

**SONY.**

**SDT-9000 Series**

**DDS-3 Tape Drive**

**User's Manual**

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## **SDT-9000/BM DDS-3 Tape Drive**

Congratulation on your purchase of the Sony DDS-3 drive SDT-9000/BM.

This drive is a high capacity data storage device using 4mm DAT (Digital Audio Tape) technology. The SDT-9000/BM drive achieves high data reliability through Read-After-Write, an additional level of Error Correction Code, and other features.

The Sony SDT-9000/BM drive stores data on tape using a standard format called DDS (Digital Data Storage), DDS-3, DDS-2, DDS-DC and DCLZ formats. These formats are used by many other DDS tape drive manufacturers, providing a broad range of compatible tape drives.

The Sony SDT-9000/BM is fully READ and WRITE compatible with the DDS-3, DDS-2, DDS and DDS-DC format tapes.

The SDT-9000/BM has the 5.25" Sony standard color bezel (default set) and can have the 5.25" AT-Gray or 3.5" Sony standard color bezel by replacing with the enclosed bezel.

# Introduction

## Product Features

	<b>SDT-9000/BM (With Data Compression)</b>
Data Capacity	24 GB (typical)*
Transfer Rate (sustained)	2.4 MB/sec (typical)*

- Supported Formats: DDS-3, DDS-2, DDS, DDS-DC and DCLZ
  - High Burst Transfer Rate- 5MB/sec Asynchronous  
10MB/sec Synchronous
  - Large 2MB Buffer
  - 3.5" Standard Height, 5.25" Half Height
  - Embedded SCSI Interface
  - Supports Variable or Fixed Record Length
  - Supports SCSI-2 Sequential-access Devices Command Set
  - Read After Write (RAW)
  - Frame Rewrite Function
  - Three Levels of Error Correction Code (ECC)
  - Quick Search (200 times normal Read/Write speed)
  - Random Read
  - N-Group Write Option
  - Dual Partition Option
  - SCSI Disconnection/Arbitration
- \* Assuming 2:1 compression. Actual capacity and transfer rate may vary since compression is depending upon data type.

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## **Precautions**

### **Installation**

Avoid placing the drive in a location subject to:

- high humidity
- high temperature
- mechanical shock and vibration
- direct sunlight

### **Operation**

- \* Do not move the drive while it is operating. Doing so may cause a malfunction.
- \* Avoid exposing the drive to sudden changes from low to high in temperature. This may cause water condensation to collect inside the drive. If the ambient temperature should suddenly rise while the drive is turned on, wait at least one hour before turning on the drive. If you attempt to operate the drive immediately after a sudden increase in temperature, a malfunction may occur.
- \* Do not turn off the drive while a tape is inside the drive.

### **Transportation**

- \* Keep the original packing materials for possible future shipments of the drive.
- \* Be sure to remove any tapes from drive prior to transportation. After removing the drive from the computer, repack the drive into its original packaging.

# Preparation

## Supplied Items

When you first open the box, make sure it contains the following items. Contact your supplier if anything is missing or broken.

- DDS Tape Drive (5.25" Half Height) ..... 1
- 3.5" Standard Height Front Panel (Sony Color) .. 1
- 5.25" Half Height Front Panel (AT-Gray Color) ... 1
- Data Cartridge ..... 1
- Cleaning Cartridge ..... 1
- Warranty Card ..... 1
- Installation Manual (This Guide) ..... 1

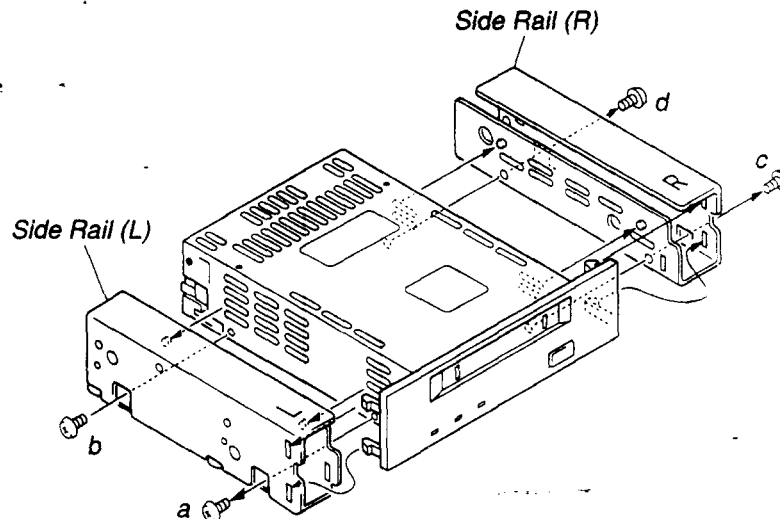
## Changing Form Factor

SDT-9000/BM is originally pre-mounted with 5.25" side rails and a Sony white color front bezel.

### **A If you want to change from HH 5.25" to 3.5":**

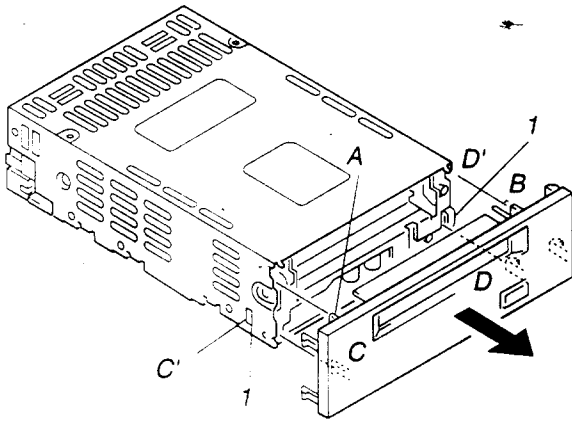
#### **A-1 Remove side rails.**

Remove four screws (a, b, c, d) securing the Side Rails (L, R) and then remove the Side Rails (L, R).



