

Part Number 813-1013-05
Revision: A of July 21, 1986

Sun 575 MByte Disk Drive

Installation Manual

Sun Microsystems, Inc.,
2550 Garcia Avenue,
Mountain View,
California 94043
(415) 960-1300

Credits and Trademarks

Multibus is a trademark of Intel Corporation.

VMEbus is a trademark of the VME Manufacturers Group.

Sun Microsystems and **Sun Workstation** are registered trademarks of Sun Microsystems, Incorporated. **Sun-3**, **Sun3**, **Sun-3/xxx**, **Deskside**, **SunStation**, **SunCore**, **SunWindows**, and **DVMA** are trademarks of Sun Microsystems, Incorporated.

UNIX is a trademark of AT&T Bell Laboratories.

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

Copyright © 1986 by Sun Microsystems, Inc.

This publication is protected by Federal Copyright Law, with all rights reserved. No part of this publication may be reproduced, stored in a retrieval system, translated, transcribed, or transmitted, in any form, or by any means manual, electric, electronic, electro-magnetic, mechanical, chemical, optical, or otherwise, without prior explicit written permission from Sun Microsystems.

Contents

| | |
|---|-----------|
| Chapter 1 Unpacking the Disk Drive | 3 |
| 1.1. Tools Required | 3 |
| 1.2. Unpacking | 4 |
| Chapter 2 Site Requirements | 9 |
| 2.1. Physical Environment | 9 |
| 2.2. Electrical Environment | 11 |
| 2.3. System Cooling | 11 |
| Chapter 3 Preparing for Rack Installation | 15 |
| 3.1. Orientation | 15 |
| 3.2. Tools Required | 15 |
| 3.3. Sun Rack - Filler Panel Removal | 16 |
| 3.4. Slide Mounting Instructions | 16 |
| Chapter 4 Disk Drive Rack Installation | 25 |
| 4.1. Tools Required | 25 |
| 4.2. Stabilizing the Rack | 25 |
| 4.3. Rack Mounting Instructions | 26 |
| 4.4. Securing the Drive in the Rack | 27 |
| 4.5. Rack Service Clearance | 29 |
| Chapter 5 Installing the Disk Drive Controller Board | 33 |
| 5.1. Tools Required | 33 |
| 5.2. The Disk Drive Controller Board | 33 |

| | |
|--|-----------|
| 5.3. Installing the Controller Board in VMEbus Systems | 33 |
| 5.4. System Hardware Configuration | 34 |
| Chapter 6 System Cabling | 37 |
| 6.1. System Cabling - Single Drive | 37 |
| 6.2. Drive Identification - Dual Drive | 37 |
| 6.3. System Cabling - Dual Drive | 38 |
| Chapter 7 Power-up and Use of Diagnostics | 43 |
| 7.1. Power Up in Sun Rack with Power Controller | 43 |
| 7.2. Power Up Not Using the Sun Rack | 44 |
| 7.3. Use of Diagnostics | 44 |
| Chapter 8 Fault Troubleshooting | 47 |
| Appendix A 2.x and Earlier DIAG Software | 51 |
| Index | 53 |

Figures

| | |
|--|----|
| Figure 1-1 Exterior Shipping Carton | 4 |
| Figure 1-2 Interior Shipping Carton | 5 |
| Figure 2-1 Physical Dimensions | 10 |
| Figure 3-1 Slide Rail Assembly Parts | 17 |
| Figure 3-2 Slide Rail Installation | 18 |
| Figure 3-3 Placement of Rear Mounting Brackets | 19 |
| Figure 3-4 Slide Mount Installation | 20 |
| Figure 4-1 Sun Rack Outriggers | 26 |
| Figure 4-2 Securing the Drive in the Rack | 28 |
| Figure 4-3 Rack Service Clearance | 29 |
| Figure 6-1 Dual Drive Cabling Configuration | 39 |



Tables

| | |
|---|----|
| Table 2-1 Physical Environment Specifications for the Disk Drive | 9 |
| Table 2-2 Physical Environment Specifications for the Disk Drive - Continued | 10 |
| Table 2-3 Physical Dimensions and Weight | 10 |
| Table 2-4 Electrical Environment Specifications for the Disk Drive | 11 |
| Table 3-1 Disk Drive Mounting Bracket Height Specifications | 21 |
| Table 6-1 Drive Option Numbers | 38 |



Preface

The Sun 575 MByte high performance disk drive is a rack-mountable unit that has an unformatted capacity of 689 Megabytes (formatted 575 Megabytes).

This document and those documents listed in Table 2, provide the information necessary to unpack, configure and install the disk drive in a 19" rack.

NOTE: The Sun 575 MByte high performance disk drive is a new product, and is desiged to be mounted into Sun's new full-height (76") 19" Rack. To install this disk drive into Sun's "old" full-height Rack requires modifications that are not supported by Sun. The following Table lists some of the more obvious differences between the new and old full-height racks.

Table 1 *Differences Between the Old and New Full-Height Racks*

| Old Rack | New Rack |
|--|--|
| Has a rear door | Has filler panels (where required) instead of a door |
| Has a cooling blower in the bottom-rear of the rack | Has an exhaust fan at the top of the rack |
| Has the power controller mounted directly above the cooling blower | Has the power controller mounted directly below the bottom rear of the logic enclosure |

The filler panels on the new rack are there to provide a chimney effect for the cooling system, and are not used to maintain FCC shielding standards: all rack-mounted options meet FCC shielding standards independently of the rack. In contrast, the rear door on the old rack was necessary to meet the FCCs standards for many options.

| | |
|---------------------|---|
| Summary of Contents | This manual has eight chapters and an appendix: |
| Chapter 1 | <i>Unpacking the Disk Drive</i> — Gives directions for removing the disk drive from its shipping container. |
| Chapter 2 | <i>Site Requirements</i> — Defines the environmental requirements for Disk Drive operation. |
| Chapter 3 | <i>Preparing for Rack Installation</i> — Provides the procedures for preparing both the disk drive and rack for drive installation. |
| Chapter 4 | <i>Disk Drive Rack Installation</i> — Describes how to install the prepared disk drive into the rack. |
| Chapter 5 | <i>Installing the Disk Drive Controller Board</i> — Describes the installation of the disk drive controller board into the host system. |
| Chapter 6 | <i>System Cabling</i> — Describes the necessary cable interconnection for operation of either one or two disk drives from a single disk drive controller board. |
| Chapter 7 | <i>Power-up and Use of Diagnostics</i> — Provides instructions for the initial power-up of the disk drive, and how to use the 3.x DIAG software to configure a Sun Workstation to the disk drive. |
| Chapter 8 | <i>Fault Troubleshooting</i> — Provides information concerning the most common installation problems. |
| Appendix | <i>2.x and Earlier DIAG Software</i> — Provides instructions on how to use 2.x (or earlier) DIAG software to configure a Sun Workstation to the Sun 575 MByte disk drive. |

List of Applicable Documents Refer to the following documents for additional information.

NOTE *Note that in the Table below various Installation Manuals are referenced. In practice, you will need only the Hardware Installation Manual that applies to your host pedestal; you will not need them all.*

Table 2 *List of Applicable Documents*

| Part Number | Description |
|-------------------|---|
| 800-1423-XX | Fujitsu M2361A Customer Engineering Manual |
| 813-2002-XX | Xylogics 450/451 Disk Controller Configurations |
| 813-2004-XX | Card Cage Slot Assignments and Backplane Configuration Procedures |
| 813-2005-XX | Fujitsu 2361A Disk Drive Configuration Procedures |
| 800-1314-XX | Sun3/160 Hardware Installation Manual |
| 800-1144-XX | Sun-2/130/160 Hardware Installation Manual |
| 800-1362-XX | Installation Manual for Sun3/180 Rackmounted System |
| Release Dependent | System Administration for the Sun Workstation |



Unpacking the Disk Drive

| | |
|--------------------------------|---|
| Unpacking the Disk Drive | 3 |
| 1.1. Tools Required | 3 |
| 1.2. Unpacking | 4 |





Unpacking the Disk Drive

The following section describes how to unpack the Sun 575 MByte disk drive from the shipping carton.

NOTE *If you received your Sun 575 MByte Disk Drive preinstalled in a Sun rack, you may ignore Chapters 1 through 5. Please skip to Chapter 6.*

1.1. Tools Required

- Knife or scissors

CAUTION **Exercise great care when following the procedures described in this document. Because of the substantial weight of the disk drive, serious personal injury and equipment damage could result from carelessness or a failure to follow the procedures.**

Observe common-sense safety precautions as you would for any electrical or electronic equipment. Always power down and disconnect the power cord before opening any system enclosure.

Please refer all servicing not described in this document to qualified service personnel. If in doubt, call Sun's Field Service Dispatch Center toll free at 800-USA-4SUN.

1.2. Unpacking

The disk drive is shipped inside two cartons that surround it in shock absorbing material (see Figures 1-1 and 1-2).

These concentric cartons surrounding the disk drive are strapped to a shipping pallet with fiber bands. The disk drive controller board, cables and applicable documentation are shipped in a separate "base box."

