POTTER

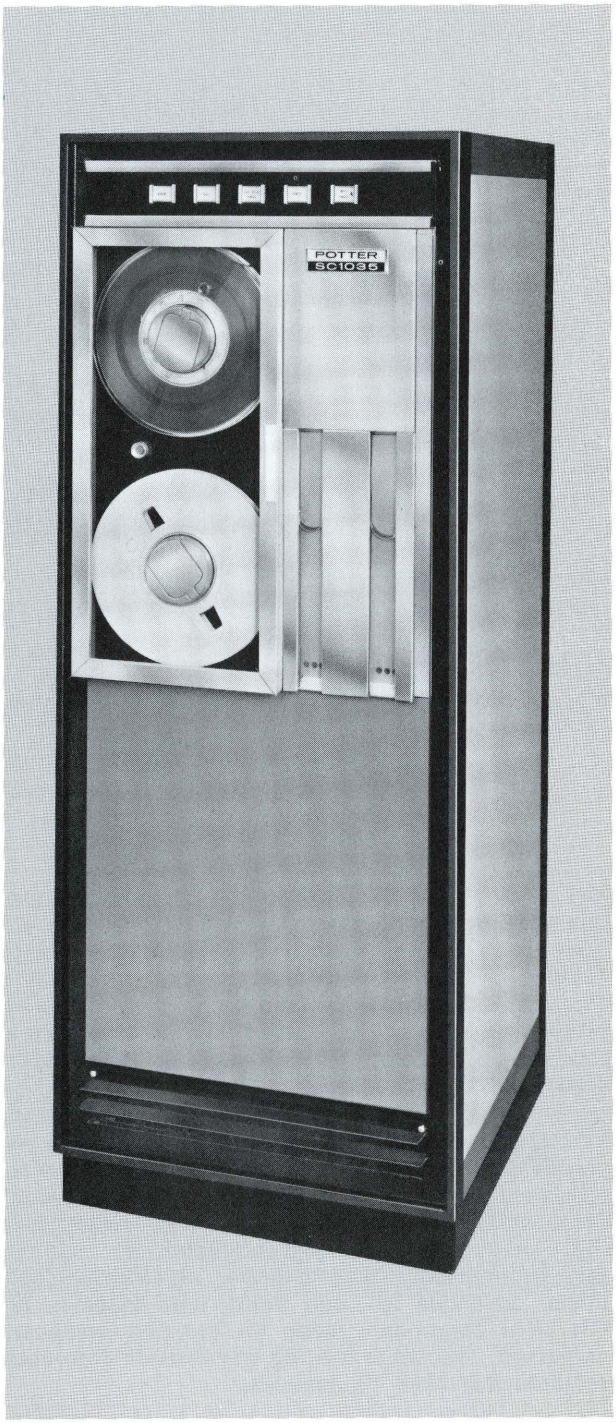
PRODUCT DATA 1-214

SC 1035 SINGLE CAPSTAN TAPE TRANSPORT

POTTER INSTRUMENT CO., INC.®

FEATURES

- Low cost with optimum performance and reliability
- Bi-directional tape speed to 45 ips
- Industry compatible recording in 9-channel 800 bpi or 7-channel dual density, NRZI format
- Single capstan, dual vacuum column tape drive for long tape life and uniform tape tension
- Data reliability — oxide surface of tape touches no fixed surface except read/write head and tape cleaner
- Permanent magnet reel motors run cool (require no field supply)
- Electronic reel braking — no mechanical adjustments required
- Industry compatible QUICK-LOCK® reel hubs
- State-of-the-art read/write amplifiers
- Simplicity in design for long life . . . minimum servicing