### A-2 Remove 5.25" HH front panel.

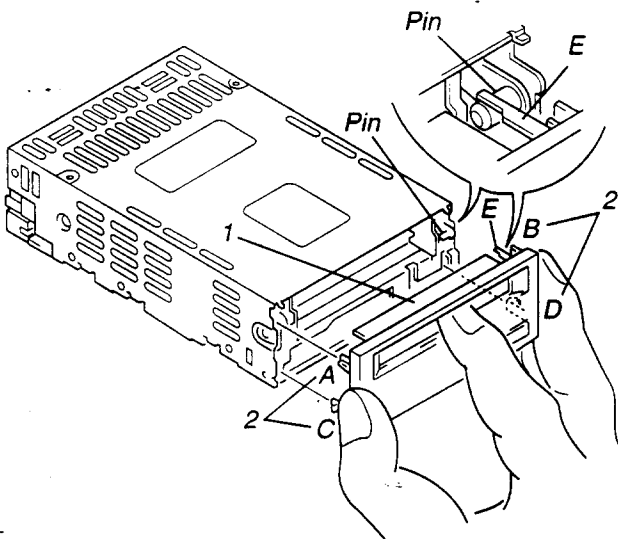
- 1 Push and unlock C and D at C' and D'.
- 2 Pull the lower part of front panel forward



### A-3 Install 3.5" front panel

- 1 Push and open lid.
- 2 Holding the lid open with your finger, push the front panel to catch the chassis at A, B, C and D.

**Note:** Part E must locate on the pin.

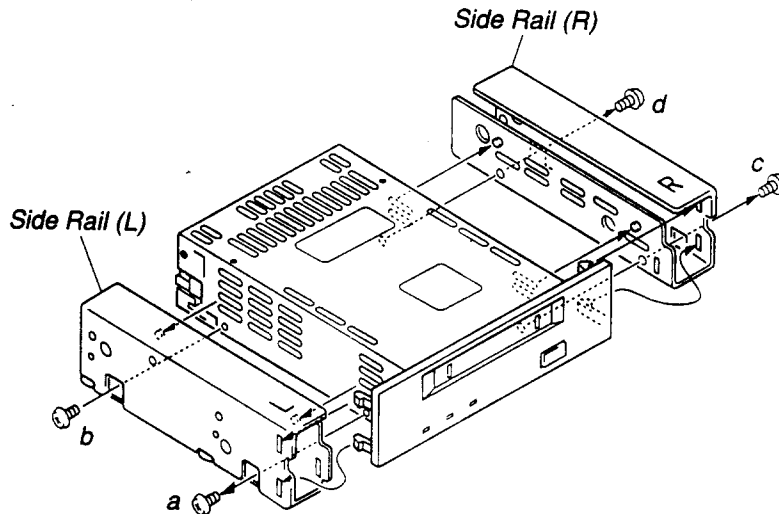




**B** If you want to change a 5.25" HH front panel to a different color 5.25" HH front panel:

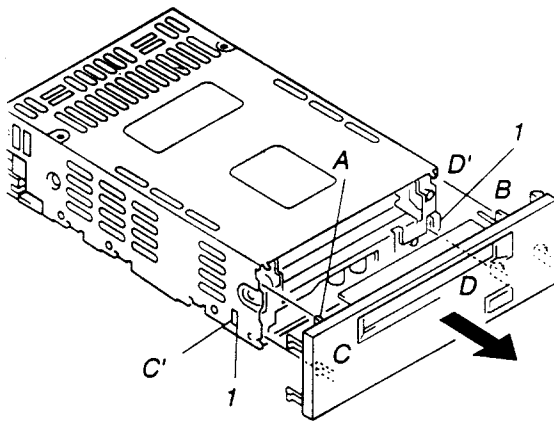
**B-1 Remove side rails.**

Remove four screws (a, b, c, d) securing the Side Rails (L, R) and then remove the Side Rails (L, R).



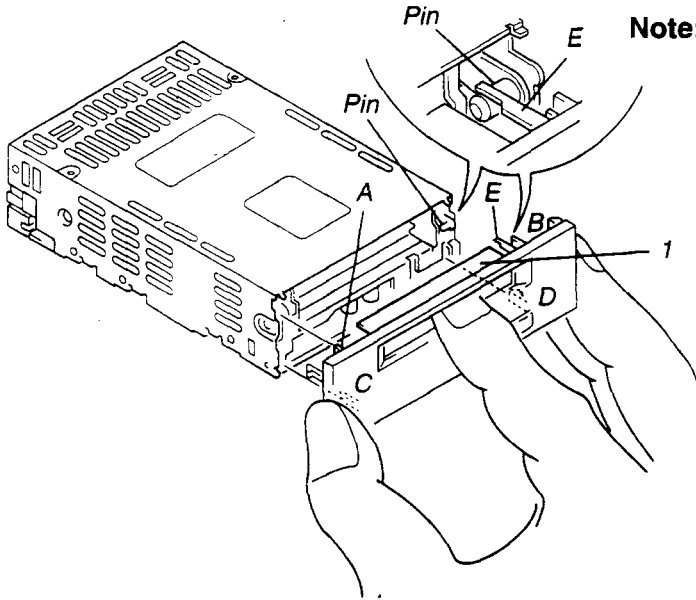
**3-2 Remove 5.25" HH front panel.**

- 1 Push and unlock C and D at C' and D'.
- 2 Pull the lower part of front panel forward.



