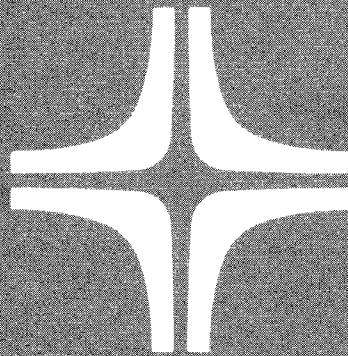


3782 Streaming Magnetic Tape Drive



Operator Reference

This document contains the latest information available at the time of preparation. Therefore, it may contain descriptions of functions not implemented at manual distribution time. To ensure that you have the latest information regarding levels of implementation and functional availability, please consult the appropriate release documentation or contact your local Sperry representative.

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WARNING: 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.

Compliance is based upon a system configuration that includes SPERRY peripherals/subsystems so labeled, and cables furnished by Sperry or built to Sperry specifications and assembly procedures.

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1. Introduction

1.1. OPERATING CAPABILITIES

The SPERRY UNIVAC 3782 Streaming Magnetic Tape Drive (Figure 1-1) provides low-cost dump and restore capabilities to back-up data stored in nonremovable disk packs of a disk subsystem. Multiple streaming tape drives are connected in a daisy-chain manner, with up to four tape drives in a subsystem. The controller for all four drives is located in the host processor cabinet.

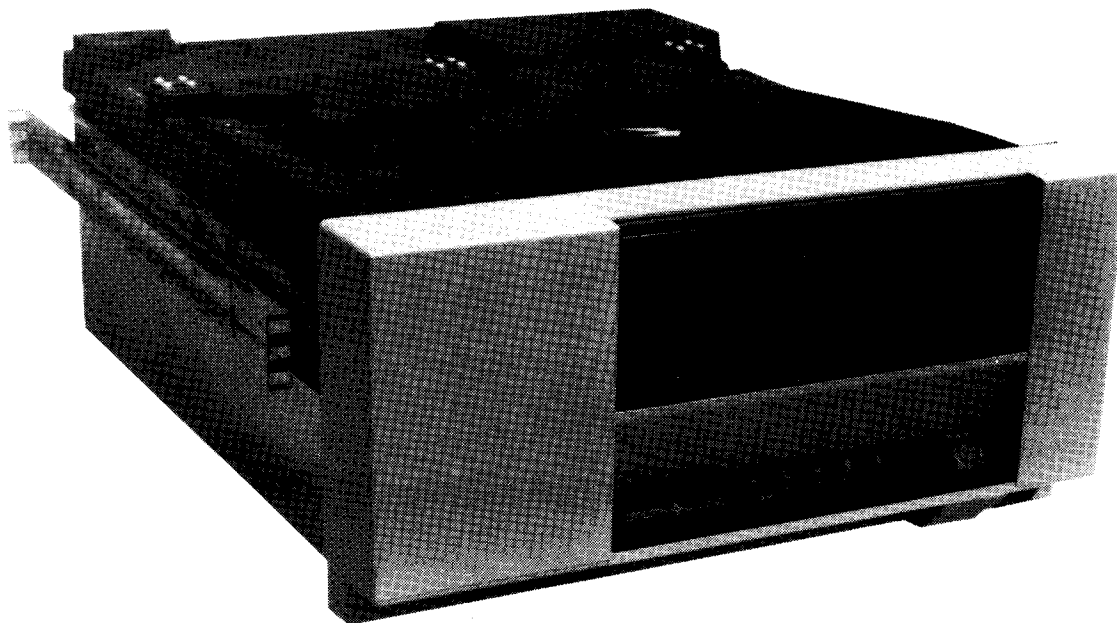


Figure 1-1. Streaming Magnetic Tape Drive

1.1.1. Operating Modes

The streaming tape drive operates at either 100 inches per second (ips) (254 cm/s) or at 25 ips (63.5 cm/s), which are equivalent to 160 kilobytes and 40 kilobytes per second, respectively. Operating speed is selectable by command under program control.

The primary mode for operating the streaming tape drive is at high speed. This mode is especially suited to back-up stored data on nonremovable disk packs.

Low-speed mode permits dump/restore operations where lower data rate is needed to avoid inefficient repositioning cycles. Low speed is also suitable for emulating traditional start/stop processing operations, especially where stop time between runs is significant and absorbs repositioning time. Access time in low speed to a streaming tape drive always requires more time than for conventional tape drives operating at the same speed.

Streaming tape operation does not permit stop and start conditions within an interblock gap. Interruption of the streaming mode requires a repositioning cycle, which creates inefficiencies in the data throughput rate, and should be avoided.

1.1.2. Compatibility

The streaming tape drive uses standard 1600 bits-per-inch (bpi) phase-encoded (PE) recording format, and permits compatible interchange of tapes conforming to ANSI X3.39-1973. This specification is met on tapes written in high- or low-speed streaming mode.

Additional manuals that pertain to operating the streaming tape drive are current versions of the following:

- 3782 streaming magnetic tape unit general description, UP-9382
- Magnetic tape subsystems media, UP-8208
- System 80, Models 3 and 5 I/O controllers reference, UP-8742 (includes streaming tape drive controller characteristics and information for programming the streaming tape drive)

1.2. OPERATOR RESPONSIBILITIES

Performance reliability of the streaming tape drive depends greatly on efficient use by the operator. The operator must:

- be thoroughly familiar with functions of the operator control panel;
- load and unload tape for the tape drive;
- replace missing or damaged beginning-of-tape (BOT) and end-of-tape (EOT) markers on the tape;

- perform cleaning operations on the tape path after each 8 hours of operation, including cleaning the:
 - read/write head assembly;
 - tape cleaner; and
 - tape guides and pulleys;
- identify operational faults from flashing indicators on the operator control panel and take recommended remedial action; and
- provide fault locations on failures indicated by power-on confidence tests for Sperry Univac customer engineer to reduce equipment downtime.



2. Controls and Indicators

The streaming magnetic tape drive is rack-mounted, on slides, with access to the operator control panel from the front. Tape is loaded through an access door at the front. No operator controls or adjustments are located inside the cabinet.

2.1. OPERATOR CONTROL PANEL

The operator control panel (Figure 2-1) contains switches and associated indicators used during normal operations. These are listed and described in Table 2-1.

