

2.1 Gbyte 7200 rpm Standard Connector Disk Drive Installation Manual



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Part No.: 802-3527-10
Revision A, May 1995

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Preface

This manual describes how to install the 2.1 Gbyte hard disk drive as a replacement or upgrade drive into the:

- Desktop Disk Pack (DDP)
- Multi-Disk Pack (MDP)

Who Should Use This Book

This manual was written for any Sun™ customer or Sun service provider who has some computer hardware experience and is qualified to install disk drives. After the hardware connections are made, a system administrator or someone familiar with disk drive software configuration should perform the necessary software steps (such as setting up and mounting file systems).

When You Need Help with UNIX Commands

This manual contains most of the specific software commands and procedures associated with these systems. Some of the software information that you may need to know include:

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

Depending upon which operating system you are using, you can find descriptions of commands and procedures in the following sources:

- The *Handbook for SMCC Peripherals* that came with your operating system.
- Online *AnswerBook*[®] software (which contains the complete set of documentation supporting the Solaris 1.1.x or Solaris 2.x environments)
- Other software documentation that you received with your system

What Typographic Changes Mean

The following table describes the typographic changes used in this book.

Table P-1 Typographic Conventions

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

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

Table P-2 Shell Prompts

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

Safety Agency Compliance

Before beginning any procedure, read the information in this section. This information explains how to work safely when installing a Sun product. French, German, and Spanish translations are in Appendix A.

Safety Precautions

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

- Follow all warnings and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source matches 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, which appear in this book, 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.

On – Applies DC power to the system.



Off – Removes DC power from the system.



Standby – Removes DC power from the system.





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

Modification to Equipment

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

Placement of a Sun Product



Caution – To ensure reliable operation of your Sun product and to protect it from overheating, openings in the equipment must not be blocked or covered. A Sun product should never be placed near a radiator or heat register.

Power Cord Connection



Warning – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electrical 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.



Warning – 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.



Warning – Your Sun product is shipped with a grounding type (3-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.



Warning – The power switch of this product functions as a standby type device only. The power supply plug is intended for use as the primary disconnect device. The product must be installed near the socket outlet such that the socket outlet is readily accessible.

Cover

You must remove the cover of your Sun computer system unit in order to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering up your computer system.



Warning – It is not safe to operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

Before You Start

1 

This chapter:

- Gives information about unpacking a new disk drive
- Lists the tools and equipment required to install a 2.1 Gbyte standard connector hard disk drive in a Desktop Disk Pack and a Multi-Disk Pack
- Provides software commands to shut down your operating system
- Describes the drive jumper settings
- Points you to the proper chapter for information specific to your system

Unpacking the Disk Drive



Caution – Make sure you handle the drive carefully. Any jarring movement or hard impact could damage the drive.

When you unpack the disk drive from the shipping box:

- 1. Compare the packing list with the hardware you received.**
- 2. Place the drive on an antistatic surface, (such as the antistatic bag in which the drive was shipped), with the printed circuit board (PCB) side up.**
- 3. Save the box and the packing material in case you have to ship the drive at some future date.**

The drive is a standard connector, 2.1 Gbyte SCSI low profile disk drive. It is approximately 1 inch high and 3.5 inches wide. It supports fast SCSI at 10 Mbytes per second.

When you examine your 2.1 Gbyte disk drive, locate the label that has the Sun part number to determine which vendor manufactured it. Disks with the 370-2067 part number are manufactured by Seagate, disks with the 370-1957 part number are from IBM. While all performance specifications are the same for both drives, the jumper locations and settings are different. Once you have identified which drive you have, follow the instructions for that specific drive only.

Mounting Hardware

When you unpack the disk drive, remove the plastic bags that contain various mounting brackets, screws, grommets and cables. The bags are labeled:

- Multi-Disk Pack
- Desktop Disk Pack

Open only the appropriate bag for your system. Put the other bags aside.

Tools and Equipment

- Phillips screwdriver, #2
- Container for screws
- Needlenose pliers (for disk drive jumper settings)
- Antistatic mat or the antistatic bag in which the disk drive was shipped
- Disposable antistatic wrist strap
- SCSI regulated terminator

Verifying the Software Environment Version

Before you begin any procedures, verify which software environment you have running on your system:

♦ **Type** `uname -rs` **and press Return.**

If the message displayed is:	Your software environment is:
SunOS 5.x	Solaris 2.x
SunOS 4.1.3_U1 Version B	Solaris 1.1.1 SunSoft Version B
SunOS 4.1.4	Solaris 1.1.2

Shutting Down the System

Before you can install the disk drive, you must shut down the system. If you omit a step, the system may fail to boot, or fail to correctly configure the disk drive.

- To shut down the Solaris 2.x software environment, proceed to the next section.
- To shut down the Solaris 1.1.x software environment, see the section “Solaris 1.1.x Software Environment” on page 1-6.

Solaris 2.x Software Environment

1. Become superuser by typing `su` and your superuser password.

If you do not know your superuser password, contact your system administrator.

```
machine_name% su  
Password: superuser password  
machine_name#
```

The root prompt (#) is displayed.



Caution – The system will not recognize the new device unless you follow the shutdown procedures for your operating system. Only Solaris 2.x software uses the `touch /reconfigure` command to ensure autoconfiguration when the system is powered on.

2. Type `touch /reconfigure`.

```
machine_name# touch /reconfigure
```

This command ensures that the operating system checks for the presence of any newly installed peripheral devices when you power on or boot your system later.

If you omit this step, you can still automatically configure the new drive when the system boots by using the `-r` option:

```
ok# boot -r
```

Note – If your system is acting as a server, inform the mounted users that you are shutting the system down as described in Step 3. If your system is a stand-alone system, use the `halt`, `shutdown`, or `init 0` command instead.

3. Type `/usr/sbin/shutdown -y -g30 -i0` and press Return.

```
tutorial# /usr/sbin/shutdown -y -g30 -i0
.
.
.
.
ok
```

Note – The 0 in `g30` and `i0` is a zero.

A message is sent notifying all users who are logged in that they have 30 seconds (`-g30`) before the system begins to shut down. The `ok` or `>` prompt is displayed after the operating environment is shut down.

4. At the `>` or `ok` prompt, turn the on/off switch to the off (O) position for each device in the following order:

- a. Peripherals
- b. Desktop system
- c. Monitor



Warning – Be sure all power switches are turned to the off (O) position. The green light emitting diodes (LEDs) on all units should not be lit and the power supply fans should not be running. Leave all power cords plugged into each unit and wall outlet(s) to prevent damage to the equipment.



Caution – After turning off the power, always wait 10 seconds before turning it on again. This pause prevents possible damage to power supply components in the desktop system.

Solaris 1.1.x Software Environment

1. Become superuser by typing `su` and your superuser password.

If you do not know your superuser password, contact your system administrator.

```
machine_name% su  
Password: superuser password  
machine_name#
```

The root prompt (#) is displayed.

Note – If your system is acting as a server, inform the mounted users that you are shutting the system down as described in Step 2. If your system is a stand-alone system, use the `halt`, `shutdown`, or `init 0` command instead.

2. Shut down the system by typing `/usr/etc/shutdown -h +`, the time to shutdown in minutes, and a message to other users on the network.

```
# /usr/etc/shutdown -h + time in minutes "message"
```

In the following example, the system will be shut down in five minutes and a warning will be sent, at intervals, to all users on the network. This allows users with mounted file systems time to save their work.

```
Isis# /usr/etc/shutdown -h +5 "Isis going down in 5 minutes"
Shutdown at time (in 5 minutes) [pid xxx]
Isis#
***System shutdown message from Isis***
System going down in x minutes
  ..system going down in x minutes
***Shutdown message from Isis***
FINAL System shutdown message from Isis
System going down in 30 seconds
System going down immediately
System shutdown time has arrived
date time Isis shutdown:halt by Isis
date time Isis syslogd:going down on signal x
syncing file systems...done
Halted
Type help for more information
ok
```

3. At the `>` or `ok` prompt, turn the on/off switch to the off (O) position for each device in the following order:
 - a. Peripherals
 - b. Desktop system
 - c. Monitor



Warning – Be sure all power switches are turned to the off (O) position. The green light emitting diodes (LEDs) on all units should not be lit and the power supply fans should not be running. All power cords should remain plugged into each unit and wall outlets to prevent damage to the equipment.



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

Locating the Jumpers and Verifying their Settings

Each SCSI device in your system needs a specific and unique SCSI address. This section identifies the 2.1 Gbyte disk drive jumpers and provides jumper settings for all supported systems except the Multi-Disk Pack.

For Multi-Disk Pack disk drive jumper locations and settings, see “Setting Jumpers and Preparing the Disk Drive for Installation” in Chapter 3, “Multi-Disk Pack.”

Note – Make sure you are wearing a wrist strap when you handle the drive to check the jumper settings. Make sure that the external power cord is connected to the subsystem and power outlet. Do *not* have the subsystem powered on when you do this.

- 1. Make sure the drive is on an antistatic surface with the PCB side visible.**
- 2. Locate the jumper blocks on the drive and verify that the pins are correctly jumpered.**
 - See Figure 1-1 on page 1-9 for the IBM drive.
 - See Figure 1-2 on page 1-11 for the Seagate drive.

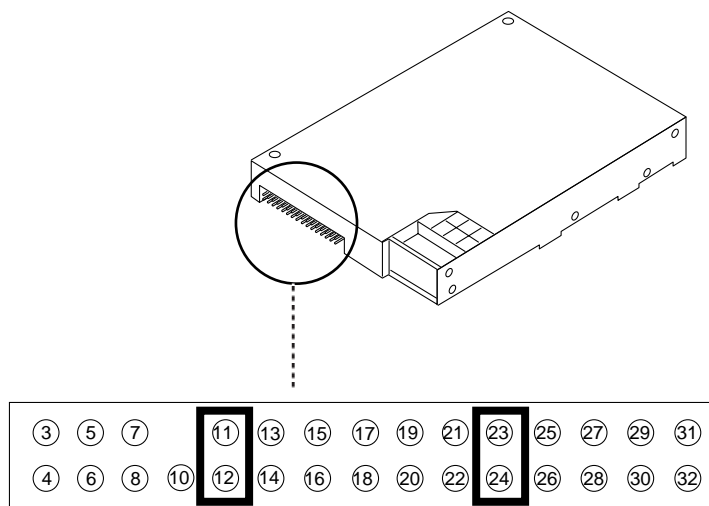


Figure 1-1 IBM Drive Jumper Settings

IBM Drive Jumper Descriptions

Table 1-1 lists the factory configured jumpers on the IBM drive. Table 1-2 lists the SCSI target address settings.

