4.0 Gbyte 1/4-Inch Tape Drive Specifications

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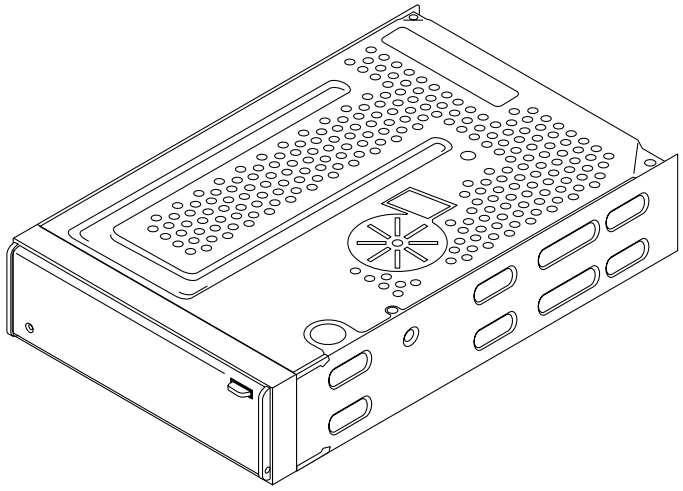
About the Tape Drive

The 4.0 Gbyte 1/4-inch tape drive is equipped with an intelligent controller and an embedded small computer system interface (SCSI). Data is transferred at 380 Kbytes per second from a 256 Kbyte buffer. The SCSI burst rate is 3.0 Mbytes per second. The tape rewind speed is approximately 3.05 m/s (120 ips).

This SCSI device is in compliance with ANSI X3.131 and QIC storage device format standards.



Installation

The procedure for installing this device is covered in your enclosure or system documentation.

Software Commands

For information about software commands, refer to the *Solaris Handbook for SMCC Peripherals* or the *AnswerBook* documentation for your operating system. The *Solaris Handbook for SMCC Peripherals* also describes how to determine which SCSI target IDs are available and how to configure your system after installation.

Operating System Modifications

Operating system modifications are required for the Solaris™ 1.1.2 as well as 2.4 and later environments. See the product notes which accompany this documentation.

Modifying Configuration Files

Depending upon the operating system you have, follow the appropriate procedures.

SunOS 5.x Operating Environments

For optimum performance on systems running SunOS releases 5.4, 5.5, 5.5.1 and 5.5.1 HW 4/97, you must modify the `st.conf` file.

Read this entire procedure before editing the `st.conf` file.

Note – The syntax is critical. Verify the placement of commas, semicolons, and beginning and ending quotation marks. Some numerical fields are preceded by `0x`.

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1. **Become superuser and make a copy of the original** `st.conf` **file**`/kernel/drv/st.conf` **as a backup (**`st.conf.old`**).**

```
%su
Password:

#cp /kernel/drv/st.conf st.conf.old
```

2. **Edit the** `st.conf` **file.**

   Using an editor, scroll through the `st.conf` file to the following line:

```
# tape-config-list=
```

   a. **Delete the # character that begins the line, if it hasn't already been removed. (# = comment line).**

   b. **Using the editor, continue to scroll until you come to the following line entry:**

```
# "TANDBERG TDC 4200",    "Tandberg 2.5 Gig QIC", "TAND-25G-
FIXED",
```

   c. **On the next lines, add the following entry exactly as shown**

```
"TANDBERG SLR5",  "Tandberg 8 Gig QIC",   "TAND-8G-VAR",
```

Note – Do not use a # character at the beginning of the line just added. The # character is used to comment-out a specific line entry.

Note – If multiple devices are enabled (lines uncommented), only the *last* uncommented line with this format needs to end with a semicolon. All previous lines with this format *must* end with a comma.

---

   d. **Using the editor, continue to scroll until you come to the following line entry:**

```
TAND-25G-VAR   =   1,0x37,0,0x967b,1,0x00,0;
```

e. On the next line, add the following entry exactly as shown:

```
TAND-8G-VAR     =  1,0x37,0,0x963b,4,0xA0,0xD0,0xD0,0xD0,3;
```

Note – Do not begin this line with a # character.

Note – This should be the last line entry and *must* end with a semi-colon.

---

f. Save the file as `st.conf`**.**

3. **Halt the system following the normal procedure.**
4. **Reboot the system with the** `-r` **option to recognize the drive:**

```
ok boot -r
```

Watch the boot messages for any indications of problems with the `st.conf` entry.

Note any indicated line numbers. If any error messages occur, edit the `st.conf` file again and then reboot.

5. **Install a tape cartridge in the tape drive and allow the drive to fully load the cartridge.**
6. **Verify that the** `st.conf` **entry is correct.**

```
%mt -f /dev/rmt/0 status
```

Note – The `mt` status return of `Tandberg 2.5 Gig QIC tape drive` is not accurate for this 4.0 Gbyte QIC tape drive. However the patch fix is not yet available. This will not affect the functionality or performance of the drive.