NOTE *Save the shipping cartons. You may want them for future use to transport the drive.*

Figure 1-1 Exterior Shipping Carton

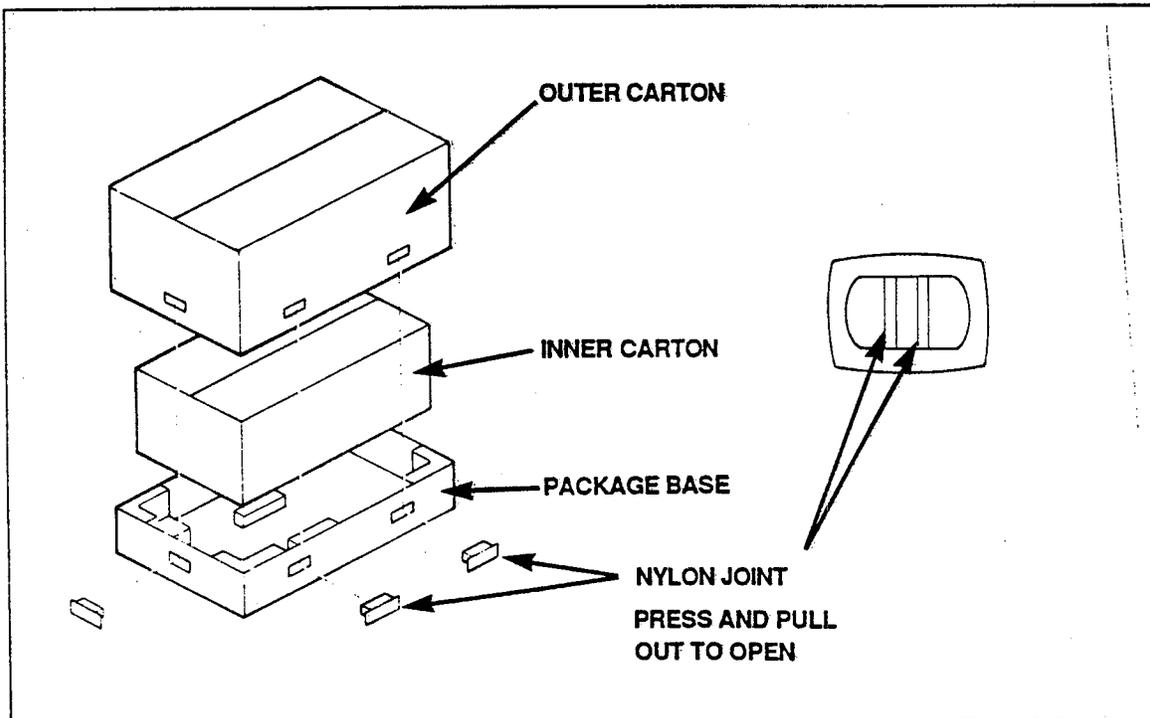
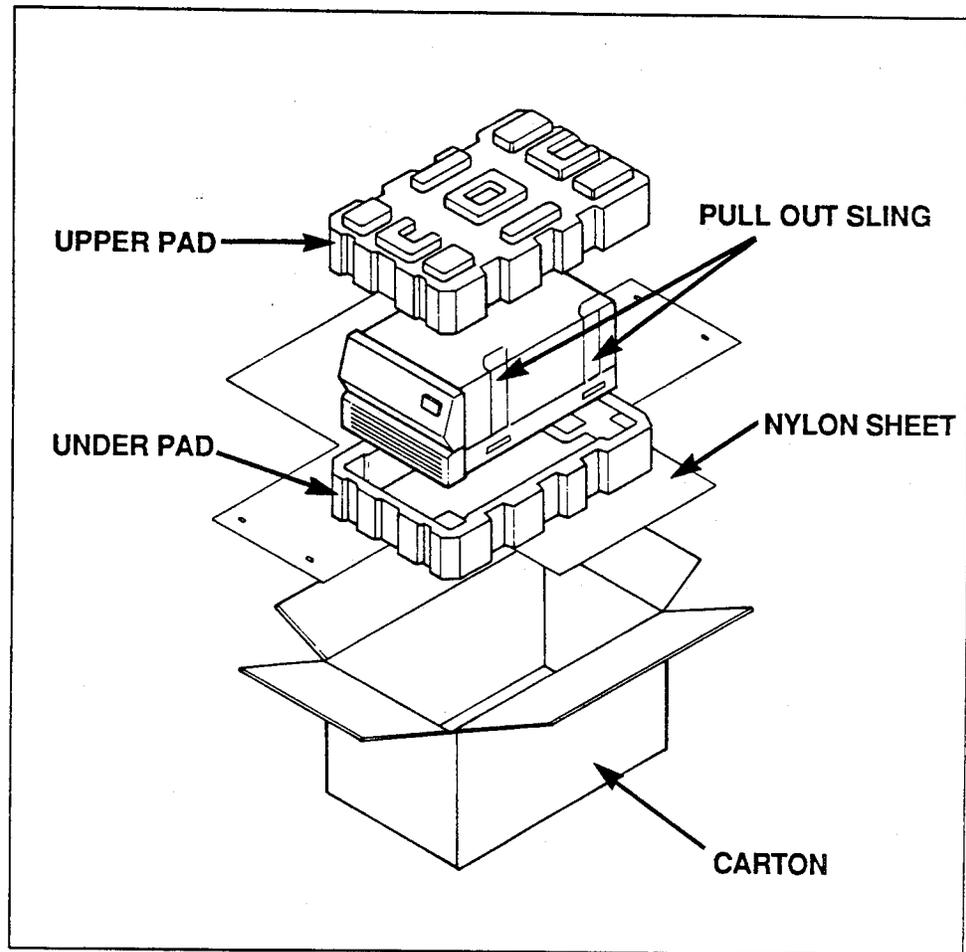


Figure 1-2 Interior Shipping Carton



When you receive your shipment, inspect all shipping cartons *immediately* for any evidence of damage. If any carton is severely damaged, request that the carrier's agent be present when the carton is opened. If the carrier's agent is not present when a carton is opened and the contents are found to be damaged, keep all contents and packing materials for the agent's inspection.

WARNING: The drive weighs approximately 176 lbs. Therefore at least two people should be available to unpack it from the carton.

To unpack the drive from its shipping carton, perform the following steps:

NOTE *Be aware that the disk drive should never be stored in an upside-down position.*

1. When unpacking the disk drive, carefully preserve and save the shipping materials for future use.
2. Cut the two fiber bands securing the drive's shipping carton to the pallet.

3. Remove the nylon joints from the exterior shipping carton as shown in Figure 1-1, and lift away the exterior shipping carton .
4. Open the interior shipping carton, and remove the upper pad.
5. Lift the disk drive out of the carton by means of the nylon bands (do not lift the disk drive by using the front panel or cover).

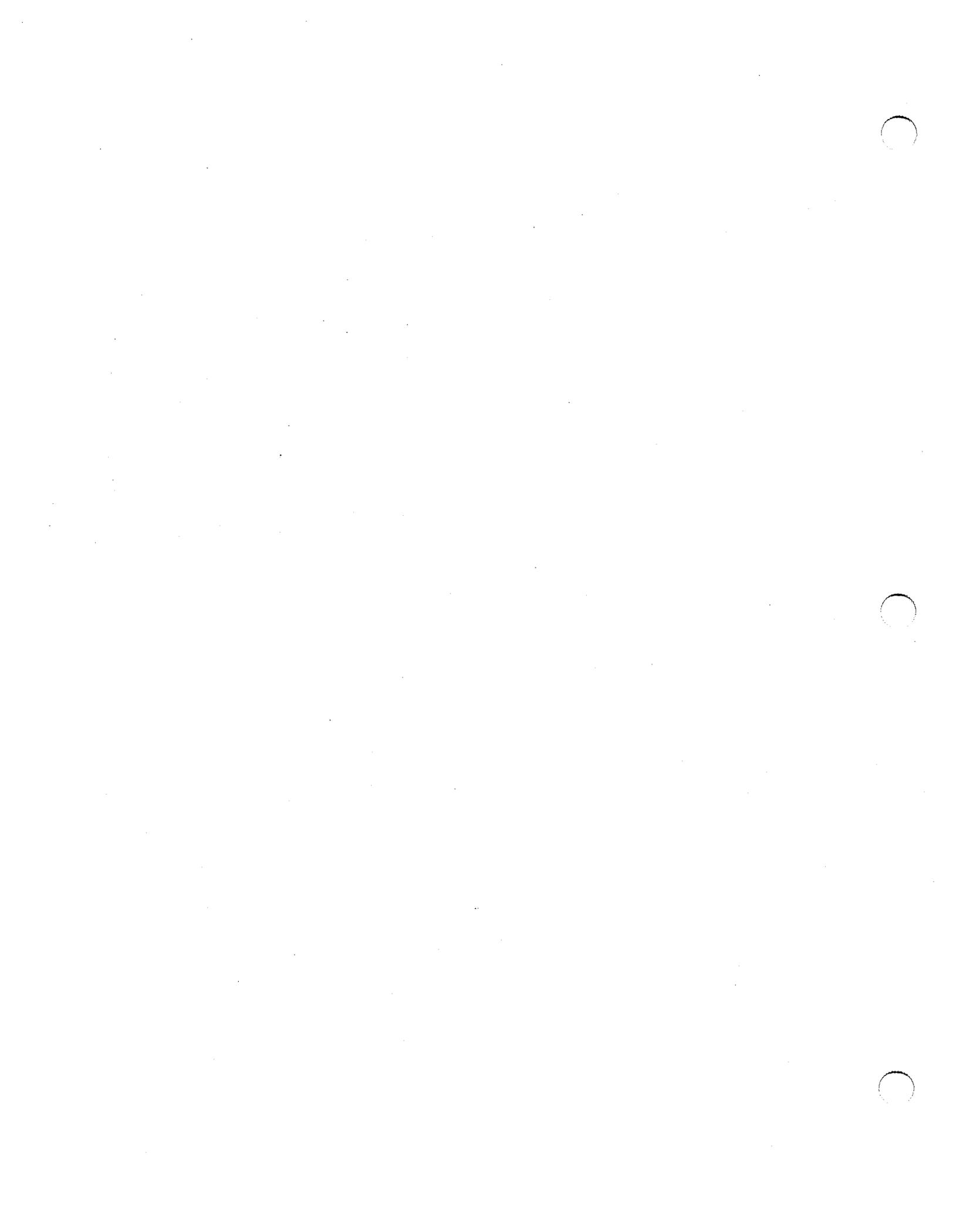
NOTE *Move the disk drive slowly and carefully to prevent unnecessary shock.*

6. The Slide Rails are packed in bubble-wrap, and are shipped in between the Exterior and the Interior Shipping Cartons. Be sure to remove them from the carton before storing the shipping materials for future use.