Table 1-1 IBM Disk Drive Option Jumper Block

Description	Jumper Pins:	Factory Set
(Reserved)	1 and 2	
SCSI ID 2	3 and 4	
SCSI ID 1	5 and 6	
SCSI ID 0	7 and 8	
Auto Start	11 and 12	yes
Enable Active Termination	13 and 14	
Master Sync	(15)	
Slave Sync	(16)	
External Acitivity LED	17 and 18	

Table 1-1 IBM Disk Drive Option Jumper Block

Description	Jumper Pins:	Factory Set
Write Protect	19 and 20	
Auto Start Delay	21 and 22	
Option Block Mode	23 and 24	yes
Disable Sync Negotiations	25 and 26	
Disable SCSI Parity	27 and 28	
Disable Unit Attention	29 and 30	
Customizing	31 and 32	

Table 1-2 IBM Drive SCSI Address Settings

Targets	Pins 3 and 4	Pins 5 and 6	Pins 7 and 8
0			
1	X		
2		X	
3	X	X	
4			X
5	X		X
6		X	X

Note – Target address 7 is reserved for SCSI controller.

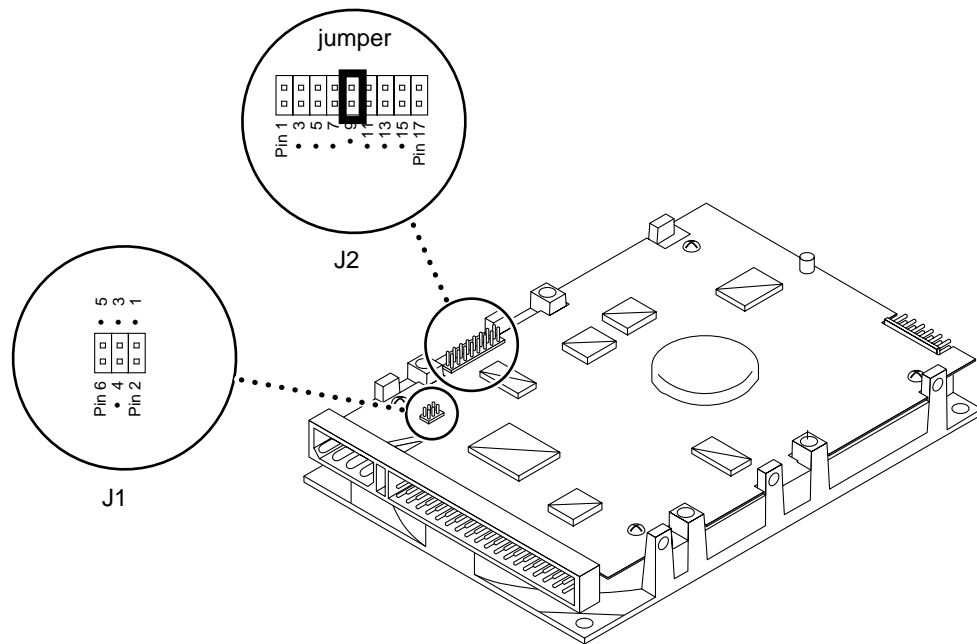


Figure 1-2 Seagate Drive Jumper Settings

Seagate Drive Jumper Descriptions

Table 1-3 describes the configuration jumpers. Table 1-4 lists the SCSI target address settings

Table 1-3 Seagate Configuration Jumper Descriptions

Description	Jumper:	Factory Set
(Reserved)	J2-1,2,3,4,13,14,15, 16,17,18	
Delay Motor Start	J2-11 to J2-12	
Motor Start	J2-9 to J2-10	yes
Write Protect -On (disables writing)	J2-7 to J2-8	
Disable Parity Check	J2-5 to J2-6	
Terminator Power from Drive	J1-1 to J1-2	

Table 1-3 Seagate Configuration Jumper Descriptions

Description	Jumper:	Factory Set
Terminator Power to SCSI bus	J1-1 to J1-3	
Terminator Power from SCSI bus	J1-2 to J1-4	
Terminator Power to SCSI bus and drive	J1-1 to J1-3 and J1-2 to J1-4	

Table 1-4 Seagate SCSI Address Settings

Targets	J4-9 to J4-10	J4-11 to J4-12	J4-13 to J4-14
0			
1	X		
2		X	
3	X	X	
4			X
5	X		X
6		X	X

Note – Target address 7 is reserved for SCSI controller.

Desktop Disk Pack



The tasks required to remove and replace a disk drive in the Desktop Disk Pack (DDP) are listed below. Tasks which are common to all systems are described in the Preface and Chapter 1.

<i>Read the Safety Precautions and Safety Agency Compliance</i>	<i>page -x</i>
<i>Verify the version of your software environment</i>	<i>page 1-3</i>
<i>Shut down your system</i>	<i>page 1-3</i>
<i>Remove the cover</i>	<i>page 2-3</i>
<i>Remove the disk drive (if necessary)</i>	<i>page 2-6</i>
<i>Set the SCSI target address</i>	<i>page 2-10</i>
<i>Install the new disk drive</i>	<i>page 2-10</i>
<i>Replace the cover</i>	<i>page 2-4</i>
<i>Turn on power to your system</i>	<i>page 2-15</i>
<i>Configure your system</i>	<i>page 2-15</i>

Figure 2-1 shows major internal components of the Desktop Disk Pack.

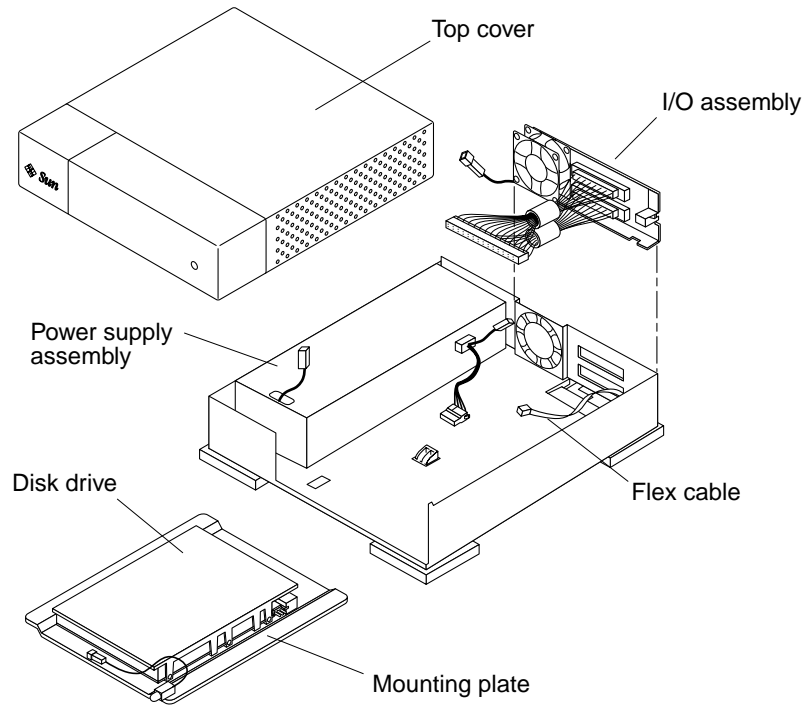


Figure 2-1 Components of the Desktop Disk Pack

Opening and Closing the Desktop Disk Pack

- 1. Read the “Safety Agency Compliance” section in the Preface for safety precautions.**
- 2. Read Chapter 1 to determine which tools are required, how to shut down the system, and how to verify jumper settings on the drive.**

Removing the DDP Cover

1. Turn off the power to your system unit and make sure the external power cord is plugged in to the DDP and to the power source.
See “Shutting Down the System” on page 1-3.
2. Locate the holes on both of the side vented panels and insert a small (2 to 3mm) screwdriver into one of the specific holes shown in Figure 2-2.

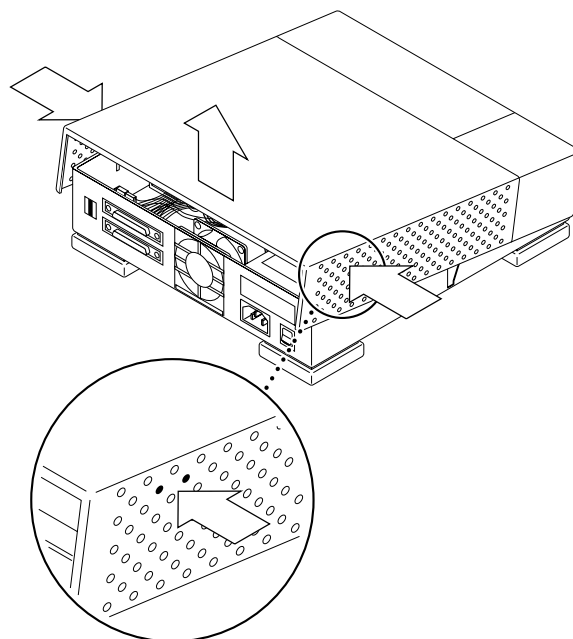


Figure 2-2 Removing the Cover

3. Push the screwdriver into the hole to release the catch. Repeat this on the other side to release that catch.
4. Lift the rear of the cover up slightly and push it forward off of the front tabs.
Set the cover aside.
5. Attach a wrist strap to your wrist and then to the power supply.
See Figure 2-3.

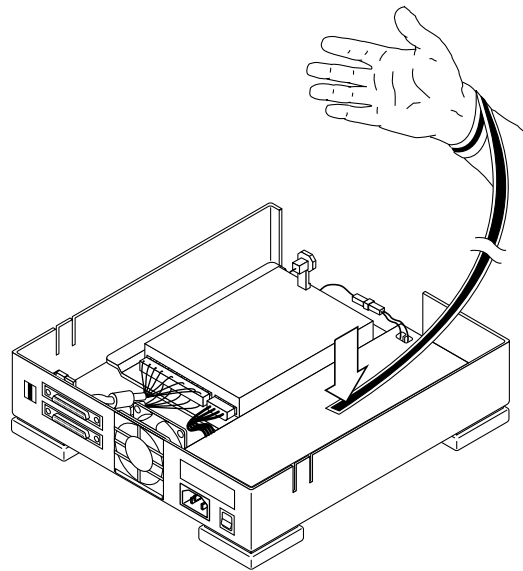


Figure 2-3 Attaching the Wrist Strap

Replacing the DDP Cover

- 1. Make sure there are no loose tools or screws in the unit, and that all internal components are seated properly.**
- 2. Make sure that all internal cable connections are secure, and that the power supply cord is tucked inside the system to avoid pinching the wiring when you replace the cover.**
- 3. Remove the wrist strap.**
- 4. Holding the cover at an angle, engage the front tabs of the cover with the front of the unit.**
See Figure 2-4.