You may need to replace the 0 with 1, 2, and so on, until you find the number that the system has identified for this drive.

- `Tandberg 2.5 Gig QIC tape drive` indicates that the tape drive is correctly recognized. The specific Sense Key returned is usually not an issue.
- `No Additional Sense` indicates that there are no error conditions.
- `Unit Attention` indicates that the drive has just been powered on or that a tape has just been inserted.

Undesired Responses from the Drive

- `SCSI tape drive` indicates the `st.conf` entry is incorrect. You must edit the `st.conf` file and reboot until you no longer see `SCSI Tape Drive`.
- `No tape loaded or drive offline` indicates there is no cartridge in the drive or that the cartridge is not yet loaded. Install a cartridge or wait for the cartridge load to complete and retry the `mt status` command.
- `No such file or directory` indicates there is no tape drive attached to that `rmt` (remote) number. Try another `rmt` number.

Other Sources of Information

- Check the man pages for additional information on software commands.

The man page for the `mt` command lists numerous helpful commands. This is accessed by typing `man mt`.

SunOS 4.1.4 Operating Environment

In order to correctly use the 4.0 Gbyte 1/4-Inch tape drive with the SunOS 4.1.4 operating environment, you must perform the following procedures to edit the `st_conf.c` and `stdef.h` files and make a new kernel.

Note – The only SunOS operating environment supported by this tape drive is SunOS 4.1.4 (Solaris 1.1.2).

---

1. **Become superuser by typing su and pressing Return.**

   The system responds with a request for your superuser password.

2. **Type your superuser password and press Return.**

   The root prompt (#) is displayed.

```
% su
Password: Type the superuser password
#
```

3. **Change directories to the device configuration directory.**

```
# cd /usr/kvm/sys/scsi/targets
```

4. **Change the permissions to allow editing of the** `st_conf.c` **file.**

```
# chmod +w st_conf.c
```

5. **Edit the** `st_conf.c` **file in the following manner.**

   Use vi or any other text editor to edit the file.:

```
/* Tandberg 4/8 Gig QIC */
{
"Tandberg 8 Gig QIC", 13, "TANDBERG SLR5",
0x37, 512,
(ST_QIC | ST_BSF | ST_BSR | ST_LONG_ERASE | ST_VARIABLE),
400, 400,
{ 0xA0, 0xD0, 0xD0, 0xD0},
{ 0, 0, 0, 0 }
},
```

Note – Rebuild the kernel after modifying the st_conf.c file. Follow the instructions in the `/usr/kvm/sys/‘/usr/bin/arch -k‘/conf/README` file.

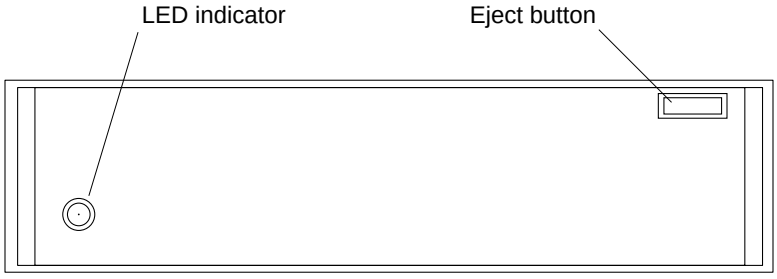
Cleaning

Clean the tape drive after every 50 hours of use to maintain reliable operation. Clean the drive more often if you use it in a particularly dusty environment or operate it infrequently.

Use the Tandberg cleaning cartridge (P/N 5678-1), or equivalent. It is a dry cleaning cartridge. Follow the instructions included with the kit.

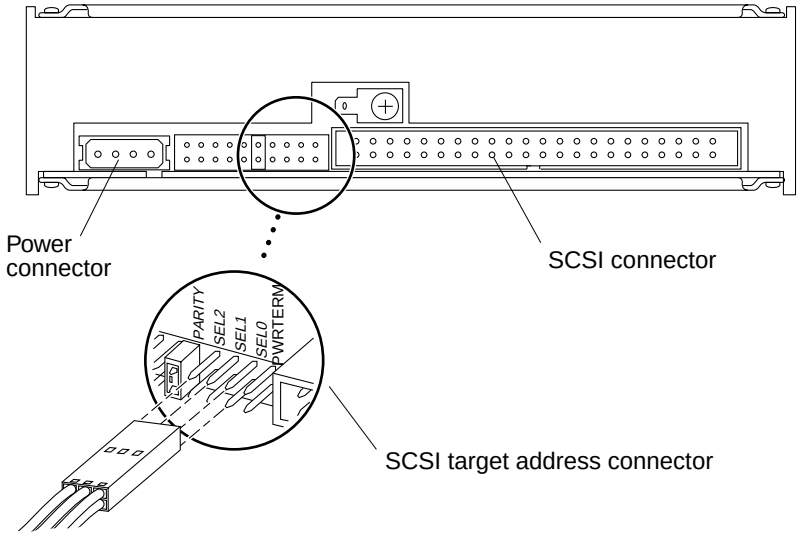
Panel Descriptions

Front Panel Controls and Indicators



LED indicator - Lit green when a tape is in the drive. Blinking when tape drive activity occurs.
Eject button - Used to open the drive door and eject the tape

