ALL NEW CAROUSEL®
FOR THE EIGHTIES

OVER 20 YEARS OF REFINEMENTS ARE EMBODIED
IN THE NEW SERIES 800, MODEL 450-452 CAROUSEL®
STILL THE LEADER IN AUDIO CARTRIDGE ROBOTS.

- Microprocessor controlled logic gives Bi-Directional action, — half the access time.
- Same physical size means easy replacement of older models
- Control panel lights give full status indication.
- Digital tray number panel readout for easy checking.

For more than 20 years Carousels have played a major role in broadcasting around the world. The name Carousel has become synonymous with automated tape cartridge players, the backbone of modern broadcasting. Twenty five years of refinements by SMC, the only maker of the Carousel, have been incorporated in the new model 450 Bi-Directional. The proven features of earlier Carousels have been retained including cast aluminum drum, steel cartridge trays and ball bearing cross shaft. Now the Model 450-452 combines microprocessor flexibility for Bi-Directional operation, front monitoring lights, enable system to allow off air audition. SMC Carousels give the maximum performance at the lowest cost per tray in the industry.

SONO-MAG CORPORATION
"THE MOST TRUSTED NAME IN BROADCAST AUTOMATION"
— BUILT FOR PERFORMING & LONG LIFE

The cartridge tape transport system (A) (deck) for the Carousel has time proven construction. It is assembled on an aluminum jig plate that retains its mechanical integrity free of massive cut outs. The stainless steel wear surfaces provide shielding and ventilation for a cooler cartridge.

The solenoid operator system (SMC pioneered the tapered plunger - 2000 Ni solenoid in 1958—copied by all manufacturers), is vertically mounted to eliminate plunger friction. (B)

The pinch roller cross shaft is the SMC pioneered ball bearing system that is fully adjustable and field replaceable.

In the Model 450 Carousel, the cartridge is guided into playing position (C) by two neoprene rollers, which hold the bottom of the cartridge directly on the head mounting plate.

— TIME PROVEN CONSTRUCTION

The Model 450 Carousel is assembled on a one piece cold-formed steel plate for maximum operational life. Massive castings and 2-inch ball bearings support the rotating drum assembly.

The tape deck, the drive motors, and the electronic chassis are all readily field-serviceable.

Electrical modules are connected to the electronic chassis with locking type connectors.

Cartridge trays are Teflon coated steel. This construction provides wear protection for cartridges.

The Model 450 will fit in the same space and mounting rails used with previous Carousels.
— Rotation & Shifting System

The bi-directional rotate motor system is solid-state controlled providing dynamic electrical braking. Additional mechanical brakes, internal to the motor, hold the drum position.

The motor and drive wheel are mounted to slide-out for easy service.

The Model 450 cartridge tray shifting system uses a rack and pinion gear and solid state controlled motor. Gears are no oil nylon.

Travel limit switches are solid-state opto-electronic.

The shift motor and pinion gear are a slide-in assembly.

— Electronic Package

The electronic chassis has three plug-in circuit boards for all logic and audio functions.

Two regulated power supplies use a flux shielded power transformer.

The solenoid power system is ramped to give fast start and reduced power during run.

All sockets to sub-assemblies are polarized and have finger release locks.

All Model 450 Carousel logic inputs from limit switches, cartridge switch, binary tray location reader, index reader, as well as Start, Stop, and Enable signals, are processed by the CLC-1, a microprocessor.

Among its many functions, this board makes the decision to turn the Carousel the shortest direction from its present location to the new address.

If the Model 450 is "busy", an immediate return signal is provided.

All front panel control switches have lighted indicators to show status of related circuits. When a logging encoded tape is running, the logging and EOM pulses are shown on the STOP LED.