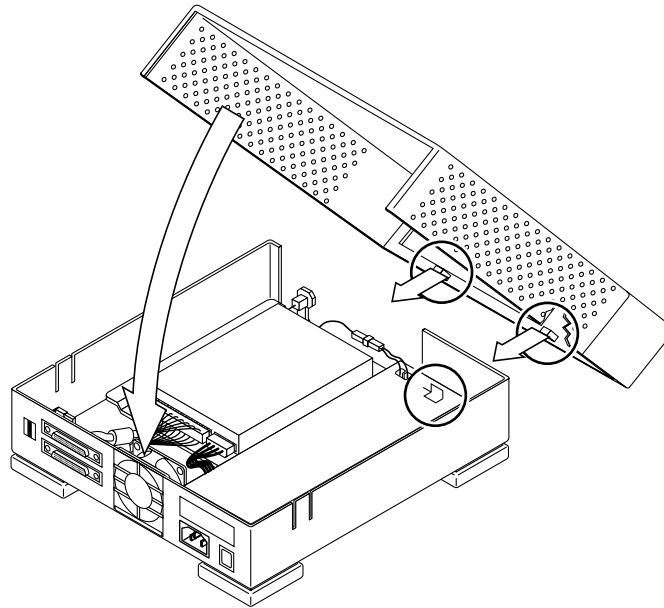


Figure 2-4 Replacing the Cover

- 5. Lower the rear of the cover.**
- 6. Press down firmly on the back end of the cover until you hear a click of both cover catches engaging.**

Removing the Disk Drive

1. **Disconnect the flex cable from the SCSI target address switch.**
See Figure 2-5. The flex cable is fragile and must be handled carefully.
2. **Disconnect the power supply connector from the LED cable on the mounting plate.**
See Figure 2-5.

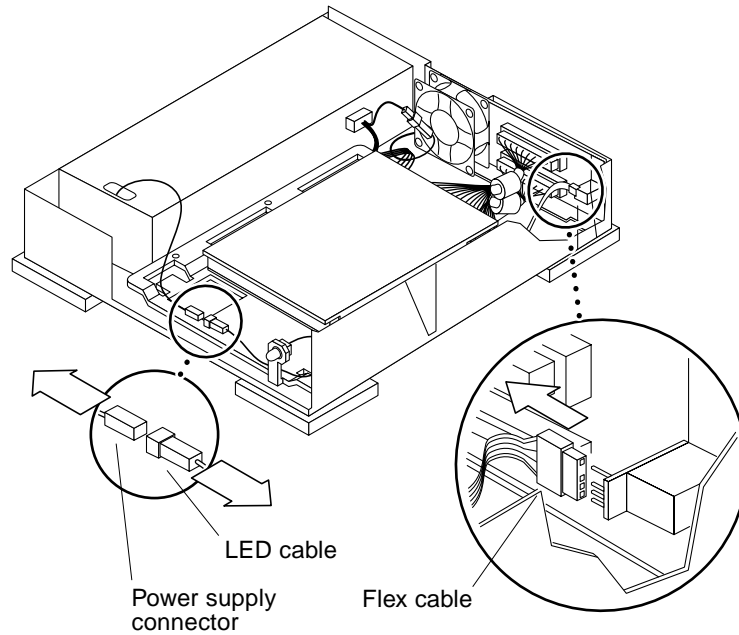


Figure 2-5 Disconnecting the Flex Cable and the Power Supply Connector

- 3. Disengage the retaining clip on the bottom of the DDP by reaching under the DDP and pulling down on the clip to clear it from the mounting plate. You can use a coin to pull down the clip so you can slide out the mounting plate. See Figure 2-6.**

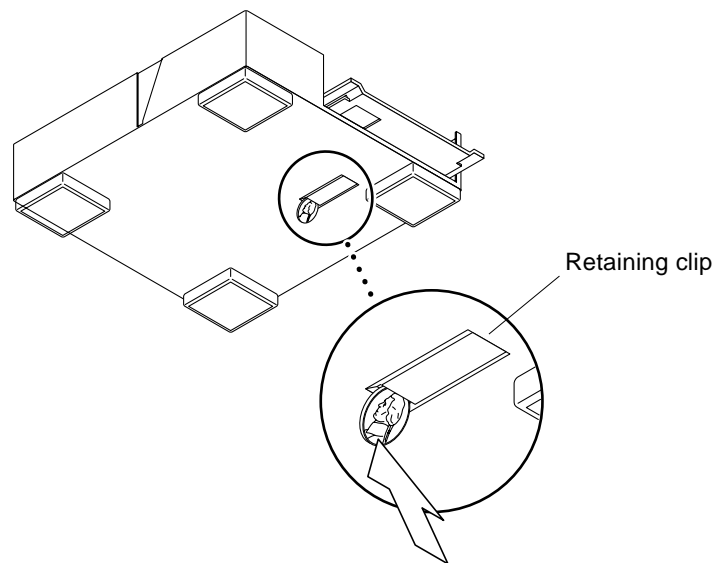


Figure 2-6 Disengaging the Retaining Clip

- 4. Slide the disk drive assembly, consisting of the disk drive and the mounting plate, partially out of the chassis (only about 1 to 2 inches). Do not completely remove the drive assembly. You just want to create a little room to disconnect the cables before removing the assembly completely. See Figure 2-7 on the next page.**

5. **Disconnect the power supply connector from the disk drive and the internal SCSI cables of the I/O assembly from the disk drive.**
See Figure 2-7.
6. **Slide the disk drive assembly completely out of the DDP.**

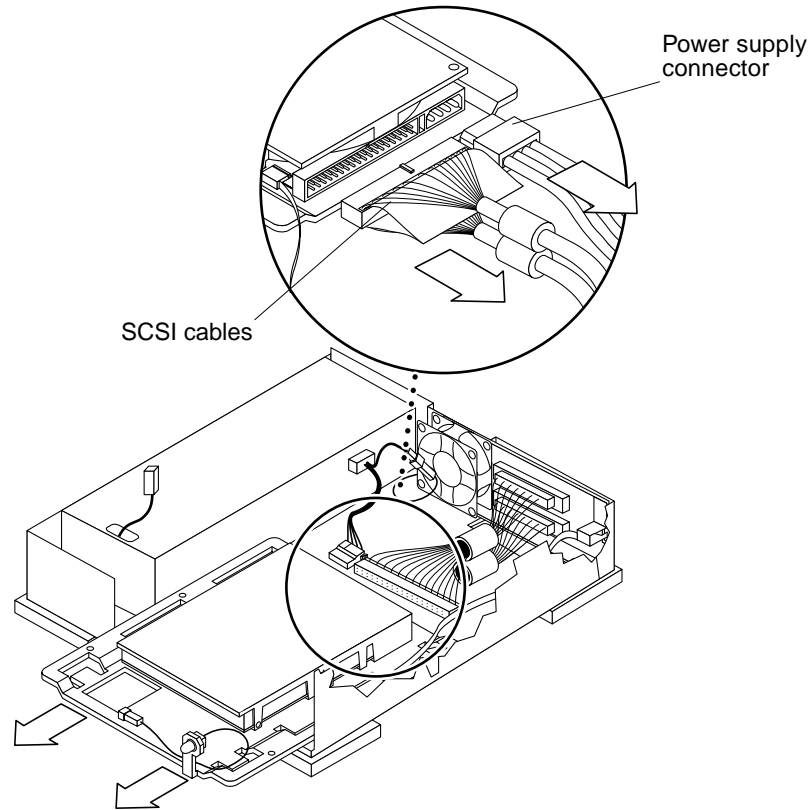


Figure 2-7 Sliding the Disk Drive Assembly Out of the Chassis and Disconnecting the Cabling

7. **Remove the four screws securing the drive to the mounting plate.**
See Figure 2-8. Place the drive on an antistatic surface.
8. **Disconnect the flex cable from the disk drive.**
See Figure 2-11 on page 2-12 for the flex cable location. The flex cable is fragile and must be handled carefully.

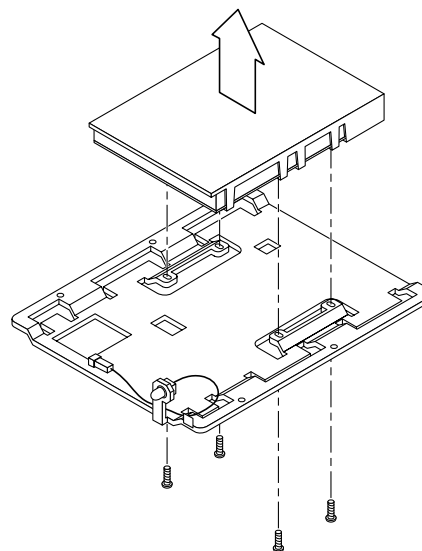


Figure 2-8 Removing the Drive from the Mounting Plate

Installing a Disk Drive:

1. **Locate the SCSI address jumpers on your disk drive as shown in Chapter 1, “Before You Start.”**
 - If you have an IBM disk drive, see Figure 1-1 on page 1-9.
 - If you have a Seagate disk drive, see Figure 1-2 on page 1-11.
2. **Remove the jumpers from the ID Select pins of the SCSI address jumper block.**
3. **Make sure the SCSI address switch on your system unit is set to the correct target address. If you need to change the address:**
 - a. **Locate the switch on the system unit.**
Figure 2-9 shows the switch location on the DDP.
 - b. **Decide on an address that is not shared by any other device on your SCSI bus.**
The most common settings for a DDP are 0 or 2. As a general rule, each device on the SCSI bus must be set at a different target address.
 - c. **Press the button on the top or bottom of the switch until the desired address number appears in the window.**

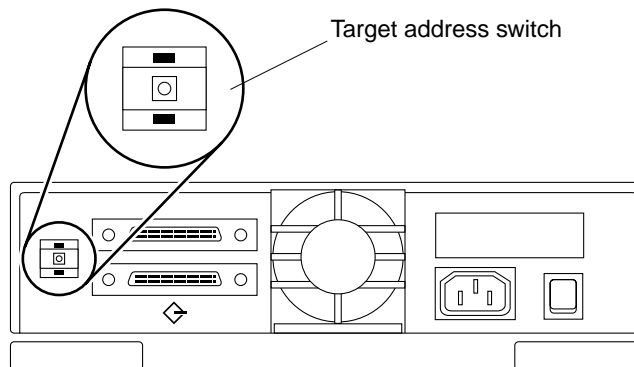


Figure 2-9 SCSI Target Address Switch Location

4. **Make sure the wrist strap is properly attached.**
See Figure 2-3 on page 2-4.

- 5. Attach the mounting plate to the bottom of the disk drive by aligning the holes in the plate with the screw holes in the drive and installing four screws.**
See Figure 2-10.

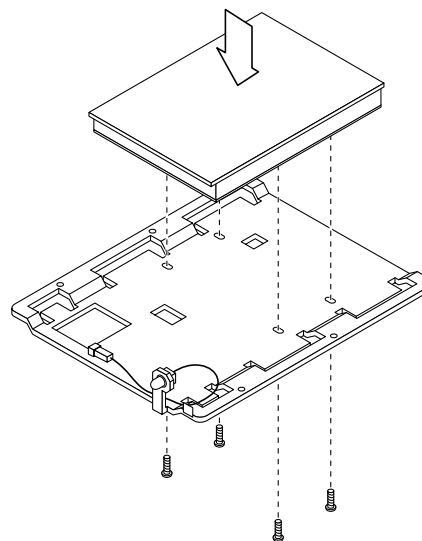


Figure 2-10 Attaching the Drive to the Mounting Plate

- 6. Slide the disk drive assembly partially into place.**
See Figure 2-12.
- 7. Connect the SCSI cable and the power supply connector to the disk drive.**
See Figure 2-12. The connectors are keyed so they will only fit one way.

8. Connect the flex cable to the disk drive.

See Figure 2-11.



Caution – The flex cable is fragile and can be easily damaged. Make sure you take extra precaution in handling it.