Back Panel Connections



Note – When installing the 4.0 Gbyte 1/4-inch tape drive into an Ultra 30, an extension cable must be used to mate the tape drive power connector with the host system power cable assembly. Without the extension cable the tape drive power connector will not reach the host system power cable assembly.

TABLE 1 Selecting the SCSI ID

ID	SEL 2	SEL 1	SEL 0
0	OFF	OFF	OFF
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	ON	ON
4	ON	OFF	OFF
5	ON	OFF	ON
6	ON	ON	OFF
7	ON	ON	ON

Inserting a Tape Cartridge

1. **Check that there is no drive activity.**

Caution – Use a software command such as `mt` to check for drive activity before ejecting the tape, or data might be corrupted. The front-panel LED indicates only that there is a tape in the drive.

2. **Push the eject button.**
3. **Verify that the tape cartridge write protect switch is set correctly.**

   If the arrow is pointed towards the lock symbol, the tape is write protected.
4. **Insert the cartridge face up into the drive.**
5. **Close the tray door.**

Tape Cartridge Information

This tape drive uses QIC-4 Gbyte 1/4-inch tape cartridges, which have a maximum storage capacity of 4.0 Gbytes (non compressed). The storage capacity can be up to 8 Gbytes with a 2:1 compression ratio. The compression ratio varies depending on the data pattern. The cartridges do not require preformatting.

Cartridge Storage Capacity

Format	Length	Capacity	Read/Write
QIC-4GB	457m (1500 ft.)	4.0 Gbytes	Read / Write
QIC-2GB	356m (1200 ft.)	2.5 Gbytes	Read / Write
QIC-1000	232m (760 ft.)	1.0 Gbytes	Read / Write
QIC-525	311m (1020 ft.)	525 Mbytes	Read / Write
QIC-150	183m (600 ft.)	155 Mbytes	Read / Write
QIC-120	183m (600 ft.)	125 Mbytes	Read / Write

Thermal Conditioning

To assure proper thermal conditioning, keep the cartridge at the same temperature as the drive for 24 hours.

Tensioning Pass

When you insert a blank tape cartridge for the first time, or if a tape has been stored for a long period of time, run it from one end to the other. This is called a tensioning pass and ensures an even distribution of tension throughout the tape.

Refer to the *Solaris Handbook for SMCC Peripherals* that corresponds to your operating system for more information.

For Solaris 2.x type:

```
% mt -f /dev/rmt/0 retension
```

Handling and Storage

- Keep cartridges away from anything magnetic.
- Store cartridges in a dust-free environment, upright on edge rather than flat.
- Keep cartridges away from direct sunlight and sources of heat, cold, or humidity.

Environmental Specifications

Temperature			
Operating[1] Nonoperating	5 to 45°C, 10°C / hr, 10°C / hour gradient -30 to +60°C, 10°C / 30 min, 1°C / min gradient		
Relative Humidity			
Operating Nonoperating	20 to 80% (wet bulb temperature of 26°C) 10 to 90%		
Shock			
Operating Storage	70 m/s^2 (7G), half sine wave, 11 ms duration 500 m/s^2 (50G), half sine wave, 11 ms duration (IEC-68-2-27)		
Vibration			
Mode	**Frequency**	**Peak Displacement**	**Acceleration**
Operating	5-60 Hz 60-500Hz	0.035 mm ±10% --	-- 0.5G
Storage	5-58 Hz 58-500Hz	0.150 mm ±10% --	-- 2.0G
Transport	5-12 Hz 12-500Hz	3.5 mm ±10% --	-- 2.0G
Altitude			
Operating Nonoperating Storage	4,000m (13,000 ft.) 13,000m (40,000 ft.) 13,000m (40,000 ft.)		

1. Due to additional heat coming from internal friction in the cartridge, the maximum surrounding temperature should not exceed 40 degrees Celsius.

Physical Characteristics

Height	43 mm (1.69 in)
Width	149 mm (5.87 in)
Depth	216 mm (8.51 in) (Including a bezel thickness of 12.5 mm(0.49 in))
Weight	1.1 kg (2.4 lbs)

Power Requirements

Standby	3.5 W
Operation	15 W