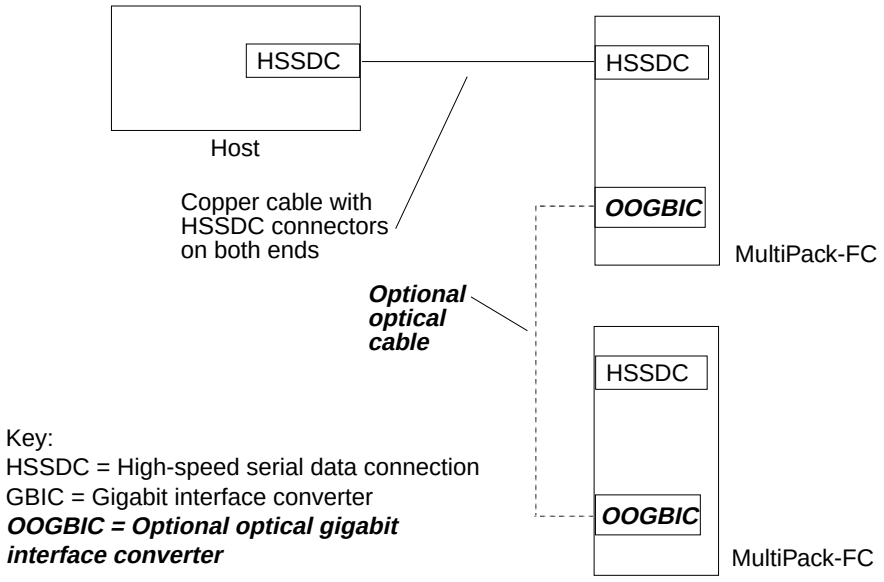


FIGURE 1-6 3.0m Copper Cable With HSSDC Connectors for Host Connection

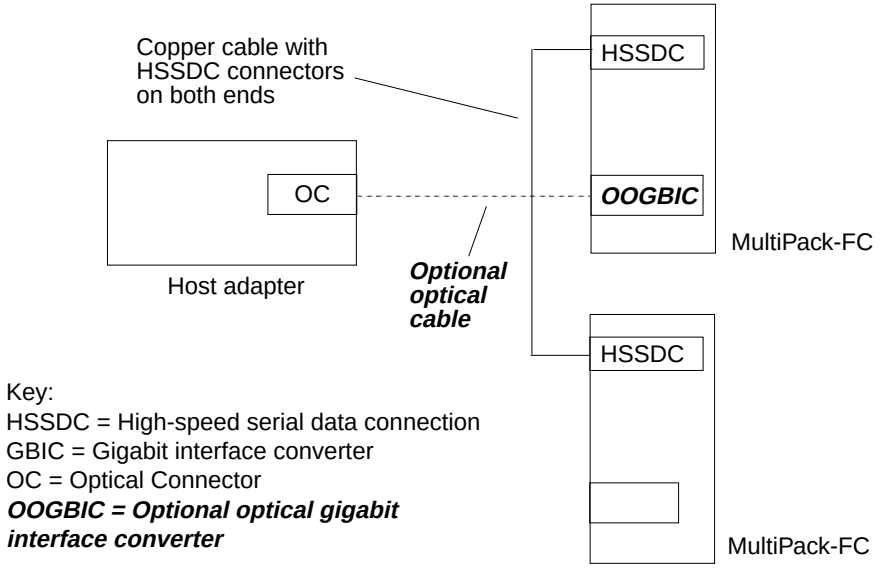


FIGURE 1-7 3.0m Copper Cable With HSSDC Connectors for Daisy-Chain Connection

1.4 Software Requirements

1.4.1 Solaris Operating Environment

The MultiPack-FC is fully functional with the Solaris 8 operating environment and later releases.

CHAPTER 2

Operation

This chapter consists of the following sections:

2.1 Front Bezel LEDs

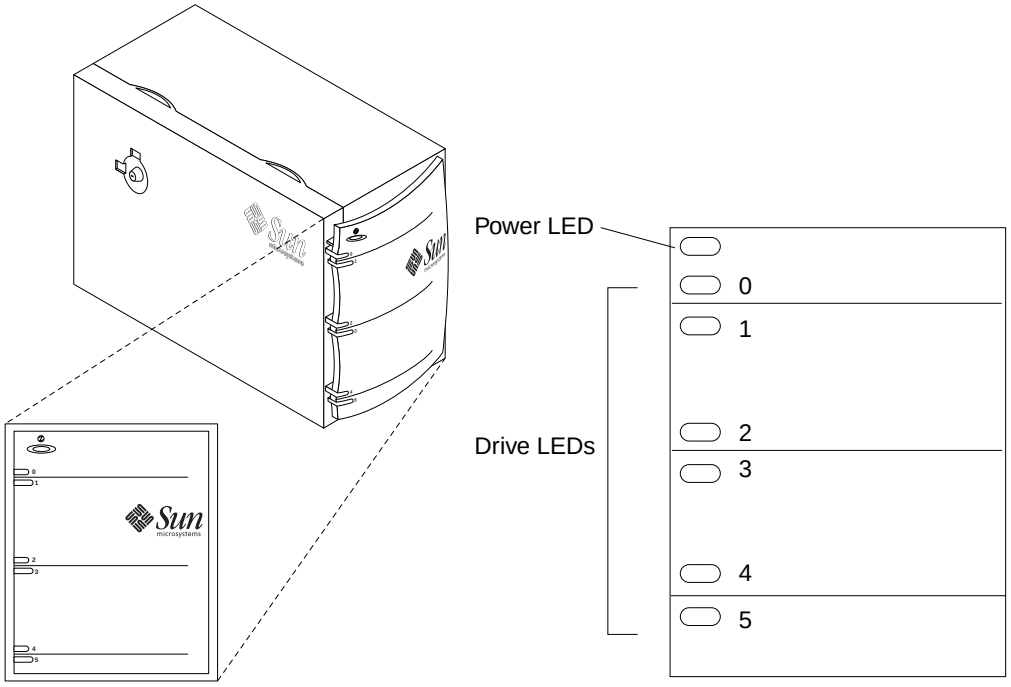


FIGURE 2-1 Front Bezel LED Identification

2.1.1 Power LED

TABLE 2-1 Power LED Displays

Display	Status
Green	Power supply turned on, normal
Off	Power supply off

2.1.2 Drive LEDs

TABLE 2-2 Drive LED Displays

Display	Status
Green, Steady	Drive present, inactive
Green, Flashing	Drive present, active
Amber, Steady	Drive present, failed
Off	Drive absent

2.2 Configuring Drives

Each Sun StorEdge MultiPack-FC unit is configured with a minimum of two and a maximum of six hard drives that are 25.4-mm (1.0-in.) in height (FIGURE 2-2).

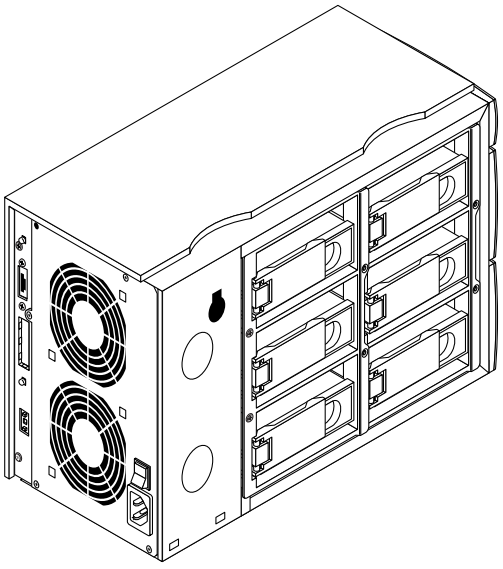
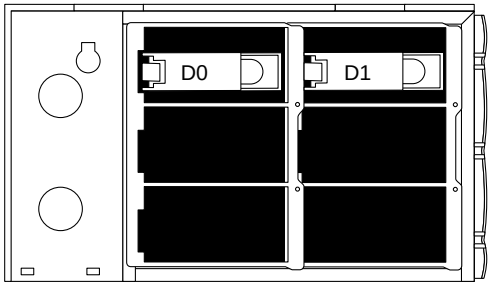
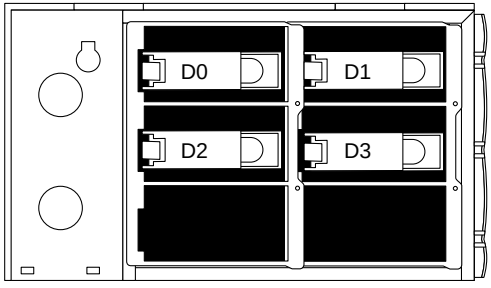


FIGURE 2-2 MultiPack-FC Equipped With Six Drives

Two-drive configuration (minimum)



Four-drive configuration



Six-drive configuration (maximum)

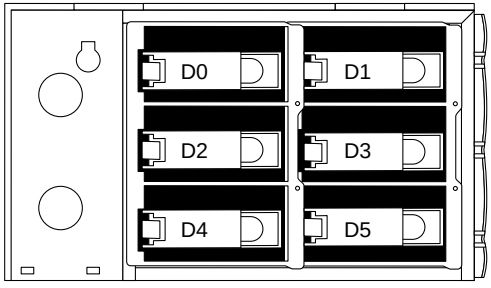
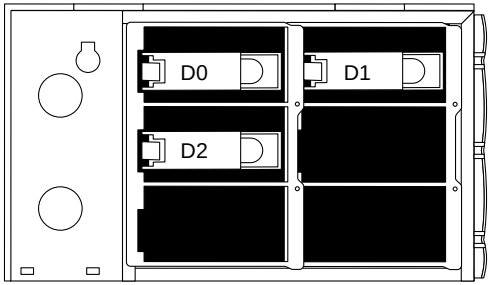


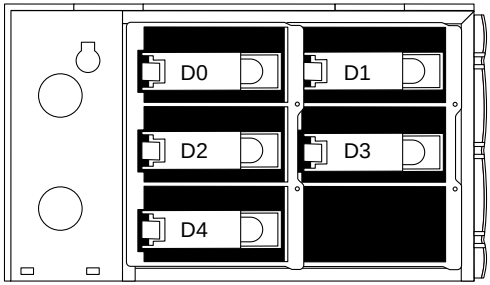
FIGURE 2-3 MultiPack-FC Standard Drive Configurations and Drive Numbering Scheme

Three-drive configuration



(two drives plus one additional drive)

Five-drive configuration



(four drives plus one additional drive)

FIGURE 2-4 Adding Drives to Standard Configurations

2.3 Setting the Box ID

On the back of the MultiPack-FC chassis is a box identification (ID) switch (FIGURE 2-5). The box ID number is set at 1 at the factory.