Site Requirements

| | |
|-----------------------------------|----|
| Site Requirements | 9 |
| 2.1. Physical Environment | 9 |
| 2.2. Electrical Environment | 11 |
| 2.3. System Cooling | 11 |





Site Requirements

2.1. Physical Environment

The disk drive is manufactured for the following physical environment:

Table 2-1 *Physical Environment Specifications for the Disk Drive*

| Temperature | | |
|--------------------------------|---|--|
| Range | | |
| <i>In Carton</i> | <i>On Site - Non Operating</i> | <i>On Site - Operating</i> |
| - 5°C to 60°C | - 5°C to 60°C | 10°C to 40°C The drive must not experience a temperature change of more than 17°C per hour. |
| Shock | | |
| <i>In Carton</i> | <i>On Site - Non Operating</i> | <i>On Site - Operating</i> |
| 5G (Max. for 30 ms) | 3G (Max. for 10 ms) | 2G (Max. for 10 ms) |
| Humidity | | |
| <i>In Carton</i> | <i>On Site - Non Operating</i> | <i>On Site - Operating</i> |
| 5% to 95% RH Non Condensing | 20% to 80% RH Non Condensing Max. change 10% per hour | |
| Vibration | | |
| <i>In Carton</i> | <i>On Site - Non Operating</i> | <i>On Site - Operating</i> |
| 3G | 0.2G (5 to 50 Hz) 1G (50 to 500 Hz) | |

Table 2-2 *Physical Environment Specifications for the Disk Drive - Continued*

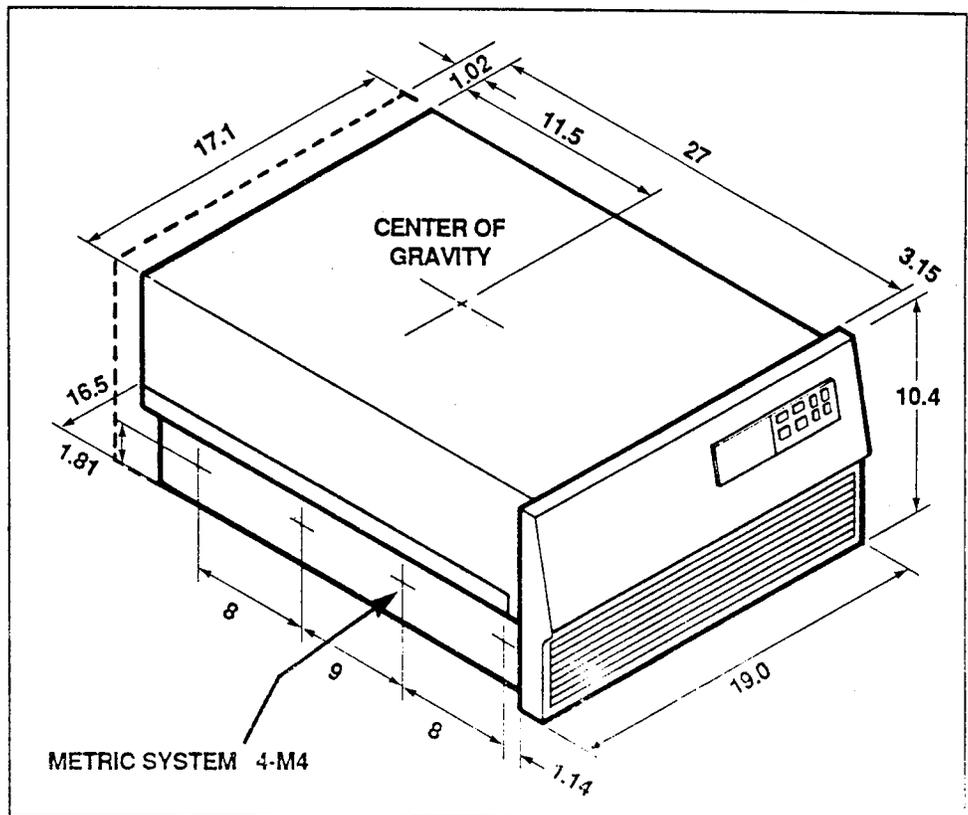
| Altitude | |
|----------------------|---------------------|
| <i>In Carton</i> | <i>Operating</i> |
| 40,000 ft (12,000 m) | 10,000 ft (3,000 m) |

* °C = 5/9 (°F-32)

Table 2-3 *Physical Dimensions and Weight*

| Physical Specifications | | |
|-------------------------|---------|----------|
| <i>Height</i> | 10.4" | (264 mm) |
| <i>Width</i> | 19" | (483 mm) |
| <i>Depth</i> | 30.15" | (766 mm) |
| <i>Weight</i> | 176 lbs | (80 kg) |

Figure 2-1 *Physical Dimensions*



For an illustration of the service clearances necessary for rack installation, see Figure 4-3 — *Rack Service Clearance*.

2.2. Electrical Environment

The disk drive requires an electrical environment that will sustain it under the following operating conditions:

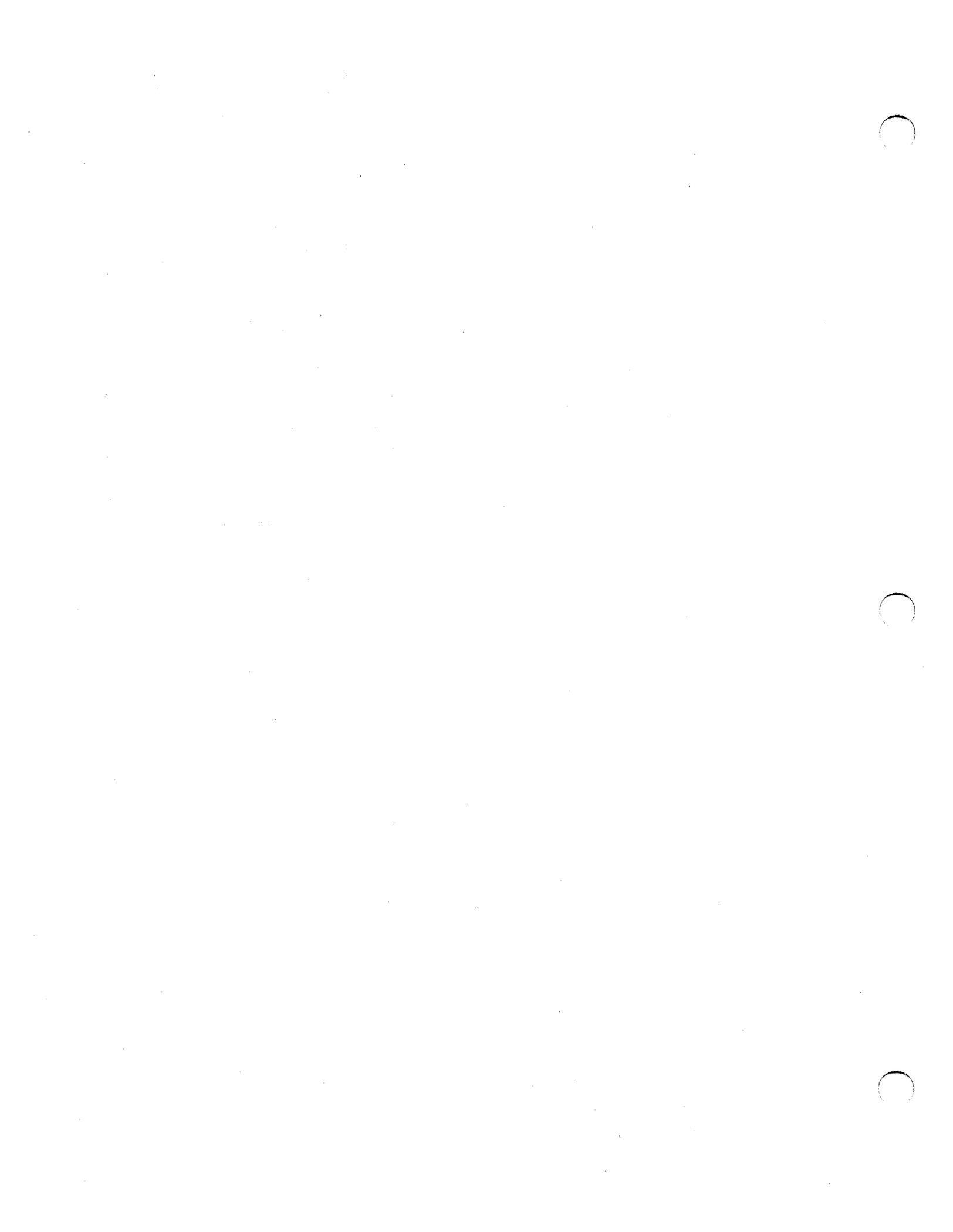
Table 2-4 *Electrical Environment Specifications for the Disk Drive*

| Voltage (Vac \pm 10%) | Frequency (Hz \pm 2Hz) | Current (AC) | | Power Consumption (kVA) | Heat Dissipation | |
|----------------------------|-----------------------------|--------------|---------|-------------------------------|------------------|-------------|
| | | Starting * | Running | | Kcal/hour | BTU/hour |
| 100 | 50/60 | 7.8/7.3 | 6.0/5.7 | 0.60/0.57 | 470/440 | 1,800/1,700 |
| 120 | 50/60 | 6.5/6.3 | 4.8/4.6 | 0.57/0.55 | 440/430 | 1,700/1,600 |
| 200 | 50/60 | 4.3/3.8 | 3.1/3.0 | 0.62/0.60 | 480/470 | 1,900/1,800 |
| 220 | 50/60 | 4.1/3.6 | 2.9/2.8 | 0.64/0.62 | 500/480 | 2,000/1,900 |
| 240 | 50/60 | 4.0/3.5 | 2.6/2.5 | 0.62/0.60 | 480/470 | 1,900/1,800 |

* Worst case transient with a maximum of 40 amps for less than 1/2 cycle of AC Input power.

2.3. System Cooling

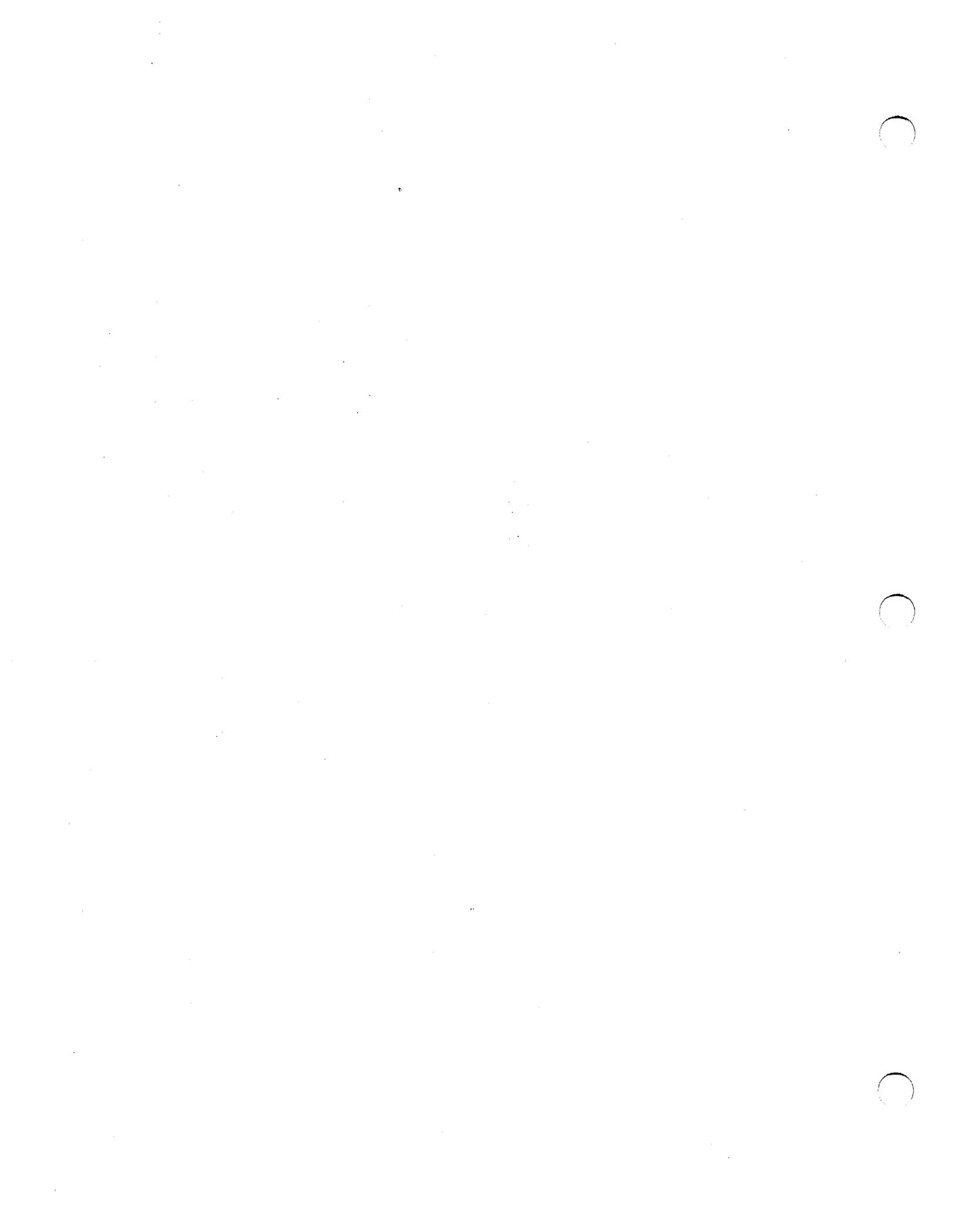
The disk drive is designed to operate at temperatures up to 104°F (40°C) without any additional cooling. If the drive is installed in the Sun rack, the operating temperature of the drive will be within specifications. If the drive is installed into some other configuration, the ambient air temperature entering at the front of the drive MUST be 40°C or less.