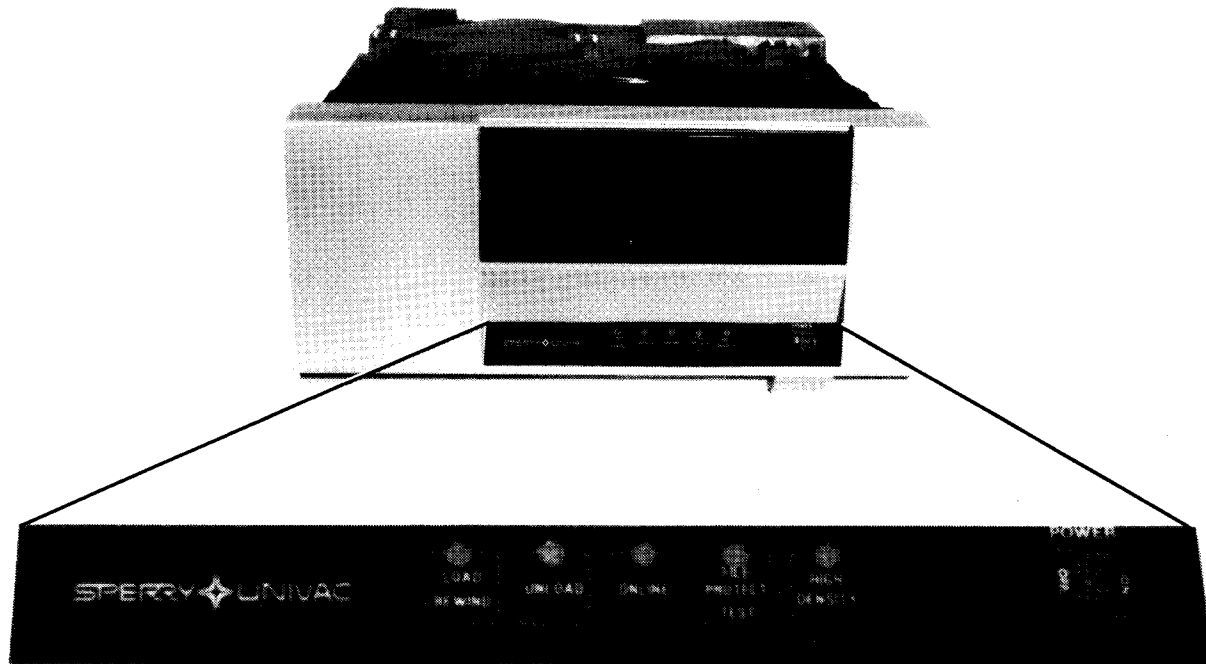


Figure 2-1. Streaming Magnetic Tape Drive, Operator Control Panel

Table 2-1. Operator Control Panel, Switches and Indicators

Switch/Indicator	Function
LOAD/REWIND switch/indicator	<p>Pressing the switch when tape is not loaded initiates a load sequence and advances tape to load point.</p> <p>Pressing the switch when tape is loaded initiates a rewind-to-load-point sequence.</p> <p>Indicator blinking indicates a load or rewind sequence is in progress.</p> <p>Indicator lit continuously indicates the beginning-of-tape (BOT) marker was sensed and all access doors are locked.</p>
UNLOAD switch/indicator	<p>Pressing the switch causes tape to be unloaded, regardless of tape position.</p> <p>Indicator blinking indicates an unload sequence is in progress.</p> <p>Indicator lit continuously indicates the unload sequence is complete and the front panel access door is unlocked to permit tape to be removed.</p>
ONLINE switch/indicator	<p>Pressing the switch while the indicator is extinguished places the tape drive online and lights the indicator.</p> <p>Pressing the switch while the indicator is lit places the tape drive offline and extinguishes the indicator.</p> <p>Pressing the switch while a load sequence is in progress (LOAD/REWIND indicator lit) places tape drive online when BOT marker is sensed.</p>
FILE PROTECT/TEST switch/indicator	<p>Pressing the switch places the tape drive in test mode.</p> <p>Indicator extinguished indicates the write-enable ring is installed on the tape reel and data may be written on tape.</p> <p>Indicator lit indicates the write-enable ring is not installed on the tape reel and data recorded on tape is protected.</p> <p>This switch is used only in test mode.</p>
HIGH DENSITY switch/indicator	<p>Pressing the switch activates an internal microprocessor to perform tests for Sperry Univac customer engineer.</p> <p>Indicator is used for error indications listed in Table 3-2.</p>
POWER ON/OFF switch/indicator	<p>Rocker switch turns power on or off for the tape drive. The switch/indicator lights when power is on.</p>

2.2. ERROR INDICATORS

Indicators associated with front panel switches also provide operating error or malfunction indications to assist the operator in performing normal routines. Error indications are made by flashing indicators above the operator control panel switches. The type of error is indicated by which indicator is not flashing. Combinations of flashing indicators and their meanings are discussed in Section 3 to assist the operator in error recovery, as well as in Section 4 to identify operational faults.

3. Operation

3.1. POWER TURN ON/OFF

During operation, power may be turned on and off locally at the operator control panel with the POWER ON/OFF switch. Power is turned off locally for cleaning, resetting error conditions, or other operator maintenance duties. When completed, however, power should remain on unless a malfunction occurs requiring notification of the Sperry Univac customer engineer.

3.1.1. Remote Power Turn On

Operating power for the streaming tape drive is normally controlled from a power on/off switch at the host processor cabinet. However, to permit remote power control, the operator must leave the POWER ON/OFF switch on the operator control panel (Figure 2-1) in the ON position.

3.1.2. Power-On Confidence Tests

The streaming tape drive is equipped with enormous capabilities for testing its own functions. When the POWER ON/OFF switch on the operator control panel (Figure 2-1) is set to ON, power-on confidence (POC) tests are automatically performed. Power is fully turned on when the tests are completed satisfactorily.

Proceed as follows to turn on power:

1. Set the POWER ON/OFF switch to ON position. Note that the switch lights. All indicators light momentarily then extinguish while POC tests are in progress. When the UNLOAD indicator remains lit, POC tests are completed satisfactorily and operation may continue. If a fault is detected, all front panel indicators flash on and off; proceed to step 2.
2. Press the LOAD/REWIND switch/indicator to determine the fault indication and to extinguish all switch/indicators except those indicating the fault area.
3. Note the binary number indicated by the three LOAD/REWIND, UNLOAD, and ONLINE indicators. Contact the Sperry Univac customer engineer and indicate the binary number and fault location, as listed in Table 3-1, so that the proper replacement equipment is available during maintenance. When contacting the Sperry Univac customer engineer, be sure to mention that the fault occurred during power-on confidence tests.

Table 3-1. Power-On Confidence Test Indications

Power-On Confidence Test Binary Number	Switch/Indicators			Power-On Confidence Test Fault Location
	LOAD/REWIND	UNLOAD	ONLINE	
1	●	○	○	Main printed-circuit board
2	○	●	○	Supply-reel motor
3	●	●	○	Take-up reel motor
4	○	○	●	Tachometer

LEGEND:

- = indicator lit (flashing)
- = indicator extinguished

NOTE:

The remaining two switch/indicators not listed are not affected during power-on confidence (POC) test indications.