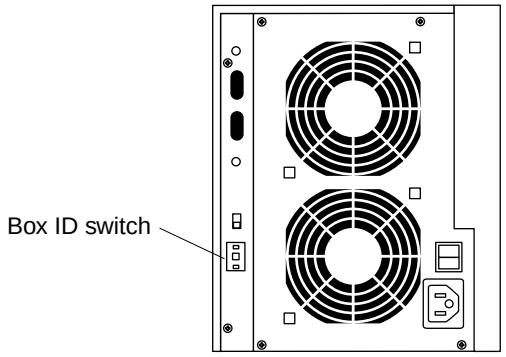


FIGURE 2-5 Box ID Switch Location

2.3.1 Connecting One Unit to the Host

1. **Check that the box ID is set to 1 before connecting the unit to the host.**
2. **Invoke the `forcelip` operations in Step 3 of Section 2.5 on pages 2-9 and 2-10.**

2.3.2 Daisy Chaining Two Units to the Host

Note – For daisy-chain cabling applications, refer to Section 1.3.6 “Cabling Applications” on page 1-8.

---

1. **Check that the box ID of the first unit is set to 1.**
2. **Set the box ID of the second unit to 2.**
3. **Connect the second unit to the first unit.**
4. **Connect the first unit to the host.**
5. **Invoke the `forcelip` operations in Step 3 of Section 2.5 on pages 2-9 and 2-10.**

2.4 Powering On and Off

This section describes how to turn on and off the power to your Sun StorEdge MultiPack-FC unit when it is connected to a desktop host.

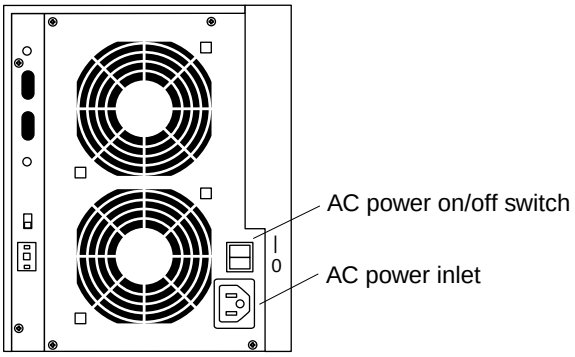


FIGURE 2-6 Power Switch and Inlet Locations on the MultiPack-FC

2.4.1 Powering On the System

Caution – Perform the appropriate procedure in Section 2.3 “Setting the Box ID” on pages 2-6 and 2-7 before performing the following power-on procedure.

1. **Turn on the power to the data storage peripheral devices connected to the host in this order:**

   a. Last device on the daisy chain

   b. Other peripheral devices

2. **Turn on the power to the monitor.**

3. **Turn on the power to the host.**

Caution – Always allow 10 seconds between turning off the power and turning it back on again. This prevents possible damage to the power supply assembly components in your system.

2.4.2 Powering Off the System

Before you can power off the system, you must shut down the operating system. Refer to the *Solaris Handbook for Sun Peripherals* for specific software instructions on shutting down your operating system.

- **Turn off the power to your system in the following order:**

  a. Desktop host

  b. Monitor

  c. MultiPack-FC unit and other peripheral devices

  The power switch for the MultiPack-FC unit is located on the back panel (FIGURE 2-6).

2.5 Daisy Chaining

Caution – Perform the box ID switch procedure in Section 2.3.2 “Daisy Chaining Two Units to the Host” on page 2-7 before performing the following procedure.

To daisy chain a second MultiPack-FC unit to a unit that is already connected to a host system (and both the first unit and host are running):

1. **Power on the second unit.**
2. **Connect the second unit to the first unit.**

   See Section 1.3.6 “Cabling Applications” on page 1-8.

3. **Invoke `forcelip` operations to all connected ports.**

   a. Determine which ports are connected:

```
# luxadm -e port
/devices/pci@1f,4000/pci@4/SUNW,qlc@4/fp@0,0:devct1 NOT CONNECTED
/devices/pci@1f,4000/pci@4/SUNW,qlc@5/fp@0,0:devct1 CONNECTED
/devices/pci@1f,4000/pci@5/SUNW,qlc@4/fp@0,0:devct1 NOT CONNECTED
/devices/pci@1f,4000/pci@5/SUNW,qlc@5/fp@0,0:devct1 CONNECTED
/devices/pci@1f,2000/pci@1/SUNW,qlc@4/fp@0,0:devct1 NOT CONNECTED
/devices/pci@1f,2000/pci@1/SUNW,qlc@5/fp@0,0:devct1 NOT CONNECTED
```

b. Invoke `forcelip` operations on all connected ports:

```
# luxadm -e forcelip /devices/pci@1f,4000/pci@4/SUNW,qlc@5/fp@0,0:devctl
# luxadm -e forcelip /devices/pci@1f,4000/pci@5/SUNW,qlc@5/fp@0,0:devctl
```

2.6 Troubleshooting

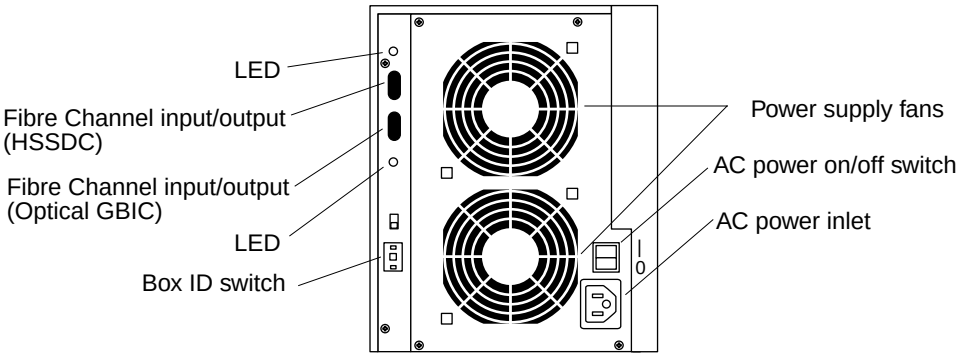


FIGURE 2-7 Sun StorEdge MultiPack-FC Back Panel Details

TABLE 2-3 lists symptoms, causes, and troubleshooting solutions for problems that might occur.

TABLE 2-3 Troubleshooting the Sun StorEdge MultiPack-FC

If:	Then:	Action(s):
A single drive is not responding.	See FIGURE 2-1 for drive LED locations. 1. Amber LED is lit. 2. Drive LED is not lit. 3. Green LED is lit.	 1. Drive is bad. Replace the drive. 2. Reseat the drive. Verify that green LED is lit. 3. There is a backplane problem. Replace the backplane.
	Check the connection between the drive connector and the connector on the backplane.	Make sure the drive is seated in the correct drive bay. Make sure the drive bay is pushed all the way in and the bracket handle is latched correctly.
All disk drives in a box are not responding or will not boot.	1. Check the power cord connection to the unit (power inlet) and to the power outlet (FIGURE 2-7). 2. Check the unit to determine if it is receiving power, and that the power switch is in the “on” position (FIGURE 2-7).	1. Secure the power cord connections if they are loose (FIGURE 2-7). Verify that the power LED is lit (FIGURE 2-1). 2. Verify that the power supply fans are spinning. If the unit appears to be powered on except for the presence of the LED light, replace the LED clip and cable.
	Check the box ID switch on the back of the unit. There may be a box ID conflict (FIGURE 2-7).	Power off the box. Change the box ID of the other box so that each box has a unique box ID [1-2] (FIGURE 2-7). Power on the box and enter a software command sequence to list all drives with a clean device table (FIGURE 2-8).
	Power cord is secure and power switch is in the “on” position, but the unit is not receiving power.	Replace the power supply.
Back panel LEDs adjacent to the I/O ports do not light.	Check the input/output cable connections.	1. Check all cable connections between the host and the MultiPack-FC for tightness. 2. Try different cable(s) of known good continuity. 3. Check that the host and/or host adapter are functioning normally.

```
% disks -C
% drvconfig
% disks
% devlinks
% format
```

FIGURE 2-8 Listing All Drives With a Clean Device Table

Note – After you enter the command sequence in FIGURE 2-8, all devices are displayed.

2.7 Diagnostic Software

2.7.1 SunVTS

The SunVTS™ diagnostic software program verifies that the MultiPack-FC unit functions properly. It is used to locate failed field replaceable units (see Chapter 3 “Service”).

2.7.2 probe-scsi-all

At the ok prompt, use the probe-scsi-all command to verify that a host system's Fibre Channel Arbitrated Loop (FC-AL) controller recognizes externally connected Fibre Channel hard drives.

```
ok probe-scsi-all
/pci@8,600000/scsi@4
Li D HA --- Port WWN --- ---- Disk description ----
1 1 210000203700ca6d SEAGATE ST39103FCSUN9.0G01479916015471
8 8 210000000ec90dac FUJITSU MAG3182F SUN18G 08129921B01224
a a 210000000ec91003 FUJITSU MAG3182F SUN18G 08129922B01729
b b 210000000ec90b48 FUJITSU MAG3182F SUN18G 08129922B01014
9 9 210000000ec90db8 FUJITSU MAG3182F SUN18G 08129922B01257
c c 210000203718b13d SEAGATE ST318203FSUN18G 034A9933260868
d d 210000203718ac99 SEAGATE ST318203FSUN18G 034A9933259826
10 10 210000000ec90dac FUJITSU MAG3182F SUN18G 08129921B01224
12 12 210000000ec91003 FUJITSU MAG3182F SUN18G 08129922B01729
13 13 210000000ec90b48 FUJITSU MAG3182F SUN18G 08129922B01014
11 11 210000000ec90db8 FUJITSU MAG3182F SUN18G 08129922B01257
14 14 210000203718b13d SEAGATE ST318203FSUN18G 034A
15 15 210000203718ac99 SEAGATE ST318203FSUN18G 034A

/pci@8,700000/scsi@6,1
Target 0
Unit 0 Disk SEAGATE ST39173W SUN9.0G2815
```

Note – The probe-scsi-all command does not function identically on all platforms and does not in all cases probe for Fibre Channel devices. In such an instance, see Section 2.7.3 "show-devs and show-children."
The probe-fcal-all command exists only on Sun Enterprise™ systems.