### B-3 Install 5.25" HH front panel

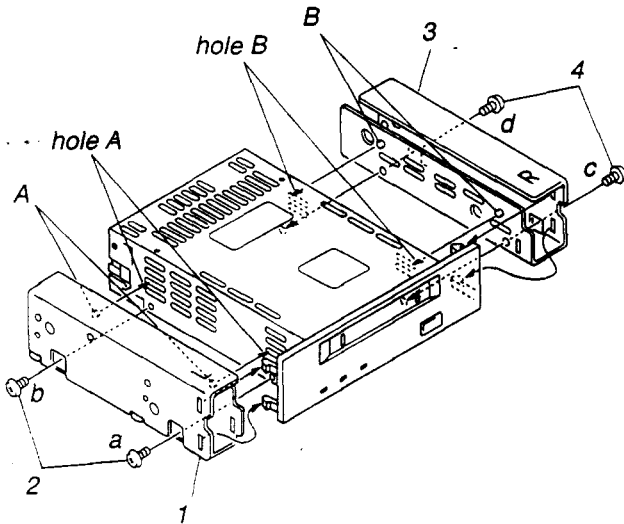
- 1 Push and open lid.
- 2 Holding the lid open with your finger, push the front panel to catch the chassis at A, B, C and D.



**Note:** Part E must locate on the pin.

### B-4 Install side rails with screws.

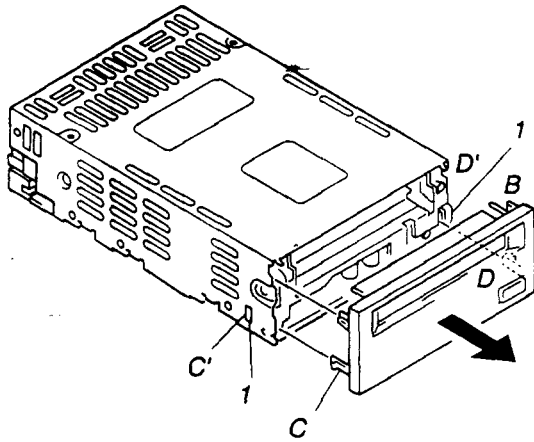
- 1 Put A into the hole A to catch the side rail (L).
- 2 Turn screw a first, and b next.
- 3 Put B into the hole B to catch the side rail (R).
- 4 Turn screw c first, and d next.



**Note:** Use the mounting screws removed in the A-1. Other screws may damage the drive mechanism.

**C If you want to change from 3.5" to 5.25" HH front panel:**

**C-1 Remove 3.5" front panel.**

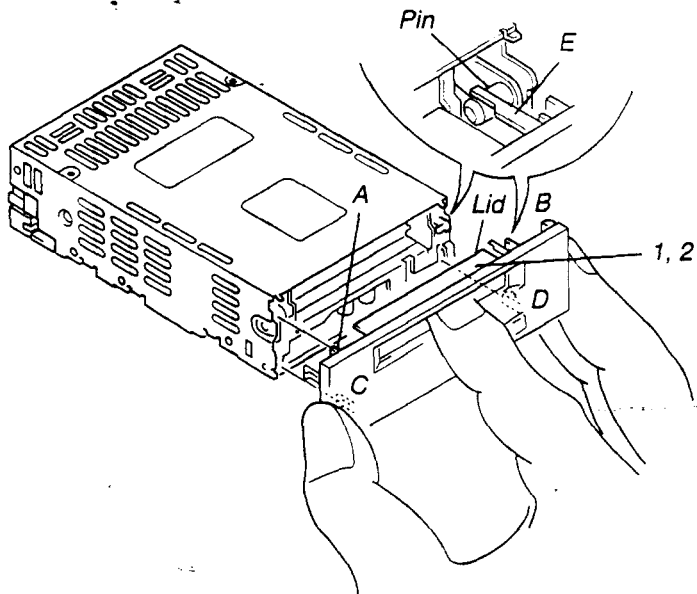


- 1 Push and unlock C and D at C' and D'.
- 2 Pull the lower part of front panel forward.

**C-2 Install 5.25" front panel**

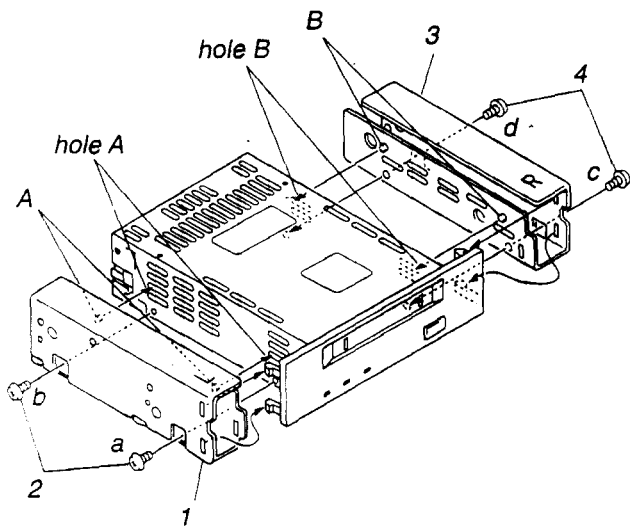
- 1 Push and open lid.
- 2 Holding the lid open with your finger, push the front panel to catch the chassis at A, B, C and D.