3.2. TAPE DRESSING

The leading edge of the tape must be free of wrinkles, dirt, oil, or other foreign matter and should have a smooth edge. If tape dressing is required:

NOTE:

If the leading edge of tape is provided with a tape attachment loop for use as a tape leader on some tape drive models, the tape end cannot be dressed for automatic threading and must be loaded manually (3.4.2).

1. Clean the leading edge of tape.
2. Insert the tape end into the slot on a SPERRY UNIVAC tape dressing tool (Figure 3-1).
3. Squeeze the tape dressing tool so that the cutter plunger is fully inserted into the tool.
4. Remove the tape from the tool and note that the tape edge is dimpled and cut to a smooth, rounded end.

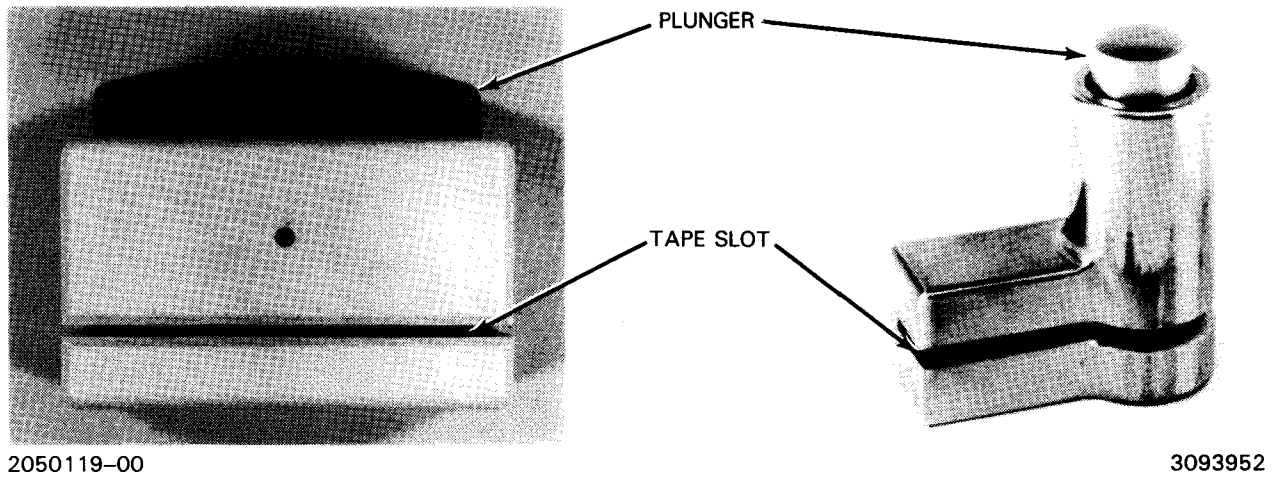


Figure 3-1. SPERRY UNIVAC Tape Dressing Tools

3.3. WRITE-ENABLE RING

If writing is to be done on a tape, a write-enable ring must be used on the reel. If no writing is to be done and files recorded on tape are to be protected, the reel must not contain a write-enable ring. It is recommended that the write-enable ring be removed from the reel when the reel is removed from the tape transport for storage. No writing or erasing occurs during a rewind operation.

To prepare the tape for writing:

1. Place tape reel face down on a flat surface.
2. Insert write-enable ring (Figure 3-2) in slot on rear of reel.
3. Load the tape reel in the normal manner.

CAUTION

To protect recorded files or data, remove the write-enable ring when it is not required for writing, because inadvertent tape erasure or modification of data may occur.

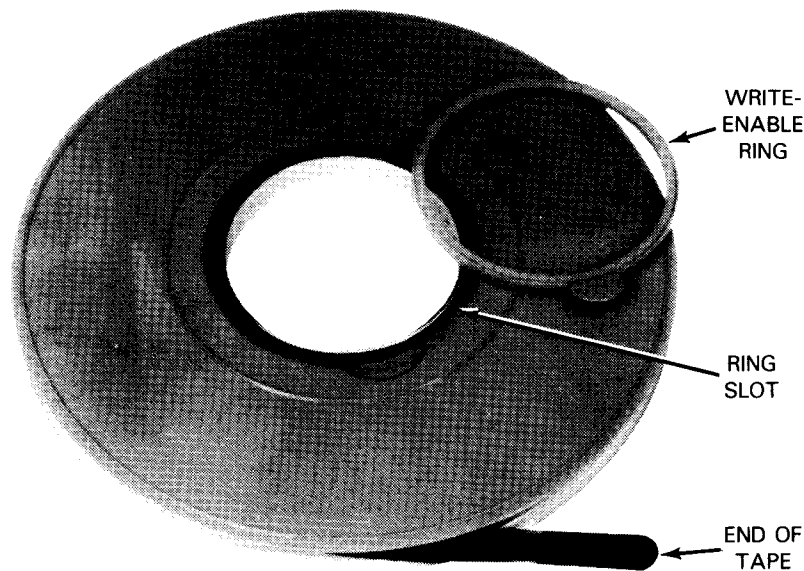


Figure 3-2. Tape Reel and Write-Enable Ring

3.4. TAPE LOADING

Tape reels are easily mounted and tape may be threaded automatically or manually. Normally, tape is threaded automatically and tape mounting and loading is extremely simplified on a streaming tape unit. However, when the tape to be run has been used on magnetic tape units requiring a tape loop or leader, tape cannot thread automatically on the streaming tape drive and must be threaded manually. No modification is required, and a tape loop or leader can remain on the tape. Procedures for autoloading, which threads tape automatically, and for manual loading are discussed separately in the following paragraphs.

3.4.1. Autoload

To mount a reel and automatically thread the tape, proceed as follows:

1. Apply power to the tape drive, either from the host processor power control switch or the POWER ON/OFF switch on the operator control panel. (Refer to 3.1.) Allow from 2 to 10 seconds for normal delay, then check that the UNLOAD switch/indicator is lit.
2. Remove the tape lock from the tape reel by unlatching the clip, and disengage the clip from the hook end (Figure 3-3a). Store the tape lock at a designated location.
3. Open the front access door by gently pressing down on top of the door at its center.

