Consumer and Corporate Affairs | Consommation et corporations
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Ottawa, Ontario
K1A 0C9

E-200
Approval No. d'approbation

Ottawa, December 18, 1980

NOTICE OF APPROVAL – AVIS D'APPROBATION

SANGAMO TYPE "ETR" MAGNETIC TAPE RECORDERS

Input requirements:	Mechanical contacts or solid state types of pulse initiators with 3 wire (Form C) outputs.
Maximum burden (on pulse initiator switch):	5 mA at 50 volts
Maximum Input Pulse Rate:	100 pulses per minute per channel
Minimum Pulse Width:	600 milliseconds
Cassette type:	Philips' certified data, wide temperature range, digital grade magnetic tape; 3.81 mm wide by 86 m long.
Magnetic recording:	Three tracks, one for encoded real time and recorder identification; two for data.
Time and Instrument Identification Recording Interval:	Every five minutes. The recorder writes the time on the tape every five minutes. The actual billing interval is determined during the translation process by adding together the required number of consecutive five-minute blocks of data; e.g. a fifteen minute interval is produced by adding three consecutive five-minute blocks. The use of billing demand intervals of less than 15 minutes is not permitted.
Record duration:	35 days
Power requirements:	120 or 240 V ±10% 50 or 60 Hz
Temperature range:	$-20^{o}C$ to $+55^{o}C$
Recorder burden:	12 VA at rated voltage
Mechanical Registers	Two 6-digit impulse counters with 10 X multiplier
Diagnostic features:	Built-in tester consisting of a battery "low" indicator and six LEDs for monitoring the recording head signal in each of the three tracks.

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Power outage indication:	Power outages are indicated on the encoded time track.
Clock carryover:	Solid state crystal controlled oscillator, powered by a small Lithium Battery, maintains correct time to 0.01% during power outages.
Battery:	Hermetically sealed Lithium Battery has a five to ten year life expectancy.
Clock display:	Four digit LED watch display showing time in hours, minutes, month and day.
Recorder identification:	Up to 12 Customer Identification ASCII characters recorded on time track every five minutes.
Connection:	MS style connector for KYZ terminals and line voltage.
Enclosure:	Steel, weather-resistant box, 4 1/32" x $5\frac{1}{2}$" x $10\frac{1}{4}$" (102 x 140 x 260 millimetres)

Description

The Type ETR Encoded-Time Magnetic Tape Recorder was designed, and will be manufactured, in Canada by Sangamo Company. The enclosure and tape drive mechanism is similar to those used in the Type MCR-1 Magnetic Tape Recorder (Approval Notice E-152, May 9, 1977). A special "Philips" type extended temperature data cassette with 3.81 mm tape is used for recording three tracks of information. Pulses proportional to load are generated by a pulse initiator in the associated watt hour meter and recorded on one of the two outer tracks. W, Q, Var or VA hour meter pulses may be recorded on the other track. The centre track has an encoded message every five minutes. This message consists of the real time in year, month, day, hour and minute, plus a 12 character identification code and a power outage indicator. The tape has capacity for up to 35 days of pulse storage. Tapes must be bulk erased prior to re-use.

The time is maintained by dividing the line frequency down, to give one pulse every five minutes. This interval pulse is fed into a microcomputer which updates the time and date information accordingly. In the event of a power interruption, the time and date are stored in a CMOS random access memory and the microcomputer is shut down. The interval pulse is

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then derived from a 32.768 KHz quartz crystal suitably divided down. During the period of the power outage, the interval pulses are stored in a 12 bit counter. When the power is restored, the microcomputer starts up again and interrogates the 12 bit counter. During the power outage, no information is recorded on the tape until the following five-minute interval after the restoration of power at which time the correct time and date are recorded. The 12 bit counter can count 2^{12} or 4096 five-minute intervals (i.e. 14 days, 5¼ hours) before it rolls over. In the event of rolling over, the recorder's indicated time would be slow by 4096 five-minute intervals behind the actual time.

During a power interruption, the current being drawn from the Lithium battery is approximately 25 micro-amperes. The reported capacity of the battery is 1.1 ampere-hours, which would give a life in excess of five years with a power outage.

The shelf life of the battery is in excess of five years, according to the manufacturer.

Visible through the window of the enclosure are two six-digit impulse counters which are advanced one count for every ten input data pulses received by the recorder. Also visible are eight diagnostic Light Emitting Diodes (LEDs). There are two LEDs connected back-to-back in series, with each track of the recorder head to monitor the actual head current directly. These LEDs are arranged in vertical pairs, with each pair assigned to a specific track, and light alternately, indicating the direction of the head current. A seventh LED is used to indicate the start of each five-minute period, and an eighth LED shows the condition of the Lithium battery.