**Note:** Part E must locate on the pin.



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**C-3 Install side rails with screws.**

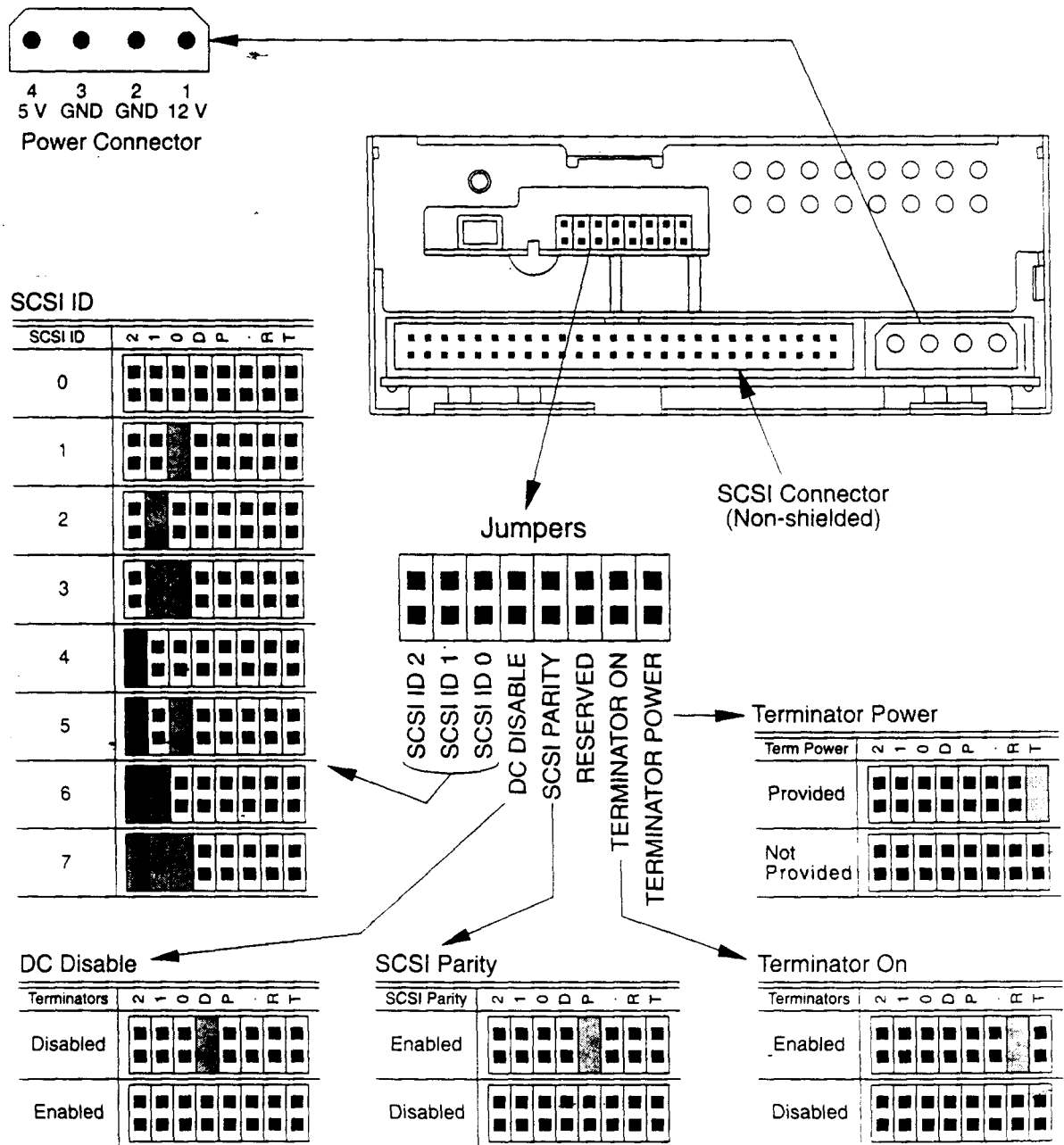


- 1 Put A into the hole A to catch the side rail (L).
- 2 Turn screw a first, and b next.
- 3 Put B into the hole B to catch the side rail (R).
- 4 Turn screw c first, and d next.