Preparing for Rack Installation

| | |
|--|----|
| Preparing for Rack Installation | 15 |
| 3.1. Orientation | 15 |
| 3.2. Tools Required | 15 |
| 3.3. Sun Rack - Filler Panel Removal | 16 |
| 3.4. Slide Mounting Instructions | 16 |





Preparing for Rack Installation

The information contained in this Chapter and Chapter 4 — *Disk Drive Rack Installation* is oriented towards installing the disk drive into a Sun 19" Rack. If you plan to install the disk drive into some other rack or cabinet, you may need to supplement these Chapters with information contained in the Fujitsu Customer Engineering Manual.

NOTE *If you are installing the Sun 575 MByte Disk Drive into a non-Sun Rack with unthreaded RETMA rails, you will need to use all of the Fujitsu hardware (see Figure 2.5.2 in the Fujitsu Customer Engineering Manual) except for the Drive Securing Bracket, the Upper Mounting Bracket and its associated hardware (see Figure 4-2 — Securing the Drive in the Rack of this manual).*

If you are installing the Sun 575 MByte Disk Drive into a Sun Rack, it is particularly important that you use 10-32 screws when attaching anything to the RETMA rails. Use of the metric screws provided by the disc drive manufacturer could permanently damage the Sun Rack.

IMPORTANT - If two disk drives are to be installed into the Rack or a second disk drive is to be added, read Section 6.2 — *Drive Identification - Dual Drive* and Table 3-1 — *Disk Drive Mounting Bracket Height Specifications* in this manual before continuing.

3.1. Orientation

All directions concerning the Disk Drive such as left, right, front and back are referenced to viewing the Disk Drive while looking at its large, beige front panel.

3.2. Tools Required

The following tools are required to prepare the disk drive and rack for drive installation.

- #2 Phillips head screwdriver - total length (handle and shaft) should not exceed 9", or the driver's shaft should be at least 10" in length.
- Tape Measure - minimum length of 2 feet
- Absorbent material for cleaning hands (Slide Rail Assembly is very oily)

3.3. Sun Rack - Filler Panel Removal

If a single Sun 575 MByte drive is to be installed into the Rack, it should always be placed in the bottom most part of the Rack. To gain access to this portion of the Rack, you must remove three filler panels: two in the bottom front and one in the bottom rear. The front filler panels are 7 inches and 3 1/2 inches high. The rear filler panel is 10 1/2 inches high.

If two Sun 575 MByte drives are to be installed into the Rack, then Drive 1 should be installed above Drive 0 (this is the convention), and, as well as removing the panels mentioned in the previous paragraph, you should remove the two 3 1/2" and one 7" panels from the middle front of the rack and also the middle rear 10 1/2" panel from the rear of the Rack.

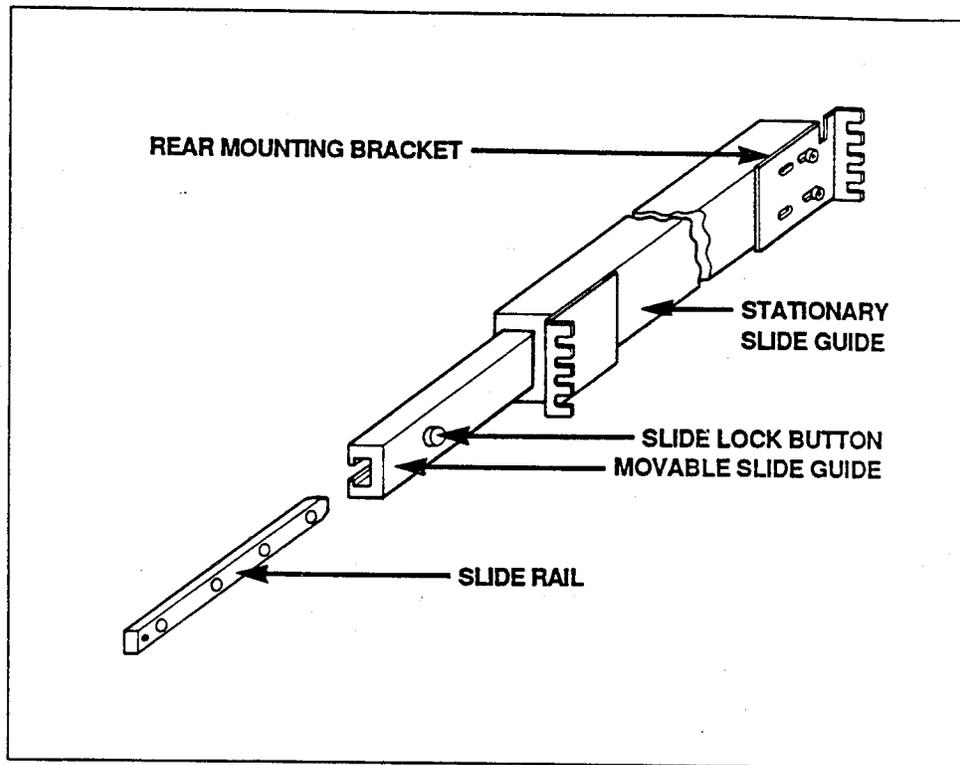
Each of these filler panels are attached to the Sun Rack with four 10-32 Phillips head screws.

3.4. Slide Mounting Instructions

These installation instructions should be applied equally to both the right and left sides of the rack and disk drive.

1. Referring to Figure 3-2, use a Phillips head screwdriver to remove the four Strap Guides from the Drive Chassis (two guides on each side). Save the Straps for use during installation.
2. Locate the two Slide Rail Assemblies in the box that the Drive came in. Remove them from their protective wrapping (note that each Rail Assembly is labelled either "Right" or "Left").
3. The Slide Rail Assembly is made up of three main parts: the slide rail, the movable slide guide and the stationary slide guide. Extend the Slide Rail and the Movable Slide Guide as far as they will go.
4. On the now exposed, inside face of the Movable Slide Guide you will see a button. This button is the Slide Lock. Press down on the Slide Lock button, and pull the Slide Rail completely free of the Slide Rail Assembly (see Figure 3-1).

Figure 3-1 Slide Rail Assembly Parts

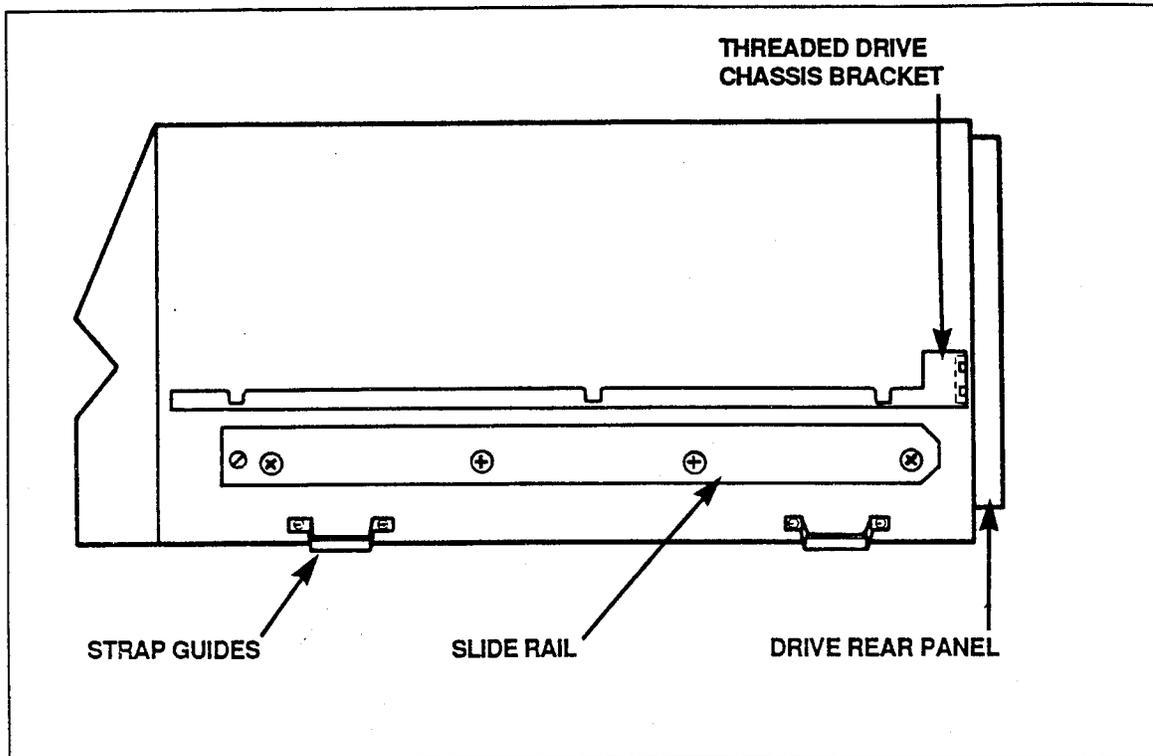


- Using the four Phillips screws provided for each Slide Rail (they are the only screws without washers), attach the Slide Rails to the Drive Chassis. While tightening the screws, push down *slightly* on the center of the Slide Rail, but ensure that the Slide Rail is level during tightening.