2.7.3 show-devs and show-children

At the ok prompt, the show-devs and show-children commands are used as shown in FIGURE 2-9 and FIGURE 2-10.

FIGURE 2-9 is continued sequentially in FIGURE 2-10.

```
ok show-devs
/SUNW,ffb@1e,0
/SUNW,UltraSPARC-II@2,0
/SUNW,UltraSPARC-II@0,0
/counter-timer@f,1c00
/pci@f,2000
/pci@f,4000
/virtual-memory
/memory@0,a0000000
/aliases
/options
/openprom
/chosen
/packages
/pci@1f,2000/pci@1
/pci@1f,2000/pci@1/SUNW,qlc@5
/pci@1f,2000/pci@1/SUNW,qlc@4
/pci@1f,2000/pci@1/SUNW,qlc@5/fp@0,0
/pci@1f,2000/pci@1/SUNW,qlc@5/fp@0,0/disk
/pci@1f,2000/pci@1/SUNW,qlc@4/fp@0,0
/pci@1f,2000/pci@1/SUNW,qlc@4/fp@0,0/disk
/pci@1f,4000/pci@5
/pci@1f,4000/pci@4
/pci@1f,4000/scsi@2
/pci@1f,4000/scsi@3,1
/pci@1f,4000/scsi@3
/pci@1f,4000/network@1,1
/pci@1f,4000/ebus@1
/pci@1f,4000/pci@5/SUNW,qlc@5
/pci@1f,4000/pci@5/SUNW,qlc@4
/pci@1f,4000/pci@5/SUNW,qlc@5/fp@0,0
/pci@1f,4000/pci@5/SUNW,qlc@5/fp@0,0/disk
/pci@1f,4000/pci@5/SUNW,qlc@4/fp@0,0
/pci@1f,4000/pci@5/SUNW,qlc@4/fp@0,0/disk
/pci@1f,4000/pci@4/SUNW,qlc@5
/pci@1f,4000/pci@4/SUNW,qlc@4
/pci@1f,4000/pci@4/SUNW,qlc@5/fp@0,0
/pci@1f,4000/pci@4/SUNW,qlc@5/fp@0,0/disk
/pci@1f,4000/pci@4/SUNW,qlc@4/fp@0,0
/pci@1f,4000/pci@4/SUNW,qlc@4/fp@0,0/disk
/pci@1f,4000/scsi@3,1/tape
/pci@1f,4000/scsi@3,1/disk
/pci@1f,4000/scsi@3/tape
/pci@1f,4000/scsi@3/disk
```

FIGURE 2-9 System Recognition of External Drives, Part 1

```
/pci@1f,4000/ebus@1/SUNW,CS4231@14,200000
/pci@1f,4000/ebus@1/flashprom@10,0
/pci@1f,4000/ebus@1/eeprom@14,0
/pci@1f,4000/ebus@1/fdthree@14,3023f0
/pci@1f,4000/ebus@1/ecpp@14,3043bc
/pci@1f,4000/ebus@1/su@14,3062f8
/pci@1f,4000/ebus@1/su@14,3083f8
/pci@1f,4000/ebus@1/se@14,400000
/pci@1f,4000/ebus@1/se@14,500000
/pci@1f,4000/ebus@1/SUNW,pll@14,504000
/pci@1f,4000/ebus@1/power@14,724000
/pci@1f,4000/ebus@1/auxio@14,726000
/openprom/client-services
/packages/sun-keyboard
/packages/SUNW,builtin-drivers
/packages/disk-label
/packages/obp-tftp
/packages/deblocker
/packages/terminal-emulator
{0} ok apply show-children /pci@1f,4000/pci@4/SUNW,qlc@4
LiD HA --- Port WWN --- ----- ---- Disk description ----
_33 33 21000020372a36d2 SEAGATE - ST336704FSUN36G 022D0019D03L53
_31 31 21000020372a3915 SEAGATE - ST336704FSUN36G 022D0019D03LCB
_34 34 21000020372a3926 SEAGATE - ST336704FSUN36G 022D0019D03M7B
_35 35 21000020372a3c9b SEAGATE - ST336704FSUN36G 022D0019D03HP0
_30 30 21000020372a3847 SEAGATE - ST336704FSUN36G 022D0019D03K5K
_32 32 21000020372a37bb SEAGATE - ST336704FSUN36G 022D0019D03M2W
_2b 2b 2100002037651cef SEAGATE - ST318304FSUN18G 022D0017L007Z8
_29 29 2100002037651cb4 SEAGATE - ST318304FSUN18G 022D0017L007MM
_2c 2c 2100002037651f1d SEAGATE - ST318304FSUN18G 022D0017L007YF
_2d 2d 2100002037651ad3 SEAGATE - ST318304FSUN18G 022D0017L007GR
_28 28 2100002037651ba6 SEAGATE - ST318304FSUN18G 022D0017L007BV
_2a 2a 2100002037651ab4 SEAGATE - ST318304FSUN18G 022D0017L0078P
{0} ok
{0} ok
```

FIGURE 2-10 System Recognition of External Drives, Part 2

CHAPTER 3

Service

This chapter consists of the following sections:

3.1 Removable Parts Breakdown

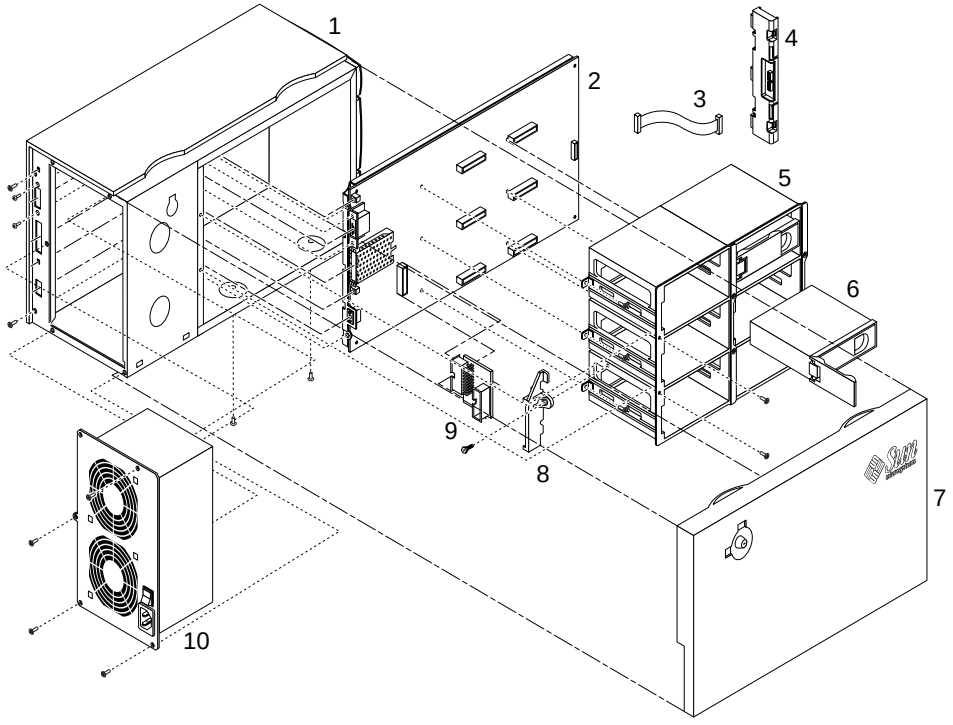


FIGURE 3-1 MultiPack-FC Removable Parts Breakdown

TABLE 3-1 MultiPack-FC Removable Parts Breakdown Key

FIGURE 3-1 Reference Number	Part Name
1	Chassis
2	Backplane
3	LED cable
4	LED clip
5	Drive cage
6	Hard drive

TABLE 3-1 MultiPack-FC Removable Parts Breakdown Key

FIGURE 3-1 Reference Number	Part Name
7	Drive access panel
8	Daughter board clip
9	Daughter board
10	Power supply

3.2 Required Tools

- Antistatic wrist strap
- Electrostatic discharge (ESD) mat for drives
- No. 2 Phillips screwdriver

3.3 Field Replaceable Units

- Hard drive (FIGURE 3-2)
- Chassis with plastic panels
- Power supply (FIGURE 3-3)
- Drive cage with backplane (FIGURE 3-4)
- LED clip and cable (FIGURE 3-1 items 3 and 4)
- Fibre Channel copper cables with HSSDC connectors:
  - 3.0 meters
  - 1.0 meter
  - 10.0 meters