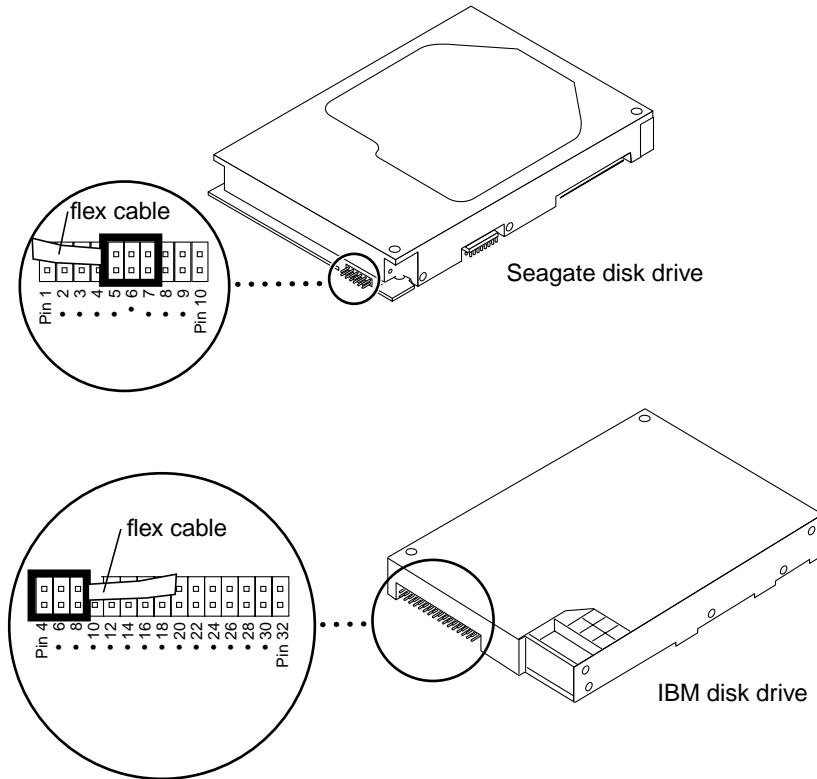


Figure 2-11 Connecting the Flex Cable

9. Connect the other end of the flex cable to the SCSI target address switch.

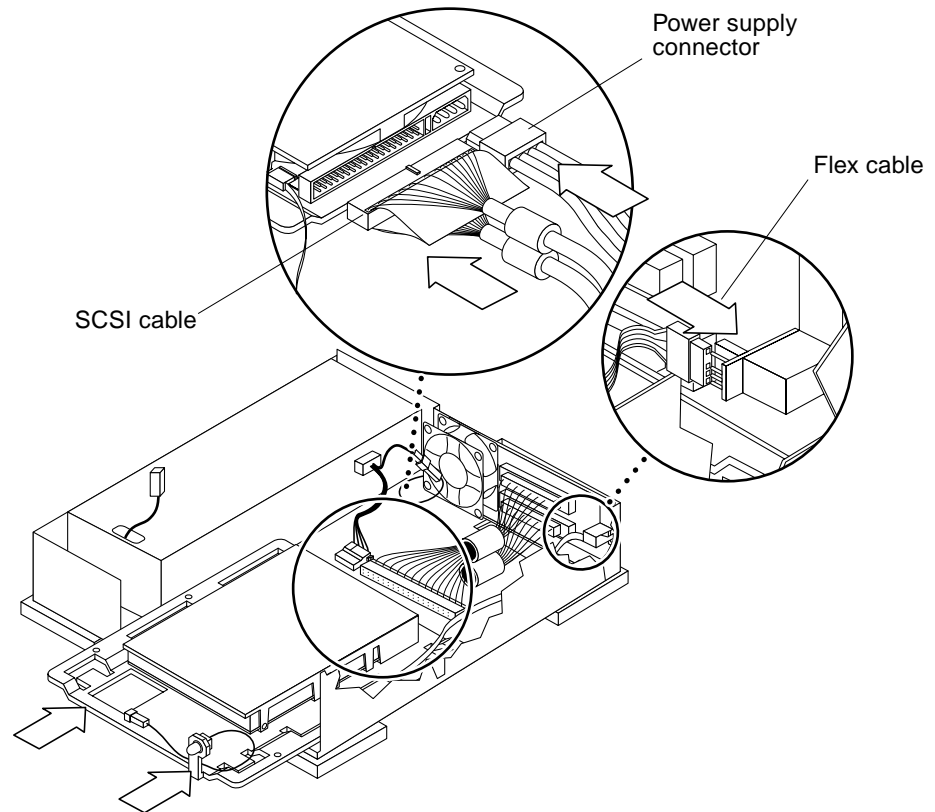


Figure 2-12 Sliding the Drive into Place and Connecting the Cables

10. Slide the disk drive assembly completely into the base, making sure the assembly engages the retaining clip on the interior floor of the DDP. See Figure 2-13.

Caution – Be sure the drive assembly snaps securely in place with the retaining clip. If the drive is not placed back in the base all the way, the cover will not close properly and the front tabs could be damaged.

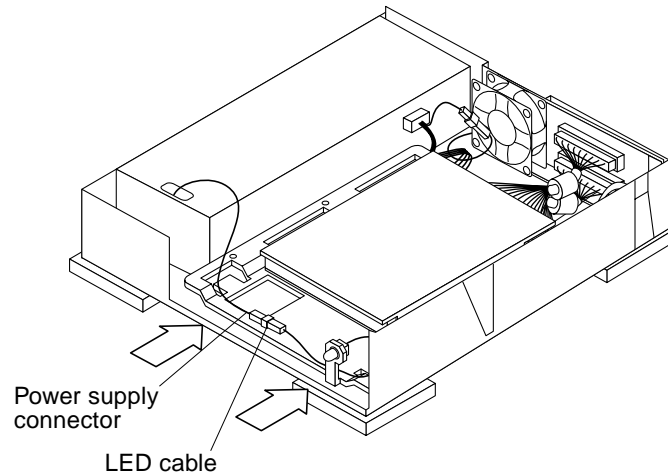


Figure 2-13 Connecting the Power Supply Connector to the LED

11. Connect the power supply connector to the LED cable on the mounting plate.

See Figure 2-13.

12. Remove the wrist strap and replace the cover.

See “Replacing the DDP Cover” on page 2-4.

Note – You must use a regulated SCSI terminator on the DDP, or on the last device in the daisy chain if there are multiple external devices. The 2.1 Gbyte disk drive is a fast SCSI device and requires the regulated SCSI terminator.

See Appendix B for descriptions of SCSI ports, types of connections, SCSI termination, and cable length.

Completing the Drive Installation

System configuration occurs after a system is successfully powered on. If the system shutdown was performed according to the procedure in Chapter 1, your system should automatically configure when you power on the system.

To complete the installation of the 2.1 Gbyte disk drive into your Desktop Disk Pack:

- 1. Go to the *Handbook for SMCC Peripherals* that came with your operating system.**
- 2. Follow the instructions in the “Configuring the System” section.**

Multi-Disk Pack



This chapter explains how to remove a disk drive and how to install a 2.1 Gbyte hard disk drive in the Multi-Disk Pack unit. Tasks which are common to all systems are described in the Preface and Chapter 1.

<i>Read the Safety Precautions and Safety Agency Compliance</i>	<i>page -x</i>
<i>Verify the version of your software environment</i>	<i>page 1-3</i>
<i>Shut down your system</i>	<i>page 1-3</i>
<i>Remove the cover</i>	<i>page 3-2</i>
<i>Remove the disk drive assembly</i>	<i>page 3-5</i>
<i>Remove the disk drive(s) from the assembly</i>	<i>page 3-7</i>
<i>Set disk drive SCSI address</i>	<i>page 3-8</i>
<i>Install the new disk drive in the disk drive assembly</i>	<i>page 3-12</i>
<i>Replace the disk drive assembly</i>	<i>page 3-13</i>
<i>Replace the cover</i>	<i>page 3-3</i>
<i>Turn on power to your system</i>	<i>page 3-16</i>
<i>Configure your system</i>	<i>page 3-16</i>

Opening and Closing the Multi-Disk Pack Unit

1. Read the “Safety Agency Compliance” section in the Preface for safety precautions.
2. Read Chapter 1 to determine which tools are required, how to shut down the system, and how to verify jumper settings on the drive.

Removing the Multi-Disk Pack Cover

1. Turn off the power to your Multi-Disk Pack and make sure the external power cord is plugged in to the Multi-Disk Pack and to the power source. See “Shutting Down the System” on page 1-3.
2. Remove the Phillips screw in the lock block. See Figure 3-1.
3. Placing your hands over both sides, lift the cover up and off the unit.

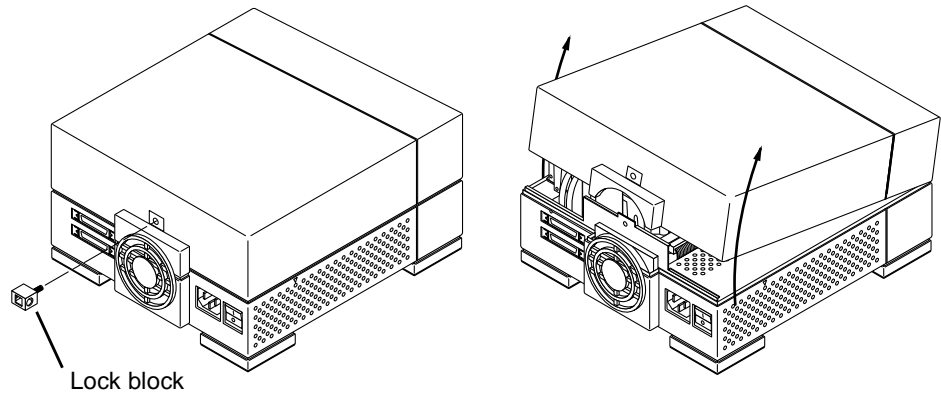


Figure 3-1 Removing the Lock Block and Lifting the Cover Off

4. **Attach a wrist strap to your wrist and then to the power supply.**
See Figure 3-2 and Figure 3-3.

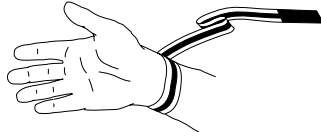


Figure 3-2 Attaching the Wrist Strap

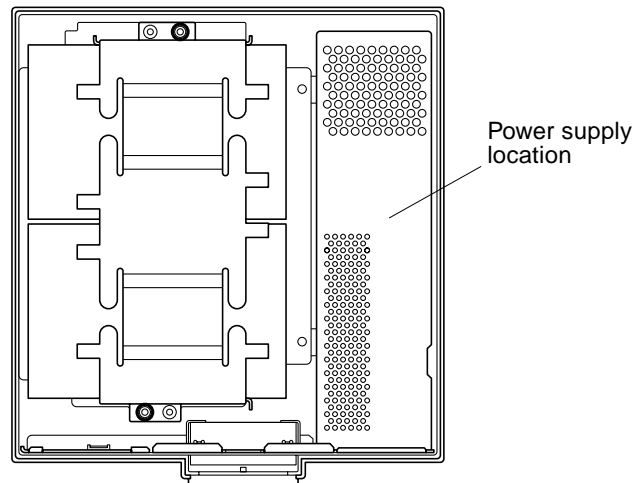


Figure 3-3 Location of the Multi-Disk Pack Power Supply

Replacing the Multi-Disk Pack Cover

1. **Remove the wrist strap from the power supply and then from your wrist.**
2. **Position the cover over the unit with the front of the cover oriented over the front of the base.**
3. **Tilt the rear of the cover up and carefully slide the cover towards the rear of the unit.**
See Figure 3-4.