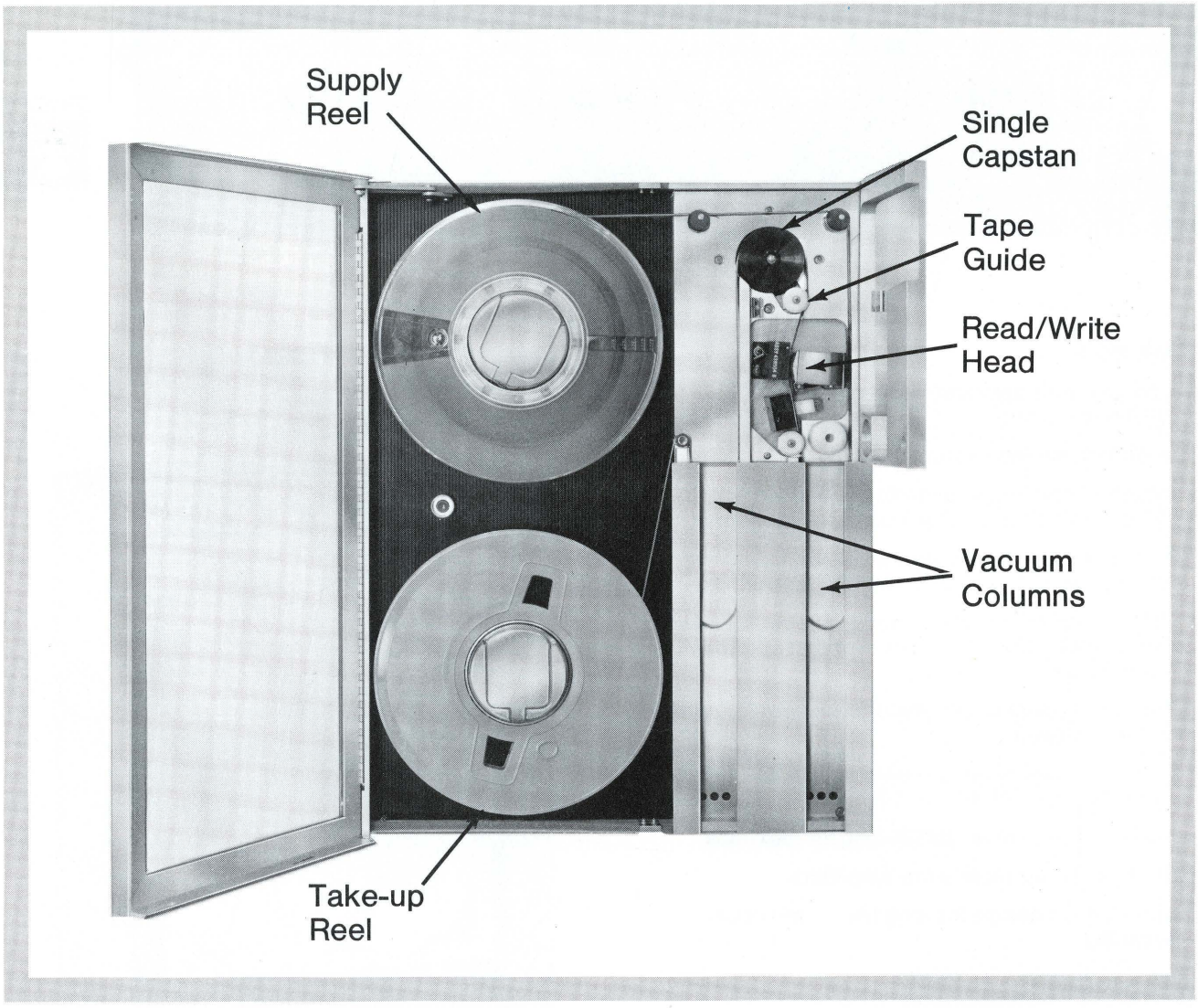
INTRODUCTION

The Potter SC 1035 Single Capstan Magnetic Tape Transport is a medium speed transport specifically designed for low cost computer and data acquisition applications. The unit incorporates all the important data reliability features of Potter's high performance SC-series transports, but all non-essential functions have been simplified or eliminated. The SC 1035 stresses low unit cost and optimum performance, without sacrificing data reliability, ease of servicing, or operator convenience.

The SC 1035 single capstan vacuum column drive provides rapid linear acceleration and deceleration while maintaining control of the tape by the capstan at all times. There are no pinch rollers or mechanical adjustments, thus assuring controlled tape tension and long tape life. The transport drive permits program-free bi-directional operation at tape speeds to 37.5 ips. A 45 ips tape speed is optionally available depending upon the rate and sequence of commands.

Control of the tape path is maintained by a precision edge guidance system which matches industry standards and assures complete tape interchangeability with the most widely used tape systems.

EFFECTIVE: APRIL 30, 1970



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

THE BASIC SC 1035 TRANSPORT consists of a mechanical transport assembly (which includes all drive components), a solid state drive electronics package with a regulated power supply, EOT/BOT sensors and amplifier, read/write electronics, a dual-gap read/write head assembly, an erase head, industry-compatible QUICK-LOCK hubs, tape cleaner, write lockout and a dust cover.