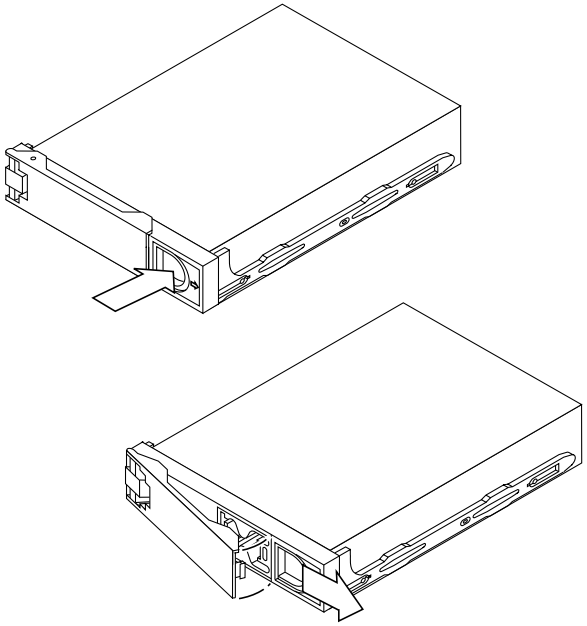


FIGURE 3-2 Hard Drive With Bracket

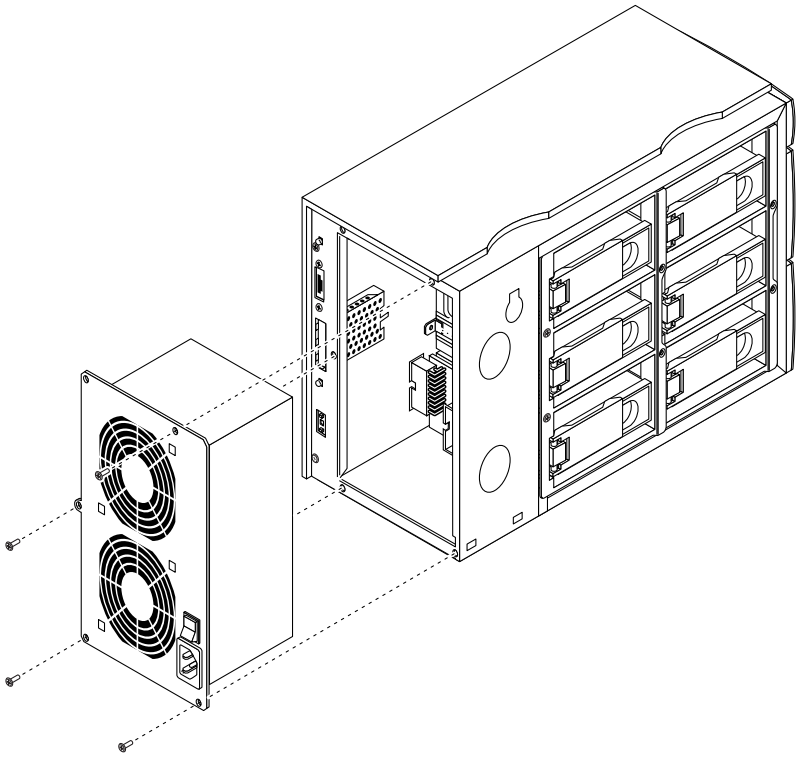


FIGURE 3-3 Removing the Power Supply

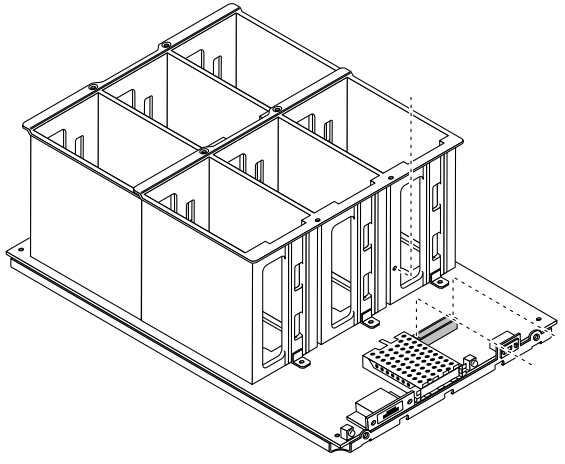


FIGURE 3-4 Drive Cage With Backplane

3.4 Opening the Drive Access Panel

1. **Unlock the panel lock by turning the key 90 degrees clockwise.**
2. **Press on the two indentations on the top of the panel (FIGURE 3-5).**
3. **Leave the panel flat or remove by lifting it up.**

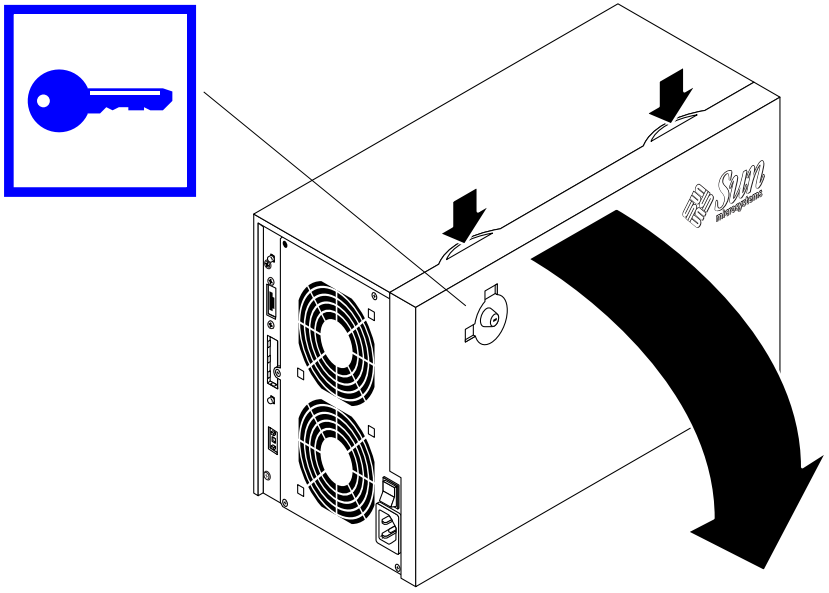


FIGURE 3-5 Opening the Drive Access Panel

3.5 Removing and Replacing a Drive

3.5.1 Hot Plugging Drives

Hot-plugging allows drives to be removed and replaced without turning power off to the MultiPack-FC.

Caution – Drives should not be pulled out randomly. If the drive is active, you must stop that activity before removing the drive. This can be done without shutting down the operating system or powering off the MultiPack-FC unit. The Sun MultiPack-FC hardware supports hot-plugging drives, but there are software considerations that must be taken into account. Follow the procedures in this section when removing, replacing, and adding drives.

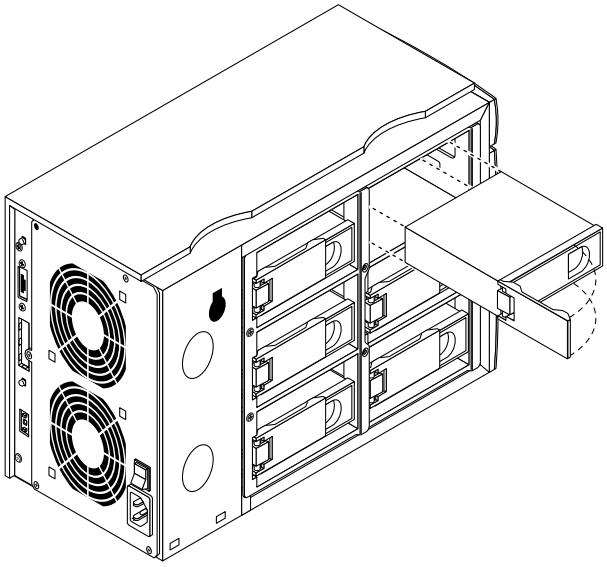


FIGURE 3-6 Removing a Drive

In general, hot-plug reconfiguration operations involve three stages:

1. Preparing for hot-plug reconfiguration
2. Adding, replacing, or removing a drive
3. Reconfiguring the operating environment

Two specific cases exist where the hot-plug feature may be useful:

- Adding a drive to a system to increase storage capacity
- Replacing a faulty drive while the system is running

3.5.2 Connecting the Antistatic Wrist Strap

Caution – The drive array is sensitive to static electricity. To prevent damage to the unit, connect an antistatic wrist strap to your wrist and to the chassis.

1. **Attach the adhesive copper strip to a metal surface of the chassis.**
2. **Wrap the other side of the wrist strap twice around your wrist, with the adhesive side against your skin.**

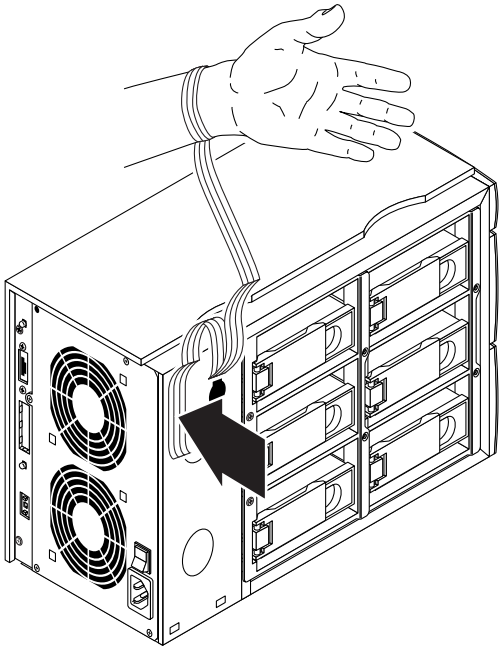


FIGURE 3-7 Attaching the Wrist Strap

3.5.3 Removing a Drive

1. **Identify all volumes or applications that use the failed drive.**

   If the volumes are mirrored or RAID 5 protected, the drive can be replaced without taking the volume down. Otherwise all input/output to the drive must be stopped using the appropriate commands.

2. **Use the** `luxadm remove_device` **command to remove the disk from the Fibre Channel Arbitrated Loop (FC-AL).**

   This command is interactive and will prompt you to physically remove the drive. For example:

```
# luxadm remove_device /dev/rdsk/c3t8d0s2

WARNING!!! Please ensure that no filesystems are mounted on these
device(s).
All data on these devices should have been backed up.

The list of devices which will be removed is:
1: Device /dev/rdsk/c3t8d0s2

Please enter ‘q’ to Quit or <Return> to Continue:

stopping: /dev/rdsk/c3t8d0s0....Done
offlining: /dev/rdsk/c3t8d0s0....Done

Hit <Return> after removing the device(s).
```

Note – Do not press Return until Step 3 and Step 4 have been completed.

Note – If the `luxadm remove_device` command fails to remove the drive, use of the `luxadm remove_device -F` option may be required. Be sure you have stopped all input/output to the drive before using the `-F` option. Refer to the `luxadm` Man Page for more information.