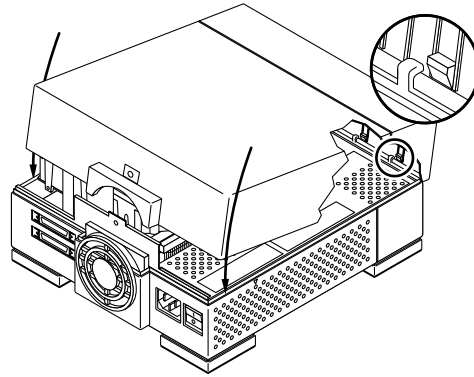


Figure 3-4 Replacing the Cover



Caution – The front of the cover is fragile. If the tabs do not hook properly on your first attempt, do not force the cover to the rear of the unit or down. Remove the cover and attempt to position the tabs until the tabs are hooked.

- 4. Install the lock block on the back of the unit.**
See Figure 3-1 on page 3-2.

Removing the Disk Drive Assembly

- 1. Disconnect the power supply power cable connector from its mating disk drive power connector.**
Grasp connector firmly in one hand, and with the other hand pull the power cable connector from its mating connector. See Figure 3-5.
- 2. Lift up on the metal handle of the SCSI connector clip and remove it from the SCSI port area.**
See Figure 3-5.

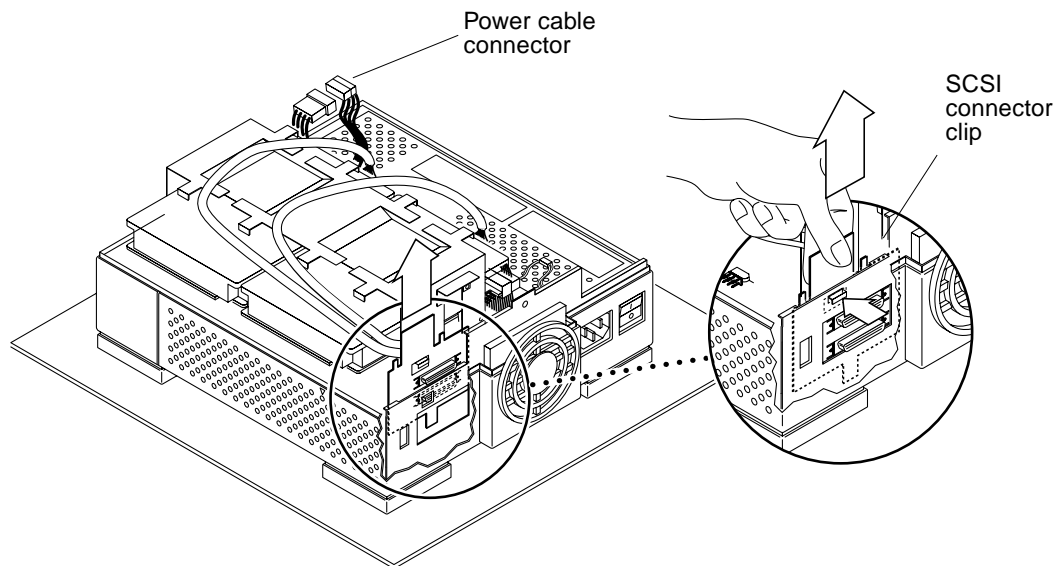


Figure 3-5 Removing the SCSI Connector Clip and Disconnecting the Power Connector

- 3. Loosen the two captive Phillips screws on the bottom of the unit.**
See Figure 3-6.
- 4. Lift the drive assembly up. Place the assembly on an antistatic mat.**
See Figure 3-6 and Figure 3-7.

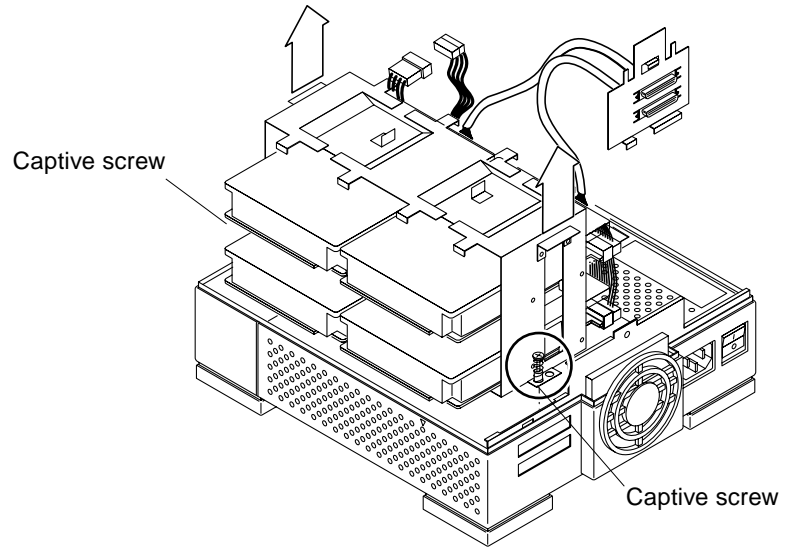


Figure 3-6 Removing the Drive Assembly

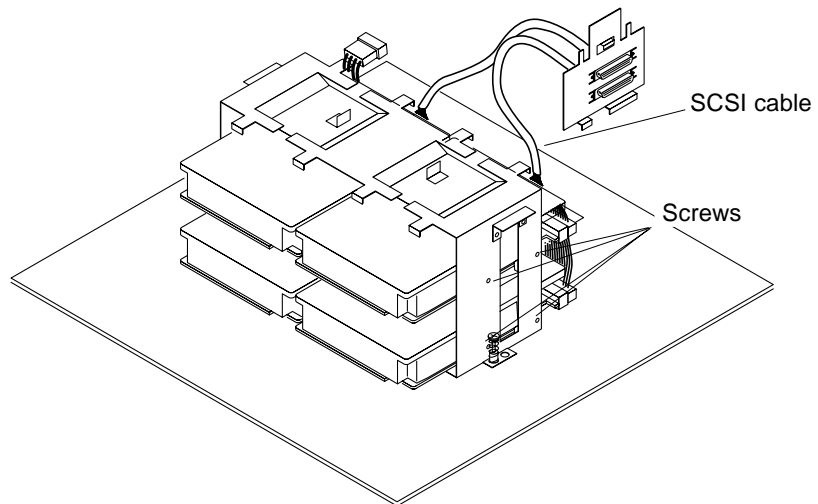


Figure 3-7 Disk Drive Assembly on an Antistatic Mat

Removing the Disk Drive from the Disk Drive Assembly

1. **Disconnect the SCSI cable and power cable from each disk drive you are replacing.**

See Figure 3-8 for connector locations on the disk drive.

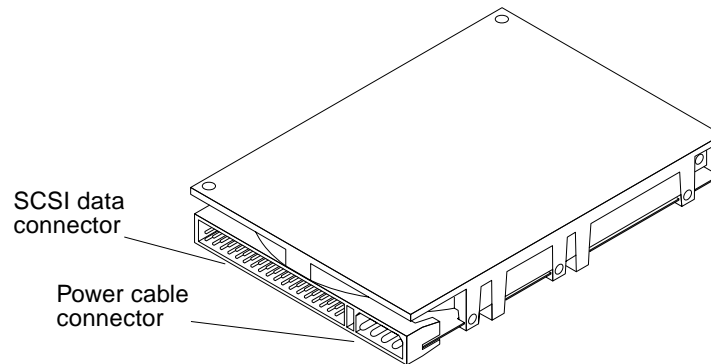


Figure 3-8 Location of SCSI Data Cable and Power Cable Connectors on a Disk Drive

2. **Remove the Phillips screws securing the disk drive to the assembly.**
See Figure 3-7 on the previous page.
3. **Carefully slide the drive out of the assembly.**
4. **Place the drive on an antistatic mat with the PCB side up.**
5. **Remove the screws securing the mounting plate to the disk drive.**
See Figure 3-9.

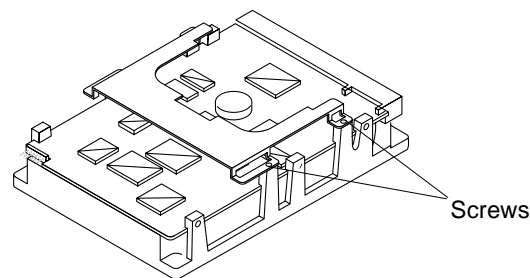


Figure 3-9 Drive with Mounting Plate Attached

Setting Jumpers and Preparing the Disk Drive for Installation

You can configure your drive with seven possible SCSI target address jumper settings:

- See Figure 3-10 for the available SCSI target address jumper settings on an IBM drive.
- See Figure 3-11 for the available SCSI target address jumper settings on a Seagate drive.

The SCSI target address jumper settings on the replacement drives are factory set to SCSI address 3.

