

POTTER

SC-1030 LOW SPEED SINGLE-CAPSTAN TAPE TRANSPORT AND SYSTEM



081K

FEATURES

- Simplicity
- Low cost
- Bidirectional tape speed to 37.5 ips
- IBM 7-and 9-channel (IBM 360 and ASCII) capability
- Information density to 800 bpi, NRZI; 1600 bpi, (PE)
- Single capstan, vacuum-column tape drive for gentle tape handling
- Data reliability — oxide surface of tape touches no stationary surface except the read/write head and tape cleaner.
- Uniform tape tension.
- Permanent magnetic reel motors require no field supply, run cool.
- No delicate tachometers used.
- Electronic reel braking — no mechanical adjustments required.
- Simplicity in design assures long life . . . minimum servicing.

GENERAL DESCRIPTION

The Potter SC-1030 Single-Capstan, Magnetic Tape Transport is a low-cost unit designed for applications requiring moderate data transfer rates. It is particularly well suited for use with small and medium scale computers, in mass storage and sequential access applications for which high-performance transports cannot be justified.

The SC-1030 represents a new design in tape transports. The system is one in a family of the industry's highest performing, single-capstan tape transports.

SC-1030 is a vacuum-column transport capable of bidirectional tape speeds to 37.5 ips with no program restrictions. The entire transport assembly and drive electronics are packaged on a single rugged casting, thereby providing ease of mounting and utilizing minimum rack space.

The unit is IBM 7- or 9-channel compatible, with packing densities to 800 bpi, NRZI, and 1600 bpi phase encoded recording.