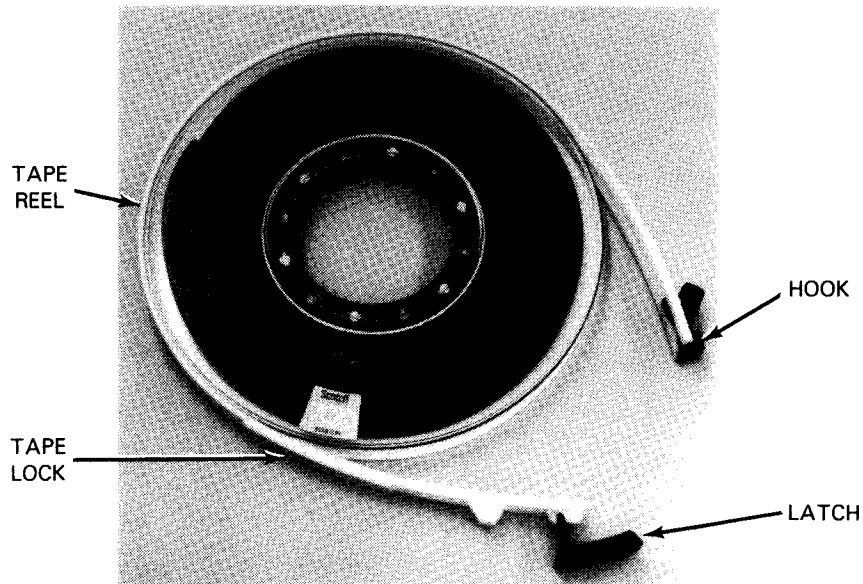
NOTE:

If you are required to write data on tape, check that the write-enable ring (Figure 3-2) is installed on the tape reel. If no writing is required, be sure that the write-enable ring is not installed to protect recorded files.

4. Ensure that the tape is wound completely onto the reel, then insert the reel into the tape drive with the reel label side up (write-enable ring slot side is down). Raise the reel slightly after entering the tape drive and insert it sufficiently to allow it to seat on the reel hub (Figure 3-3b).
5. Close the access door.
6. Press the LOAD/REWIND switch/indicator. Note that the indicator flashes until the beginning-of-tape (BOT) marker is sensed, then remains lit.

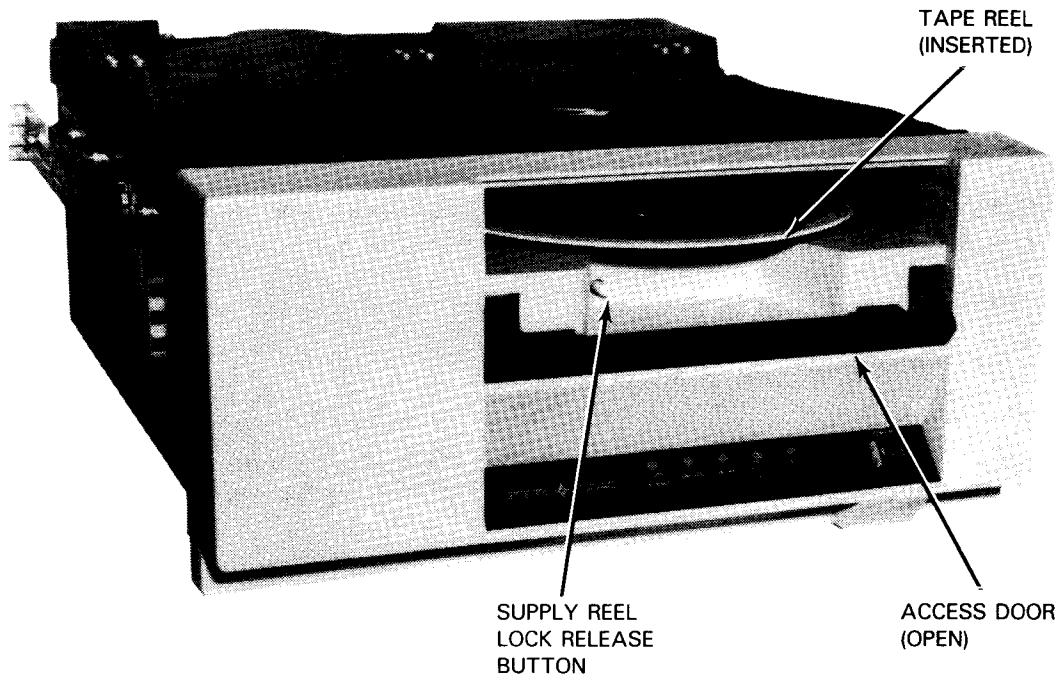
CAUTION

The access door and top cover are locked when tape is loaded. Do not attempt to open either at that time or damage may result to the locking mechanism.



a. Removing the tape lock

Figure 3-3. Feeding Tape for Autoload (Part 1 of 2)



b. Tape reel inserted into tape drive

Figure 3-3. Feeding Tape for Autoload (Part 2 of 2)

3.4.2. Manual Load

To load tape manually after failure of the autoload procedure (3.4.1) or because a tape leader is used, proceed as follows:

1. Set the POWER ON/OFF switch on the operator control panel to the OFF position.

CAUTION

Be sure that the tape drive is securely mounted in the rack before extending it on slides. Weight of the tape transport, with the tape drive in the extended position, could upset an inadequately mounted equipment rack. If an anti-tip mechanism is used on the peripheral cabinet (when tape drive is included in a peripheral cabinet), the mechanism should be fully extended.

2. Release the rack retaining mechanism located on the lower left side of the tape drive front panel.
3. Hold the front panel firmly from the sides and withdraw the tape drive on its slides until the first lock engages.

4. Release the first lock retainer on the right side and firmly withdraw the tape drive on its slides until the second lock engages.
5. Raise the top cover and secure it open by placing the top cover stay rod, on the left side, into its retaining slot on the drive frame (Figure 3-4a).
6. Remove the tape lock from the tape reel by unlatching the clip and disengage the clip from the hook end (Figure 3-3a). Store the tape lock at a designated location.