---

3. **Open the drive access panel (FIGURE 3-8).**

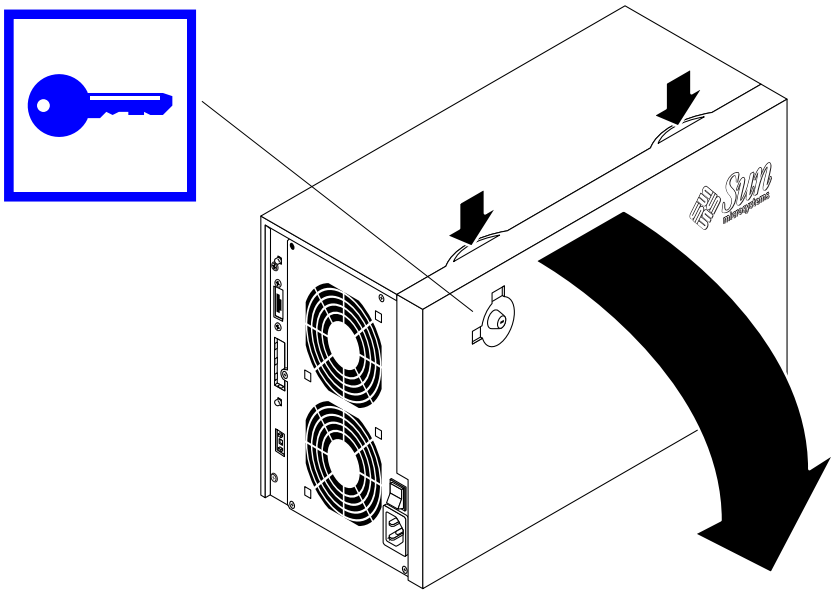


FIGURE 3-8 Opening the Drive Access Panel

4. **Remove the drive and place it on an antistatic mat.**

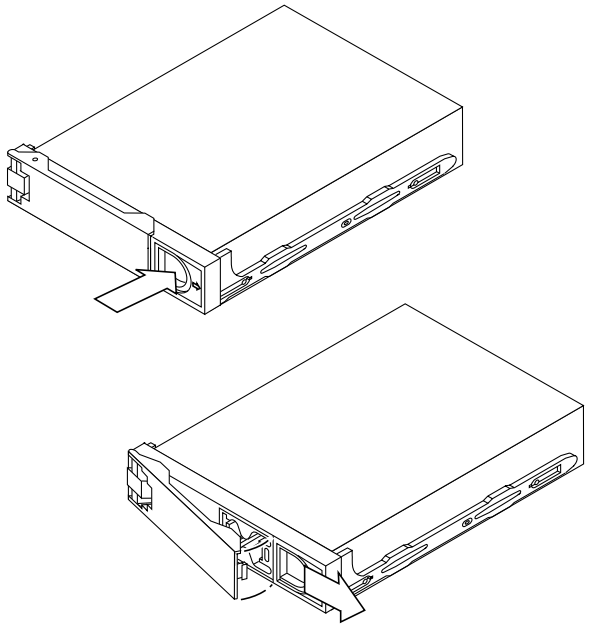


FIGURE 3-9 Opening the Drive Bracket

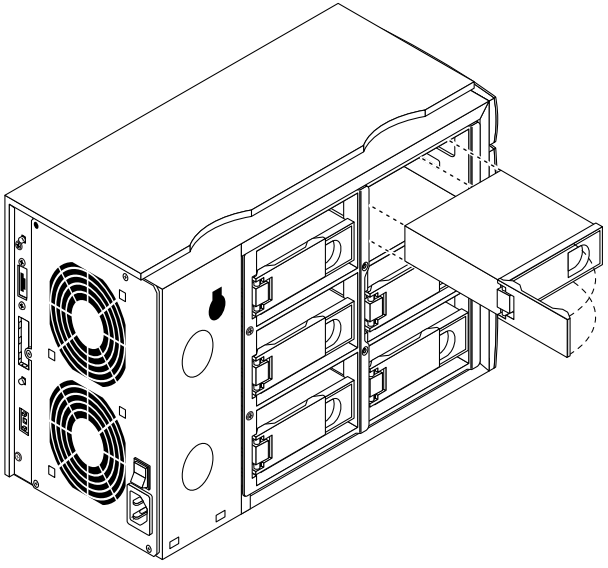


FIGURE 3-10 Removing a Drive

5. **Press Return to complete the** `luxadm remove_device` **command.**

   For example:

```
Hit <Return> after removing the device(s).

Device: /dev/rdsk/c3t8d0s0
Removing Logical Nodes:
Removing c3t8d0s0
Removing c3t8d0s1
Removing c3t8d0s2
Removing c3t8d0s3
Removing c3t8d0s4
Removing c3t8d0s5
Removing c3t8d0s6
Removing c3t8d0s7
```

3.5.4 Installing a Drive

1. **Use the luxadm insert_device command to install the replacement drive.**

   For example:

```
# luxadm insert_device

The list of devices which will be inserted is:
Device: /dev/rdsk/c3t8d0s0

Please enter ‘q’ to Quit or <Return> to Continue:

Hit <Return> after inserting the device(s).
```

Note – Do not press Return until Step 2 and Step 3 have been completed.

---

2. **Install the new drive.**

   Slide the drive into the slot with the handle released. Once you have inserted the drive as far as it will go, push down on the handle to secure it.

3. **Reinstall the drive access panel and lock it.**

4. **Press Return to complete the** `luxadm insert_device` **command.**

   For example:

```
Hit <Return> after inserting the device(s).

Device: /dev/rdsk/c3t8d0s0
Logical Nodes under /dev/dsk and /dev/rdsk:
c3t8d0s0
c3t8d0s1
c3t8d0s2
c3t8d0s3
c3t8d0s4
c3t8d0s5
c3t8d0s6
c3t8d0s7
```

3.6 Removing and Replacing the Power Supply

3.6.1 Removing the Power Supply

1. **Shut down and power off the host, the MultiPack-FC unit, and all peripherals that are connected to the system.**

   Refer to the *Solaris Handbook for SMCC Peripherals* for specific software procedures for shutting down and powering off your system.

2. **Remove the Fibre Channel cable(s) and power cord from the unit.**

3. **Remove the lock box and the four screws to release the power supply from the chassis (FIGURE 3-11).**

4. **Open and remove the drive access panel.**

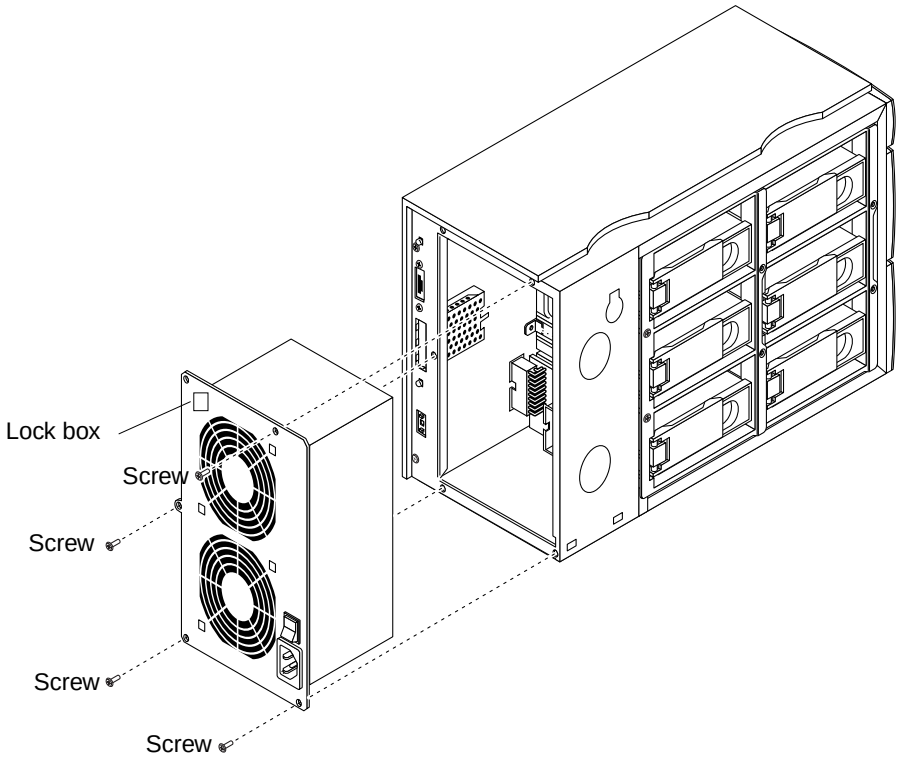


FIGURE 3-11 Lock Box and Power Supply Screw Locations on Back Panel

5. **Pull the power supply completely out of the chassis.**

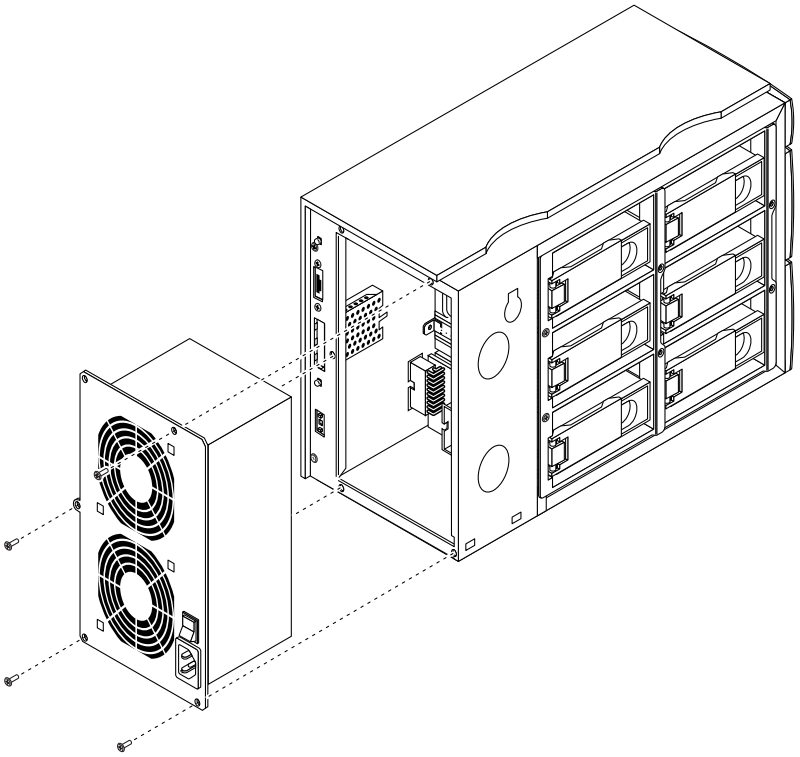


FIGURE 3-12 Removing the Power Supply

3.6.2 Replacing the Power Supply

1. **Align the power supply at the back of the unit so that the connector on the power supply aligns with the connector on the daughter board (FIGURE 3-13).**