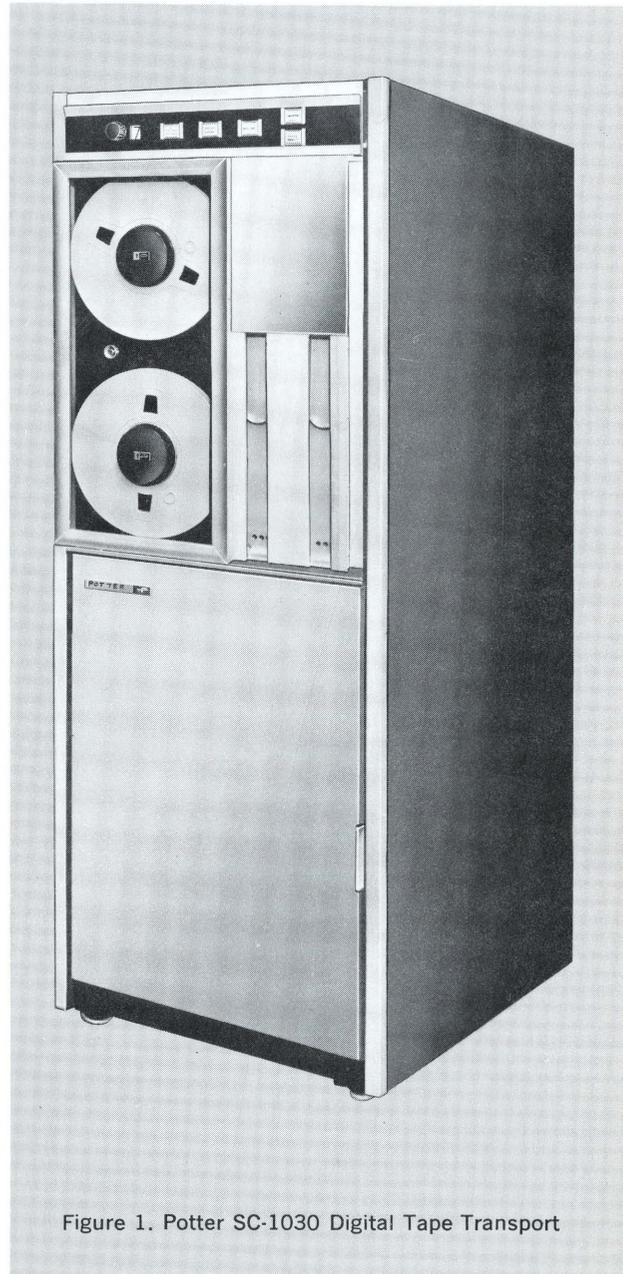


Figure 1. Potter SC-1030 Digital Tape Transport

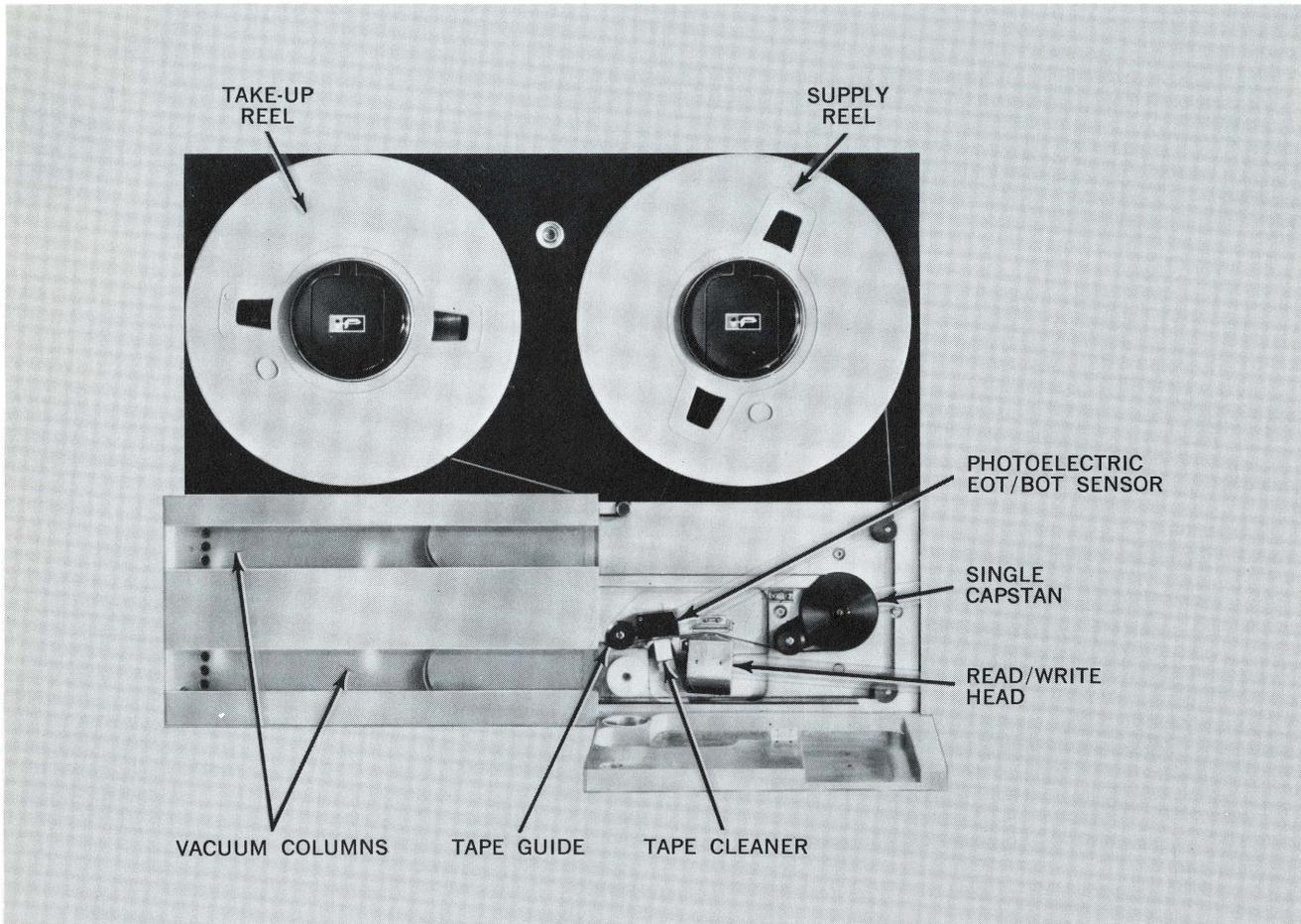


Figure 2. New Single-Capstan Vacuum-Column Tape Drive System is the ultimate in design simplicity. Transport can be vertically or horizontally (shown) mounted.