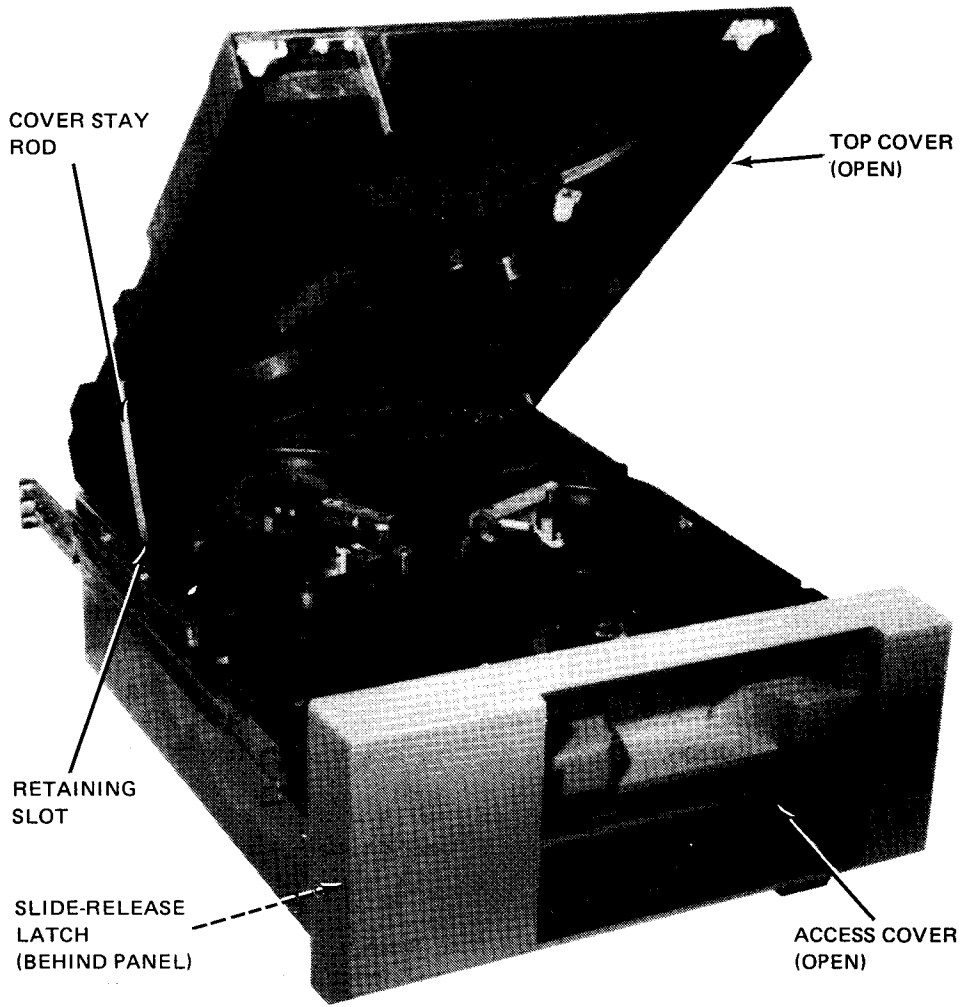
NOTE:

If you are required to write data on tape, check that the write-enable ring (Figure 3-2) is installed on the tape reel. If no writing is required, be sure that the write-enable ring is not installed to protect recorded files.

7. Ensure that the tape is wound completely onto the reel, then place the reel on the supply hub (Figure 3-4b) with the reel label side up (write-enable ring slot is down). Check that the reel is seated evenly on the reel supply hub.
8. Set the POWER ON/OFF switch on the operator control panel to the ON position.
9. Pull tape from the supply reel and thread it around the supply roller guide, compliance arm roller guide, tape roller guide, along the tape cleaner and read/write heads, and around the take-up roller guide. Carefully move the tachometer assembly away from the take-up hub and wrap several turns of tape clockwise around the take-up hub (Figure 3-4b).
10. Check that the tape is seated correctly on all roller guides and threaded properly along the read/write heads.
11. Return the stay rod (step 5) to its stored position and close the top cover firmly to latch it (the front access door should remain closed). Slide the tape drive into the normal operating position in the rack.
12. Press and hold the HIGH DENSITY switch/indicator, then actuate the LOAD/REWIND switch/indicator. Tape will now be pulled to normal tension and will advance forward until the BOT marker is sensed. The LOAD/REWIND indicator remains lit at that point. If a write-enable ring is included with the reel, the FILE PROTECT/TEST indicator is extinguished.

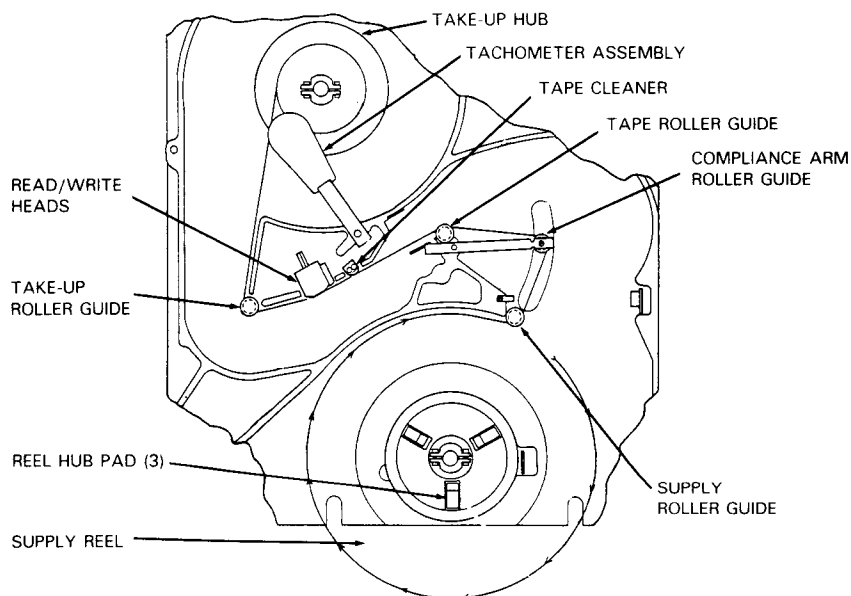
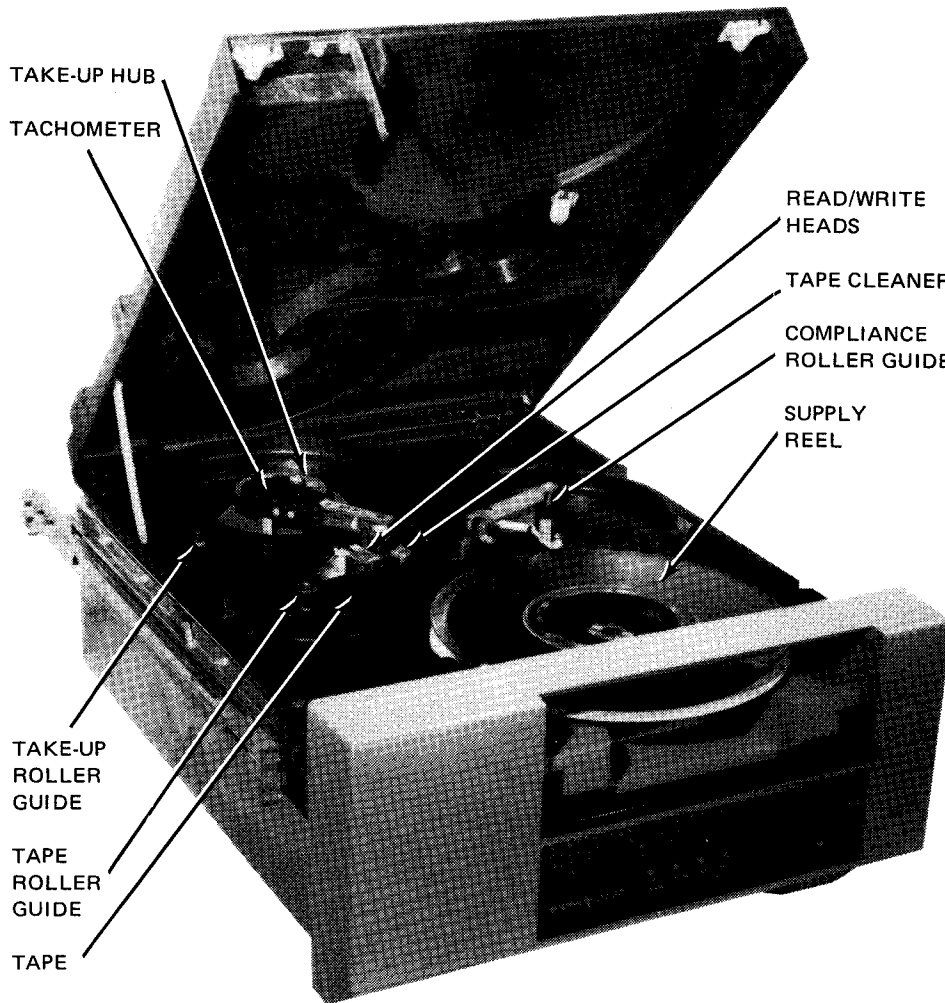
CAUTION