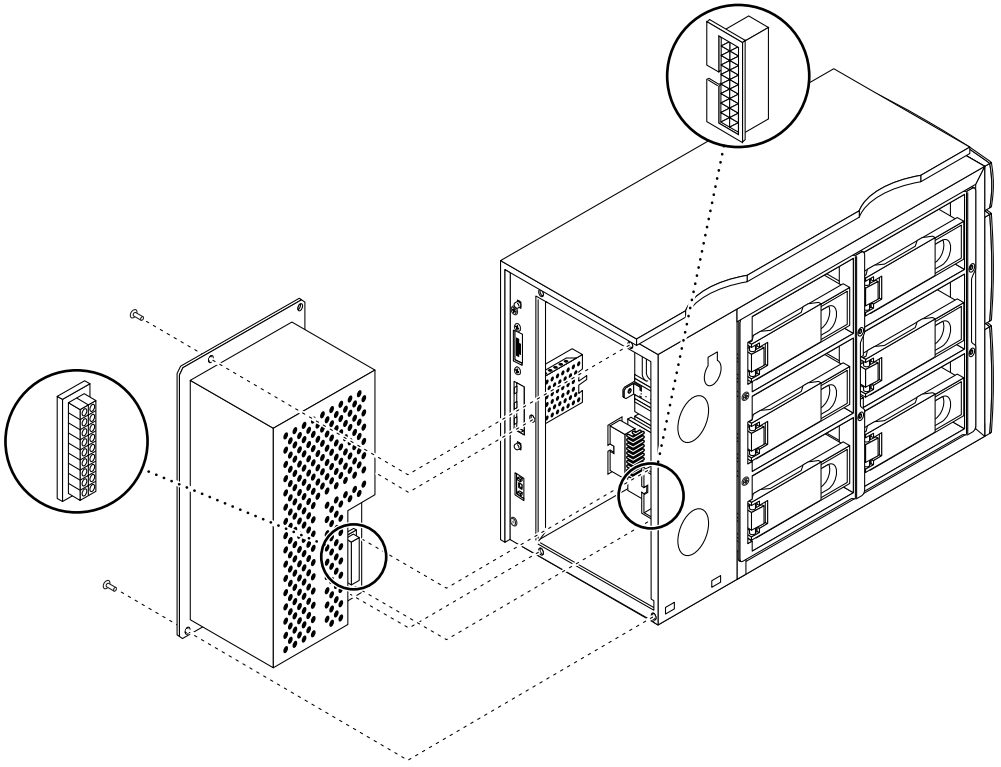


FIGURE 3-13 Replacing the Power Supply

2. **Insert the power supply into the unit until the edges of the power supply are flush against the edge of the chassis.**
3. **Replace the lock box and screws that secure the power supply to the chassis.**

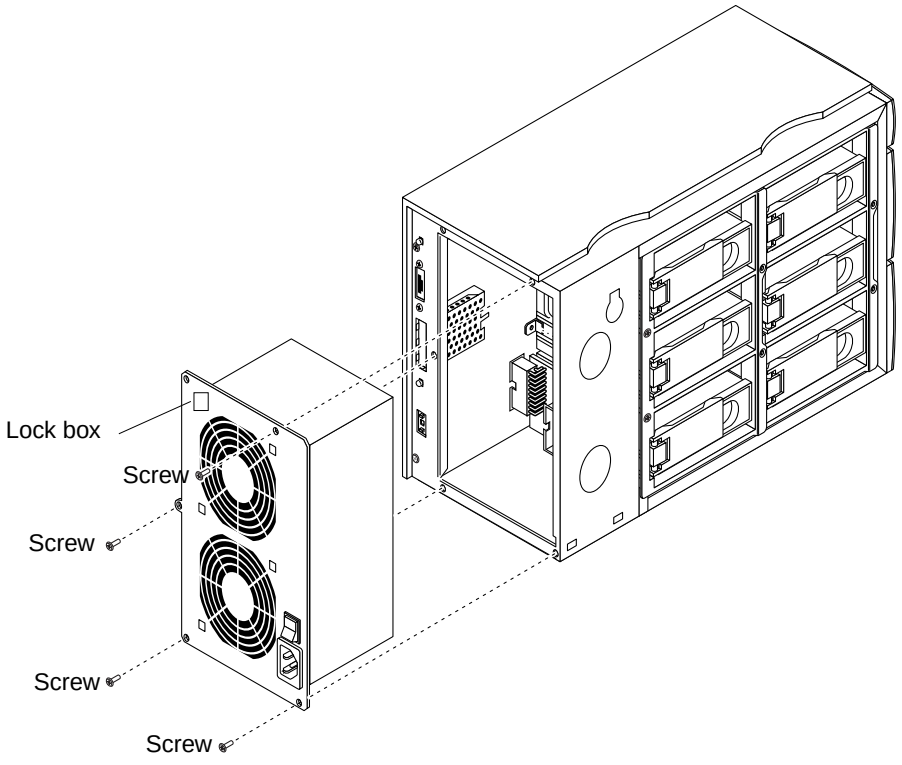


FIGURE 3-14 Lock Box and Power Supply Screw Locations on Back Panel

4. **Reconnect the Fibre Channel cable(s) and power cord.**
5. **Turn on the power to your system.**
   See Section 2.4.1 “Powering On the System”.

3.7 Removing and Replacing the Drive Cage and Backplane

3.7.1 Removing the Drive Cage and Backplane

1. **Be sure that the power to the system is off.**

See Section 2.4.2 “Powering Off the System”.

2. **Remove Fibre Channel cable(s) and power cord (FIGURE 3-15).**

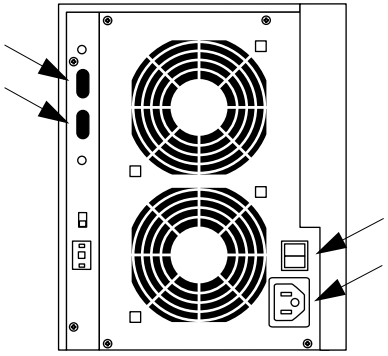


FIGURE 3-15 Fibre Channel Cable Connectors, Power Switch, and Power Inlet Locations

3. **Turn the key lock and open the drive access panel.**

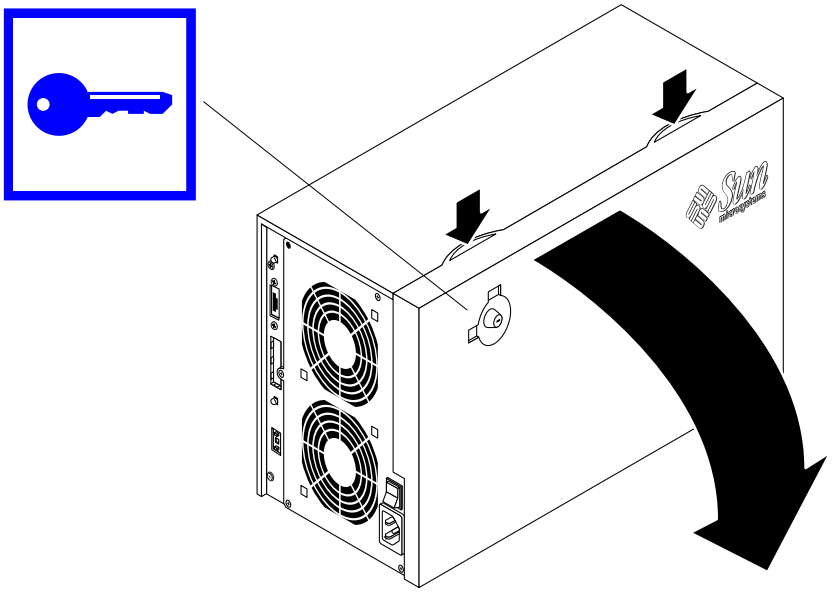


FIGURE 3-16 Opening the Drive Access Panel

4. Remove all the drives.

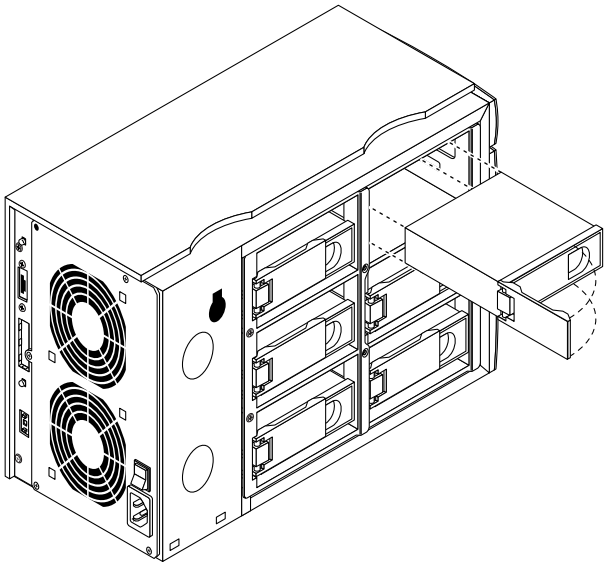


FIGURE 3-17 Removing a Drive

Note – Make careful note which drive is removed from which slot (especially the boot drive). This will help you to replace the drives in the proper order.