The tapered end of the Slide Rail should go at the rear of the Chassis, and the rail's countersunk holes should face away from the Chassis (see Figure 3-2).

CAUTION After installation, check that the four screws provided for securing each Slide Rail to the Chassis are flush with, or slightly recessed from, the surface of the Slide Rail. If the screws protrude from the countersunk holes, you have used the wrong screws, and the Disk Drive will not be able to slide into the Rack.

Figure 3-2 Slide Rail Installation



NOTE Steps 6 and 7 are required to install the Sun 575 MByte Disk Drive into a Sun rack or any Rack that has a 25" spacing between the forward edges of the front and rear RETMA rails. Other 19" racks may not require the performance of these Steps.

6. Remove the four screws (two for each Slide Guide) that secure the Rear Mounting Brackets to the Slide Guides (see Figure 3-3).
7. Place the Rear Mounting Bracket into the position shown in Figure 3-3, and lightly secure the Rear Mounting Bracket to the Slide Guide with the screws removed in Step 6.
8. Adjust the position of the Mounting Brackets until the Brackets just extend past the Rack's RETMA rails. Using eight screws on each Slide Guide (four in the front and four in the rear), lightly secure each Slide Guide's Mounting Brackets to the Rack's RETMA rails as shown in Figure 3-4 (see Table 3-1 for Mounting Bracket height specifications).
9. Fully tighten the screws securing the Slide Guides to the Rear Mounting Brackets.

Figure 3-3 Placement of Rear Mounting Brackets

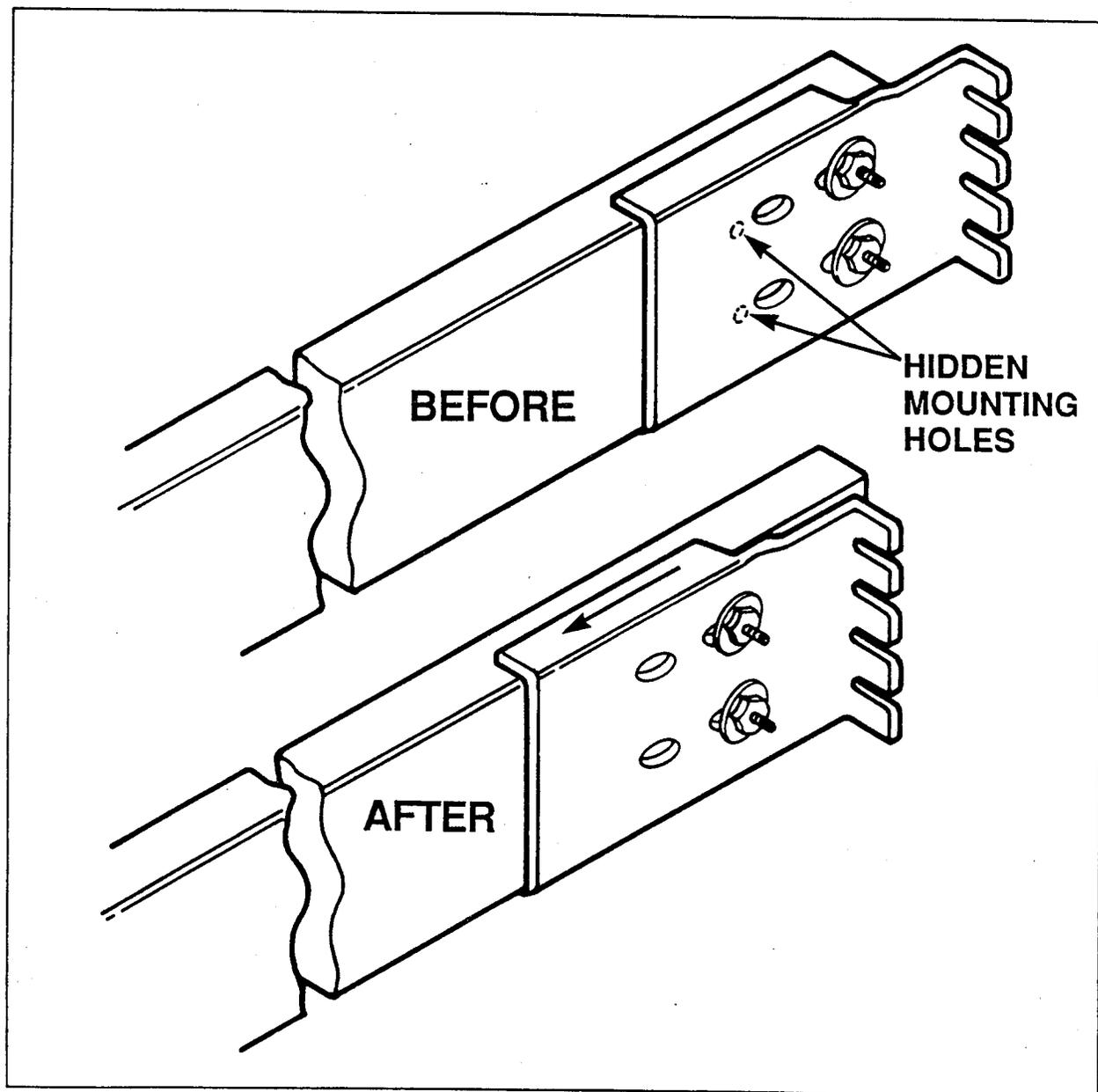
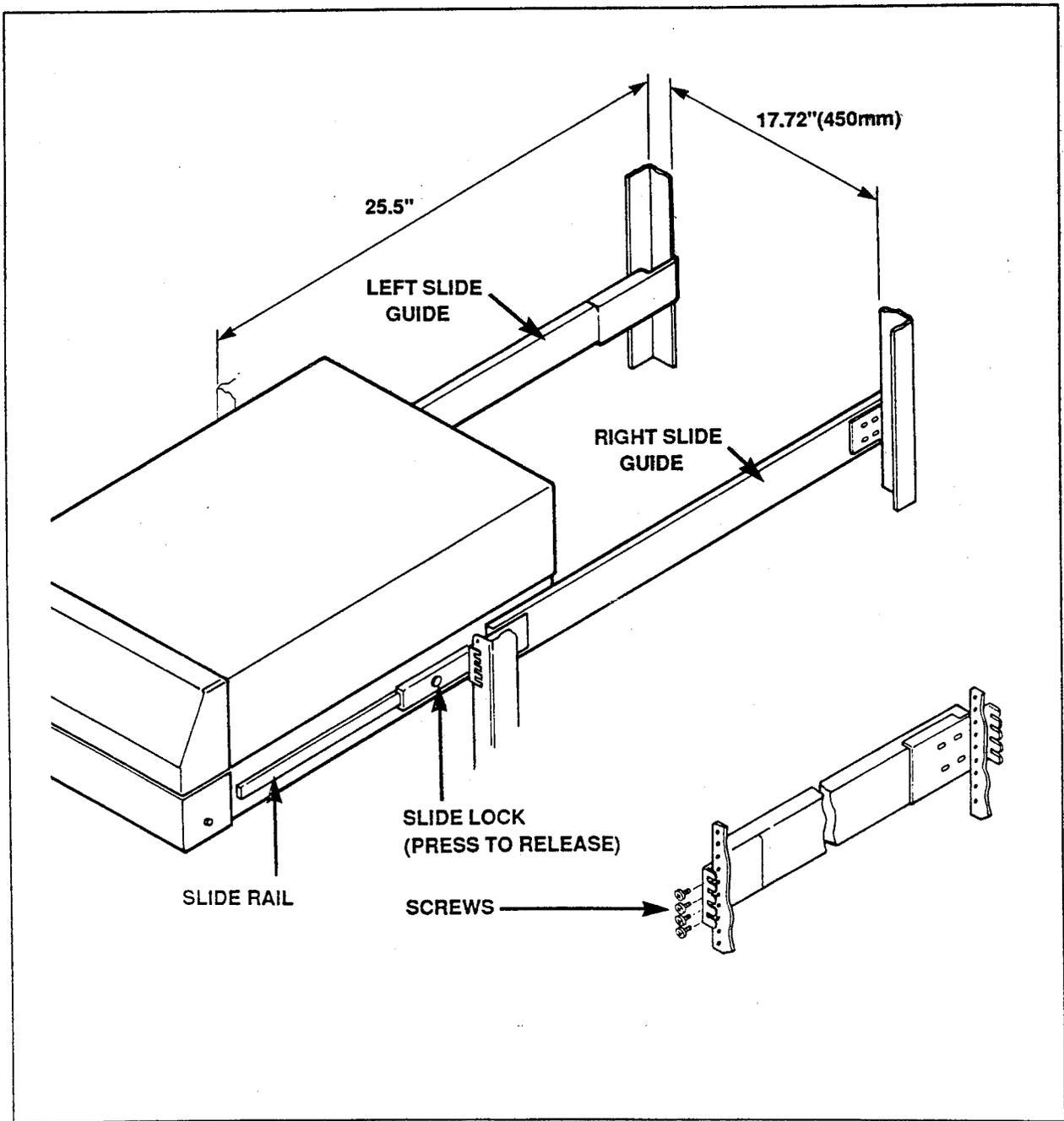