SIMPLIFIED TAPE LOADING yields operator convenience with minimum tape handling. After the reel is placed on the QUICK-LOCK®hub and threaded, the operator then depresses the "Load" switch, and the transport automatically completes the load cycle. Automatically, tape is pulled into vacuum columns, advances to Load Point, and assumes an ON LINE condition — ready for the first computer command. The entire loading and threading process requires less than 15 seconds.

A LOW INERTIA CAPSTAN DRIVE provides rapid linear acceleration and deceleration with positive tape control. Slippage is prevented by having the tape pass 180° around a capstan with a resilient coating, while dual vacuum columns assure continuous tape to capstan contact. No pinch rollers are used.

A fast reacting low inertia servo motor directly drives the capstan. The speed of the motor is precisely controlled by maintenance-free integrated circuitry. Tachometers, optical decoders, and mechanical adjustments have been eliminated.

Start/stop performance of the capstan drive is compatible with standard inter-record gaps of either 0.75 inch (7-channel) or 0.60 inch (9-channel) up to 45 ips. Program restrictions are non-existent while reading or generating any combination of industry-compatible blocks.

THE REEL SERVO SYSTEM optically detects and servo maintains tape position within the vacuum columns. Tape is automatically payed into or taken from the vacuum columns as required by capstan movement. Potter's exclusive dynamic braking system operates on the reel servo motors and eliminates mechanical brakes and adjustments. The permanent magnetic reel motors run cool and provide reliable performance unaffected by line voltage variations.

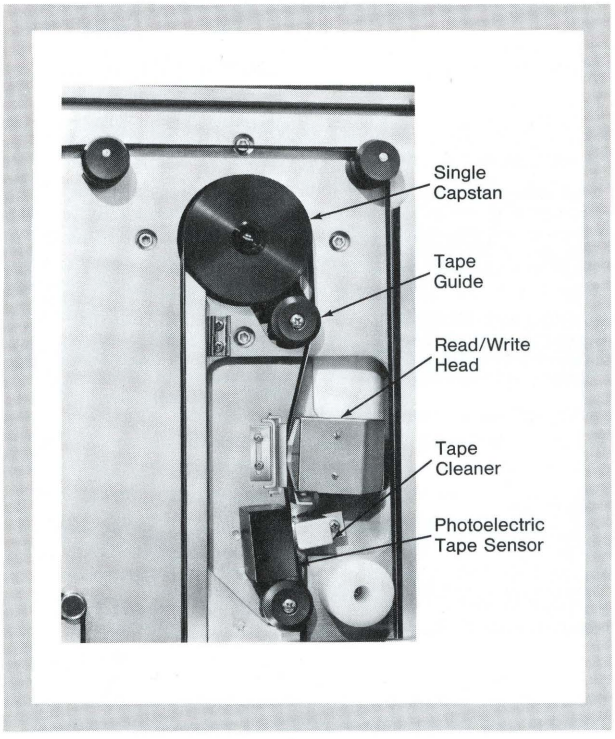
Tape tension is uniform throughout the entire reel. All tape movement, including rewind, takes place with tape in the vacuum columns, thus maintaining uniform tape tension.

In the event of power failure, the unit comes to a smooth controlled halt. There is no danger of tape spillage, damage or information loss.

THE TAPE GUIDANCE SYSTEM consists of a simplified tape path and precision spring-loaded edge guides. In forward, reverse or rewind, the only stationary surfaces touched by the tape oxide are the read/write head and tape cleaner. The results of this tape path are long-term tape life and data reliability.

The precision edge guidance system guarantees IBM interchangeability. Spring-loaded edge guides, located on each side of the read/write head, enable tapes to be freely interchangeable with IBM series 729, 2401, and 2420 tape units. Potter specifies the dynamic skew in terms of the IBM 2401-Mod 3 (see specifications).

THE DRIVE ELECTRONICS package includes all required power supplies, and servo amplifiers mounted on plug-in modules. Capstan and servo amplifiers use silicon solid-state components. Integrated circuits are used for all logic function and low power linear applications. Test points are provided on all modules for routine maintenance and service checks. Modules are mounted on the rear of the tape deck with all potentiometer adjustments readily accessable.



Close-up of Single-Capstan Mechanism.

EOT/BOT SENSING is accomplished by a dual channel photoelectric sensor adjacent to the read/write head assembly. It detects the presence of standard IBM photoreflective strips and indicates Load Point and End-of-Tape positions with logic level outputs.

