

FEATURES

- Tape velocity to 75 ips
- IBM and ANSI compatible
- Phase-encoded 1600 cpi, 9-track
- Multi-density 7-track NRZI at 800, 556, or 200 cpi, or 9-track NRZI at 800 cpi
- Multi-format 7- and 9-track read-only units
- Front accessibility of all electronics
- Read-after-write dual-gap, or read/write single-gap heads
- Transfer rates to 120,000 characters per second
- Forward and reverse read
- Dynamic electrical braking
- Buffer arm, photo-translator
- Exclusive "Edit" capability
- Tape cleaner
- Capstan speed disk
- Programmed data recovery



LOW COST, HIGH PERFORMANCE 10½ INCH REEL TRANSPORTS

Pertec's 10½ inch reel transport provides exceptional performance and reliability in reading or writing 7- or 9-track NRZI or phase-encoded tapes. Engineered and designed to reduce operator and maintenance costs, these IBM- and ANSI-compatible tape transports are the front-runners of their class. Available in read-after-write, read/write, and read-only models, they offer tape speeds to 75 ips and data transfer rates up to 120,000 characters per second.

The Pertec 6000-Series offers superior reliability and ease of operation in applications including:

- Key-to-Tape
- Optical Character Recognition
- Data Acquisition
- Point-of-Sale Devices
- Data Terminals
- Data Communications
- Minicomputers
- Off-Line Systems

FUNCTIONAL DESCRIPTION

The tape unit is designed to ensure interchangeability of IBM and ANSI tapes, whether the application requires read/write single-gap head models, or read-after-write dual-gap head versions. Head and guide geometry is designed to be compatible with IBM requirements and eliminates dynamic tape skew caused by normal tape slitting irregularities. Tape tension is carefully regulated to conform with IBM standards, minimizing potential interchange hazards that could result from excessive tape stretching or cinching.

Pertec 6000-Series read/write and read-after-write transports are available in 9-track versions with data densities of 800 cpi (NRZI) or 1600 cpi (phase encoded), or in 7-track NRZI versions with any two standard data densities (800, 556, and 200 cpi).

Pertec's 6000-Series transports are also available in read-only configurations with multi-format capability. The models offer forward and reverse read with programmed data recovery for reading older or marginal-amplitude tapes. An extra low threshold is remotely selectable, as is a high timing margin which allows reading tapes with questionable skew. These transports are available in 9-track phase-encoded, 9-track NRZI, or a combination of both phase-encoded and NRZI. Seven-track read-only models are available

which can read any two 7-track densities. A combination of 7- and 9-track units are also available to provide multi-format read capability. Dual-speed units provide an advantage when a constant transfer rate is required. A dual-speed unit permits halving the speed when reading phase-encoded tapes recorded at twice the density of 9-track NRZI. All models include Pertec's industry standard interface which provides plug compatibility with the whole family of Pertec synchronous transports.

The simple single capstan and tape path of the 6000-Series provide the ultimate in tape handling, requiring only 24 inches of rack height. The unit includes data electronics, load point logic, tape motion control electronics, single potentiometer electronic deskewing, photoelectric buffer arm sensors, and tape cleaner. The tape transport is approved by both UL and CSA.

An important, cost-saving product for tape drive users is Pertec's data formatter which contains the timing and control functions usually provided in external tape control units. Through the simple interface, a user can transfer data to and from phase-encoded and/or NRZI transports without having to concern himself with any of the tape-related housekeeping or data recovery logic. All this is done within the Pertec formatter.

EQUIPMENT DESCRIPTION

The 6000-Series transport consists of five major assemblies: the deck assembly, power supply, tape control logic, power and servo control electronics, and data electronics. For simplified troubleshooting and repair, the tape deck assembly swings out to provide front access to major electro-mechanical components and printed circuit boards.

Basic Deck Assembly

The basic deck assembly is an aluminum deck plate on which the major subassemblies are mounted. All mechanical components utilize a single reference plane for precise location of critical tape path guides and major components. In addition, the precision frame serves as the base plate for the following major subassemblies:

- **Head and guide plate assembly.**

These important elements are precisely aligned on a precision plate to allow both forward and reverse reading without troublesome and un-

reliable single-shot adjustments. The critical skew adjustment is factory set and is not considered a field adjustment.