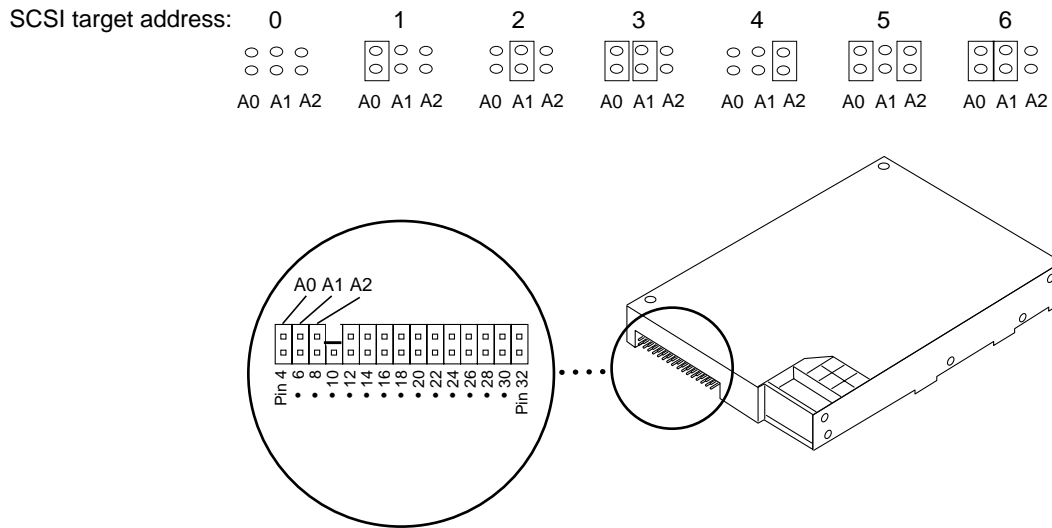


Figure 3-10 Available SCSI Target Address Jumper Settings—IBM Drive

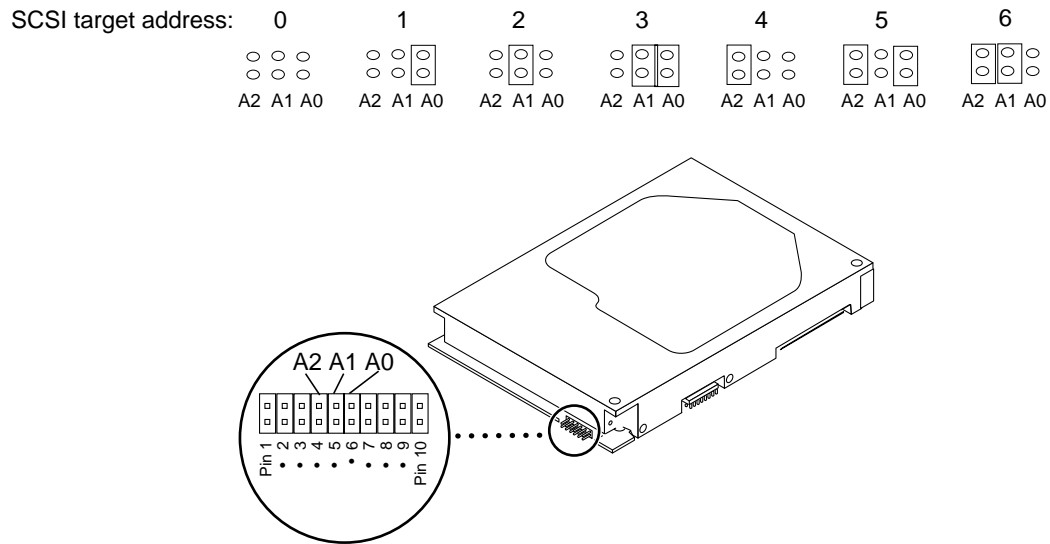


Figure 3-11 Available SCSI Target Address Jumper Settings—Seagate Drive

1. Compare the drive configuration jumper settings to Figure 3-12 or Figure 3-12.

- If your drive configuration jumper settings are the same as shown in the figure for your drive, leave them as they are.
- If the jumper settings are *not* the same, use needlenose pliers and change the jumpers to match the settings shown for your particular drive.

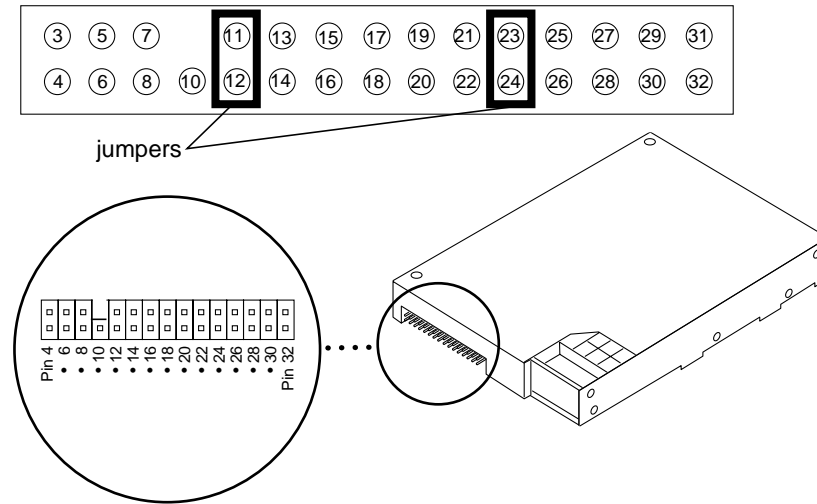


Figure 3-12 Configuration Jumper Settings—IBM Disk Drive

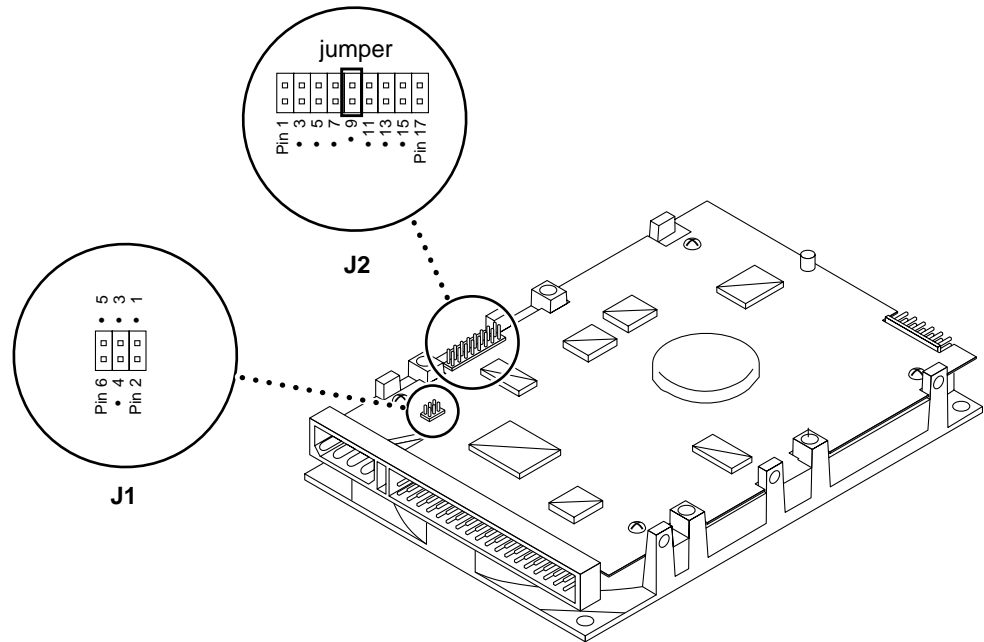


Figure 3-13 Configuration Jumper Settings — Seagate Disk Drive

2. **Install the mounting plate that you received with your new drive to the PCB side of the disk drive.**
See Figure 3-14. .

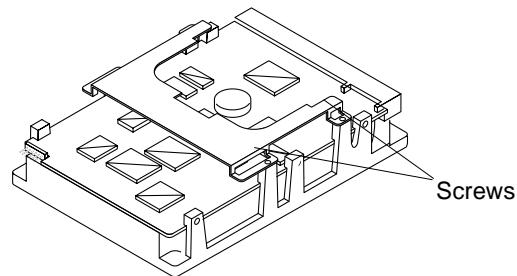


Figure 3-14 Disk Drive With Mounting Plate Attached

3. **Replace the drive in the assembly.**

Replacing a Disk Drive in the Disk Drive Assembly

1. **Slide the drive into the assembly.**
The PCB side of the disk drive will face down, and the SCSI data and power connectors face the power supply.
2. **Insert and tighten the screws securing the drive to the assembly.**
See Figure 3-7 on page 3-6.
3. **Connect the SCSI data cables to the SCSI data connectors of each drive.**
See Figure 3-15 on the next page. The connectors are keyed. Make sure that you connect the proper connector, labeled P2 through P4, to the proper SCSI connector on the disk drive.

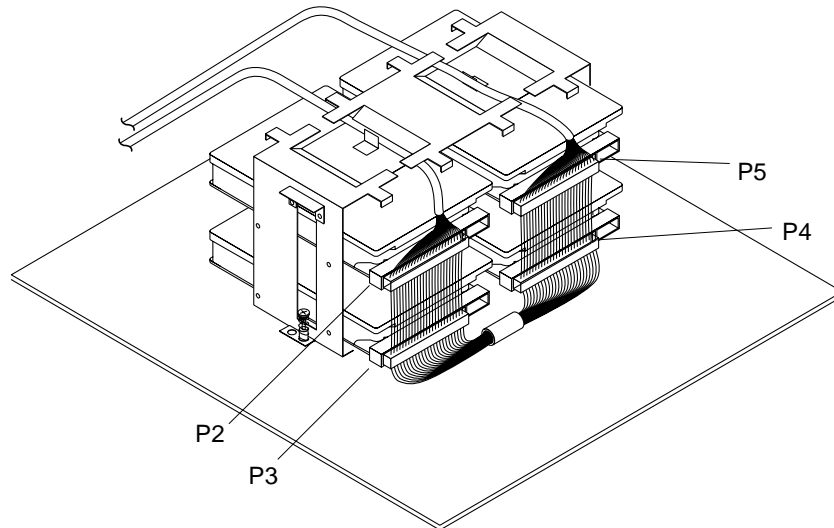


Figure 3-15 Connecting the SCSI Data Cables to the Disk Drives

4. **Connect the power cable to the power connector of each disk drive.**
See Figure 3-16.
5. **Install the disk drive assembly into the Multi-Disk Pack unit.**

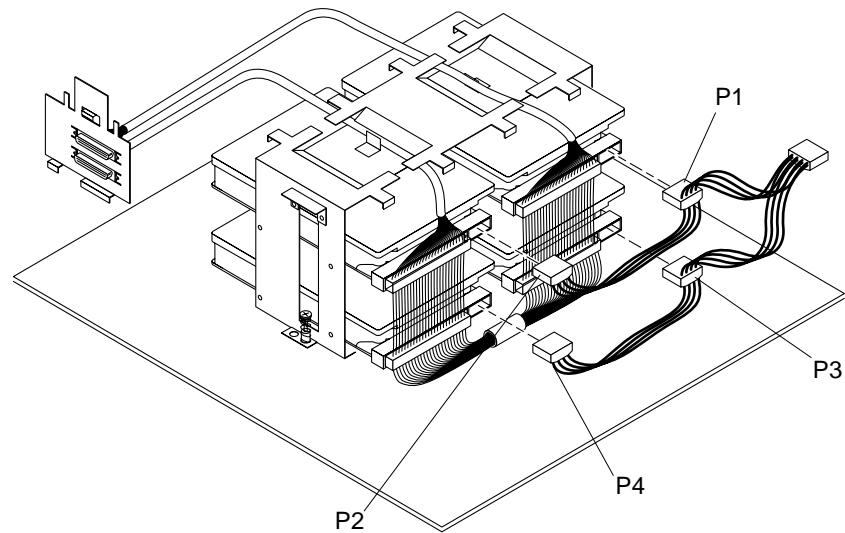


Figure 3-16 Connecting the Power Cables to the Disk Drives

Replacing the Disk Drive Assembly

- 1. Move the power supply cable leading from the I/O bracket/fan out of the unit.**
- 2. Lower the drive assembly. Rock it back and forth to make sure the drive assembly sits properly.**
- 3. Tighten the two captive screws on the bottom of the assembly.**
You may have to shift the drive assembly back and forth until the holes are aligned with the captive screws. See Figure 3-17.

Note – Do not use a power screwdriver on a captive screw.