The impulse counters are not to be used for billing purposes.

Approval granted to:

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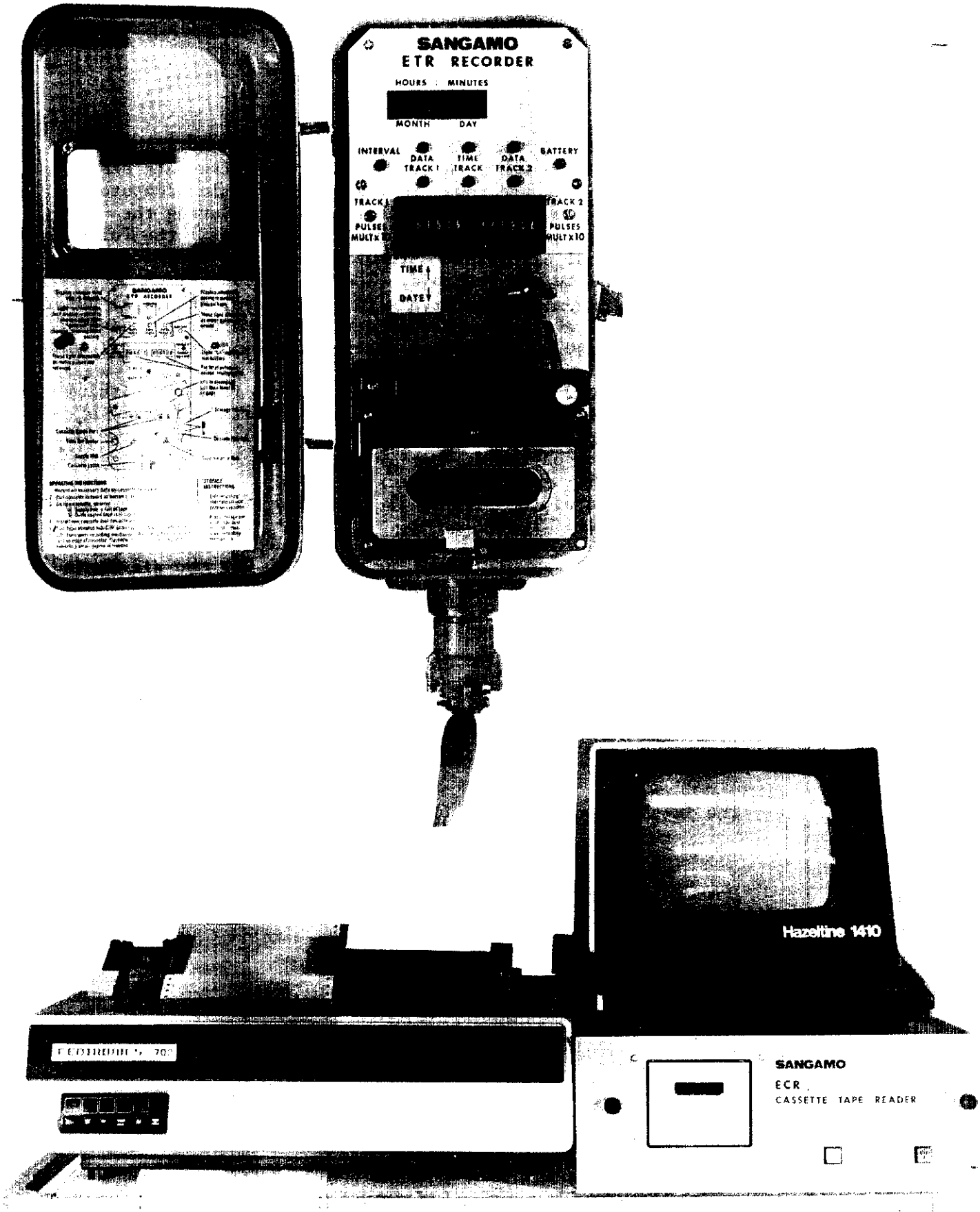
SANGAMO
ETR RECORDER
HOURS
MINUTES
MONTH
DAY
INTERVAL
DATA TRACK 1
TIME TRACK
DATA TRACK 2
BATTERY
TRACK 1
TRACK 2
PULSES MULT x 1
PULSES MULT x 10
TIME
DATE
Hazeltine 1410
SANGAMO
ECR
CASSETTE TAPE READER