**Note:** Use the mounting screws removed in the A-1. Other screws may damage the drive mechanism.

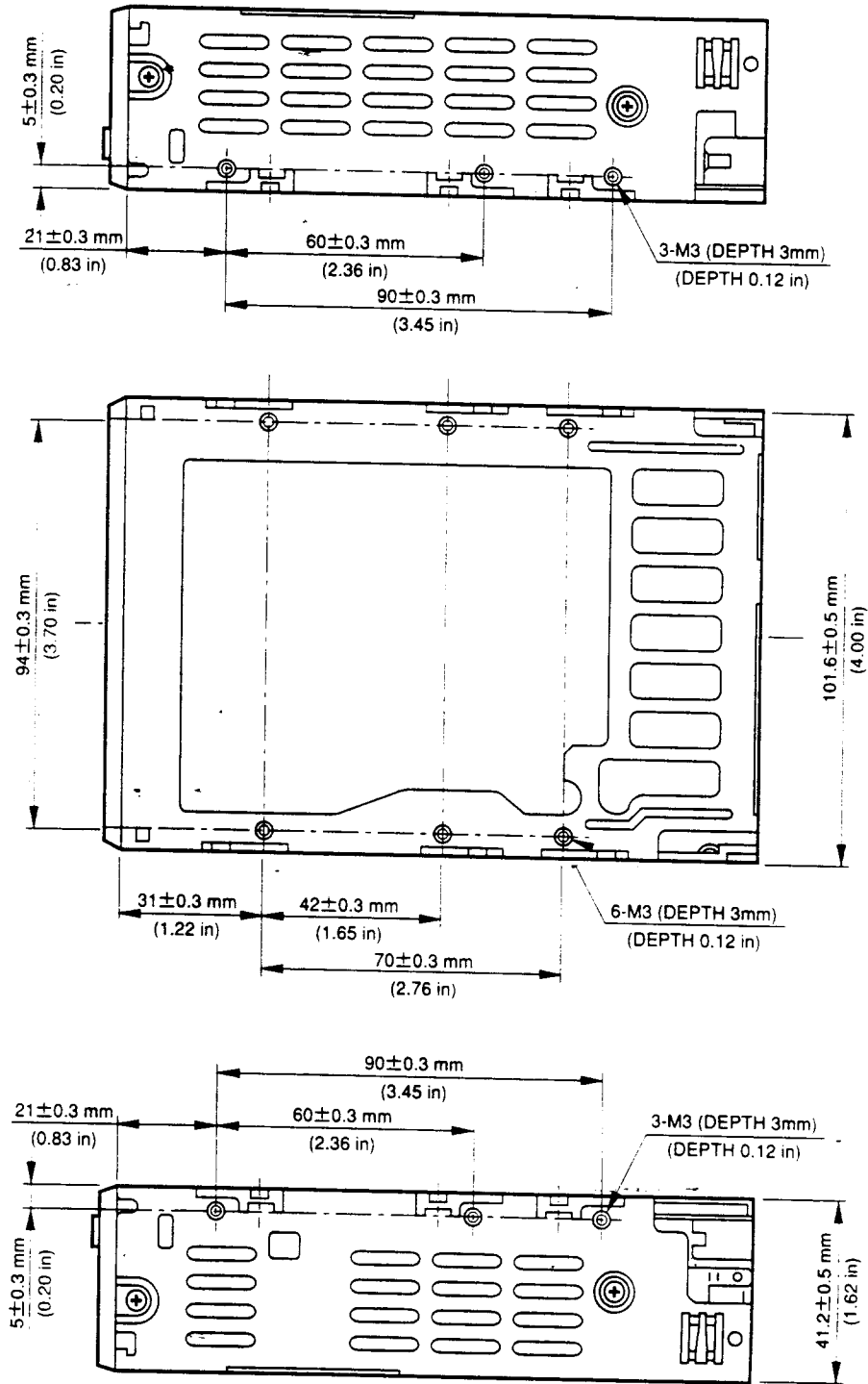
# Installation

## SCSI Connection/Setting the SCSI ID/Option Switches

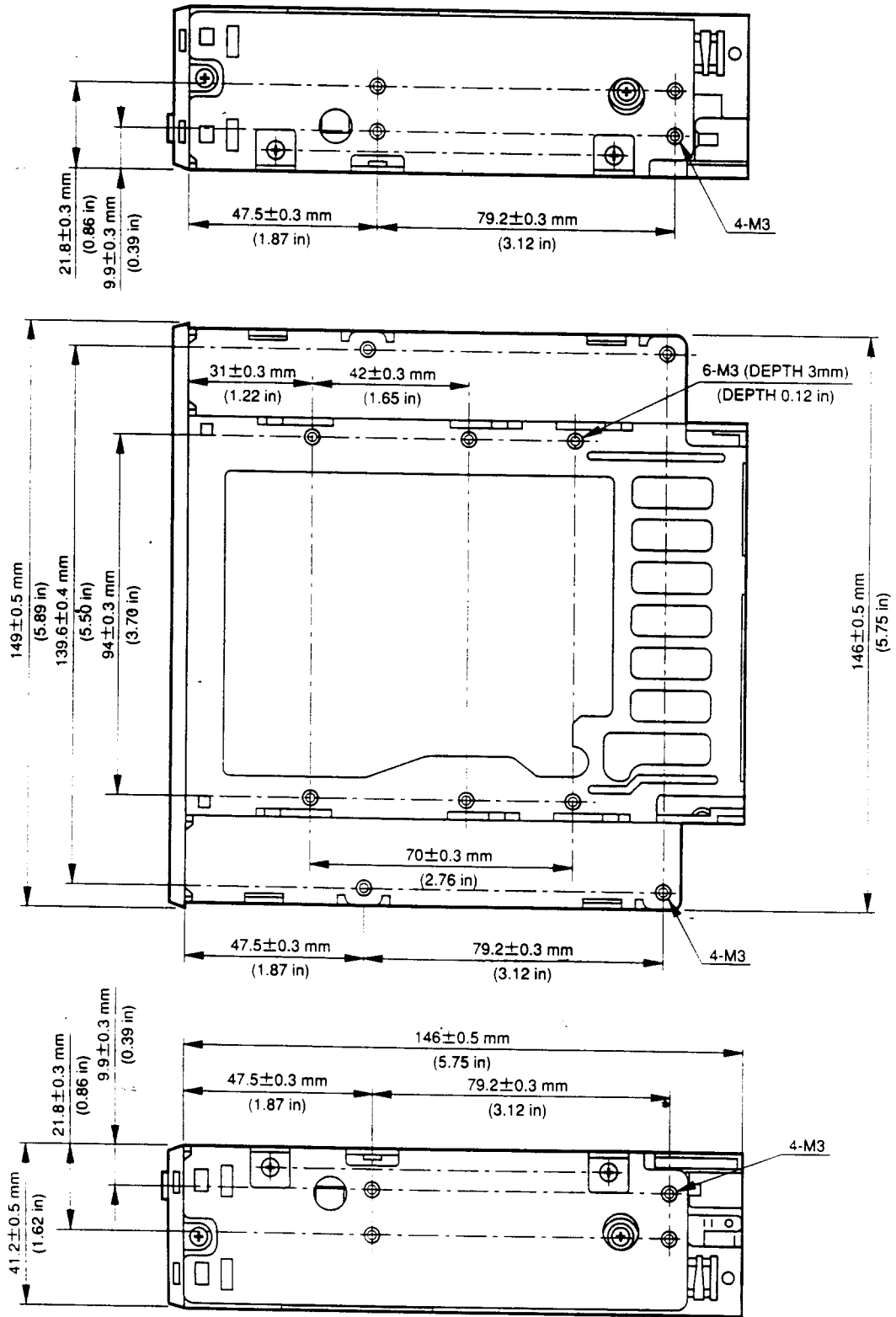


**Note :** ■ = CLOSED Jumper installed  
□ = OPEN Jumper not installed

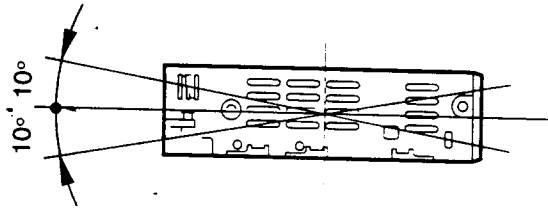
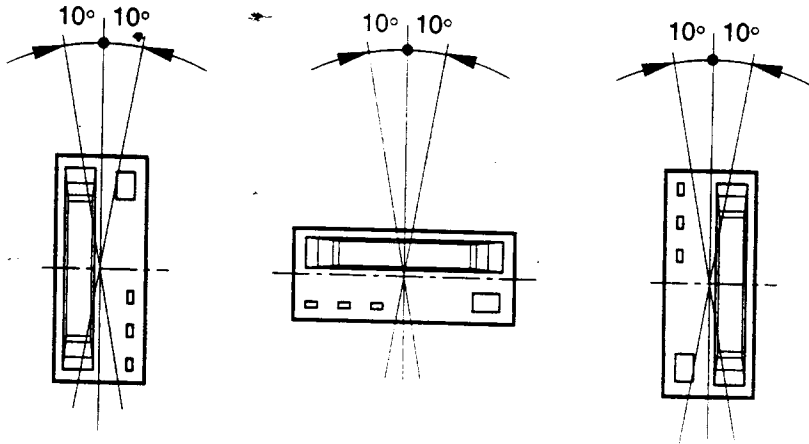
# Mounting Holes for 3.5" Standard Height



# Mounting Holes for 5.25" Half Height



# Orientation





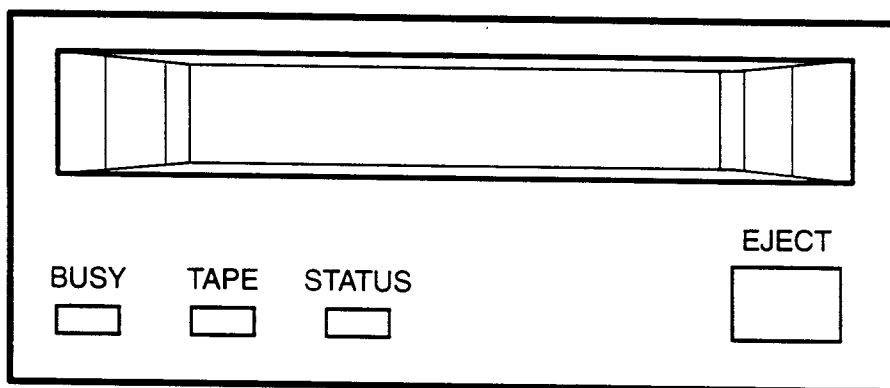
## Operation

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### Location of 3 LEDs

There are three LED indicators (BUSY, TAPE and STATUS) and an EJECT button on the front panel of the unit.

#### Front Panel (for 3.5" Standard Height)



## LED Indication for Drive Status

LED			State		
BUSY	TAPE	STATUS	Activity	Cartridge	Other
			None	None	None
			SCSI	None	None
			Drive	Loading/Unloading	None
			Drive	Loading/Unloading	Write Protected
			None	Loaded	None
			SCSI	Loaded	None
			SCSI/Drive	Loaded	None
*			*	Loaded	Write Protected
			None	Loaded	Cleaning Tape at EOM