A digital read out of the tray number in playing position is shown on the escutcheon panel.
SPECIFICATIONS & APPLICATIONS

MODELS: 450 - MONO
       452 - STEREO

Catalog No. 150-0410-001
Catalog No. 150-0411-001

Cartridge Capacity:
Tape Speed: 24 NAB Type A-AA
Tape Drive: 7.5 ips (19.05 CM/S)
Speed Accuracy: Hysterisis Synchronous Motor
Wow/Flutter: ±0.2%
Rotation Access: Weighted Peak .15% (ANSI S4.3)
Shift Time: Bi-directional 11 sec. max. (60 Hz)
Random Access: 4 sec
Sequential: External BCD data and Timing
Audio: Strobes required
       Selector Switch provided.
Output: Transformer; External load 600 Ohm.
Level: (Series impedance 77 Ohms)
Response: 0 dBm re 160nWm tape flux
Noise: +12 dBm (before clipping)
(at-10 dBm) 50 Hz-12KHz ± 2dB.
Tape Cue: RE NAB 0 level; Mono - 48dB
          Stereo - 45dB
          RE 3%THD level; Mono - 56dB
          Stereo - 53dB
Logging: 1KHz Phase Lock Loop-Adjustable
E.O.M.: 3.85KHz Phase Lock Loop-Adjustable
        150Hz Adjustable
Power: 117v 60Hz 1Amp
       120/240v 50Hz; Special Order
Dimensions: Rack Space: 19x19½ inches
            (48.26 x 48.9 cm)
Weight: 90 lbs (41 kilo)
          U.S. Pat. 3,113,708

APPLICATIONS
Models 450/452 are directly interchangeable with SMC Models 350RSB/352RSB on ESP-1
and DP-2 Systems, and Mini-Pro 1 with RSC-100 equipment.
On systems using SMC Carousels model 250, consult factory.
FEATURES...

• ALL decision making instructions are permanently stored in non-volatile read only memory units.

• Full display of the next or now data even while the cassette or teletype is dumping or loading into the memory.

• Teletype or cassette may be loaded with information directly from the console of the programmer, without any interruption of "on air".

• Subroutine may be scheduled in any manner.

• Video display of the fifteen next and now events plus time and date.

• Additional control mini consoles may be added for the traffic office and P.D.

• Business computer interface built in. ASCII and 110, 300, 600 Baud W/DP-2 Format.

Specifications

The DP-2 DIGITAL PROGRAMMER, alternately called the central processor, or memory, is used to store all the information about events to be used in the format and to sort them out for random select and airing. The DIGITAL PROGRAMMER comes in various sizes, the two thousand event unit has 500 steps of subroutine, the four, six and eight thousand event units all have one thousand events of subroutine. The DIGITAL PROGRAMMER utilizes non-volatile PROM integrated circuits into which the software instructions are fixed, and the user changes only the event information and the instruction codes to cause the machine to do different things... fade, join net, etc.

Using micro-processor control, the DP-2 can be programmed up to seven days. Used with the PDC-4 Super Clock, program segments may be aired on selected days. Multi-cartridge machines may be armed up to 25 steps in advance, even in the subroutines.

Memory Capacity: 2K, 4K, 6K, 8K
Sub-Routines: 500 steps with 2K; 1000 steps, 4K - 8K
Work length: 16 bits
Output signals: Active high TTL, Tri-State.
Control capacity: 99 channels x 99 random access trays.
Special Function codes: 15
Power requirements: +8 - 10 volts, 4 amps
15 Volts, 1 amp
Cooling fan: 120 volts ¾ amp.
Size: Panel space: 19” x 5¼” (48 cm. x 13 cm)
Depth: 19½” (49.5 cm)
Control console projection: 7” (18 cm)
Weight: 25 lbs. (11 Kilo)
8000 RTS, RETURN FROM SUBROUTINE, this code marks the end of a subroutine and should always appear as the last step of a subroutine. If this code appears in the main memory it is ignored. (All subroutines are in the 7000 series of events.)

8010 LINK, this code appears between two or more events in either the main memory or the subroutine memory, that are not to be divided by a time command. An example would be a music tape and a talk tape used extra and/or intro.

8020 TIME CORRECT FLAG, this code marks the point that the programmer will "step ahead" to upon a time correct instruction from the PDC-5 clock. The next event after this code becomes the next to play.

8030 START REPEAT BLOCK, marks the beginning of a block of events, including the subroutine if desired, that are to be repeated. The last digit (the 0) may be changed on this command to indicate to the programmer how many times the repeat is to take place (up to 9 times). The block can be any length and would be used for late night or early morning when you are only playing music.

8040 END REPEAT, used to tell the programmer that this is the end of the repeat block. When the programmer sees this command it will automatically go back to the 8030 command and start all over with block of steps. If the repeat is not to be done again it will go to the main programmer and pick up at the appropriate event.

8050 SKIP, this code marks the beginning of a block of steps that are to be skipped by the programmer, useful for getting around special formats that may run only on Sunday.