Do not attempt to raise the top cover or open the front access door while the LOAD/REWIND switch/indicator is flashing or lit continuously, since they are locked, and damage may result to the locking mechanism.



a. Top cover raised to access take-up hub

Figure 3-4. Loading Tape Manually and Tape Path (Part 1 of 2)



b. Tape path for manual threading

Figure 3-4. Loading Tape Manually and Tape Path (Part 2 of 2)

3.5. TAPE UNLOADING

Tape may be removed from the tape transport automatically or manually.

3.5.1. Automatic Tape – Unloading

To remove tape from the tape drive, proceed as follows:

1. Press the ONLINE switch/indicator. Note that the switch/indicator extinguishes.
2. Press the UNLOAD switch/indicator and note that it begins flashing, then remains lit when tape can be removed.

NOTE:

During the unloading sequence, while the UNLOAD switch/indicator is flashing, the front access door and top cover remain locked until the switch/indicator stops flashing and remains lit continuously.

3. Press down on the top of the front access door at its center to open the door.
4. Raise the tape reel from the supply reel hub and carefully remove the tape reel from the tape drive.
5. Close the access door.
6. Rewind loose tape onto the reel and attach the tape lock to the reel. Be sure that the tape lock tracks fit into the reel before latching the tape lock closed. Store the sealed tape reel at a designated location.

3.5.2. Manual Tape – Unloading

If the tape drive cannot complete a rewind/unload sequence, the tape reel may be rewound manually as follows:

1. Perform steps 1 through 5 of 3.4.2 to access inside the tape drive cabinet.
2. Rotate the supply reel manually in a counterclockwise direction to rewind tape onto the supply reel.
3. Press the supply reel lock release button (Figure 3-3b) and simultaneously rotate the supply reel counterclockwise until it rotates freely and can be removed from the tape transport.
4. Perform steps 3 through 6 of 3.5.1 to remove the supply tape reel.

3.6. OPERATOR ERROR RECOVERY

Operating errors may occur during tape loading by a faulty tape condition or by operator errors during procedures. The errors are indicated by the operator control panel switch/indicators flashing in an even off-on pattern. The error indication, probable cause, and remedy are listed in Table 3-2.

Table 3-2. Operator Error Indications and Recovery (Part 1 of 2)

Indication	Probable Cause	Remedy
All indicators are flashing.	<p>Tape drive was unable to complete a loading sequence after four attempts.</p> <p>NOTE:</p> <p>If a tape leader is attached to tape end, load tape manually (3.4.2).</p>	<ol style="list-style-type: none"> 1. Check first 5 feet (1.5 meters) for mechanical damage. 2. Correct tape end with dressing tool as directed in 3.2. 3. Reset error condition by setting POWER ON/OFF switch to OFF, then to ON position. 4. Load tape automatically (3.4.1) or manually (3.4.2). <p>NOTE:</p> <p>Load tape manually if a second attempt with autoloading fails, then contact Sperry Univac customer engineer.</p>
All indicators except FILE PROTECT/TEST are flashing.	A loading sequence was attempted without inserting a tape reel into the tape drive.	<ol style="list-style-type: none"> 1. Reset the error by setting POWER ON/OFF switch to OFF, then to ON position. 2. Insert a tape reel for autoloading as directed in 3.4.1, or for manual load as directed in 3.4.2.
All indicators except UNLOAD are flashing.	A load sequence was attempted with tape reel inserted upside down.	<ol style="list-style-type: none"> 1. Remove tape reel from drive. 2. Reset the error by setting POWER ON/OFF switch to OFF, then to ON position. 3. Perform steps 4, 5, and 6 of 3.4.1.

Table 3-2. Operator Error Indications and Recovery (Part 2 of 2)

Indication	Probable Cause	Remedy
All indicators except ONLINE are flashing.	A load or unload sequence was attempted with the access door or top cover not fully closed.	<ol style="list-style-type: none"> 1. Close top cover firmly to actuate internal latch. Close access door fully. 2. Reset error by setting POWER ON/OFF switch to OFF, then to ON position. 3. Load tape for autoloading as directed in 3.4.1 or manually as in 3.4.2, or unload tape as directed in 3.5.
All indicators except LOAD/REWIND are flashing.	The beginning-of-tape (BOT) marker was not detected within the first 35 feet (10.7 meters) of tape.	<ol style="list-style-type: none"> 1. Reset error by setting POWER ON/OFF switch to OFF, then to ON position. 2. Unload and remove tape as directed in 3.5.1 or 3.5.2. 3. Attach BOT marker as directed in 4.1. 4. Load tape for autoloading as directed in 3.4.1, or manually as in 3.4.2.