*		*	*	Loaded	Error Rate Warning
*	*		*	*	Cleaning Request
*	*		*	*	Selftest Failure
	*	*	*	*	Waiting for Reset
*		*	*	*	Waiting for Eject



3.5 sec on / 0.5 sec off



1 pulse (0.25 sec on)



2 pulses (0.25 sec on),  
0.5 sec off



off



on



0.25 sec on / 0.25 sec off

\* : Not defined.

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## Drive Operation

### Loading a Cassette

Insert a cassette into the slot on the front panel with the arrow on the cassette pointing towards the drive. When the cassette is inserted, the drive takes it and automatically loads it into drive mechanism.

### Unloading a Cassette

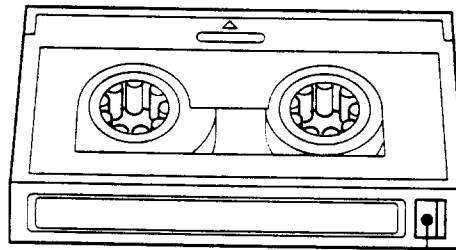
The cassette can be removed from the SDT-9000/BM either in response to a SCSI Unload Command, or by pressing the eject button.



By pressing Eject button, the tape goes to BOM, the drive unthreads it, and ejects the cassette from the slot.

### Write-protecting a Cassette

Cassettes can be write-protected by sliding the tab on the back of the cassette open.

In this state, data can be read from the tape but not written onto it.