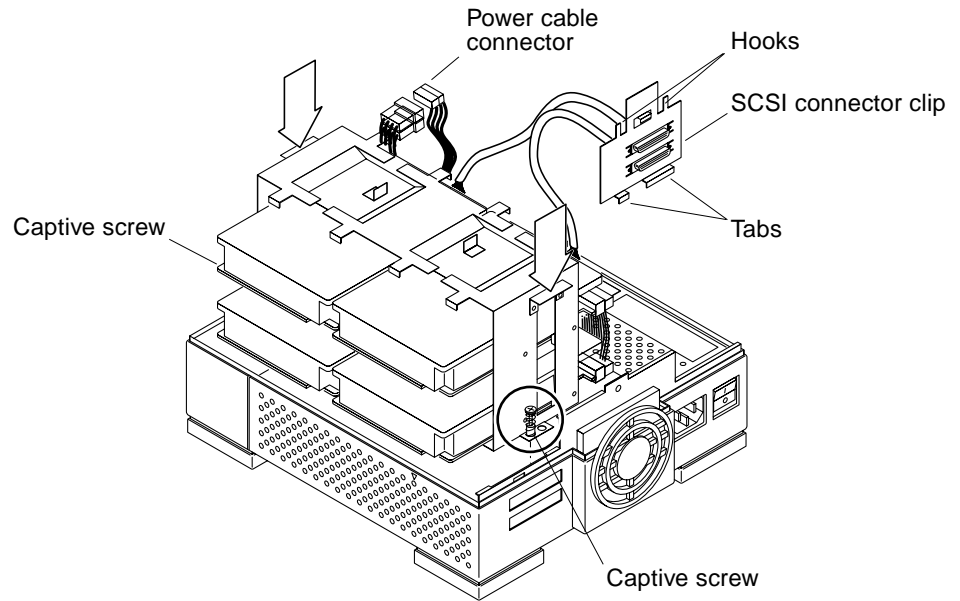


Figure 3-17 Lowering the Drive Assembly

4. Tuck the power supply cable leading from the fan into the unit.

5. Install the SCSI connector clip into the SCSI port area.

See Figure 3-17.

a. Lower the SCSI connector clip.

Align the two metal tabs at the bottom of the SCSI connector clip between the plastic molded tabs on the lower SCSI port opening of the unit.

You should see both SCSI connectors in the SCSI connector openings on the rear panel.

b. Holding the top of the SCSI connector clip, lift up on the SCSI connector clip.

The hooks on the top of the SCSI connector clip will lock into place on the rear of the unit.

Note – Make sure that the SCSI connector clip is completely and securely inserted. If it is loose, reinstall the SCSI connector clip. You may have to install the clip to a lower position in the opening then raise the clip slightly by lifting it and hooking the tabs to attach it to the unit and secure the clip.

6. Make sure that the SCSI cable is held in place by the two fingers on the top of the disk drive assembly

See Figure 3-18.

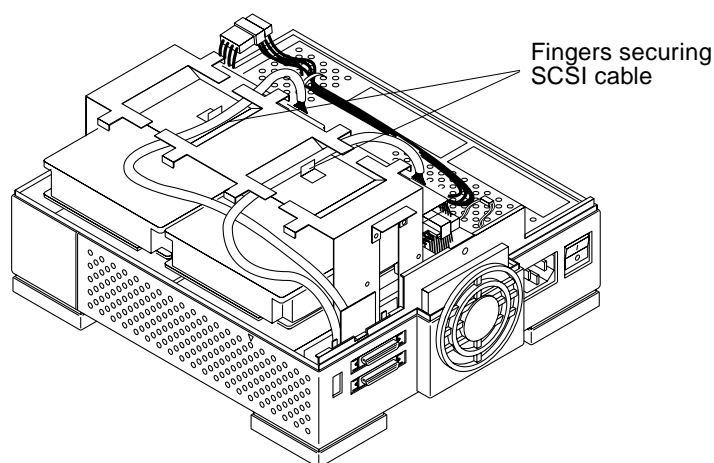


Figure 3-18 SCSI Cable Held in Place by Fingers on Disk Drive Assembly

7. Connect the power cable labeled P0 to the disk drive power connector.

See Figure 3-17.

8. Detach the wrist strap and replace the cover.

See “Replacing the Multi-Disk Pack Cover” on page 3-3.

Note – You must use a regulated SCSI terminator on the Multi-Disk Pack, or on the last device in the daisy chain if there are multiple external devices. The 2.1 Gbyte disk drive is a fast SCSI device and requires the regulated SCSI terminator. See Appendix B for descriptions of SCSI ports, types of connections, SCSI termination, and cable length.

Completing the Drive Installation

System configuration occurs after a system is successfully powered on. If the system shutdown was performed according to the procedure in Chapter 1, your system should automatically configure when you power on the system.

To complete the installation of the 2.1 Gbyte disk drive into your Multi-Disk Pack:

- 1. Go to the *Handbook for SMCC Peripherals* that came with your operating system.**
- 2. Follow the instructions in the “Configuring the System” section.**

Compliance Statements



This appendix contains the Safety Compliance statements translated into French, German, and Spanish. For the English version, see the Preface. These instructions explain how to work safely with the internal components of your system.

Conformité aux Normes de Sécurité

Cette préface traite des mesures de sécurité qu'il convient de suivre pour l'installation d'un produit Sun Microsystems, Inc.

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'objet quel qu'il soit dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence d'éléments haute tension. 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:



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



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

Warning – Marche – Le commutateur marche/arrêt de *marche*.

| est en position

Warning – Arrêt – Le commutateur marche/arrêt pri



est en position

Modification du Matériel

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

Positionnement d'un Produit Sun



Caution – 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.

Connexion du Cordon d'Alimentation



Warning – Avertissement – 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.



Warning – Avertissement – 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.



Warning – Avertissement – Votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils du type avec prise de terre. Pour écarter les risques d'électrocution, toujours brancher ce cordon dans une prise mise à la terre.

Couvercle



Caution – Attention – Il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Sicherheitsbehördliche Vorschriften

In diesem Anhang werden die Sicherheitsmaßnahmen beschrieben, die bei der Installation eines Produkts von Sun Microsystems, Inc., zu befolgen sind.

Sicherheitsmaßnahmen

Beachten Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsmaßnahmen, wenn Sie Ihre Geräte aufbauen:

- Beachten Sie alle auf den Geräten angebrachten Warnungen 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 niemals irgendwelche Gegenstände in Öffnungen in den Geräten. Es können gefährliche Spannungen vorliegen. Leitfähige fremde Gegenstände könnten einen Kurzschluß verursachen, der zu Feuer, Elektroschock oder einer Beschädigung Ihrer Geräte führen könnte.

Symbole

Die verwendeten Symbole haben die folgende Bedeutung:



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



Caution – Vorsicht – Gefahr von Personenverletzung und Geräteschaden. Anweisungen befolgen.

Caution – Ein – Der Hauptschalter steht auf *Ein*.



Caution – Aus – Der Hauptschalter steht auf *Aus*.



Änderung der Geräte

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, Inc., ist nicht verantwortlich für die Einhaltung behördlicher Vorschriften, wenn an einem Sun-Produkt Änderungen vorgenommen wurden.

Aufstellungsort eines Sun-Produkts



Caution – Vorsicht – Um einen zuverlässigen Betrieb Ihres Sun-Produkts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder bedeckt werden. Ein Sun-Produkt sollte niemals in der Nähe eines Heizkörpers oder einer Heizluftklappe aufgestellt werden.

Anschluß des Stromkabels



Warning – Warnung– Sun-Produkte sind für den Betrieb mit Einphasen-Stromsystemen mit einem geerdeten Mittelleiter vorgesehen. Um die Elektroschockgefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Arten von Stromsystemen an. Wenden Sie sich an Ihren Anlagenleiter oder einen qualifizierten Elektriker, wenn Sie sich nicht sicher sind, welche Art von Strom Ihr Gebäude erhält.



Warning – Warnung– Nicht alle Stromkabel besitzen die gleichen Stromnennwerte. Haushaltsverlängerungsschnuren haben keinen Überlastungsschutz und sind nicht zum Gebrauch mit Computersystemen bestimmt. Benutzen Sie keine Haushaltsverlängerungsschnuren für Ihr Sun-Produkt.



Warning – Warnung – Ihr Sun-Produkt wird mit einem Erdungs-Netzkabel (3-Leiter) geliefert. Um die Elektroschockgefahr zu reduzieren, schließen Sie das Kabel nur an eine geerdete Steckdose an.

Obere Abdeckung



Caution – Vorsicht – Der Betrieb von Sun-Produkten ohne obere Abdeckung ist nicht sicher. Bei Nichteinhalten dieser Vorsichtsmaßregel kann es zu Personenverletzung und Systemschäden kommen.

Conformidad Con La Agencia de Seguridad

Este prólogo presenta las precauciones de seguridad a seguir cuando se instala un producto de Sun Microsystems, Inc.

Precauciones de Seguridad

Para su protección, observe las siguientes preocupaciones de seguridad al instalar su equipo:

- Siga todos los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de su fuente de alimentación sean iguales al voltaje y frecuencia indicados en la etiqueta de la capacidad eléctrica nominal del equipo.

No introduzca jamás objetos de ninguna clase por las aberturas del equipo porque pueden estar presentes voltajes peligrosos. Cualquier objeto conductor extraño puede producir cortocircuito que podría causar incendio, electrochoque o daños a su equipo.

Símbolos

Los siguientes símbolos significan:



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



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



Caution – Encendido – El interruptor principal de encendido/apagado está en la posición de *encendido*.



Caution – Apagado – El interruptor principal de encendido/apagado está en la posición de *apagado*.

Modificaciones al Equipo

No haga modificaciones mecánicas o eléctricas al equipo. Sun Microsystems, Inc., no se hace responsable del cumplimiento de las regulaciones de un producto Sun si ha sido modificado.

Colocación de un Producto Sun



Caution – Precaución – Para lograr un funcionamiento seguro de su producto Sun y protegerlo contra el calentamiento excesivo, no se deben bloquear o cubrir las aberturas del aparato. Ningún producto Sun se debe colocar jamás cerca de un radiador o una fuente térmica.

Conexión del Cable de Alimentación



Warning – Aviso – Los productos Sun han sido diseñados para funcionar con sistemas de alimentación monofásicos que tengan un conductor neutro a tierra. Para reducir el riesgo de electrochoque, no enchufe los productos Sun a ningún otro tipo de sistema de alimentación. Si no está seguro del tipo de alimentación eléctrica que se suministra a su edificio, consulte al administrador de la propiedad o a un electricista profesional.



Warning – Aviso– No todos los cables de alimentación tienen la misma capacidad nominal de corriente. Las extensiones tipo casero no tienen protección contra sobrecargas y no están destinadas a usarse con sistemas de computación. No use extensiones caseras con su producto Sun.



Warning – Aviso – Su producto Sun se le provee con un cable de alimentación con salida a tierra (trifilar). Para reducir el riesgo de electrochoque, enchufe siempre el cable a un tomacorriente con conexión a tierra.

Cubierta Superior



Caution – Precaución– Los productos Sun no pueden funcionar sin riesgo si la cubierta superior no está colocada en su sitio. Si no toma esta precaución, correrá el riesgo de lesionarse personalmente y dañar el equipo.