A READ/WRITE AMPLIFIER records and reproduces industry compatible data in 9-channel, 800 bpi or 7-channel dual density, NRZI format. The amplifier, integrally packaged within the transport drive electronics, consists of a two module "read" amplifier, a one module "write" amplifier, and a one module "control". The "read" amplifier outputs de-skewed "read" data in 7- or 9-channel format and provides an associated clock pulse for each character. The "write" amplifier accepts 7- or 9-channels of digital data and outputs de-skewed data onto tape. And the "control" module functions as an interface between the TCU input and the internal logic of the amplifier. In addition it also contains threshold potentiometers and write status flip-flops. Two threshold levels for increased data reliability are a standard feature. The high threshold is automatically selected during the write operation; the low threshold during read operation. Among other standard amplifier features are: electronic skew compensation (forward direction only), automatic reset of write flip-flops, variable read gate (strobe delay) for output clocking, and automatic reset of read buffer flip-flops whenever power is applied.

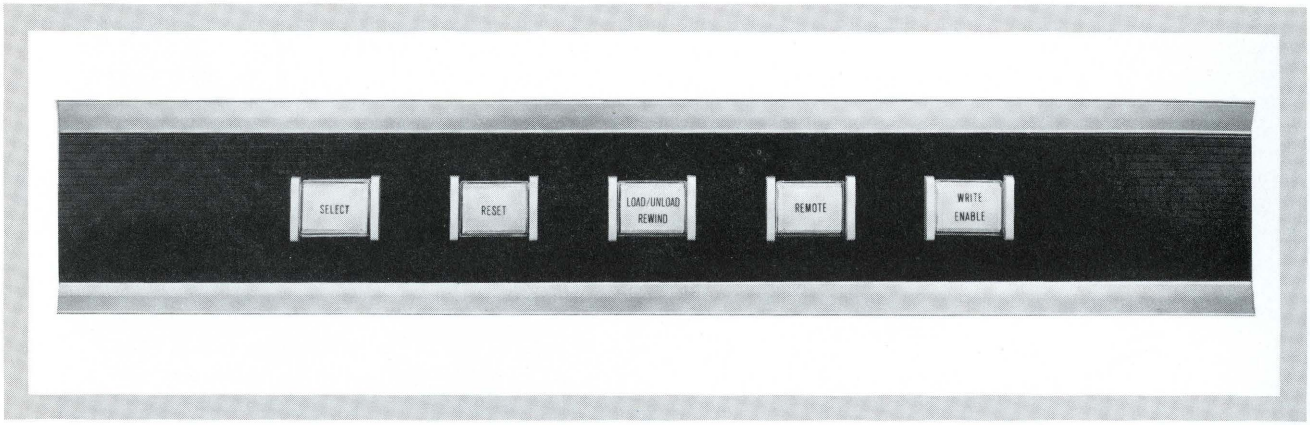
THE DUAL-GAP READ/WRITE HEAD ASSEMBLY uses an all-metal flush surface housing for longer tape life and greater reliability. The precision built, fully interchangeable head requires no mechanical adjustments and can readily be replaced by field personnel. Industry-compatible 7- and 9-channel assemblies are available.

The electrical characteristics of the head have been designed to be compatible with standard Potter amplifiers. They comply with all requirements for 200/556/800 bpi operation.

THE ERASE HEAD is a separate component mounted on the head block assembly. It is operated out of contact with the tape.

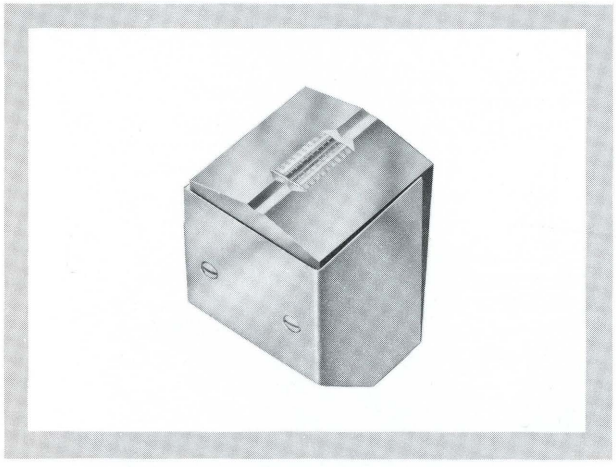
INDUSTRY-COMPATIBLE QUICK-LOCK® HUB ASSEMBLIES are standard on the SC 1035. They provide ease of tape loading and minimum projection from the front panel of the transport.

A TAPE CLEANER is located on the supply side of the magnetic head. Along with the magnetic head, it is the only other stationary surface which contacts tape oxide.