The tape path has been chosen so that the oxide side of the tape touches no fixed surface except the read/write head and tape cleaner. The Mylar™ surface of the tape is in constant contact with the non-slip drive capstan. Acceleration and deceleration of the tape is performed gently, resulting in maximum tape life.

The basic transport includes drive electronics, EOT/BOT photoreflexive sensors and QUICK-LOCK™ reel hubs.

Drive electronics feature integrated circuits in all logic and low power linear functions. With the exception of two germanium power drivers, all remaining electronics are silicon.

Horizontal and Vertical Mounting

The SC-1030 transport assembly can be supplied as a separate integral unit for both 24" horizontal or 19" vertical mounting.

The unit can be vertically mounted in Potter's standard CAB-250 cabinet. Special color combinations are available.

SEMI-AUTOMATIC TAPE LOADING

SC-1030 design utilizes a single capstan to drive the tape across the read/write head. After the tape is threaded and the load pushbutton is depressed, tape is

automatically drawn into the vacuum columns and driven to the LOAD point.

Potter's IBM-compatible QUICK-LOCK hubs enhance tape loading and provide minimum projection from the front of the transport.

LOW INERTIA CAPSTAN DRIVE

A low inertia drive provides rapid acceleration and deceleration while maintaining control of the tape on the capstan at all times.

The tape is driven (See Figure 3) by passing the tape 180° around a metal capstan coated with a resilient material. Sufficient tension is applied to the tape by the vacuum columns to preclude slippage of the tape with respect to the capstan.

The capstan is directly driven by a high-performance, low inertia motor. A combination of integrated and discrete drive circuitry controls the speed of the capstan. No tachometers or optical decoders are used. There are no program restrictions while reading or generating any combination of IBM-compatible blocks.

REEL SERVO SYSTEM

The tape position in the vacuum columns is controlled by two "bang-bang" servo amplifiers. Photoelec-

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QUICK-LOCK is a trademark of Potter Instrument Co. Inc.

tric cells provide reliable control of tape loop movement. *Mechanical brakes and adjustments are completely eliminated.* No tachometers or other velocity sensors are required. Even if AC power is interrupted, all rotary components are brought to a controlled stop without tape damage, whether the transport is in normal operation or in high speed rewind. The permanent magnetic reel motors provide reliable performance and are not affected by line voltage variations.

Tape tension is uniform throughout the entire reel. All tape movement, including rewind, takes place with tape in the vacuum columns, thus maintaining uniform tape tension.

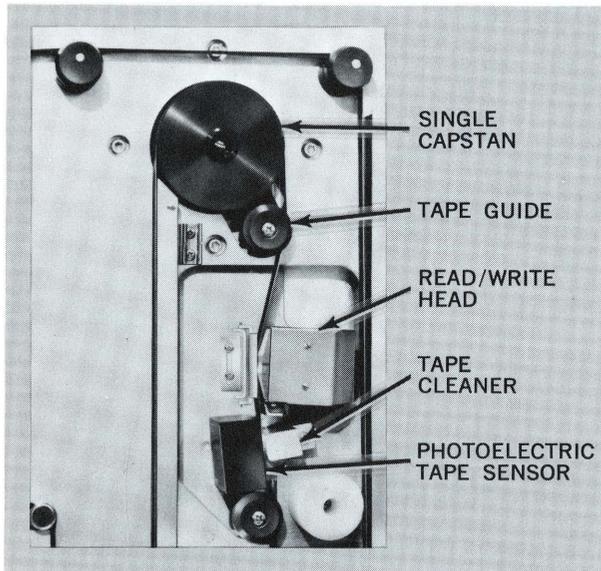


Figure 3. Precision Tape Guidance System

TAPE GUIDANCE SYSTEM

IN FORWARD/REVERSE OR REWIND OPERATION THE OXIDE TOUCHES NO STATIONARY SURFACE EXCEPT THE READ/WRITE HEAD AND TAPE CLEANER.

Control of the tape path is maintained by a precision edge guidance system guaranteeing IBM interchangeability. The guidance system consists of a spring-loaded edge guide located on each side of the read/write head. The guides are designed to minimize tape wear and the formation of wear particles, thus increasing both tape life and data reliability.