Small Computer Systems Interface Information



This appendix describes the Small Computer Systems Interface (SCSI). Topics covered in this appendix include:

- SCSI ports and connections
- SCSI bus length
- SCSI bus termination information

SCSI Ports and Connections

If fast SCSI devices and old-style connectors must be used in the same system, the old-style connectors should be connected to a separate SCSI port that doesn't contain fast SCSI devices. Do not connect fast SCSI devices and old-style connectors in the same daisy chain.

Old-style connectors can be identified by a 3-row 50-pin D connector, a 50-pin ribbon style connector, or a 50-pin "Centronics style" of a connector (1/2-inch Front Load Tape (FLT) drive).

There is a microminiature SCSI port on the back panel of a DDP. The SCSI connectors have 50 pins divided into two rows. You can connect the DDP your system in two ways—*direct connection* or a *daisy chain*.

Direct Connection

Use a direct connection when you are connecting the first SCSI device in the SCSI bus to the desktop computer system by connecting one end of the SCSI cable to one of the SCSI ports of the DDP, and the other end of the SCSI cable to the SCSI port of the desktop system. You must connect a regulated SCSI terminator to the other SCSI port of the DDP.

Note – If you install a SBus card with an additional SCSI port in the desktop system, you can connect the DDP to the SCSI port of the SCSI card.

Daisy Chain Connection

A daisy chain connection is a means of connecting a number of SCSI peripherals to a host system. It allows a single port on the desktop system to connect to more than one SCSI peripheral. If you want more than one SCSI peripheral on a bus, you need to daisy chain.

Note – Devices with the old-style connectors (3-row 50-pin D connectors or 50-pin ribbon connectors) should not be used on the same bus (daisy-chained) with fast SCSI devices.

If you connect SCSI devices to your system in this manner, connect a regulated terminator to the unused SCSI port on the back panel of the last device in the daisy-chain.

SCSI Bus Length

A *bus* is a signal route to which several parts of a computer system may be connected so that signals can pass between them. The total length of a SCSI bus includes:

- The length of the external SCSI cable *plus*
- The length of the internal SCSI buses for the device and the system

Your desktop system performance is reliable with a maximum SCSI bus length of 20 feet (6 meters), as illustrated below. The internal signal path of your system unit and the external SCSI cables must not exceed this maximum length. If this length is exceeded, the system will not run in a reliable manner.

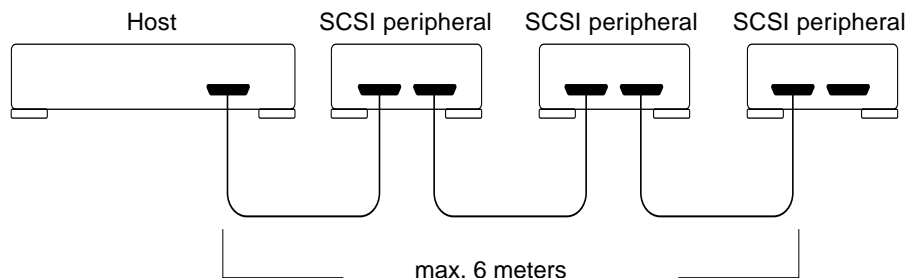


Figure B-1 Maximum SCSI Bus Length

Table B-1 lists the internal and external cable lengths for the DDP and most of the supported desktop systems and servers.

Note – When connecting the DDP to your system, find the total SCSI bus length for your configuration. To do this, add the length of the internal bus lengths of each device of the system to the length of the external SCSI cable, which can measure either 0.8, 2, or 4 meters in length. The total length must be less than 20 feet (6 meters).

Table B-1 SCSI Internal Cable (Bus) Lengths

Devices and Cables	SCSI CABLE LENGTH	
	Meters	Inches
Desktop Disk Pack (tape, disk, CD-ROM)	0.3	11.8
Desktop Storage Module (disk unit)	0.3	11.9
Desktop Storage Module (tape unit)	0.4	15.7
Multi-Disk Pack	1.0	39.3
SPARCstation 2 and IPX	0.5	19.7
SPARCstation 10, LX, SPARCclassic	0.9	35.4
SPARCstation ELC	0.2	7.8
SBus cards (SBE/S, FSBE/S, SBus SCSI Host Adaptor)	0.1	3.9
SBus Expansion Subsystem	0.9	35.4

Table B-1 SCSI Internal Cable (Bus) Lengths

Devices and Cables	SCSI CABLE LENGTH	
	Meters	Inches
SPARCstation 5	1.6	62.6
SPARCstation 20	1.6	62.6
SPARCstation Voyager	0.4	15.7
SPARCserver 1000*	1.8	70.2

* Only for first system board. For any other system board, use 0.9

** Does not contain an on-board SCSI interface

Examples of Computing SCSI Bus Lengths

- If you have a SPARCstation 2 and two DDPs, add the following cable lengths:
 - 0.5 meters (for the internal circuitry of the SPARCstation 2)
 - 1.6 meters (for two DDP cables, 0.80 m x 2)
 - 0.6 meters (for the internal circuitry of two DDPs
0.3 m x 2)

The total length of cable for this configuration is 2.7 meters of cable, less than the 6 meter maximum for each SCSI bus.

- If you have a SPARCstation 10 and two DDPs, add the following cable lengths:
 - 0.9 meters (for the internal circuitry of the SPARCstation 10)
 - 1.6 meters (for two DDP cables, 0.80 m x 2)
 - 0.6 meters (for the internal circuitry of two DDPs
(0.3 m x 2))

The total length of cable for this configuration is 3.1 meters of cable, less than the 6 meter maximum for each SCSI bus.

- If you have a SPARCstation IPX, one DDP, and one Desktop Storage Module with a disk drive, add the following cable lengths:
 - 0.5 meters (for the SPARCstation IPX)
 - 0.8 meters (for the DDP cable)
 - 0.3 meters (for the internal circuitry of the DDP)

- 0.8 meters (for the Desktop Storage Module cable)
- 0.3 meters (for the internal circuitry of the Desktop Storage Module)

The total length of cable for this configuration is 2.7 meters of cable, less than the 6 meter maximum for each SCSI bus.

Additional SCSI Buses

If the SCSI bus length exceeds 6 meters, you can install some of the devices on additional SCSI buses by installing an SBus SCSI Host Adapter card (SSHA) or a FSBE/S with desktop systems or an SBE/S SBus card with deskside systems. The SBus SCSI Host Adapter card provides an additional SCSI port (SCSI bus) for your system. The SBE/S or FSBE/S SBus card provides an additional SCSI port and an Ethernet port.

When you insert an SBus SCSI Host Adapter card into your system, the SCSI bus length total does not include the internal cable length of the system, listed in Table B-2. For example, if you have a SPARCstation IPC and are connecting two Desktop Storage Modules and two DDPs to the SBus SCSI Host Adapter card of the system, you need to add the following cable lengths:

- 3.2 meters (4 SCSI cables, 0.8 meters x 4 cables)
- 0.8 meters (2 DSMs, 0.4 meters x 2 units)
- 0.6 meters (2 DDPs, 0.3 meters x 2 units)
- 0.1 meters (SBus SCSI Interface FSBE/SSHA/SBE)

The total length of cable for this configuration is 4.5 meters of cable length, less than the 6 meter maximum for each SCSI bus. Note that you do not include the internal bus length of the SPARCstation IPC (0.5 meters).

Additional SCSI buses, SCSI bus 1, 2, 3, and 4 are named based on the order they are found by the OpenBoot™ PROM when probing SBus slots. SBus slots are probed in this order: on-board, slot 0, slot 1, slot 2, slot 3.

For example, if the first FSBE/S SBus card is in slot 2, when the system probes the SBus slots, it begins probing the on-board SCSI bus, then SBus slot 1, then SBus slot 2, and so on. Because slot 2 contains the first FSBE/S SBus card, this is SCSI bus 1. As Table B-2 illustrates, SCSI bus 1 supports disk, tape, and CD-ROM.

Table B-2 Devices Supported With Additional Single-ended SCSI Buses (SunOS 4.1.x)

SCSI Bus Number	Device
SCSI bus 1, first FSBE/S SBus card	Disk
	Tape
	CD-ROM
SCSI bus 2, second FSBE/S SBus card	Disk
SCSI bus 3, third FSBE/S SBus card	Disk
	Tape
	CD-ROM
SCSI bus 4, fourth FSBE/S SBus card	Disk

Note – For the Solaris 2.x operating system, tape, disk and CD-ROM devices are supported on all SCSI buses

Terminating SCSI Devices

You must attach a regulated SCSI terminator to the SCSI port at the end of the SCSI bus. A terminator holds the bus at a predetermined signal level when the bus is not active and maintains impedance matching.

All SCSI daisy chains must be terminated at the last unit attached to the SCSI bus. Also, a terminator is built in to all SBus SCSI cards and to all host systems to terminate that end of the bus. The regulated terminators must be used for all 50-pin SCSI buses having fast SCSI drives on a fast SCSI host.

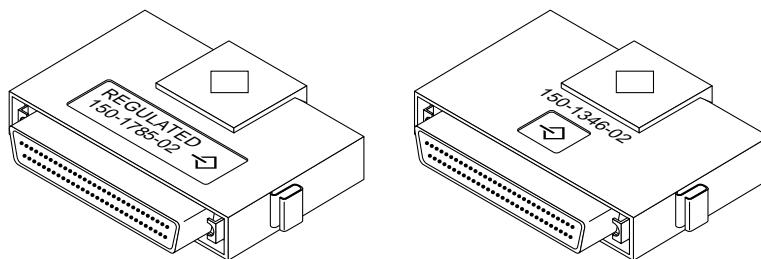


Figure B-2 Regulated and Nonregulated Terminators

SCSI Termination Guidelines

- The SCSI device at the end of a daisy chain *must* be electrically terminated.
- Only the last device in a SCSI daisy chain is terminated.
- Any fast SCSI device or a daisy chain of fast SCSI devices must be terminated with a regulated terminator.
- Any configuration with an External Expansion Module (EEM) or an External Storage Module (ESM) must have a DDP as the last device to provide regulated term power.

50-pin Ribbon Connectors

Devices with the 3-row 50-pin D connector or the 50-pin ribbon connector (old-style connectors) should not be used on the same bus with fast SCSI devices.

Note – The mixing of fast SCSI devices and old-style connectors in the same daisy chain is not recommended since errors may be created and performance may be degraded.

If fast SCSI devices and old-style connectors must be used in the same system, the old-style connectors should be connected to a separate SCSI port that doesn't contain fast SCSI devices.

If you are using SunOS 4.1.3 (Solaris 1.1) or a later version with a fast SCSI bus, you must turn off the fast bus or performance will be degraded.

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Reader Comments

We welcome your comments and suggestions to help improve this manual. Please let us know what you think about the *2 Gbyte Standard Connector Disk Drive Installation Manual*, part number 802-3527-10.

- The procedures were well documented.

Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
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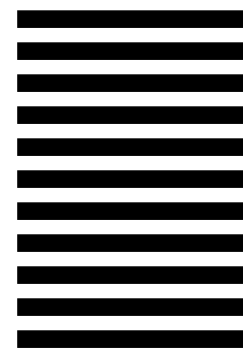
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