Figure 3-4 Slide Mount Installation

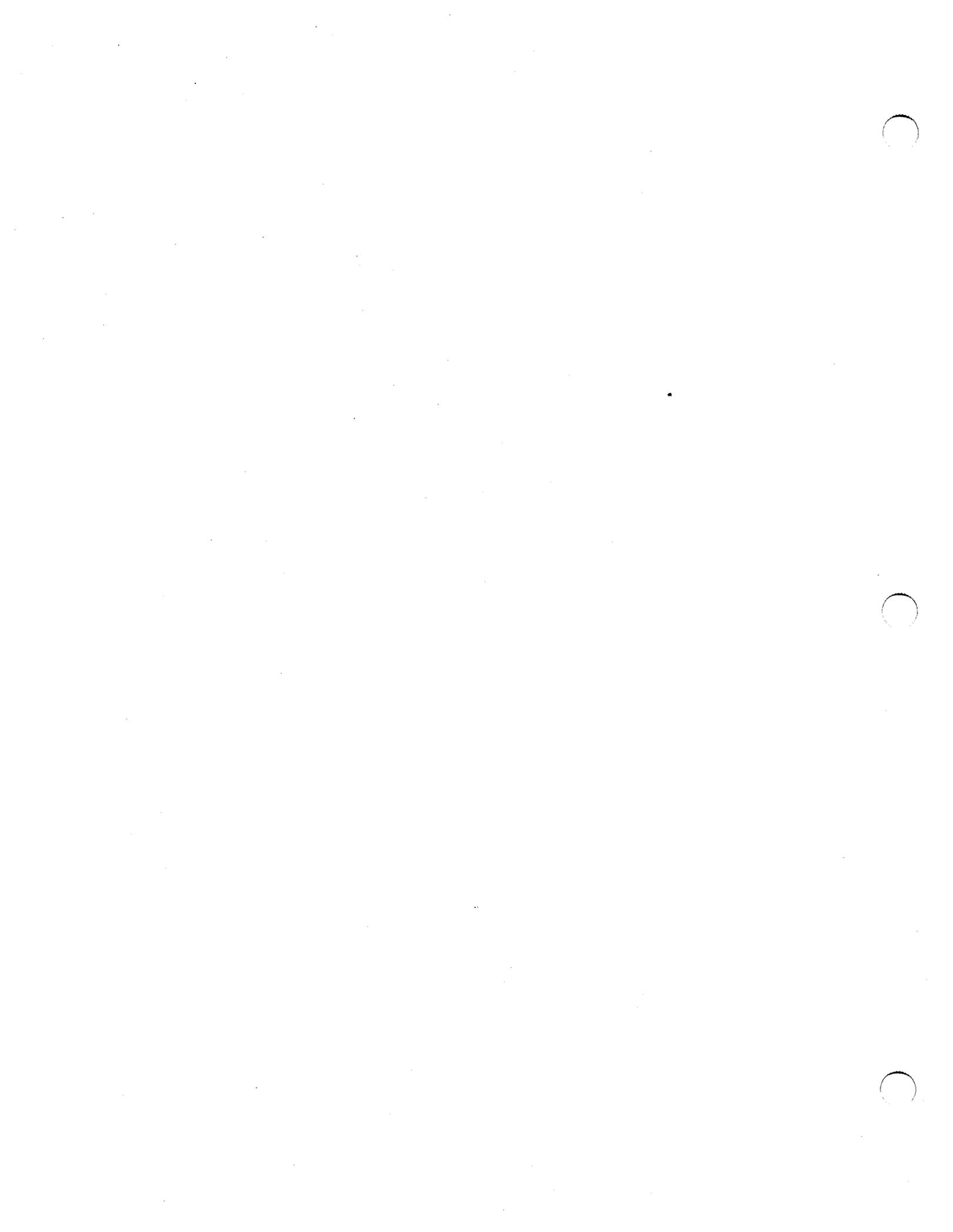


10. Before fully tightening the screws that secure the Front and Rear Mounting Brackets to the RETMA rails, check the following items:
 - The distance between the outside faces of the right and left Slide Guides should be 17 1/2" (+ 1/8" - 0"). Adjust this distance if necessary.
NOTE: This distance should be the same at the top and bottom of the Slide Guides.
 - Each Slide Guide is approximately the same distance from the RETMA rails.
 - Each Slide Guide is parallel to the RETMA rails (is not tilted to one side or the other). This is similar to the first item.
11. Lift up firmly on the middle of one Slide Guide (for maximum clearance beneath the guide) while at the same time ensuring that the items in Step 10 remain true; now fully tighten the eight screws (four in front and four in the rear) that secure the Slide Guide's Mounting Bracket to the RETMA rails.
12. Repeat Step 11 for the other Slide Guide.

Table 3-1 *Disk Drive Mounting Bracket Height Specifications*

| Height Specifications * | |
|--------------------------------|---------|
| Drive 0 (Lower Drive) | 7/8" |
| Drive 1 (Upper Drive) | 11 3/8" |

* Measured from the floor of the Rack (or if non-Sun rack, measured from the bottom of the mounting (RETMA) rails) to the center of the bottom most screw of the Mounting Bracket.



Disk Drive Rack Installation

| | |
|---|----|
| Disk Drive Rack Installation | 25 |
| 4.1. Tools Required | 25 |
| 4.2. Stabilizing the Rack | 25 |
| 4.3. Rack Mounting Instructions | 26 |
| 4.4. Securing the Drive in the Rack | 27 |
| 4.5. Rack Service Clearance | 29 |





Disk Drive Rack Installation

CAUTION The disk drive weighs approximately 176 lbs. (80 kg), and will require AT LEAST two people to install into its rack. The Drive should always be placed into the lowest possible position in the rack.

4.1. Tools Required

The following tools are required to install the disk drive into the rack.

- #2 Phillips head screwdriver - total length (handle and shaft) should not exceed 9", or the driver's shaft should be at least 10" in length.
- Tape Measure - minimum length of 2 feet
- Absorbent material for cleaning hands (Slide Rail Assembly is *very* oily)

4.2. Stabilizing the Rack

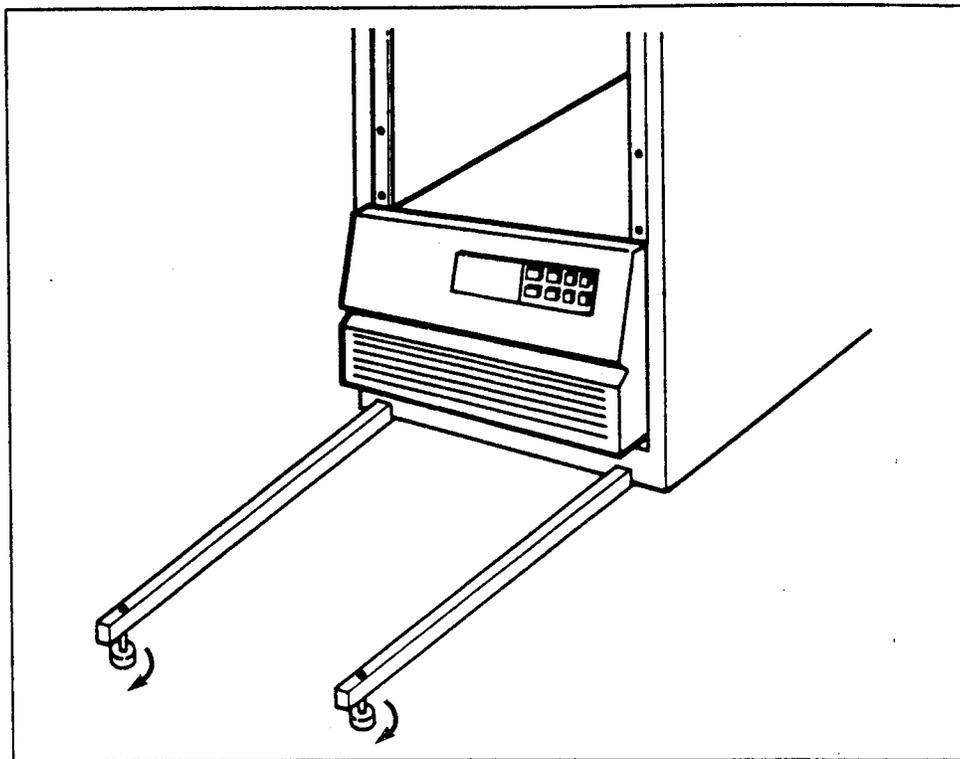
The Sun Rack is equipped with stabilizing "outriggers" to stabilize the Rack during drive installation. These "outriggers" are located at the bottom front corners of the Sun Rack, and extend forward to stabilize the Rack during drive installation (see Figure 4-1).

It is **VERY IMPORTANT** that these "outriggers" be used because, if they are not used, the Rack may tip over during drive installation and **VERY** serious injury could result.

To use the Sun Rack's stabilizing "outriggers", perform the following steps:

1. Turn the feet until they almost touch the floor (when viewed from above, turning the feet clockwise = down, counterclockwise = up).
2. Pull the "outriggers" out from under the Rack until they are fully extended.
3. Turn the feet clockwise by hand until they are in full contact with the floor and can no longer be easily turned.
4. "Outrigger" extension is now complete.

Figure 4-1 Sun Rack Outriggers



4.3. Rack Mounting Instructions

The goal of the next few steps is to install the drive into the rack, and also to ensure that the Slide Guides are giving good support to the drive.

1. On each rear RETMA rail, loosely install (just a few turns) two #10 screws. There should be two unused screw holes between the lowest of the two screws and the top of the rear Mounting Bracket (these screws will be used later).
2. Route the nylon straps (you used them to lift the Disk Drive out of its shipping container) underneath the Disk Drive, and place them into the same positions they had before you removed them.

Unfortunately the Slide Rails and the Strap Guides cannot be attached to the Drive at the same time, so be *VERY* careful during the next step that the straps do not slip.

3. Using the nylon straps, *CAREFULLY* lift the Disk Drive, and slide the Slide Rails into the Slide Guides. Slowly push the Disk Drive all the way in or until it starts to bind in the Slide Guides.

4. If the Disk Drive slides in easily, you may skip this Step.

If the Disk Drive started to bind as you installed it into the Slide Guides, recheck the items listed in Step 10 of Section 3.4 — *Slide Mounting Instructions* in this manual.

If the Disk Drive is still not running smoothly in its Slide Guides, determine which of the Slide Guides is causing the binding and *slightly* loosen that Slide Guide's Mounting Brackets.

Slowly move the Disk Drive back and forth, and adjust the position of the Slide Guide until the drive is sliding easily. Tighten that Slide Guide's Mounting Brackets.