---

5. Remove the power supply.

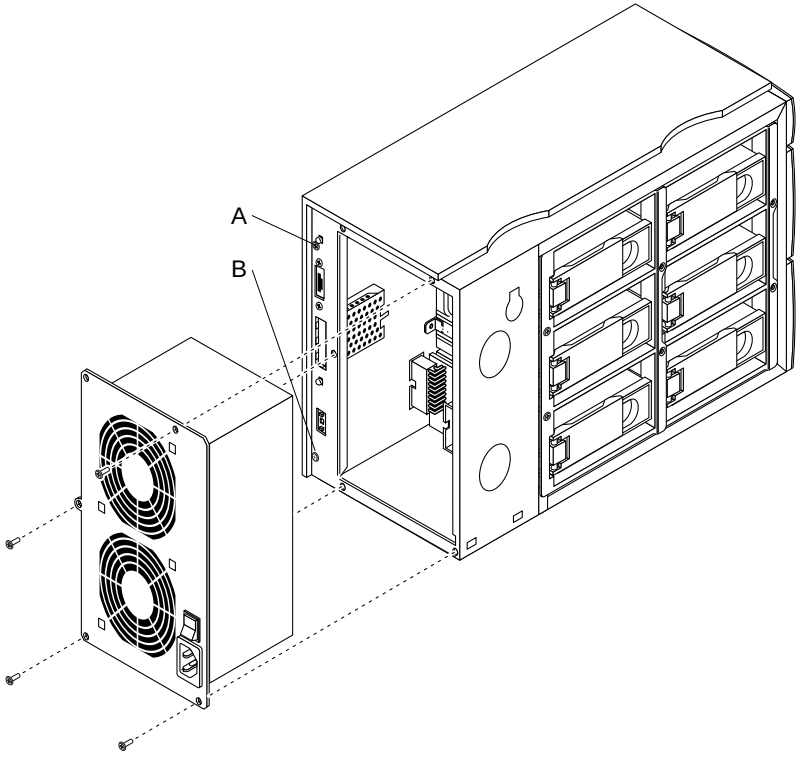


FIGURE 3-18 Removing the Power Supply

6. Remove six screws:

- Two screws on the back panel near the I/O connectors (FIGURE 3-18, A and B)
- Two screws on the left side of the drive cage (FIGURE 3-19)
- Two screws on the bottom of the chassis (FIGURE 3-19)

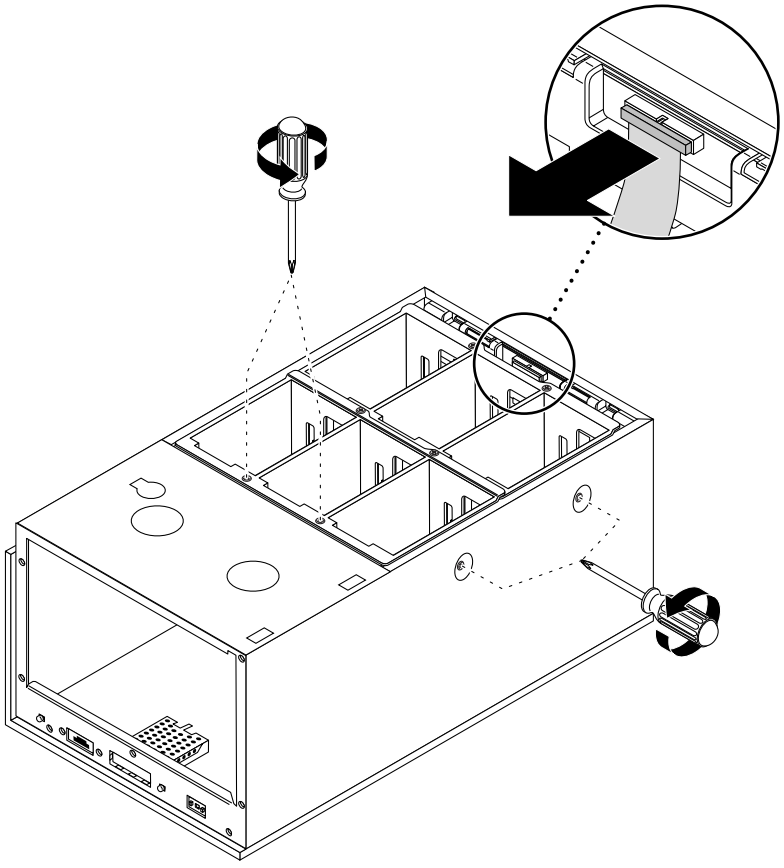


FIGURE 3-19 Drive Cage and Chassis Bottom Screws

7. **Remove the daughter board and its plastic clip from the drive cage.**

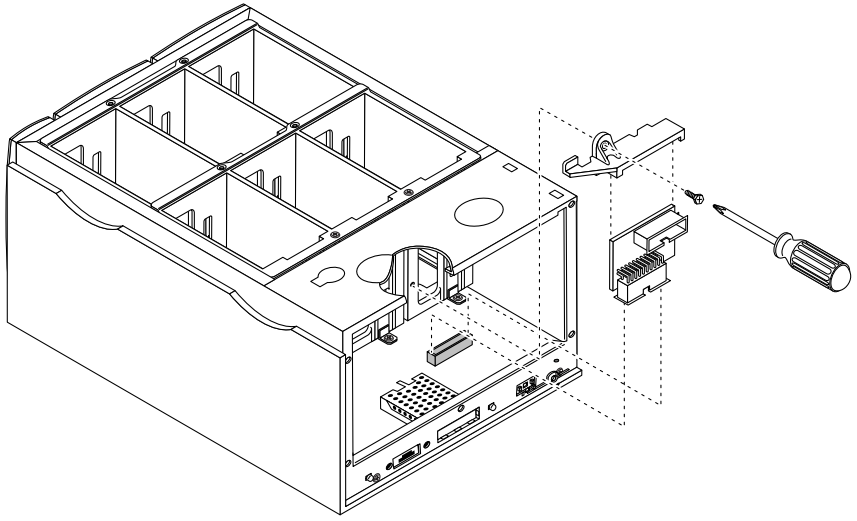


FIGURE 3-20 Removing the Daughter Board Clip and the Daughter Board

8. **Remove the LED cable from the LED clip (FIGURE 3-19).**

9. **Pull the drive cage and backplane assembly upward until the assembly clears the enclosure. Remove the assembly from the enclosure.**

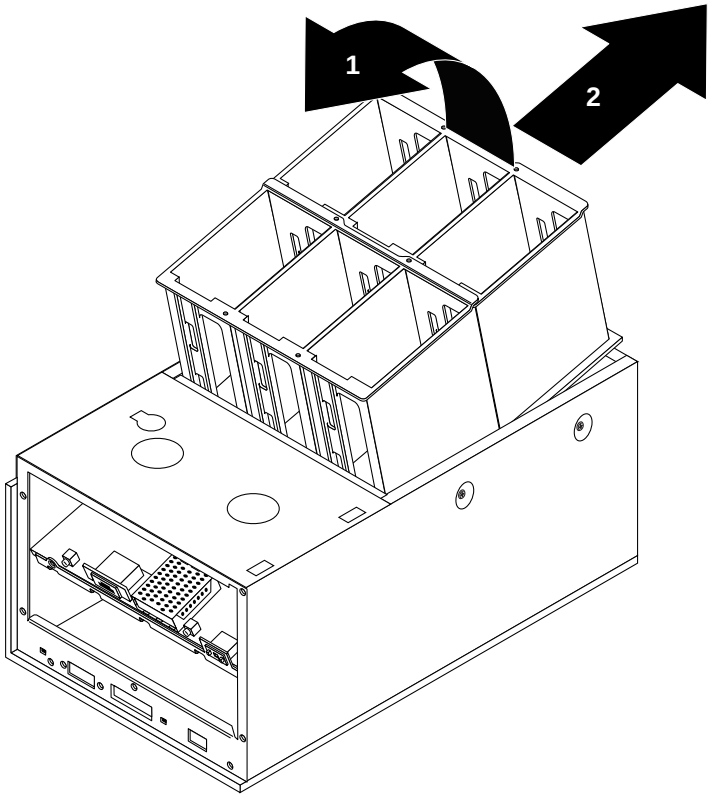


FIGURE 3-21 Removing the Drive Cage and Backplane Assembly

10. **Reassemble the system.**

    a. **Replace the drive cage and backplane assembly.**
    Slide the assembly towards the back of the system so that the screw holes align.

    b. **Replace the LED cable.**

    c. **Replace the daughter board and the daughter board clip.**

    d. **Replace the power supply.**

    e. **Replace the drives.**

    f. **Replace the drive access panel.**

11. **Turn on the power to the system.**

    See Section 2.4.1 “Powering On the System”.

3.8 Removing and Replacing the LED Clip and Cable

Note – The LED clip contains the LED board, and together with the LED cable they are a field replaceable unit.

Caution – The power must be turned off and the power cord must be removed from the MultiPack-FC before the parts removal procedures are attempted.

Caution – Remove all I/O cables from the MultiPack-FC before the parts removal procedures are attempted.

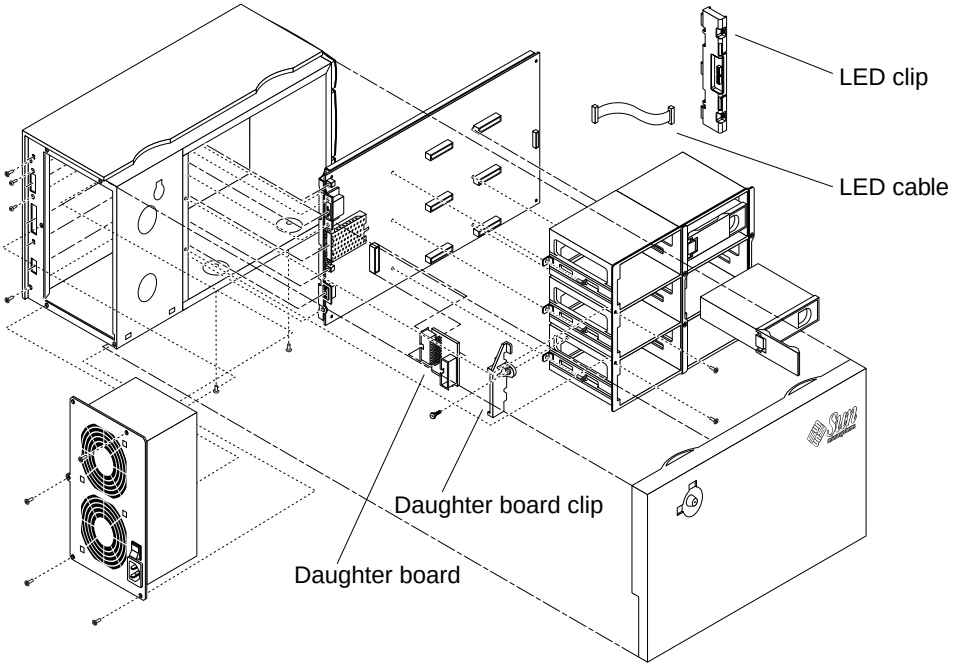


FIGURE 3-22 MultiPack-FC Removable Parts Breakdown

3.8.1 Removing the Major Assemblies

1. **Turn the MultiPack-FC enclosure so that it rests on its stationary side panel, with the locking drive access panel facing you.**
2. **Unlock the drive access panel and remove it.**
3. **Remove the power supply (four screws and the lock box).**
4. **Remove the daughter board and its plastic clip from the drive cage (FIGURE 3-23).**