- **Single capstan drive.**

Tape motion is controlled by a single capstan drive using a low-inertia, dc servo motor. Velocity feedback from a dc tachometer provides the stable speed characteristic required to generate IBM- and ANSI-compatible tapes. For easy service and preventative maintenance, the capstan has a built-in strobe disk allowing speed checks to be made with either 50- or 60-Hz ambient light.

- **Reel servo system.**

All Pertec 6000-Series transports feature an indirect reel drive servo — a field-proven principle resulting in minimum power consumption and, therefore, higher reliability for servo electronics. Another benefit — the replacement of a reel motor is greatly simplified and can be

accomplished from the rear of the transport without removing the front trim. The alignment and perpendicularity of the motor shaft is not critical — a big plus in minimizing overall system down time. Tension arm position data is provided by a special Pertec-innovated phototranslator. The device generates a reference voltage, proportional to the angular position of the tension arm, which activates the reel servo amplifier to maintain correct tape tension and reel servo speed.

- **Power Supply.**

A modular power supply is mounted on the rear of the deck to provide easily accessible transformer taps. Two different supplies are used; one for speeds between 12.5 and 45 ips, and another for 75-ips operation.

- **Control Logic.**

All motion control logic is contained on a single printed circuit board assembly.

- **Power and Servo Control.**

The reel servo amplifier and power supply regulator are contained on one printed circuit board assembly. The printed circuit board assembly is connected through plug-in connectors for serviceability and easy replacement. Multi-board spares are virtually eliminated, as well as the numerous connectors required when using smaller printed circuit board assemblies.

- **Data Electronics.**

Nine or seven full channels of read/write electronics are provided on one printed circuit board. For NRZI transports, write data is presented to the transport as nine or seven data lines plus a clock, and the transport presents the equivalent read channels plus a clock to the controller interface.

In phase-encoded versions, write data is presented to the transport through nine data lines with a double-frequency clock line, and the read signals are presented to the interface as nine distinct phase-encoded waveforms. All input and output lines are TTL- and DTL-compatible incorporating ground true levels.

Perfec's exclusive "Edit" capability is now offered as a standard feature on all 6000-Series transports. This feature controls the critical turn-on and turn-off of write and erase currents to prevent spurious signals, and thus permit rewriting selected records. In many data entry applications this is a basic requirement for achieving record update or correction without leaving noise in the inter-record gap.

In deskewing the single-gap head transport (Model 6X60), the emphasis is placed on the precise alignment of the guides with relation to the head. This permits doing away with adjustable single shots, providing an ideal transport from the standpoint of service and tape interchangeability. In read-after-write, dual-gap head versions of the transport (Model 6X40), electronic write deskewing is provided through Perfec's unique digital deskewing technique which requires only one potentiometer adjustment at very infrequent intervals. When reading IBM-compatible tapes, the emphasis in read deskewing is in precise positioning of the head guides to provide minimal skew in both forward and reverse directions.

Another innovation introduced by Perfec is "SKEW-SCAN", designed to reduce preventative maintenance and service time. With this feature, the serviceman can adjust the total channel skew while observing a single test point.

FRONT PANEL SWITCHES/ INDICATORS

POWER	Turns on and indicates ac power.
LOAD	Energizes servo and advances tape to load point.
ON-LINE	Following load operation, sets transport to respond to external commands.
REWIND	Off-line function which causes reverse tape motion at nominal rewind speed.
WRT EN (9 track)	Indicates when write enable ring is on supply reel (7/9-track read only units sets transport to read 9-track tapes).
HI DEN	Selects character packing density on those units designed for dual density (7-track and 9-track dual density transports).
FORWARD	Off-line function causes forward tape motion at synchronous speed.
REVERSE	Off-line function causes reverse tape motion at synchronous speed.

AVAILABLE MODELS

The Pertec 6000-Series transports are available in six basic models — 6X40, 6X60, 6640-9, 6660-9, 6X11 and 6X12. A number of options are provided with each to meet any industry standard requirements. Table 1 outlines the basic model numbers and specific capabilities regarding speed, densities, and the number of tracks. All units are shipped with a set of input/output connectors and a maintenance manual.