Close-up of Operator Control Panel.

THE CONTROL PANEL 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 and REMOTE. WRITE/ENABLE is supplied as an indicator.



Close-up of Read/Write Head.

Close-up of QUICK-LOCK® Hub.

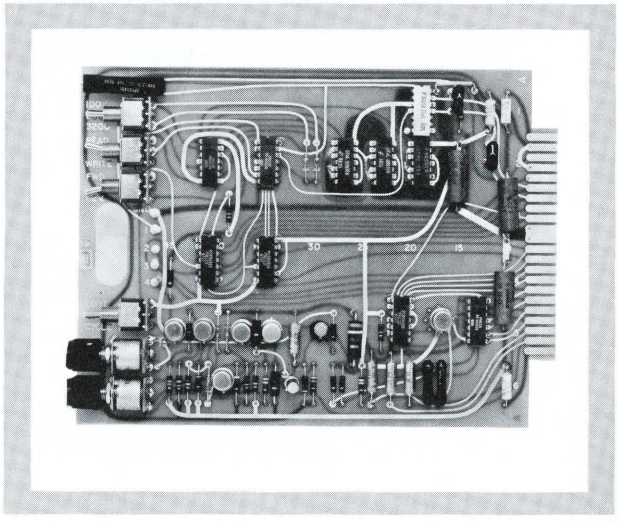
A WRITE LOCKOUT (file protect switch) is another standard feature. It insures against accidental erasure of recorded data.

A DUST COVER protects the unit under all operations and helps reduce periodic cleaning and maintenance.

OPTIONAL EQUIPMENT includes an operator control panel, maintenance control module, and CAB 110 cabinet.

THE MAINTENANCE CONTROL MODULE allows the unit to be cycled in the FORWARD and REVERSE directions at a rate of 1 to 120 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/BOT markers. The module also includes an all "1" pattern generation feature to facilitate amplifier deskewing at densities of 200, 556 and 800 bpi.

A CAB 110 CABINET is available to satisfy system packaging of the transport system and manual control. The standard CAB-110 can be supplied with Potter colors or can be finished to customer specifications.



Close-up of Maintenance Control Module.

SPECIFICATIONS

TAPE DRIVE ..... Single Capstan, Vacuum-Column

TAPE LOADING ..... Simplified Tape Loading
Automatic BOT searching

TAPE SPEED (Standard) ..... 37.5 ips, 30 ips, 25 ips
Other tape speeds from 5 ips to 45 ips optional

TAPE SPEED VARIATION (Steady State) ..... ±2%
(Short Term) ..... 37½ ips ± 2.5%
25 ips ± 3%
10 ips ± 5%

REWIND SPEED AND TIME (2400 ft. reel) ..... Less than 4 minutes for 2400′ of tape

TYPICAL PERFORMANCE	**37.5 ips**	**25 ips**	**10 ips**
Start time (to within 10% of speed)	8 ms	6 ms	6 ms
Start distance — inches	0.160 ± .025″	0.075 ± .020″	.030 ± .020″
Stop time (max)	7 ms	5 ms	5 ms
Stop distance — inches	0.110 ± .020″	0.050 ± .020″	0.020 ± .010″

COMMAND REPETITION RATE ..... 120 command/sec

SKEW
(a) Static ..... 6 μsec, max (37.5 ips)
(b) Dynamic*
guidance + reading all 1'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 1035 a tape which has been generated on an IBM-2401, or for reading tapes on the IBM 2401 generated on the SC 1035.

TAPE WIDTH ..... ½″

TAPE TYPE ..... 3M777 or equal; 1.5 mil Mylar

TAPE REELS ..... Standard 10½″

REEL HUBS ..... Potter QUICK-LOCK® IBM-compatible

REMOTE CONTROL INPUTS
Logic Levels ..... Logic "1" = 0 volts
Logic "0" = +5 volts

Input Commands and Write Data Lines	Select	Write Data (1-9)
	Direction (FWD/REV)	Write Clock
	Run/Stop	Set Write
	Rewind	Write LRCC
		Read Enable
Status Replies and Read Data Lines	EOT/BOT	Read Data — 9 lines
	Ready	Read Clock
	Rewinding	
	Write Status	

ELECTRONICS ..... All control circuits fully transistorized or integrated, modular plug-in construction throughout