The tape guidance system enables tapes to be freely interchangeable with IBM series 729 and 2401 tape transports. Potter specifies the dynamic skew in terms of the IBM 2401-Mod 3 (see specification page 5).

DRIVE ELECTRONICS

Capstan and servo amplifiers of the SC-1030 use silicon solid-state components throughout. Integrated circuits are used for all logic function and low power linear applications. The drive electronics package includes all required power supplies, and servo amplifiers mounted on interchangeable plug-in modules.

Test points are provided on all modules for routine maintenance and service checks. All potentiometer adjustments are accessible with the modules in place.

RELIABILITY AND MAINTENANCE

All components and sub-systems are designed for maintenance-free operation, other than periodic cleaning of the head and the vacuum tanks.

No mechanical adjustments are required.

All components, including plug-in electronics modules, are mounted on the rear of the tape deck.

OPERATOR CONTROLS

Operator controls are available as an option. The control panel (Figure 4), can be located directly above the transport. Indicators show the status of the system under local command conditions. Illuminated push button controls include: RESET, LOAD/REWIND, REMOTE, and UNIT SELECT (Rotary Switch).

In addition, the following indicators are provided: EOT/WRITE ENABLE.

EQUIPMENT

The basic Potter SC-1030 transport consists of the following subassemblies:

- The tape transport assembly including all tape drive components
- Solid-state drive electronics and regulated power supply
- Beginning-of-tape (BOT) and End-of-Tape (EOT) sensors, photoreflexive IBM-compatible, plus amplifier.
- IBM-compatible QUICK-LOCK hubs
- One empty IBM-type plastic take-up reel
- Standard panel color — Black

Optional Accessories

- Operator control panel with address select switch (8 position)
- Master reel write lockout (file protect), IBM-type switch
- Tape cleaner
- Dual gap read/write head assembly for 7-channel (IBM 729 operation: 0.048 inch write and 0.030 inch read tracks on 0.070 inch centers. Gap spacing 0.300 inch)
- Dual gap read/write head assembly for 9-channel (IBM 2401 or ASCII) operation: 0.044 inch write and 0.040 inch read tracks on 0.055 inch centers. Gap spacing: 0.300"
- Erase head
- Maintenance Control Module
- Dust cover
- 190-250 VAC power kit
- Cabinet (incl. dust cover, access doors, mounting and cabling. Optional Accessories: jacks and casters, fan, power panel and outlets and door interlock.

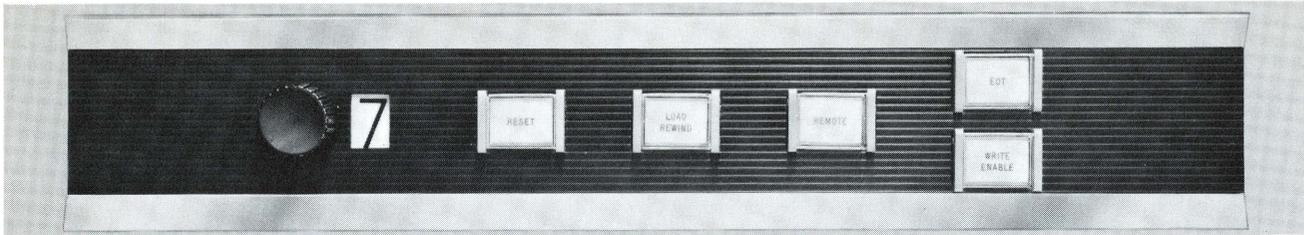


Figure 4. Operator Control Panel

ACCESSORIES

Read/Write Heads and Erase Heads

The dual-gap read/write head assembly uses an all-metal flush surface housing for longer life and greater reliability. The precision-built, fully interchangeable head requires no mechanical adjustments and can readily be replaced by field personnel.

A complete selection of IBM-compatible 7 and 9-channel assemblies is available.

The electrical characteristics of the head have been designed to be compatible with Potter's standard MA-series amplifiers, and comply with all requirements for 200/556/800 bpi operation.

The erase head is a separate component mounted on the head block assembly. The erase head is operated out of contact with the tape and is required on all recording systems.

Reels and Hubs

Potter IBM-compatible QUICK-LOCK hub assemblies, standard on the SC-1030, provide ease of tape loading and minimum projection from the front panel of the transport.