Model 6X60 Read/Write

Model 6X60 is a single-gap head unit available in 7- or 9-track NRZI, or 9-track phase-encoded. This model provides select capability and has appropriate input/output gating for multi-transport daisy-chain operation. Output data (NRZI) from a deskew register in the transport is clocked with the read data strobe to provide simultaneous pulses for the user's controller. Available speeds are 12.5, 18.75, 25, 37.5, 45, and 75 ips. The transport includes motion and control electronics, read/write electronics, read/write head, power supply, and dust-sealed cover door.

Model 6X40 Read-After-Write

For read-after-write applications requiring 7- or 9-track NRZI or phase-encoded capability, the

Model 6X40 is available in speeds between 12.5 and 75 ips. The model uses a dual-gap head with automatic multi-level read thresholds, and has select capability and input/output gating for multi-transport daisy-chain operation. The basic transport includes motion and control electronics, read/write electronics, dual-gap read-after-write head, power supply, and dust-sealed cover door.

Model 6X11/6X12 Read Only

These units are for read-only applications requiring 7- and/or 9-track NRZI and/or phase-encoded capability. Models 6X11 and 6X12 are available in speeds between 12.5 and 75 ips with four dual-speed versions of 75/37.5, 45/22.5, 37.5/18.75, and 25/12.5 ips. The models use a single-gap 7- or 9-track head, or a dual-gap 7- and 9-track head. The transport has select capability and input/output gating for multi-transport daisy-chain operation. Threshold and timing margin selection provide the ability to read marginal tapes. The basic transport includes motion and control electronics, read-only electronics, single-gap 7- and/or 9-track head, or dual 7- and 9-track head, power supply, and dust-sealed cover door.

OPTIONAL FEATURES (which must be defined at the time of order) are:

- **color coordination panel.** an adhesive-backed front panel lets the customer adapt the transport to his own color scheme. Pertec standard transport deck is pearl white with smoke-color acrylic door. Pertec standard color for the 75-ips unit is warm grey overlay with warm grey panel inserts.
- **special speeds.** for speeds other than the standard 12.5, 18.75, 22.5, 25, 37.5, 45, and 75 ips, consult factory.
- **customer logo.**
- **220 v ac operation.** normally wired for 115 v ac operation. Customer may specify 220 v ac for European operation.
- **status gating.** provides transport status when the transport is off-line.
- **transport ready.** forces transport-ready status without completing load sequence.
- **multiple transport adapter (MTA).** provides the cabling and terminations, and adapts transports for daisy-chaining. Supplied with 10 feet of ribbon cable for each transport.

TABLE 1

	MODEL NO.	NO. OF TRACKS	DATA DENSITY CPI	DATA TRANSFER RATE (KHZ)					
				12.5 ips	18.75 ips	25 ips	37.5 ips	45 ips	75 ips
READ/WRITE	6860-9	9	800	10	15	20	30	36	60
	6860-75	7	800/556	10/6.95	15/10.43	20/13.9	30/20.9	36/25.02	60/41.7
	6860-72	7	800/200	10/2.5	15/3.75	20/5	30/7.5	36/9	60/15
	6560-72	7	556/200	6.95/2.5	10.43/3.75	13.9/5	20.9/7.5	25.02/9	41.7/15
	6660-9	9	1600	20	30	40	60	72	120
READ-AFTER-WRITE	6840-9	9	800	10	15	20	30	36	60
	6840-75	7	800/556	10/6.95	15/10.43	20/13.9	30/20.9	36/25.02	60/41.7
	6840-72	7	800/200	10/2.5	15/3.75	20/5	30/7.5	36/9	60/15
	6540-72	7	556/200	6.95/2.5	10.43/3.75	13.9/5	20.9/7.5	25.02/9	41.7/15
	6640-9	9	1600	20	30	40	60	72	120