5. Verify that the Disk Drive slides smoothly in its Slide Guides.

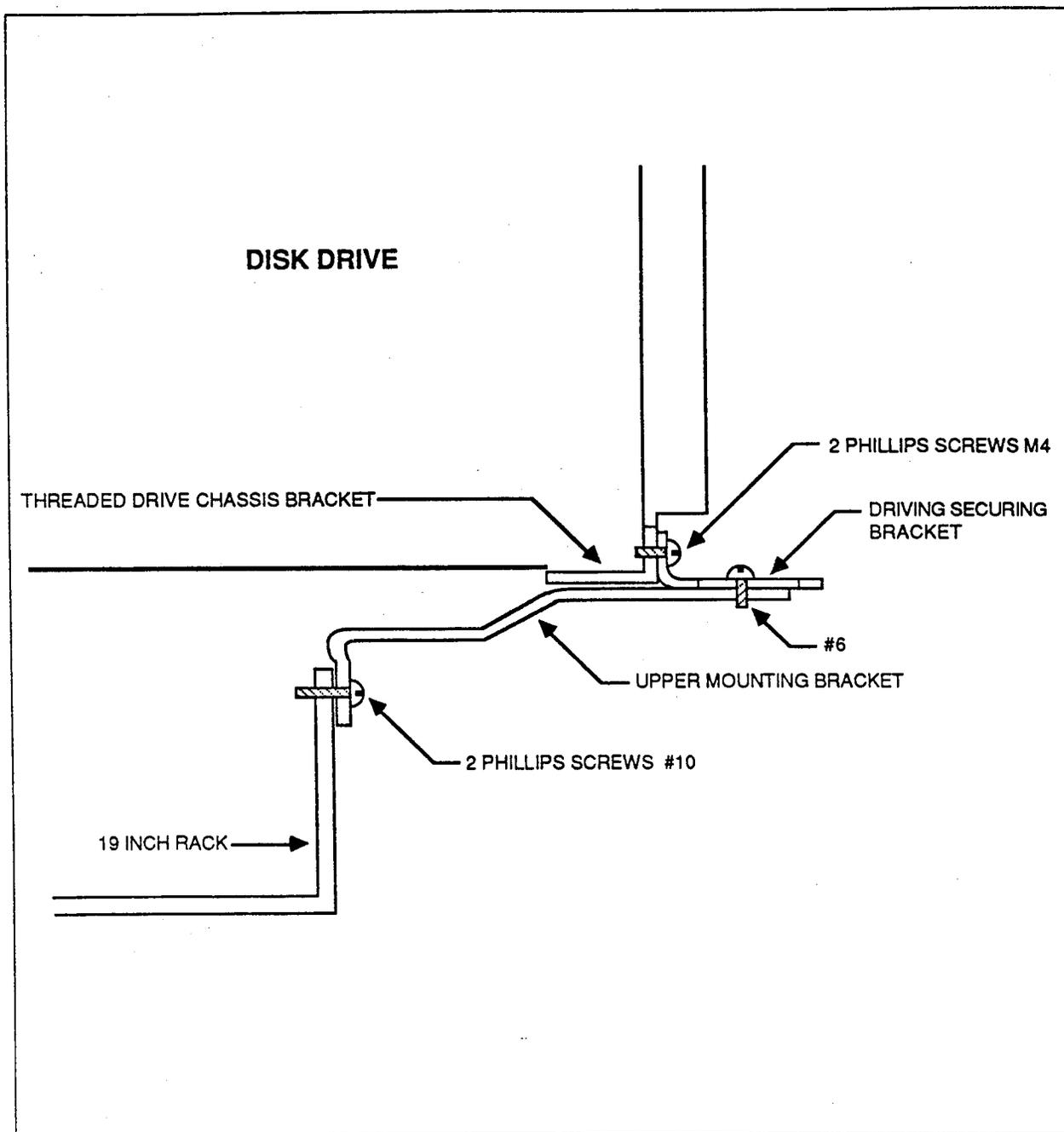
4.4. Securing the Drive in the Rack

CAUTION The sliding feature of the disk drive is intended only for ease of servicing. For normal use the drive should remain stationary because it is susceptible to damage if moved while powered up.

To secure the Drive in the rack, refer to Figure 4-2 and perform the following steps.

1. Place the Upper Mounting Bracket onto the #10 screws installed in Step 1 of Section 4.3. There should be two unused rack screw holes between the Upper and Lower Mounting Brackets.
2. Slide the Drive Securing Bracket forward until it lines up with the Threaded Drive Chassis Bracket.
3. Using two M4 (Metric) Phillips head screws, fasten together the two brackets from Step 2.
4. Tighten the #6 screw that holds the Drive Securing Bracket to the Upper Mounting Bracket, and tighten all other screws mentioned in this Section.
5. Repeat this Section for the opposite rear corner of the drive.

Figure 4-2 Securing the Drive in the Rack

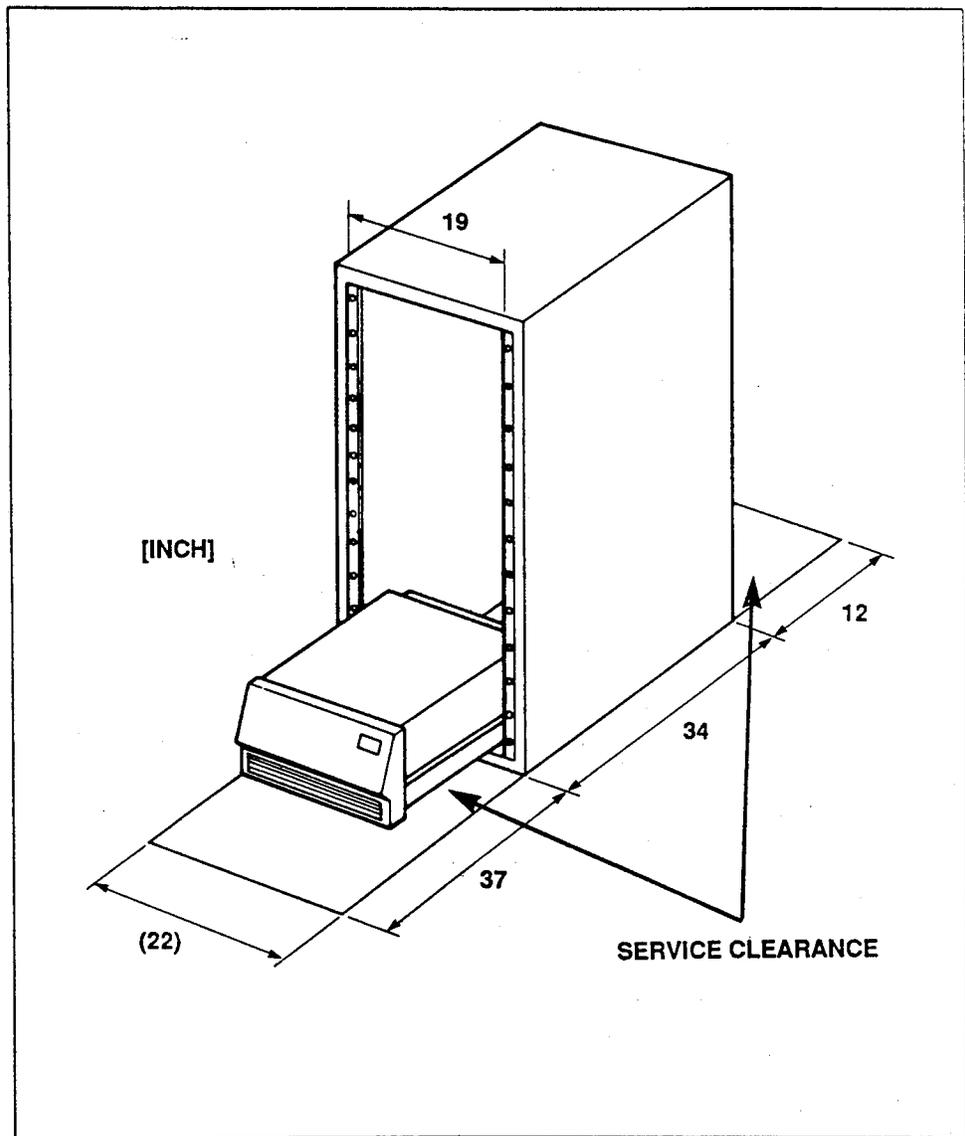


4.5. Rack Service Clearance

The Disk Drive when installed into the Rack needs to be accessible not only for servicing, but also needs to have adequate clearance for ventilation.

The following figure describes the clearance needs of the drive and rack as a unit.

Figure 4-3 *Rack Service Clearance*





Installing the Disk Drive Controller Board

| | |
|--|----|
| Installing the Disk Drive Controller Board | 33 |
| 5.1. Tools Required | 33 |
| 5.2. The Disk Drive Controller Board | 33 |
| 5.3. Installing the Controller Board in VMEbus Systems | 33 |
| 5.4. System Hardware Configuration | 34 |





Installing the Disk Drive Controller Board

This chapter, in conjunction with the *Card Cage Slot Assignments and Backplane Configuration Procedure, P/N 813-2004-XX* and the *Xylogics 450/451 Disk Controller Configuration Procedure, P/N 813-2002-XX*, describes how to configure, install and cable the disk drive (SMD) controller board for a VMEbus™ system.

NOTE *If you ordered the host system and disk drive together as a single system, the drive controller board is already in place, and the host system is already configured to the disk drive; therefore, you may skip to Chapter 6.*

5.1. Tools Required

The following tools are required to install the disk drive controller board.

- 2.0 mm (5/64) Hex wrench
- Flat bladed screwdriver (Xcelite R184)
- #2 Phillips head screwdriver

5.2. The Disk Drive Controller Board

Although your system may currently support a hard disk drive, and may even have a Xylogics 450 disk drive controller, you must install the Xylogics 451 disk drive controller board into your workstation cardcage.

5.3. Installing the Controller Board in VMEbus Systems

The disk drive controller must be inserted into the host system cardcage using the VME-to-Multibus Adapter Board. The Xylogics 451 controller board is mounted to the adapter board and the pair are shipped from Sun as a single assembly. This assembly is installed and cabled as follows:

NOTE *Refer to the Card Cage Slot Assignments and Backplane Configuration Procedures, P/N 813-2004-XX for the correct backplane configuration and cardcage slot assignment for your system.*

1. Power down and unplug the AC line cord from the host pedestal or Rack.
2. Using the Card Cage Slot Assignments and Backplane Configuration Procedure, choose the target slot in the host system card cage. Using the hex wrench, remove the filler panel on the rear of the card cage corresponding to the target slot (save the screws). For Sun-3 models, remove the air restrictor also.

3. Insert the VME-to-Multibus Adapter Board and Disk Controller assembly into the the cardcage so that the component side faces towards the right side of the system chassis (when viewed from the rear). The board should slide into the cardcage slot with little resistance and fit snugly when seated into the backplane connectors. While a moderate amount of force is required to seat the board, anything in excess of this is cause for inspection. Check the cardcage slot for any obvious obstructions, and both the board and the backplane for damage (bent connector pins, etc.).
4. Using the hex head screws from step 1, secure the board to the card cage.

5.4. System Hardware Configuration

1. Gain access to the solder side of the system backplane (refer to your host system Installation Manual for the exact procedure).
2. Refer to the *Card Cage Slot Assignments and Backplane Configuration Procedures* and to your host system Installation Manual for backplane jumpering procedures.
3. Close the host system up.