8060 END SKIP, this code marks the end of the block of steps that you desired to skip... 8050 starts the skip and 8060 stops the skip.

8100 AUTO SWITCHER START, this command is used for delay start of an event that you may want to lay over another event, time over the first part of a musical selection, an artificial AUX tone is generated. The exact time of the delay is controlled by changing the last "0" in this command to the desired delay start time (up to nine seconds). Used primarily for production control of jingles, time, voice overs, etc.

8110 AUTO START, this code places the switcher in the auto start mode and enables the silence sensor, it is activated from the system master clock.

8120 AUTO STOP places the switcher in the auto stop mode and disables the internal silence sensor, used to turn the unit off at sign-off, in normal application the unit would wait for an 8110 command to start at sign-on.

8130 FADE DOWN, this code sends a fade down instruction to the digital switcher with the effect of fading out of whatever is on the air and going immediately to the next to play. Normally this code is controlled by the master clock and is used for net joins from a fade.

8150 LOAD CASSETTE, LOAD TELETYPE, when this code becomes next to play the programmer will sequentially and automatically turn on either the Cassette or Teletype and load your new format into the programmer's master file. The loading is accomplished even while the programmer is operating the station on the air. The Cassette stores hundreds of thousands of events. The Teletype storage is on paper punch tape.

8160 NET END, this code causes an immediate switch FROM THE NET to the NEXT SCHEDULED EVENT.

8170 BACKFILL START, used in conjunction with the master clock to automatically start the backfill machine without placing it on the air but making it the next to play. The backfill will automatically crossfade with the now playing event if the current event is too long or will fade up at a normal switch.

8180 USER FLAG may be used to do anything the operator wants that we haven't thought of and that is possible electrically. Either clock or programmer function.
FEATURES...

- Studio encoding
- 512 Character monitor
- Simultaneous or after the fact encoding
- Instant proof back
- Encoder may be connected to hard copy printer
- Easy message correction

AUTOMATION LOGGING SYSTEM

Specifications

The SMC automation logging system consists of SMC Logi-Cart recorder (model 790 mono or 792 stereo), encoding terminal model DT-4, and CRT monitor screen.

This system permits silent studio operation for the encoding of messages on the cue track of broadcast cartridges.

Cartridges may be encoded at 10 characters per second for the running time of the audio portion of the cartridge.

The encoding terminal and monitor screen allow the message to be typed, verified and then transmitted to the cartridge in the recorder. The message on the screen may be retained for transmitting to carts with multiple cuts. The cartridge may be played back to proof the message on the screen.

SONO-MAG CORPORATION

1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
LOGGING PACKAGE DESCRIPTION

Cat. No. 150-0275-001 MONO
150-0275-002 STEREO

The complete SMC logging package includes the DT-4 encoder, the SMC Recorder, the CRT monitor, the CLB-1 logging buffer card in the DS-20A, and the page printer. Necessary cables are included.

The logging system will print audio source number and tray number, hours, minutes, and seconds that the event started, and the encoded information from any cartridge.

Carriage return and line feed codes are generated automatically at each start cycle. Encoded messages longer than one printer line are accommodated by encoding the CR and LF code at the proper point on the tape.

BUFFER TITLER OPTION

The logging package may be enhanced with a buffer-titler board, BT-1. Cat. No. 150-0279-001.

When this board is plugged into SMC audio switcher model DS-20A, up to eight music channels can be identified on the log with MUSIC. When Ch. 15 is aired, the word NETWORK will be printed.

Any time the silence sensor operates, the log will show SIL SNSE on the faulty event line.

When using the manual remote control with the DS-20A, the word MAN will print the first time the system is in manual mode and will print AUTO at the time the system is returned to automatic mode.

The following titles may be printed on the log when selected by external active high TTL pulses:

XMIT OFF
SIGN OFF
STA ID.

All of the titles can be changed for a program charge.