4. Operator-Performed Maintenance

4.1. TAPE MARKER REPLACEMENT

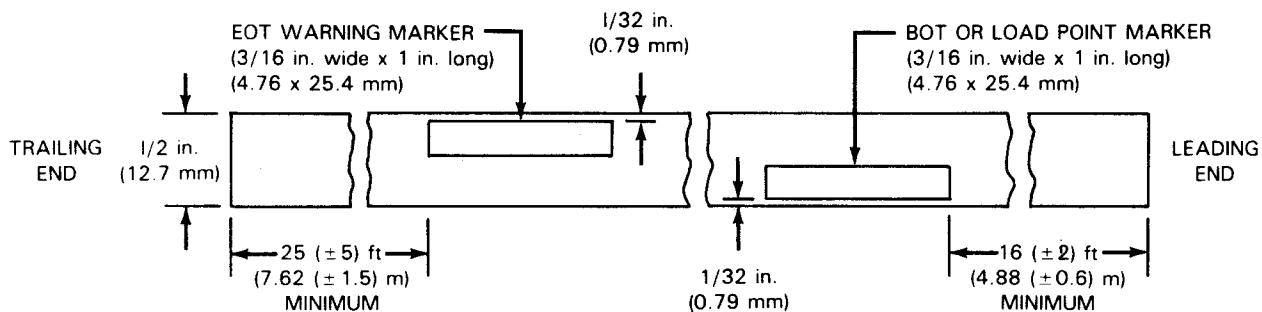
Magnetic tape used on the streaming tape drive must include markers that are sensed for beginning-of-tape (BOT) or load point, as well as for the end-of-tape (EOT) warning.

The two markers (Figure 4-1) consist of light-reflective aluminum strips measuring 1 inch by 3/16 inch (25.4 mm by 4.76 mm), with a pressure-sensitive adhesive coating on the reverse side (SPERRY UNIVAC part number 3011819-00). The strips are mounted on the shiny side of the tape (outside surface as tape is wound on the reel). The inner tape surface is coated with iron oxide.

The BOT (or load point) marker is placed 1/32 inch (0.79 mm) from the outside edge of the tape and at least 16 (± 2) feet (4.88 (± 0.6) m) from the leading end. The outer tape edge is closest to the label side of the reel (opposite the write-enable ring slot side).

The EOT warning marker is placed 1/32 inch (0.79 mm) from the inner tape edge and at least 25 (± 5) feet (7.62 (± 1.5) m) from the trailing end of the tape.

The operator is responsible for replacing damaged or missing tape markers according to the specifications described and illustrated here. The tape drive does not operate properly without both of these markers properly placed on the tape.



NOTE:

Tape shown shiny side up

Figure 4-1. Tape Markers Specifications

4.2. TAPE DRIVE OPERATIONAL FAULTS

Operational faults, which do not include data errors, can occur during a tape loading sequence, an unloading sequence, or during normal read/write operations. A malfunction of the tape drive usually causes an operational fault indication; however, in some cases, improper commands supplied from the host processor may be the cause.

4.2.1. Switch/Indicator Binary Assignments

Operator control panel switch/indicators serve to indicate operational faults. A rapid double-pulse flash by certain combinations of indicators provide the operator with an indication of the occurring fault. The combination of flashing indicators provides a binary number that is associated with the operational fault. The switch/indicators and their binary assignments are listed in Table 4-1.

Table 4-1. Switch/Indicator Binary Assignments

Operational Fault Binary Number	Switch/Indicator				
	LOAD/ REWIND	UNLOAD	ONLINE	FILE PROTECT/ TEST	HIGH DENSITY
1	●	○	○	○	○
2	○	●	○	○	○
4	○	○	●	○	○
8	○	○	○	●	○
16	○	○	○	○	●

LEGEND:

- = indicator lit (flashing)
- = indicator extinguished

4.2.2. Operational Fault Indications

Correcting operational faults is usually beyond the scope of an operator. However, in some cases, the operator should check if the faulty condition is caused by a routine normally performed by the operator. If the check proves that the condition is not caused by failure of an operating routine, the recommended remedial contact should be made.

Table 4-2 lists the binary indications presented on the operator control panel switch/indicators for operational faults (rapid double-pulse flashing). The cause of the fault is also listed, along with the recommended operator action. When contacting the Sperry Univac customer engineer or host processor programmer, be sure to mention the binary number and the operational fault indication.

Table 4-2. Operational Fault Indications (Part 1 of 3)

Operational Fault Binary Number and Lit Indicators	Operational Fault	Recommended Action
3 ● ● 0 0 0	Over 3700 feet (1127.7 meters) of tape beyond the BOT marker has been detected.	Tape is probably 1 mil in size and should not be used.
4 0 0 ● 0 0	Tension arm swing during the load sequence has exceeded the range for normal operation.	Contact the Sperry Univac customer engineer.
5 ● 0 ● 0 0	A command has been received at the tape drive before the previous command was completed.	<ol style="list-style-type: none"> 1. Contact the host processor programmer. 2. Contact the Sperry Univac customer engineer.
6 0 ● ● 0 0	A write command was received from the host processor, but the tape reel is protected from writing.	Contact the programmer responsible for requesting a write command. If the write command is valid, attach the write-enable ring to the tape reel, reset with the POWER ON/OFF switch, and retry the operation.
7 ● ● ● 0 0	An illegal or undefined command was received by the tape drive.	Contact the host processor programmer.
8 0 0 0 ● 0	The supply reel hub locking mechanism is inoperative.	Contact the Sperry Univac customer engineer.
9 ● 0 0 ● 0	Not used	-
10 0 ● 0 ● 0	The automatic-zero function of the digital-to-analog converter failed during power-up sequence.	Contact the Sperry Univac customer engineer.

Table 4-2. Operational Fault Indications (Part 2 of 3)

Operational Fault Binary Number and Lit Indicators	Operational Fault	Recommended Action
11 ● ● ○ ● ○	Take-up servo error	Contact the Sperry Univac customer engineer.
12 ○ ○ ● ● ○	The supply reel is not seated properly on its hub, or the file protect sensor circuit failed.	Reload the tape reel as directed in 3.4.1 or 3.4.2. If the fault indication persists, contact the Sperry Univac customer engineer.
13 ● ○ ● ● ○	The supply reel did not remain locked during a tape unload operation.	Contact the Sperry Univac customer engineer.
14 ○ ● ● ● ○	Commands from the host processor have caused the tape to travel more than 18 feet (5.5 meters) beyond the EOT marker.	<ol style="list-style-type: none"> 1. Contact the host processor programmer. 2. Contact the Sperry Univac customer engineer.
17 ● ○ ○ ○ ●	The tape buffer tension arm exceeded its free travel limits during any operation except the load and unload sequences, when tape tension is not under control of the tension arm.	<ol style="list-style-type: none"> 1. Check if tape ran off reel due to a missing EOT marker. 2. Contact the Sperry Univac customer engineer.
18 ○ ● ○ ○ ●	Tape speed variations have occurred in excess of the required ANSI maximum of ± 10 percent deviation from normal.	Contact the Sperry Univac customer engineer.
19 ● ● ○ ○ ●	Hard wiring error	Contact the Sperry Univac customer engineer.