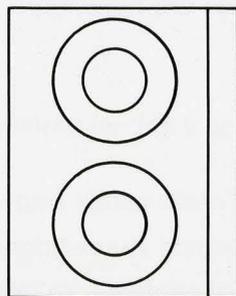
TABLE 2

MODEL NO.	NO. OF TRACKS	DATA DENSITY (CPI) 9-TRACK 7-TRACK	DATA TRANSFER RATE (KHZ)								HI SPEED IS ALWAYS NRZI		
			12.5 ips	18.75 ips	25 ips	37.5 ips	45 ips	75 ips	75/37.5 ips	45/22.5 ips	37.5/18.75 ips	25/12.5 ips	
6611-000-*	9	1600	20	30	40	60	72	120					
6611-800-*	9	1600/800	20/10	30/15	40/20	60/30	72/36	120/60	60/60	36/36	30/30	20/20	
6612-850-*	9	1600/800	20/10	30/15	40/20	60/30	72/36	120/60	60/60	36/36	30/30	20/20	
	7	800/556	10/6.95	15/10.4	20/13.9	30/20.8	36/25.02	60/41.7	60/41.7	36/25.02	30/20.8	20/13.9	
6612-820-*	9	1600/800	20/10	30/15	40/20	60/30	72/36	120/60	60/60	36/36	30/30	20/20	
	7	800/200	10/2.5	15/3.75	20/5	30/7.5	36/9	60/15	60/15	36/9	30/7.5	20/5	
6612-852-*	9	1600/800	20/10	30/15	40/20	60/30	72/36	120/60	60/60	36/36	30/30	20/20	
	7	556/200	6.95/2.5	10.4/3.75	13.9/5	20.8/7.5	25.02/9	41.7/15	41.7/15	25.02/9	20.8/7.5	13.9/5	
6811-000-*	9	800	10	15	20	30	36	60					
6811-500-*	7	800/556	10/6.95	15/10.4	20/13.9	20/13.9	30/20.8	36/25.02					
6811-200-*	7	800/200	10/2.5	15/3.75	20/5	30/7.5	36/9	60/15					
6511-200-*	7	556/200	6.95/2.5	10.4/3.75	13.9/5	20.8/7.5	25.02/9	41.7/15					
6812-500-*	9	800	10	15	20	30	36	60					
	7	800/556	10/6.95	15/10.4	20/13.9	20/13.9	36/25.02	60/41.7					
6812-200-*	9	800	10	15	20	30	36	60					
	7	800/200	10/2.5	15/3.75	20/5	30/7.5	36/9	60/15					
6812-520-*	9	800	10	15	20	30	36	60					
	7	556/200	6.95/2.5	10.4/3.75	13.9/5	20.8/7.5	25.02/9	41.7/15					

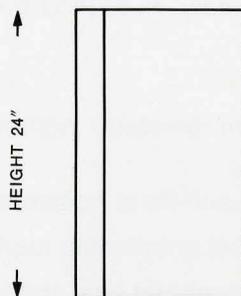
*Speed. Dash number is at head of each column.

SPECIFICATIONS

Data Density	9 Track — 1600 cpi phase-encoded or 800 cpi NRZI
Tape Velocity	75, 45, 37.5, 25, 18.75, or 12.5 ips standard (dual speeds optional with read-only transport)
Instantaneous Speed Variation	±1% for up to 37.5 ips; ±2% for 45 ips; ±3% for 75 ips
Long Term Speed Variation	±1%
Start/Stop Displacement	0.19 inch ±0.02 (4.83 mm ±0.51)
Start/Stop Time	8.0 ms ±0.55 at 45 ips Inversely proportional to tape speed
Number of Tracks	7- or 9-track IBM compatible (Models 2400, 729, and others)
Recording Mode	NRZI is IBM-compatible Phase-encoded units IBM- and ANSI-compatible
Tape Format	IBM-compatible
Tape Specifications	0.5 inch (12.7 mm) wide 1.5 mil (38.1 microns) thick. Computer grade
Tape Tension	8 ounces (226.7 grams)
Electronics	Silicon solid state and 930-Series DTL logic
Tape Unit Interface	DTL-, TTL-compatible logic (low true)
Rewind Speed	150 ips (nominal)
Reel Size	10½ inch
Weight	80 lbs. (38.3 kg) — up to 45 ips 95 lbs. (41.38 kg) — at 75 ips
Power	117/230v ac, 48 to 400 Hz, 400 watts
Operating Temperature	35° to 122°F (2° to 50°C)
Relative Humidity	15 to 95% non-condensing
Altitude	0 to 20,000 feet
Mounting	Standard EIA rack mount
Dimensions	
Height	24 inches
Width	19 inches
Depth (behind panel)	14.25 inches



← WIDTH 19" →



↑
HEIGHT 24"
↓

← DEPTH 14.25" →

INTERFACE DESCRIPTION

All Pertec synchronous transports are connected through three interface connectors. The interface allows multi-transport daisy-chained operation and, therefore, the true logic condition is set at ground level and the false condition set at +3v dc. See interface diagram for appropriate drivers, receivers, and terminating resistors.