Tape Cleaner

A tape cleaner is located on the supply side of the magnetic head.

Write Lockout

A write lockout, or file protect switch is available (Form C contact).

EOT/BOT Sensing (Standard)

A dual-channel photoelectric sensor is provided im-

mediately adjacent to the read/write head assembly to detect the presence of standard photoreflective marker strips, indicating load point and end-of-tape positions. An amplifier with logic level output is provided on BOT; a flip-flop memorizes passing of EOT marker.

MAINTENANCE CONTROL MODULE

The Maintenance Control Module allows the unit to be cycled in the FORWARD and REVERSE directions at a rate of 1 to 150 commands-per-second; or allows the machine to run in a continuous mode in the FORWARD or REVERSE direction, with automatic stopping provided at EOT and BOT markers.

The module also includes an all "1" pattern generation to facilitate amplifier deskewing at densities of 200, 556, 800 and 1600 bpi.

READ-WRITE ELECTRONICS

Read/write amplifiers are available to accommodate packing densities up to 800 bpi and data transfer rates up to 30 kc.

Each read/write electronics assembly contains:

- up to 9 read-write amplifier channels
- clock generator
- write inhibit electrical switching
- erase head control
- head compensation for read/write (as required)

CABINET

Potter can offer a variety of cabinet styles to satisfy system packaging of the transport, manual control and read/write electronics.

Cabinets are supplied with Potter colors or can be finished to customer specifications.



Figure 5. QUICK-LOCK Hub

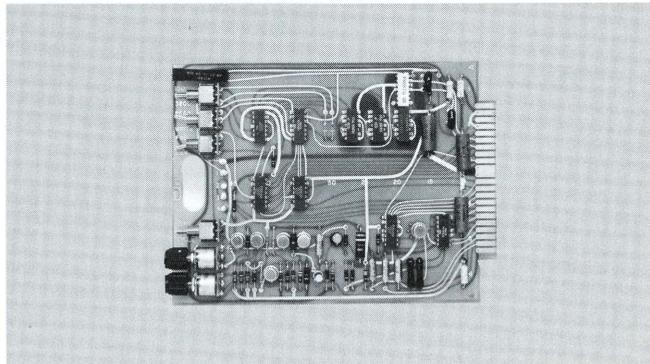


Figure 6. Maintenance Control Module

SPECIFICATIONS

TAPE DRIVE	Single Capstan, Vacuum-Column
TAPE LOADING	Semiautomatic tape loading in less than 15 seconds Automatic BOT searching
TAPE SPEED (Standard)	37.5 ips, 30 ips, 25 ips Other tape speeds from 5 ips optional
TAPE SPEED VARIATION (steady state)	37.5 ips 5% 25.0 ips 6% 10.0 ips 8%
REWIND SPEED AND TIME (2400 ft. reel)	Less than 4 mins. for 2400' of tape
PROGRAM RESTRICTIONS	None within IBM IRG specifications
TYPICAL PERFORMANCE (37.5 ips)	
Start time (to within 10% of speed)	8 ms
Start distance—inches	0.160 ± .025"
Stop time (max)	7 ms
Stop distance—inches	0.120 ± .020"
Command Repetition rate	120 command/sec

SKEW

(a) Static	6 μsec, max (37.5 ips)
(b) Dynamic**	
guidance + reading all I's tape	5 μsec peak
guidance + head + reading random tape	8.0 μsec peak

**The dynamic skew figure is specified when reading on the SC-1030 a tape which has been generated on an IBM-2401, or for reading tapes on the IBM-2401 generated on the SC-1030.

TAPE WIDTH	1/2"
TAPE TYPE	3M 8980 or equal; 1.5 mil Mylar
TAPE REELS	Standard 10 1/2"
REEL HUBS	Potter QUICK-LOCK IBM-compatible
REMOTE CONTROL INPUTS	
a. Logic Levels 0/ + 5 standard	
b. Input Commands	
Unit Select, Direction, Run, Rewind, Rewind & Unload	

STATUS REPLIES

EOT/BOT, Selected and Ready, Rewinding
Write Lockout (Form C contact)

ELECTRONICS	All control circuits fully transistorized or integrated, modular plug-in construction throughout
SERVO CONTROL	All solid state with dynamic braking.