EXAMPLE PRINT OUT

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>MUSIC</td>
</tr>
<tr>
<td>0900</td>
<td>11:59:15</td>
</tr>
<tr>
<td>1500</td>
<td>12:00:00</td>
</tr>
<tr>
<td>0100</td>
<td>10:59:00</td>
</tr>
<tr>
<td>0200</td>
<td>11:00:00</td>
</tr>
<tr>
<td>0300</td>
<td>11:25:00</td>
</tr>
<tr>
<td>0400</td>
<td>12:00:00</td>
</tr>
<tr>
<td>0500</td>
<td>12:30:00</td>
</tr>
<tr>
<td>0600</td>
<td>12:59:59</td>
</tr>
<tr>
<td>0700</td>
<td>13:00:00</td>
</tr>
<tr>
<td>0800</td>
<td>13:15:00</td>
</tr>
<tr>
<td>0900</td>
<td>13:30:00</td>
</tr>
<tr>
<td>1000</td>
<td>13:45:00</td>
</tr>
<tr>
<td>1100</td>
<td>14:00:00</td>
</tr>
<tr>
<td>1200</td>
<td>14:15:00</td>
</tr>
<tr>
<td>1300</td>
<td>14:30:00</td>
</tr>
<tr>
<td>1400</td>
<td>14:45:00</td>
</tr>
<tr>
<td>1500</td>
<td>15:00:00</td>
</tr>
<tr>
<td>1600</td>
<td>15:15:00</td>
</tr>
<tr>
<td>1700</td>
<td>15:30:00</td>
</tr>
<tr>
<td>1800</td>
<td>15:45:00</td>
</tr>
<tr>
<td>1900</td>
<td>16:00:00</td>
</tr>
<tr>
<td>2000</td>
<td>16:15:00</td>
</tr>
<tr>
<td>2100</td>
<td>16:30:00</td>
</tr>
<tr>
<td>2200</td>
<td>16:45:00</td>
</tr>
<tr>
<td>2300</td>
<td>17:00:00</td>
</tr>
</tbody>
</table>

SONO-MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.

Phone 309-829-6373
TWX No. 510-352-2506
PRINTED IN U.S.A. 1-78
SPECIFICATIONS

FEATURES

- 20-Channel solid state switcher
- Stereo Silence Sensor
- Built-in network line amplifier
- BCD Channel select
- AGC and Balance metering.

DS-20 20 CHANNEL AUDIO SWITCHER

With logging option, the DS-20 provides time, channel/tray and cartridge logging information for direct connection to 20-Ma serial printer. Tilt-down panel provides access to all adjustments on plug-in circuit boards. Optional accessories include AP-20 manual access panel, RC-20 remote manual control for Auto, Manual, or Semi-Auto (operator assist) mode; Slave switcher, SS-20 for 20 additional channels.

Specifications

Data input: 8 bit active high source select and 8 bit tray select
Data output: Source start: active low
Source enable: Active high Logging; 20 ma loop & TTL
Capacity: 19 programmable channels 1 channel special.
Source input: 0 dBm maximum
Source load: 600 ohms
Output: +18 dBm MAX.
Distortion: 0.7%, 400 Hz. +18dBm
Noise: -62 dB re + 8 dBm
Cat. No. 150-0252-001

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
**DS-20 OPTIONAL EQUIPMENT**

<table>
<thead>
<tr>
<th>RAC-20</th>
<th>CAT. No. 150-0259-001 Remote Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The RAC-20 is designed to operate with the Model DS-20 Digital Audio Switcher equipment.</td>
</tr>
<tr>
<td></td>
<td>It provides for manual operation of the 19 normal channels of the switcher, and for the random select arming of up to 20 multi-cartridge playbacks.</td>
</tr>
<tr>
<td></td>
<td>A semi-Auto mode permits the operator to use the pre-programmed instructions from a DP-2, DP-1B or RP-1000 and manually control the “Start” sequence for operator “assist.”</td>
</tr>
<tr>
<td></td>
<td>Several RAC-20 units may be connected to the systems at the same time.</td>
</tr>
<tr>
<td></td>
<td>It is self-powered, and requires a 25-wire cable to the DS-20. Several RAC-20 units may be connected together and used on a “one at a time” control basis. The DS-20 switcher must be equipped with the RMT-1 Interface board.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AP-20</th>
<th>CAT. No. 150-0272-001 Access Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This unit is located next to the DS-20 to allow local control of start function of all 20 channels of DS-20. Channel S may be controlled as a “bulletin” source.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SS 20</th>
<th>CAT. No. 150-0256-001 Slave Switcher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used in conjunction with the DS-20, an additional 20 channels may be controlled by the DP-2. Same size as the DS-20.</td>
</tr>
</tbody>
</table>
The RAC-30 remote control is designed to operate with the SMC-DS-20/A digital audio switcher. Providing for manual operation of the 19 normal audio channels of the switcher, and for random-select arming of up to 99 multi-cartridge playback machines. Switcher channel and tray number data are stored in the RAC-30 by using the data keyboard. The operator simply keys in four digits to enter the required data.