The input/output lines are considered in four functional groups as follows:

1. TRANSPORT CONTROL INPUTS.

SELECT (SLT). Level, when true, remotely conditions transport and enables all input/output signals.

SYNCHRONOUS FORWARD COMMAND (SFC). Level, when true, causes forward tape motion.

SYNCHRONOUS REVERSE COMMAND (SRC). Level, when true, causes reverse tape motion.

REWIND COMMAND (RWC). Pulse, when true, initiates reverse tape motion at rewind speed.

OFF-LINE COMMAND (OFFC). Pulse, when true, causes tape transport to be placed under manual control.

SET WRITE STATUS (SWS). Level, when true, 20 μ sec after SFC conditions write current.

DATA DENSITY SELECT (DDS). Level, when true, remotely selects high density in 7-track units.

OVERWRITE (OVW). Level, when true, controls write and erase current turn-on and turn-off for selective record updating.

READ THRESHOLD 1 (RTH1). Level, when true, selects high threshold when verifying a record on single-gap systems. On ready-only versions, sets high timing margin.

READ THRESHOLD 2 (RTH2). Level, when true, selects extra low threshold to recover very-low-amplitude data (not available on 6X40 and 6X60 transports).

2. TRANSPORT STATUS SIGNALS.

READY (RDY). Level, when true, indicates transport is on-line and not rewinding.

ON-LINE (ONLINE). Level, when true, indicates tape unit is ready for on-line operation.

REWINDING (RWD). Level, when true, indicates unit is in rewind cycle.

END OF TAPE (EOT). Level, when true, indicates end of tape photo tab is being detected.

LOAD POINT (LDP). Level, when true, indicates tape unit is at load point.

FILE PROTECT (FPT). Level, when true, indicates reel of tape with write enable ring removed has been loaded on tape unit.

DATA DENSITY INDICATOR (DDI). Level, when true, indicates the selection of high density.

3. TRANSPORT DATA INPUTS.

WRITE DATA STROBE (WDS). Pulse, when true, causes data on input lines to be recorded on tape. In phase-encoded transports, two clocks are required for each character to copy the waveform on tape.

WRITE AMPLIFIER RESET (WARS). Pulse, when true, generates LRC character on NRZI tape. In addition, it is used to signal current turn-off when in the "edit" mode.

DATA INPUTS (WDP, WDO-7). Levels, one input line for each track on tape. Used in conjunction with write clock to record data.

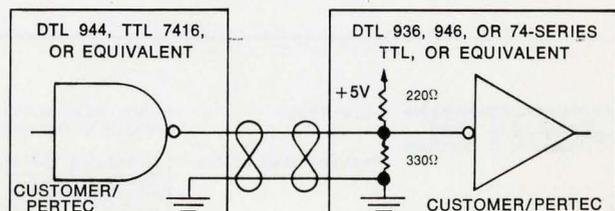
4. TRANSPORT DATA OUTPUTS.

READ DATA STROBE (RDS). Pulse, when true, is used for clocking data lines out of transport (not available on Models 6660 and 6640).

READ DATA OUTPUT (RDP RDO-7). Levels, one line for each track of data on tape. Data is assembled in parallel form and clocked out of tape unit with read clock. If phase-encoded, the output signal is a replica of the data input.

LEVELS: True = Low = 0 to 0.4v dc
False = High = 3v dc

PULSES: Amplitudes as above, 1 μ sec. typical width. Edge transmission delay over 20 feet of twisted cable is less than 200 nsec.



NOTES

PERTEC

Policy Note:

Pertec reserves the right to change specifications at any time. It is Pertec policy to improve products as new techniques and components become available.

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