SERVO CONTROL ..... All solid state with dynamic braking

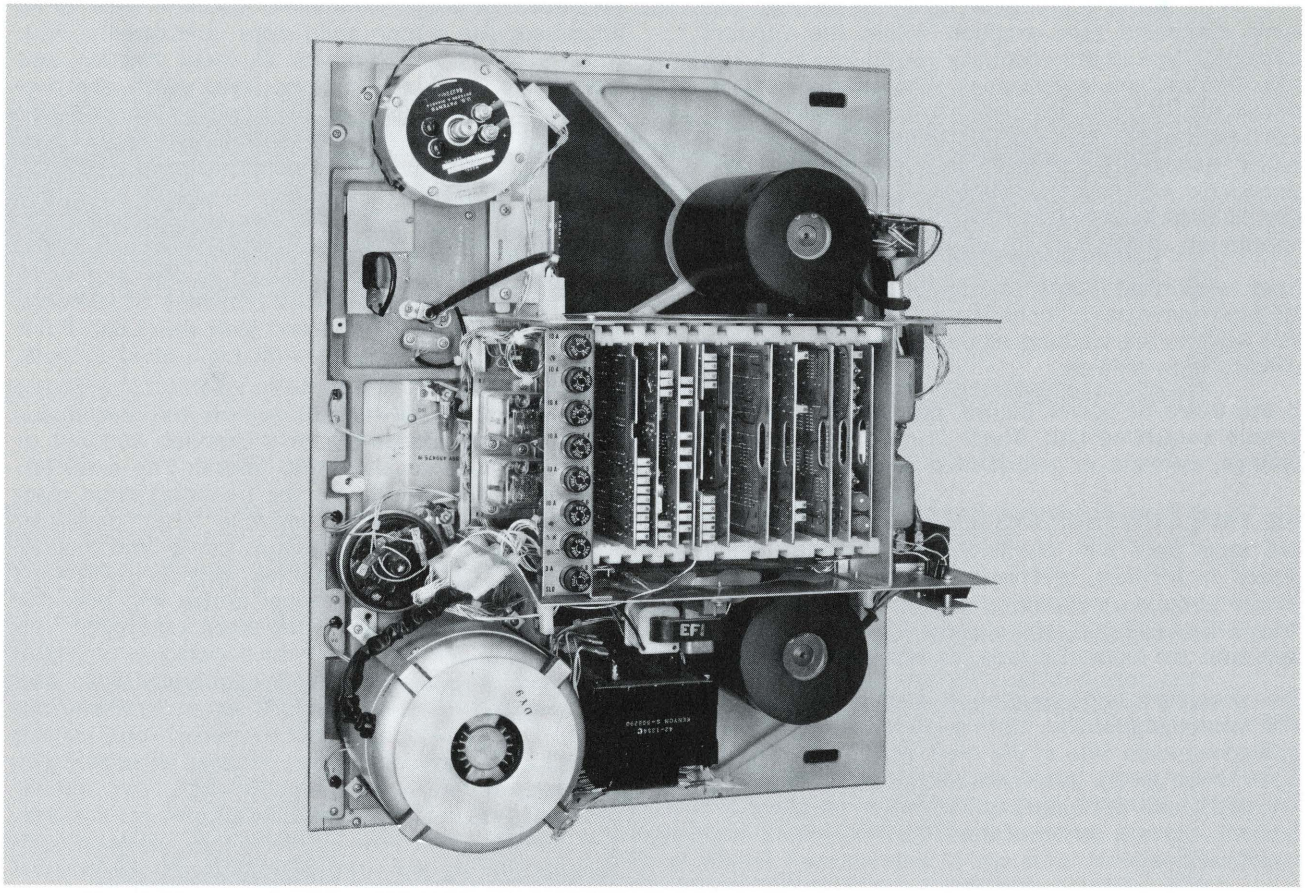
ENVIRONMENTAL CONDITIONS
Ambient Temperature — Operating (within tape characteristics) ..... 45°F to 110°F
Non-Operating ..... −40°F to 165°F
Humidity ..... 20% to 80% (without condensation)

POWER REQUIREMENT ..... 115 VAC ±10%, 50/60 Hz, single-phase or optional multi-tap transformer to provide operation at: 100, 110, 120, 200, 220, 240 VAC

POWER CONSUMPTION: at 120′ VAC ..... 4 amperes — Standby
5.0 amperes — Running
7.0 amperes — Peak (less than 100 ms)

DIMENSIONS	**Height**	**Width**	**Depth**
Transport Assembly Only	24½″	19″	11″
Manual Control	3½″	19″	6″

WEIGHT (Transport Only) ..... 100 lbs.



Rear view of SC 1035 Tape Transport.

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