The semi-automatic mode permits the operator to use pre-programmed instructions from a DP-2 or ESP-1 programmer and manually control the 'start' command of each pre-programmed source.

When in the automatic mode the RAC-30 has no control over the automation system. Totally self contained, the RAC-30 is self powered, and several units may be used together on the same system on a 'one at a time' control basis. A busy light is provided to indicate when another RAC-30 is in control of the system.

**SPECIFICATIONS**

- **Source Selection:** Numeric Keyboard, 1 to 99
- **Arming Selection:** 99 machines by 24 cartridges
- **Output Signals:** BCD, Active high TTL, Tri-State
- **Modes:** Automatic; Semi-automatic; Manual
- **Power Requirement:** 120/240v, 50/60 Hz, 10 watts
- **Dimensions:** 33 x 20.3 x 11.4 cm (13 x 8 x 4 inches) W-D-H
FEATUR ES ...

- Studio encoding
- 512 Character monitor
- Simultaneous or after the fact encoding
- Instant proof back
- Encoder may be connected to hard copy printer
- Easy message correction

AUTOMATION LOGGING SYSTEM

Specifications

The SMC automation logging system consists of SMC Logi-Cart recorder (model 790 mono or 792 stereo), encoding terminal model DT-4, and CRT monitor screen.

This system permits silent studio operation for the encoding of messages on the cue track of broadcast cartridges.

Cartridges may be encoded at 10 characters per second for the running time of the audio portion of the cartridge.

The encoding terminal and monitor screen allow the message to be typed, verified and then transmitted to the cartridge in the recorder. The message on the screen may be retained for transmitting to carts with multiple cuts. The cartridge may be played back to proof the message on the screen.

- Full cursor control of the screen permits easy corrections or deletions prior to transmitting to the cartridge.
- Up to 16 one-line messages may be put on the screen at the same time for transmitting one at a time to 16 different cartridges.
- Speed: 110 baud
- Screen: 32 characters x 16 lines
- Keyboard: Full ASCII
- Cursor Control: Full
- Power: 120/240 50/60 Hz.
- Encode Freq: 3960 or 3520 Hz.

The encoding terminal DT-4 may be connected to 20-ma. loop printer as Teletype.

The logging printer furnished with the SMC logging package will be an 80 column dot-matrix machine.

SONO-MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
LOGGING PACKAGE DISCRIPTION

Cat. No. 150-0275-001 MONO
150-0275-002 STEREO

The complete SMC logging package includes the DT-4 encoder, the SMC Recorder, the CRT monitor, the CLB-1 logging buffer card in the DS-20A, and the page printer. Necessary cables are included.

The logging system will print audio source number and tray number, hours, minutes, and seconds that the event started, and the encoded information from any cartridge.

Carriage return and line feed codes are generated automatically at each start cycle. Encoded messages longer than one printer line are accommodated by encoding the CR and LF code at the proper point on the tape.

When using the manual remote control with the DS-20A, the word MAN will print the first time the system is in manual mode and will print AUTO at the time the system is returned to automatic mode.

The following titles may be printed on the log when selected by external active high TTL pulses:

XMIT OFF
SIGN OFF
STA ID.

All of the titles can be changed for a program charge.

EXAMPLE PRINT OUT

When this board is plugged into SMC audio switcher model DS-20A, up to eight music channels can be identified on the log with MUSIC. When Ch. 15 is aired, the word NETWORK will be printed.

Any time the silence sensor operates, the log will show SIL SNSE on the faulty event line.

BUFFER TITLER OPTION

The logging package may be enhanced with a buffer-titler board, BT-1. Cat. No. 150-0279-001.

SONO-MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
Phone 309-829-6373
TWX No. 510-352-2506
PRINTED IN U.S.A. 1-78
The MOST WIDELY USED
MULTIPLE CARTRIDGE PLAYER
Thousands of reliable CAROUSELS in use in broadcasting and commercial service speak for this versatile cartridge tape player.