System Cabling

| | |
|--|----|
| System Cabling | 37 |
| 6.1. System Cabling - Single Drive | 37 |
| 6.2. Drive Identification - Dual Drive | 37 |
| 6.3. System Cabling - Dual Drive | 38 |





System Cabling

If you received both your Disk Drive and the System Card Cage preinstalled in a Sun rack, you may ignore this Chapter.

CAUTION Be careful not to overtighten the connector securing screws. These screws need only to be "snug"; tightening them further may damage the connector.

6.1. System Cabling - Single Drive

1. Locate the round, shielded cables that were shipped in the smaller base box (one pair and one single cable).

NOTE *When installing the cables, try your best not to turn the cables against the natural bend they acquired during shipping. Damage to the connectors can result if this advice is not followed.*

2. Insert the ends of the cable pair into the Disk Drive's rear panel connectors labelled SMD COMMAND - IN (25 pin, and 37 pin). Tighten the connector securing screws.
3. Route the cable pair to the disk controller board connector panel. Insert the cables into the panel connectors labelled "COMMAND," and tighten the connector securing screws.
4. Connect a single cable from the Disk Drive's rear panel connector labelled "SMD DATA" to the disk controller board's lower "DATA" connector.
5. Tighten all connector securing screws.

6.2. Drive Identification - Dual Drive

The two disk drives are not identical. The most important difference between Drive 1 and Drive 0 is the lack of a Terminator Board on Drive 1. For correct rack installation and cabling (Drive 1 should be installed in the rack above Drive 0), it is important that you identify the disk drives correctly. To help you do this, Sun has placed a label on the rear of the disk drive that has the drive's option number on it. The following table lists the option numbers the drives have for both Sun 2 and Sun 3 host systems.

Table 6-1 *Drive Option Numbers*

| | Sun 2 Option Number | Sun 3 Option Number |
|----------------|---------------------|---------------------|
| Drive 0 | 70 | 625 |
| Drive 1 | 71 | 626 |

6.3. System Cabling - Dual Drive

When installing two Sun 575 MByte Disk Drives that are to be controlled by the same drive controller board, use the following instructions (see Figure 6-1 for a graphic presentation of the cabling required when connecting two drives to a single disk drive controller board).

1. The Drive Address switch is located on the Display Panel (front of the drive, behind the door). Verify that the second drive's address switch is set to 1.

| | | | |
|-----|-----|-----|----|
| Off | Off | Off | On |
|-----|-----|-----|----|

2. Locate the round, shielded cables that were shipped in the smaller base boxes (two single cables and two cable pairs if both drives were shipped together).

NOTE *When installing the cables, try your best not to turn the cables against the natural bend they acquired during shipping. Damage to the connectors can result if this advice is not followed.*

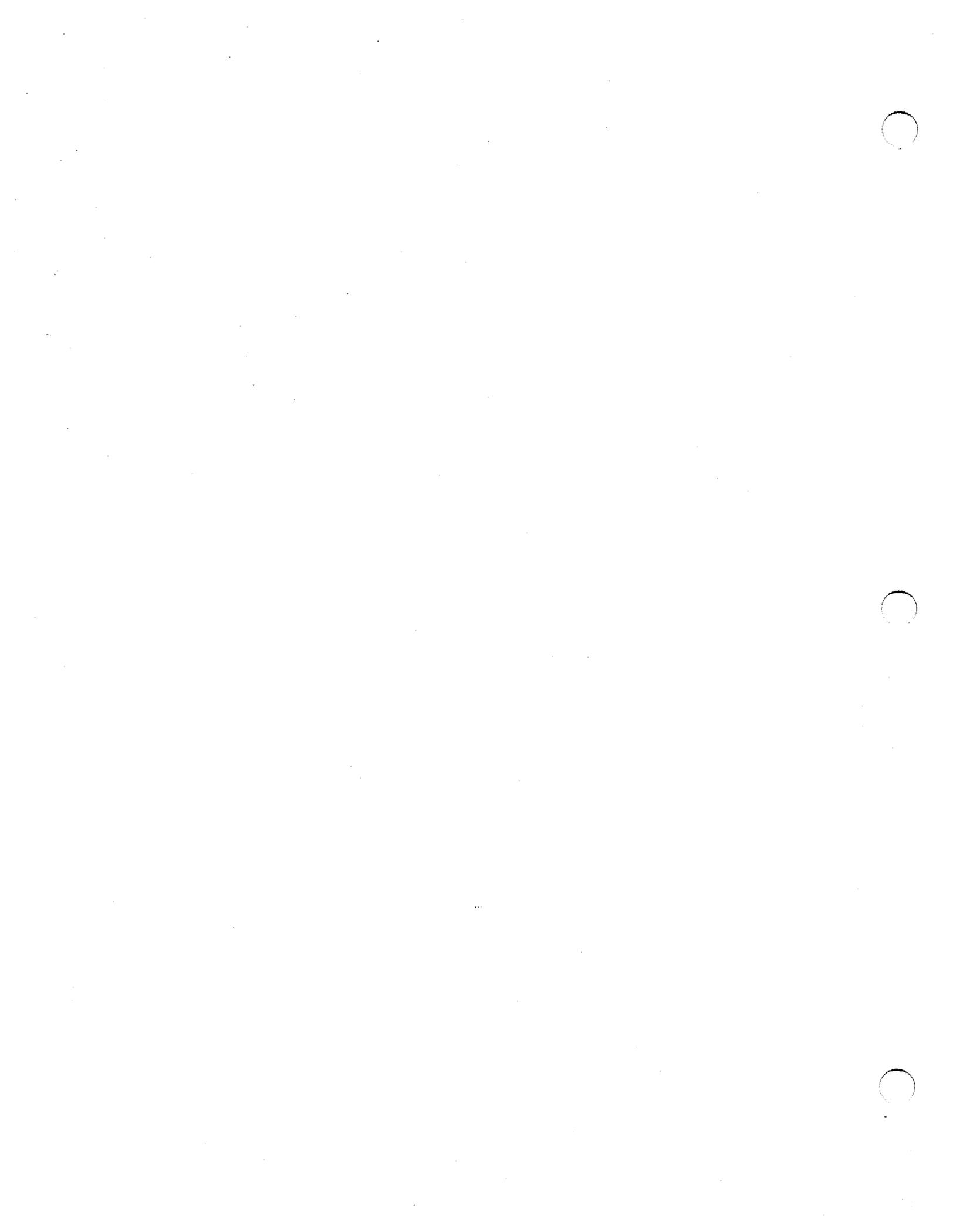
3. Insert the ends of the first cable pair into **Drive 1's** rear panel connectors labelled SMD COMMAND - IN (25 pin, and 37 pin). Tighten the connector securing screws.
4. Route the first cable pair to the disk controller board connector panel. Insert the cables into the panel connectors labelled "COMMAND," and tighten the connector securing screws.
5. Insert the ends of the second cable pair into **Drive 1's** rear panel connectors labelled SMD COMMAND - OUT (25 pin, and 37 pin). Tighten the connector securing screws.
6. Route the second cable pair to **Drive 0's** rear connector panel. Insert the cables into **Drive 0's** rear panel connectors labelled SMD COMMAND - IN (25 pin, and 37 pin). Tighten the connector securing screws.
7. Connect a single cable from **Drive 1's** rear panel "SMD DATA" connector to the disk controller board's upper "DATA" connector.



Power-up and Use of Diagnostics

| | |
|---|----|
| Power-up and Use of Diagnostics | 43 |
| 7.1. Power Up in Sun Rack with Power Controller | 43 |
| 7.2. Power Up Not Using the Sun Rack | 44 |
| 7.3. Use of Diagnostics | 44 |





Power-up and Use of Diagnostics

7.1. Power Up in Sun Rack with Power Controller

Sun Microsystems does not recommend or support the act or concept of having non-Rack mounted drives plugged into the Power Controller/Sequencer that is mounted to the rear of the Rack.

1. Verify that all of the Rack's components are plugged into the Power Controller.

NOTE

The Power Controller has eight outlets arranged in two blocks of four outlets each. If there are two disk drives in the rack, be sure that the AC Line cords for the two drives are NOT plugged into the same block of outlets.

2. Ensure that the Rack's front panel key switch is in the OFF (vertical) position.
3. Ensure that the ganged Main Power switch on the Power Controller is in the OFF (down) position.
4. Ensure that the Remote/Local switch on the Power Controller is in the REMOTE position.
5. Ensure that the Power Controller is plugged into a properly rated AC wall outlet.
6. Turn ON the ganged Main Power switch on the Power Controller (up position).
7. Verify that the Power switches of all the Rack's components are in the ON position, and that the Start switch on the Disk Drive(s) is in the START position.

NOTE

If necessary, refer to the Installation Manual for Sun3/180 Rackmounted Systems or the component manuals for switch locations.

8. Turn the front panel key switch to the ON (horizontal) position. The host system will wait for the drive to become ready before continuing to boot.

NOTE

The disk drive is equipped with an automatic shipping lock. When power is provided to the drive, it will automatically unlock. There is absolutely no need to open the enclosure to unlock the disk drive.



Fault Troubleshooting

Fault Troubleshooting 47





Fault Troubleshooting

This chapter provides information concerning the most common installation problems. Sun Microsystems has engineered this product for ease of installation and use. The possibility of damage during shipping or installation is extremely small; therefore, if you experience problems with your disk drive after installation, check your installation for the following basic items.

1. Is the disk drive plugged in to the AC wall outlet (or Power Controller for Drives installed in Sun Racks)? This may seem elementary, but it is certainly worth checking.
2. Did you turn on the power (Main Line) switch on the rear of the disk drive; and following that, did you turn on the Start switch on the front Operator panel (For Drives installed in Sun Racks, reverify the Steps in Section 7.1).
3. Did you turn on the host system power switch?
4. Check all cable connections:
 - a. Check that during cable installation none of the connector pins were pushed back into the connector housings causing an intermittent or nonexistent connection.
 - b. Did you screw down all cable connectors that have screws? If you did not, the cable shield will not be properly grounded and/or the cable connectors can become dislodged.
5. Recheck cable routing: are all cables going to their appropriate connectors?
6. Did you insert the drive controller board into the appropriate slot in your host system card cage?
7. Recheck the controller board configuration and the backplane jumpers. Note that if the placement of other boards within the host system card cage was changed to make room for the disk drive controller board, then the slots that those boards were moved to must also be checked for correct backplane jumpering.

8. Verify that the Sector Count and Drive Select switches are set correctly (refer to the Fujitsu 2361A Disk Drive Configuration Procedures P/N 813-2005-XX).

If all of the above checks have been made and the system is still not functioning properly, call Sun's Field Service Dispatch Center toll free at 800-USA-4SUN.