-  Using your fingernail, push the switch in the direction of the arrow to avoid accidental overwriting or erasure of data.
-  Return the switch to its original position to re-enable writing.

### Using a Cleaning Tape

The SDT-9000/BM has a built-in super head cleaner designed to last for the life of the drive.

In addition, a cleaning tape should be used periodically to clean the entire tape path.

The drive will automatically request you to perform a cleaning operation.

The need for a cleaning tape is determined by the drum rotating hours since the last cleaning was performed. The drive will request a cleaning operation every 24 hours of drum rotation.

## Emergency Cassette Removal Procedure

In case the tape is stuck inside the drive, you could remove the tape cartridge manually.

1. Remove the drive from the chassis or enclosure to allow access to the bottom and left side of the drive.
2. Remove the drive's top cover to monitor the degree of tape slack throughout the process.

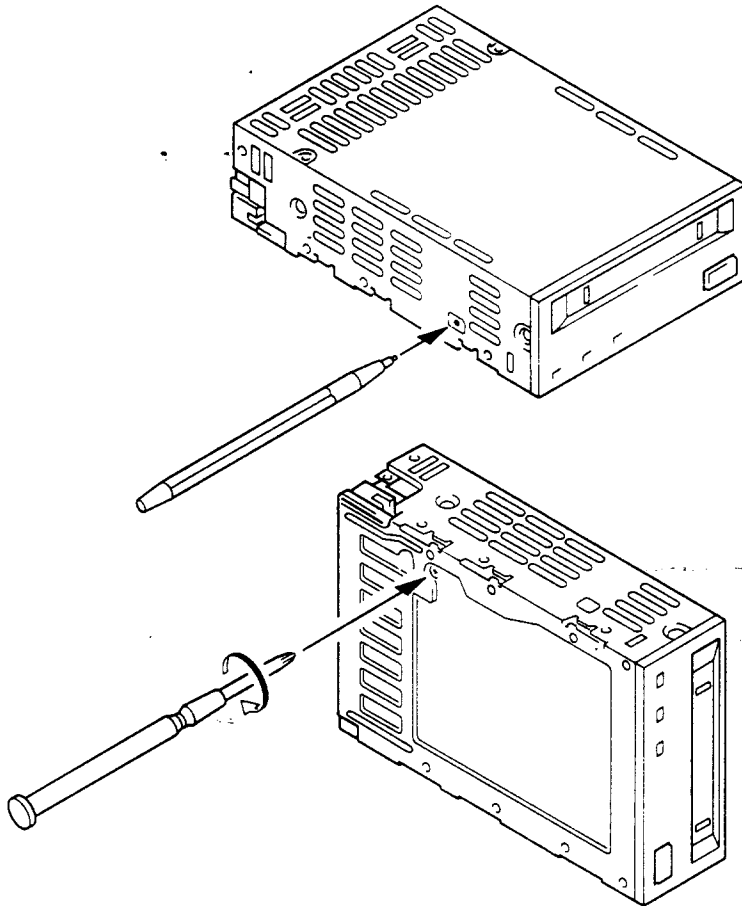
Note: Never touch the inside of the drive when the top cover is opened. Otherwise it may cause a trouble.

3. Rotate the Loading/Threading motor clockwise with a small screwdriver (ex. Phillips "+" No. 1) put into the plastic screw head on the back of the drive (see the location in a drawing below). This will enable you to move back the threading mechanism to the initial position.

Note: Do not rotate the screw further when you reach to the mechanical limit to avoid damage on the mechanism.

Note: To prevent damage on the tape, take up the slack of tape from time to time by clicking the ratchet mechanism located on the left side of the drive.

4. Continue the procedure until the tape is lifted out of the drive mechanism and ejected.
5. Return the drive to a service station for repair.



# Interface Implementation

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## Supported SCSI Messages

Abort	Message Parity Error
Bus Device Reset	Message Reject
Command Complete	No Operation
Disconnect	Restore Pointers
Extended Message	Save Data Pointer
-Synchronous Data Transfer Request	
Identify (w/&w/o Disconnect)	
Initiator Detected Error	

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## Supported SCSI Commands

Erase	Receive Diagnostic Results
Inquiry	Release Unit
Load/Unload	Request Block Address
Locate	Request Sense
Log Select	Reserve Unit
Log Sense	Rewind
Mode Select (6)	Seek Block
Mode Sense (6)	Send Diagnostic
Prevent Allow Medium Removal	Space
Read	Test Unit Ready
Read Block Limits	Verify
Read Buffer	Write
Read Position	Write Buffer
	Write Filemarks

# Specification

## Product Specifications

### Dimensions

	3.5" Standard Height	5.25" Half Height
Height	41.2 mm (1.62 in)	41.2 mm (1.62 in)
Width	101.6 mm (4.0 in)	146.0 mm (5.75 in)
Depth	146.0 mm (5.75 in)	146.0 mm (5.75 in)

### Acoustic Noise

(A) curve weight

Streaming Write/Read	35 db (A)
Insert/Eject	60 db (A)

Note : The sound-meter on (A) scale is located 1m in front of the center of the drive front panel.