ENVIRONMENTAL CONDITIONS

Ambient Temperature—Operating (within tape characteristics)	45°F to 110°F
Non-Operating	-40°F to 165°F
Humidity	20% to 80% (without condensation)

POWER REQUIREMENT	115VAC ± 10%, 50/60 Hz, single-phase or 230VAC optional
	4 amperes — Standby
	5.0 amperes — Running
	7.0 amperes — Peak (less than 100 ms)

DIMENSIONS

Transport Assembly Only	Height	Width	Depth
Manual Control	24 1/2"	19"	11"
	3 1/2"	19"	3"

WEIGHT

Transport Only	130 lbs.
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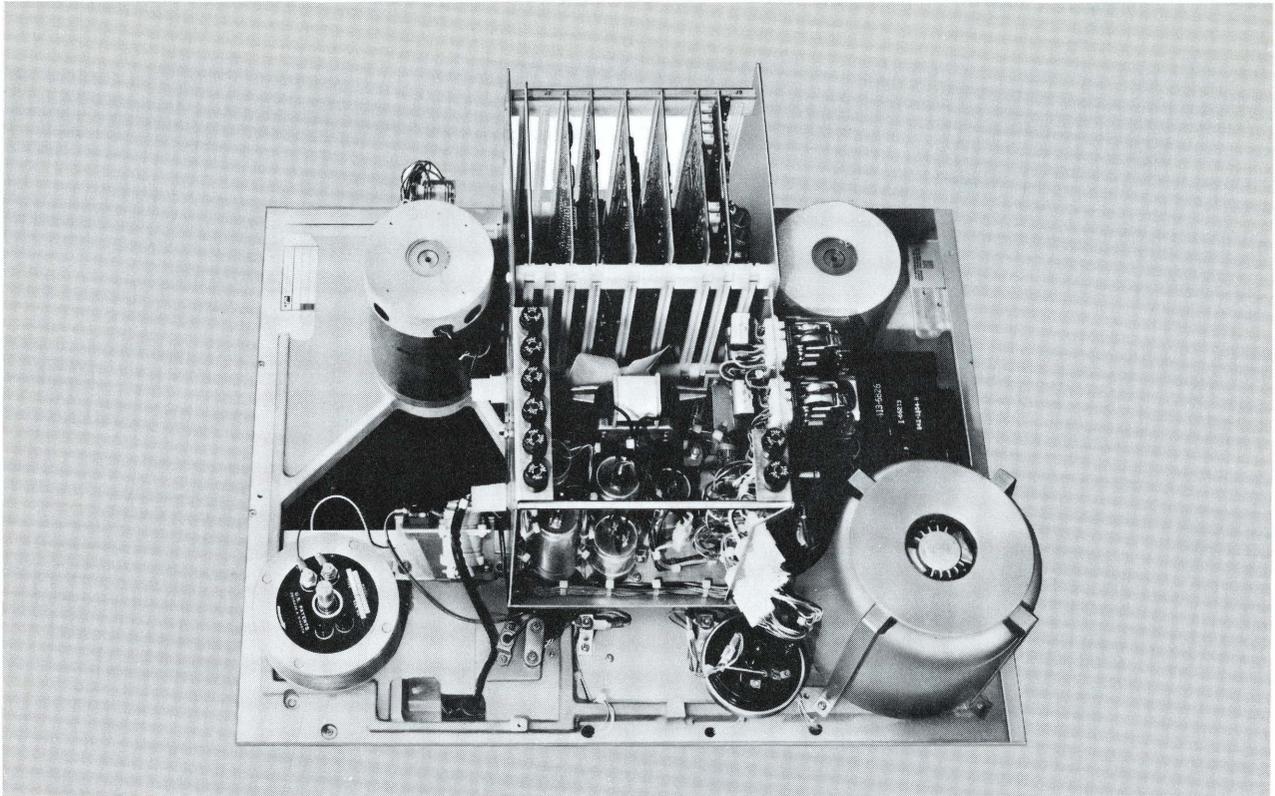


Figure 7. Rear view of SC-1030 Tape Transport

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