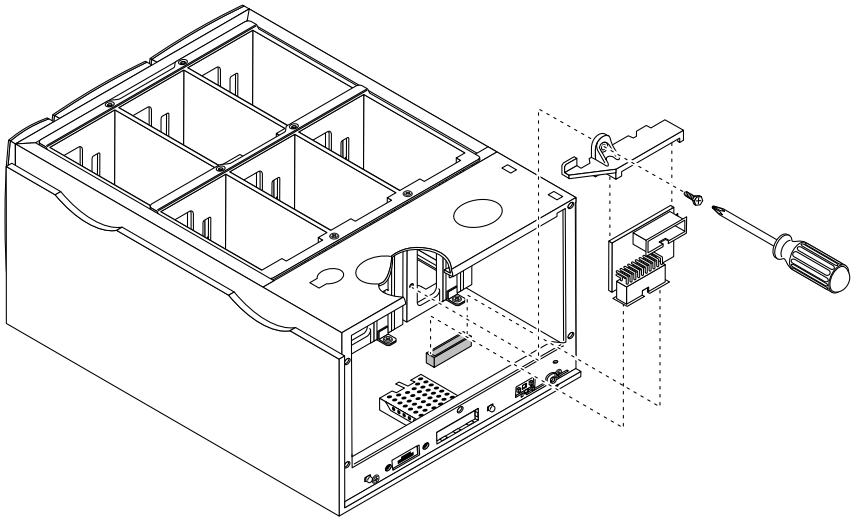


FIGURE 3-23 Removing the Daughter Board Clip and the Daughter Board

5. **Remove all the drives from the drive cage.**

6. **Remove the drive cage (FIGURE 3-24). There are six screws to remove:**
   - Two screws on the bottom of the chassis
   - Two screws on the back of the chassis near the I/O connectors (FIGURE 3-24, A and B)
   - Two screws by the left side of the drive cage

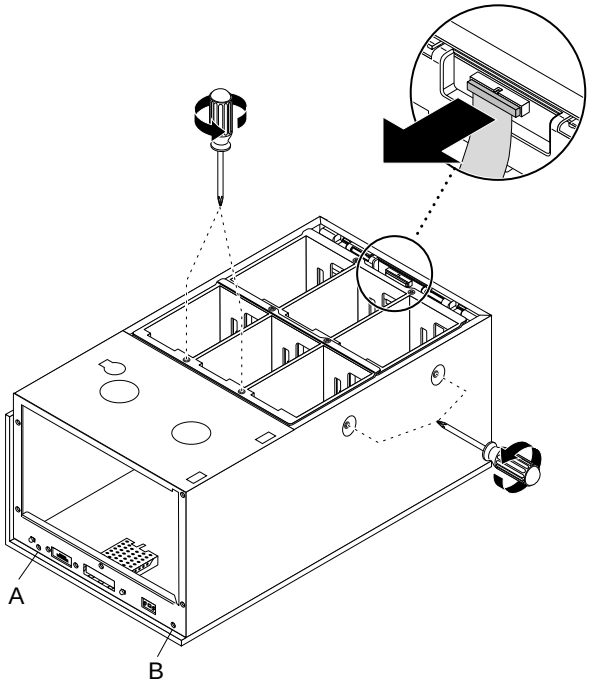


FIGURE 3-24 Removing the Drive Cage and the LED Cable From the LED Clip

3.8.2 Removing the LED Clip

1. **Remove the LED cable from the LED clip (FIGURE 3-24).**
2. **Press down on the two clip tabs.**
3. **Unhook the clip from the chassis.**

3.8.3 Replacing the LED Clip and Cable

1. **Hang the clip onto the two hooks on the chassis lip.**
2. **Push the two catches downward on the clip so that the clip snaps are secured to the chassis.**
3. **Connect the replacement LED cable to the main logic board (FIGURE 3-25).**

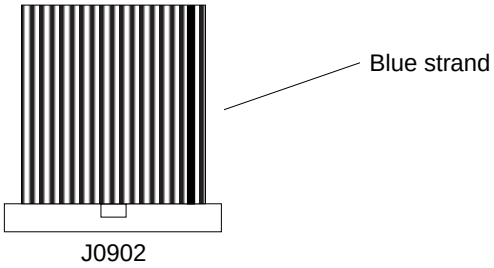


FIGURE 3-25 Connecting the LED Cable to the Main Logic Board

3.8.4 Reassembling the MultiPack-FC

1. **Install the drive cage and the main logic board assembly.**

   Push the assembly all the way back into the chassis so that it meets the chassis I/O connectors area.

2. **Tighten the drive cage and the main logic board assembly screws in this order:**
   - Two screws by the drive cage
   - Two screws by the I/O connectors
   - Two screws on the bottom of the chassis

3. **Install the daughter board into the main logic board (FIGURE 3-26).**

4. **Install the daughter board clip onto the daughter board. Tighten the screws on the clip to the drive cage (FIGURE 3-26).**

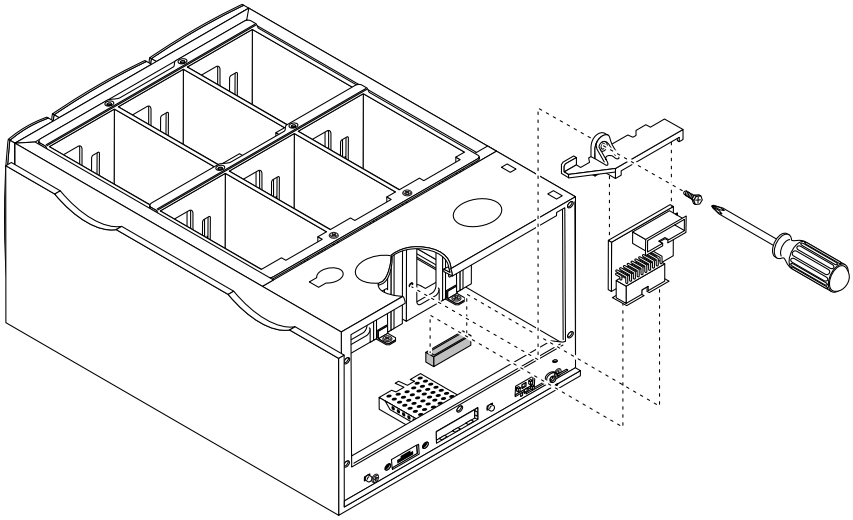


FIGURE 3-26 Replacing the Daughter Board and the Daughter Board Clip

5. **Connect the LED cable to the LED clip.**

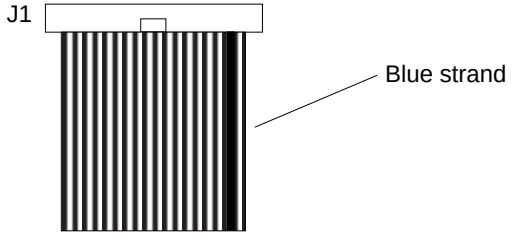


FIGURE 3-27 Connecting the LED Cable to the LED Clip

6. **Install the power supply, and tighten the corner screws and lock box.**
7. **Install the hard drives.**
8. **Install the drive access panel, and lock it.**
9. **Install the power cord to the power supply.**
10. **Connect the I/O cables to their connectors on the back panel.**

The MultiPack-FC is now ready for use.

APPENDIX **A**

Product Specifications

This appendix consists of the following sections:

A.1 Electrical Specifications

TABLE A-1 Electrical Specifications

Input voltage	100–240 VAC
Frequency	47–63 Hz
Maximum input power	185W
Maximum input current	3.0A
Maximum input VA	300 VA
Maximum heat output	900 BTU

A.2 Physical Specifications

TABLE A-2 Physical Specifications

Height	240-mm (9.45-in.)
Width	197-mm (7.76-in.)
Depth	452-mm (17.80-in.)
Weight:	
Without drives	8.6 kg (19.0 lb)
With six 25.4 mm (1.0 in.) height drives	12.7 kg (28.0 lb)

A.3 Environmental Specifications

TABLE A-3 Environmental Specifications

Temperature	
Operating	5°C to 40°C
Nonoperating	-40°C to 60°C
Relative Humidity	
Operating	20% @ 40°C to 80% @ 31°C
Nonoperating	5% to 93%
Vibration	
Operating	0.2 G (0~Pk) Swept Sine
Nonoperating	1.0 G (0~Pk) Swept Sine
Altitude	
Operating	3,000 meters @ maximum operating temperature derated 1.8°C per 1,000 meters of altitude above sea level
Nonoperating	12,000 meters

A.4 Safety Standards

TABLE A-4 Safety Standards

Specification	Comments
UL1950	USA ITE
CSA 22.2 No. 950	Canada ITE
EN60950	Europe (TUV) ITE
EMKO-TSE (74-SEC)-207	Nordic deviations to EN60950
CB scheme	Report to IEC950 and Nordic deviations

A.5 Electromagnetic Interference

TABLE A-5 Electromagnetic Interference (EMI)

Specification	Comments
EN55022 class B	EMI regulation for CE mark, Europe
EN61000-3-2	Power harmonics, Europe
FCC Part 15, class B	USA
VCCI Class 2	Japan
CSA C108.8-M1983 class B	Canada

A.6 Electrical Disturbances

TABLE A-6 Electrical Disturbances

Specification	Comments
EC1000-4-2	Electrostatic discharge (ESD)
EC1000-4-3	Radiated electromagnetic field
EC1000-4-4	Electrical fast transient
EC1000-4-5	Surge