### Altitude

Operating	0 to 7000 feet
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### Shock

Operating	No Data Loss Half Sine Performance 5 G Peak 3 ms 3 axes, 3 directions *Interval 10 seconds
Non-Operating	No Device Damage Half Sine 90 G Peak 3 ms (30 G Peak 11 ms) 3 axes, 3 directions

### Vibration

Operating	Swept Sine 5 to 500 Hz *0.25 G Peak 1 Octave/min. 3 axes, 3 directions
Non-Operating	Swept Sine 5 to 500 Hz *0.5 G Peak 1 Octave/min. 3 axes, 3 directions

### Temperature and Humidity Range

#### Temperature

Operating	5 °C to 40 °C ( $\Delta T < 10$ °C/h)
Non-Operating (mech)	- 40 °C to 70 °C ( $\Delta T < 20$ °C/h)
Non-Operating (tape)	- 40 °C to 45 °C ( $\Delta T < 20$ °C/h)

#### Humidity

Operating	20 to 80% RH, non-condensing Maximum wet bulb temperature = 26 °C
Non-Operating (mech)	5 to 95% RH ( $\Delta RH < 30\%/h$ )
Non-Operating (tape)	20 to 80% RH ( $\Delta RH < 30\%/h$ )

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### Power Requirements

Voltage	Max Ripple	Current	
		Typical	Maximum
5V +/- 5%	100 mVp-p	1.0 A	2.0 A
12 V +/- 10%	100 mVp-p	0.2 A	0.7 A

### Suspended Particulate

Operating	Less than 150 microgram/m <sup>3</sup>
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### EMI

Radiated	FTZ/FCC class B, VCCI-2 (Equivalent)
Conducted	FTZ/FCC class B, VCCI-2 (Equivalent)
ESD	Discharge Voltage < 15 kV: No operation failure < 20 kV: No drive damage

### Air-cooling Requirement

Surrounding temperature	< 40 °C
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Clean air flow is recommended to minimize the possibility of data loss.

## Third Party Support Contacts (In the USA)

Host Adapter Vendors	Phone Numbers
Adaptec	408-945-8600
ATTO	716-691-1999
Bus Logic	408-492-9090
DPT	407-830-5522
Future Domain	714-253-0400
Initio	408-988-1919
Qlogic	714-438-2200
Ultera Systems Inc.	714-367-8800

Operating Systems	Backup Software Vendors	Phone Numbers
DOS	Arcada	407-333-7500
	Cheyenne	516-484-5110
	Columbia Data Products	407-869-6700
	Corel	613-728-8200
	NovaStor	805-579-6700
	Palindrome	708-505-3300
	ST. Bernard Software	619-676-2277
	Sytron	508-898-0100
	Tapedisk	715-235-3388
Macintosh	Cheyenne	516-484-5110
	Corel	613-728-8200
	Dantz	510-253-3000
	NovaStor	805-579-6700
OS/2	Cheyenne	516-484-5110
	Corel	613-728-8200
	IBM	800-426-3333
	NovaStor	805-579-6700
	Sytron	407-333-7500
Windows	Arcada	407-333-7500
	Cheyenne	516-484-5110
	Corel	613-728-8200
	Creata	909-595-8811
	NovaStor	805-579-6700
	ST. Bernard Software	619-676-2277
	Sytron	508-898-0100
Windows NT	Arcada	407-333-7500
	Cheyenne	516-484-5110
	Creata	909-595-8811
	Microsoft	206-882-8080
	NovaStor	805-579-6700
	Avail Systems	303-444-4018
Windows NT Advanced Server	Microsoft	206-882-8080
Windows 95	NovaStor	805-579-6700
DEC Unix	Cheyenne	516-484-5110
	NovaStor	612-933-8790
	Software Moguls	612-933-8790
	Work Station Solutions	603-880-0080

\* All phone numbers listed are in the USA.

Add the country code (1) prior to those numbers when calling from outside the USA.



Operating Systems	Backup Software Vendors	Phone Numbers
SUN Unix	Legato	415-812-6000
	NovaStor	818-707-9900
	Software Moguls	612-933-8790
	Sun Soft	310-348-8649
	Work Station Solutions	603-880-0080
Solaris Unix	Cheyenne	516-484-3150
	Legato	415-812-6000
	NovaStor	818-707-9900
	Software Moguls	612-933-8790
	Sun Soft	310-348-8649
SCO Unix	Work Station Solutions	603-880-0080
	Cheyenne	516-484-3150
	Legato	415-812-6000
	Software Moguls	612-933-8790
NCR Unix	Work Station Solutions	603-880-0080
	NovaStor	818-707-9900
	Work Station Solutions	603-880-0080
HP Unix	Cheyenne	516-484-3150
	NovaStor	818-707-9900
	Work Station Solutions	603-880-0080
AIX Unix	Cheyenne	516-484-3150
	Legato	415-812-6000
	NovaStor	818-707-9900
	Software Moguls	612-933-8790
	Work Station Solutions	603-880-0080
Interactive Unix	Sun Soft	310-348-8649
SGI Unix	Software Moguls	612-933-8790
	Work Station Solutions	603-880-0080
Novell UNIXware	Novell	801-263-3500
Novell NLM	Arcada	407-263-3500
	Avail Systems	303-444-4018
	Cheyenne	516-484-3150
	Columbia Data Products	407-682-0265
	Creata	909-595-8811
	Legato	415-812-6000
	NovaStor	818-707-9900
	Novell	801-419-5544
	Palindrome	708-505-3300
	Performance Tech	210-979-2110
	ST. Bernard Software	619-676-2277
	Symantec	310-449-4156
Sytron	508-898-0100	
Banyan	Performance Tech	210-979-2110
Lantastic	NovaStor	818-707-9900
Amiga	Moonlighter	407-384-9484
RS6000	Legato	415-812-6000
	NovaStor	818-707-9900
	Software Moguls	612-933-8790

# **Sony Contacts**

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**For further information, please contact:**

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3300 Zanker Road San Jose, CA95134, 1940. USA

TEL: (1) 800-352-7669 FAX: (1) 800-883-7669 TELEX: 171331

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