Table 4-2. Operational Fault Indications (Part 3 of 3)

Operational Fault Binary Number and Lit Indicators	Operational Fault	Recommended Action
20 ○ ○ ● ○ ●	Tachometer error	Contact the Sperry Univac customer engineer.
21 ● ○ ● ○ ●	PIC error	Contact the Sperry Univac customer engineer.
27 ● ● ○ ● ●	8049 microprocessor time-out	Contact the Sperry Univac customer engineer.
30 ○ ● ● ● ●	False interrupt	Contact the Sperry Univac customer engineer.
31 ● ● ● ● ●	POC failure	Contact the Sperry Univac customer engineer.

LEGEND:

- = indicator lit (flashing)
- = indicator extinguished

4.3. CLEANING

To ensure reliability of the tape drive by removing dirt and dust accumulations, the operator must maintain a regular cleaning schedule based on the number of hours in operation. No tape should be in the tape transport when the operator cleans the unit.

4.3.1. Tape Handling

Dirt on tape can interfere with trouble-free operation. Therefore, the tape and areas contacted by tape must be kept clean.

When not in use, tape should be protected with a tape lock (Figure 3-3a) and stored in containers designated for its protection. When manually loading tape, the operator should unreel no more tape than is necessary to load the transport. Tape must not be abused. It should be handled gently and not dropped or thrown or stored in extreme temperatures. Proper care of tape helps to maintain error-free operation.

4.3.2. Tape Drive Cleaning

Certain areas of the tape drive must be cleaned after every 8 hours of operation. The tape drive casing must also be cleaned at unscheduled times whenever oxide coating begins flaking from tape.

4.3.2.1. Eight-Hour Cleaning

To clean the tape drive after 8 hours of operation, or daily (whichever comes first), proceed as follows:

1. Unload the tape drive and remove the tape reel from the unit (3.5.1 or 3.5.2).
2. Perform steps 1 through 5 of 3.4.2 to access inside the tape drive cabinet.

CAUTION

Do not allow cleaning solvent to contact the tachometer disk, located inside the tachometer housing, or permanent damage may result in tachometer operation.

3. Moisten a cotton swab with trichlorotrifluoroethane, SPERRY UNIVAC part number 2050143-00, and carefully wipe the tachometer roller and tape guides gently with the cotton swab (Figure 4-2).

CAUTION

Do not use rough or abrasive materials that can scratch metal parts of heads and guides. Improper cleaning solvents, such as alcohol, can create operating faults. Do not soak guides excessively with cleaner, which may break down and remove bearing lubricant.

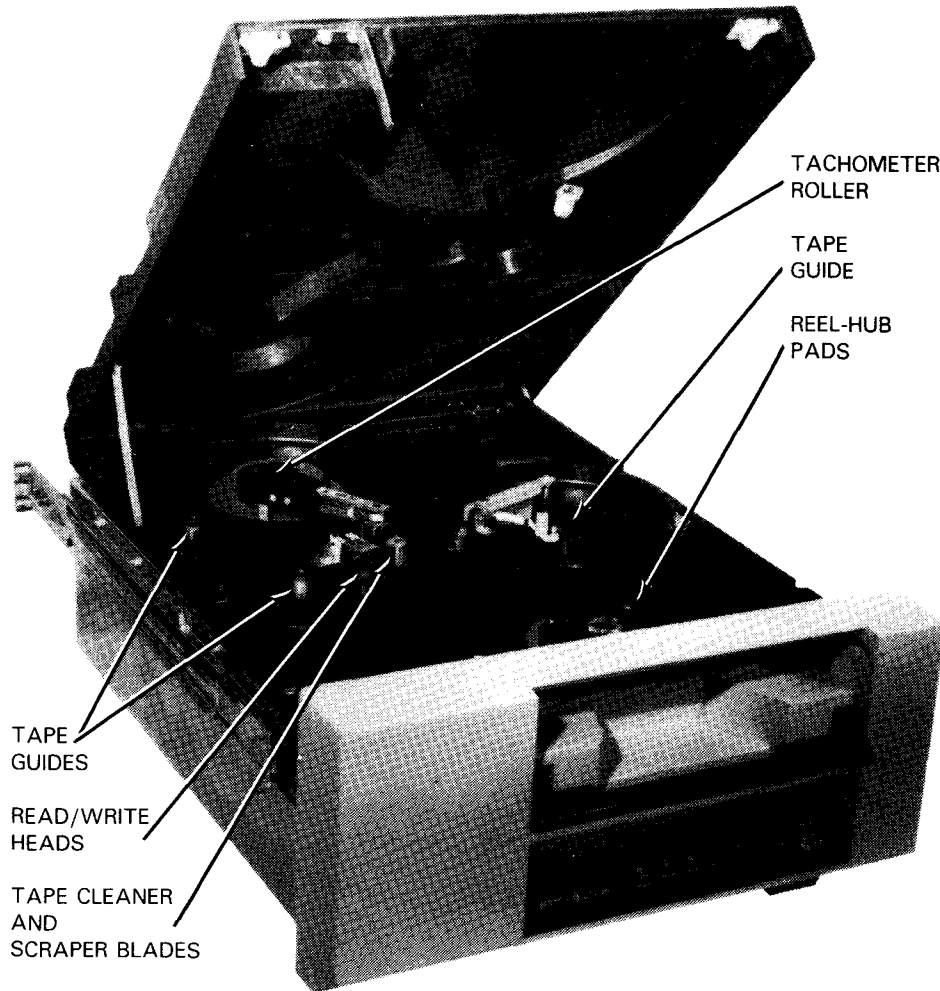


Figure 4-2. Tape Drive Cleaning

4. Clean the read/write heads, tape guides, and tape path with a lint-free, nonabrasive cloth, or with a cotton swab moistened with 1,1,1, Trichlorethane (Inhibisol*), SPERRY UNIVAC part number 2050127-00.

WARNING

Exercise care to avoid injury from sharp edges of tape cleaner blades. Do not damage the sharp edges of blades.

5. Wipe away any accumulated debris clinging to the tape scraper blades and tape cleaner housing with a cotton swab moistened with 1,1,1, Trichlorethane.
6. Wipe away any accumulated debris clinging to the reel-hub pads with a cotton swab moistened with trichlorotrifluoroethane.

4.3.2.2. **Unscheduled Cleaning**

Flakes of oxide coating from the tape may stick to the tape, read/write heads, or other critical locations and produce errors. If flaking is suspected or errors are repeated for any other reason related to cleaning, the tape drive housing, top cover, access door, and operator control panel must be cleaned thoroughly. Use Miller Stephenson Chemical Company cleaner part number MS-260, Windex*, or any equivalent, commercial grade, plastic cleaner.

NOTE:

A container of 1,1,1, Trichlorethane, cotton swabs, and cleaning tissues are supplied with the tape drive. Additional supplies of 1,1,1, Trichlorethane are available from your Sperry Univac customer engineer. Other materials are available commercially.

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