The simple, rugged mechanism has a minimum of mechanical and electronic parts for unsurpassed reliability and minimum maintenance.

Series 350 CAROUSELS are fourth generation with a unique combination of 15 years experience and the latest integrated circuitry, including solid-state switching—no relays.

**FEATURES . . .**

- Solid-state control circuits—no relays.
- Totally enclosed, low noise shift and rotate motors.
- Solid-state, noisless electronic indexing system.
- Low-noise operational amplifiers.
- Three adjustable frequency tone sensors.
- Two regulated power supplies.
- Glass-epoxy plug-in circuit boards.
- Spring-locking chassis connection sockets.
- External enable for secondary and tertiary sensors.
- External enable for tray eject.
- Ball-bearing pinch roller cross shaft.
- Heavy-duty, direct-drive tape transport.
- Cue track logging system output standard.
- Random-select switch optional.
- Direct random select programming.

**SPECIFICATIONS**

**MODELS:**

- 350 Mono Cat. No. 150-0172-001
- 352 Stereo 150-0172-002
- 350 RS 150-0172-005
- 352 RS 150-0172-006
- 350 RSB 150-0172-003
- 352 RSB 150-0172-004

- Tape Speed: 7.5 IPS (19.05 cm/s) standard
- Output: +12 dBm (before clipping)
- 600 ohms, floating transformer
- Normally 0 dBm re NAB reference
- Har. Dist: Below 1% @ NAB 0 level
- Freq. Response: (at -10 dBm level)
  - 50 Hz. to 12KHz: ±2 dB

- Noise: Re NAB 0 Level;
  - Mono: -48 dB
  - Stereo: -45 dB
  - Re 3% THD level
  - Mono: -56 dB
  - Stereo: -53 dB

- Cue Freq. (end of tape): 1 KHz. ±75 Hz.
- Secondary cue (EOM): 150 Hz.
- Logging sensor: 3.96 KHz.
- Cartridge Capacity: 24 Type 300
- Shift time: Cue No. 1 to No. 2 ready: 4 sec.
- Drum rotation time: Max. 22 sec.
- Dimensions: Rack space; 19” W x 19 1/8” H x 18” D.
  - 48.26 cm x 48.9 cm x 45.7 cm.

- Weight: 90 pounds (41 kg)
- Power: 115 V. 60 Hz. 2 Amp. Standard
  - 120/240 V. 50 Hz. Special order
- U.S. Pat. 3,113,708

**SONO-MAG CORPORATION**

1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.

Printed in U.S.A. 1-78
ELECTRONIC FEATURES

- Analog audio switching.
- Operational amplifiers for all tape-track signals.
- Dual independent audio systems with 12 carts per channel. May be strapped for single source.
- Stereo electronics standard.
- Decoded logging output standard.
- BCD tray selection circuit.
- Lowest power consumption instant access machine.
- Transformer isolated individual solenoid power supplies.
- No relays. Solid state counter for audition selection or sequential operation.
- Premium printed circuit boards and plug-in IC devices.

Specifications

The Caro-Stat® plays NAB type A cartridges in a vertical position with reduced internal cartridge friction. The horizontal 7.94 mm non-magnetic stainless steel capstan does not collect tape oxide in the shaft bearings. The cartridge and its holding tray are pivoted on bearings into play position,—no fragile sliding trays. The head nest is an integral part of the cartridge tray system and the registration of head and cartridge is not dependent upon a sliding fit of a tray and guide system. Solenoid operated lever-roller system permits fast, quiet start and stop. High energy storage drive belt system provides approximately four times the torque of similar machines. Head azimuth is adjusted on a true co-axial mount that does not change track alignment or zenith.

The Caro-Stat® is the result of 15 years SMC experience building thousands of Carousels®. It combines the time proven techniques with the latest solid-solid-state circuitry.

The dual output circuits allow the Caro-Stat to be used as two independent 12-cartridge sources or one 24-cartridge source.

Programming restrictions common to multiple cartridge players are eliminated with the true instant access of the Caro-Stat.

Engineered by the designers of the Carousel®, long life, serviceability, and performance are inherent in the Caro-Stat.

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.

Phone 309-829-6373
TWX No. 510-352-2506
PRINTED IN U.S.A. 3-78
Specifications

Cartridge Capacity: 24 NAB Type A/AA
Tape Speed: 7.5 ISP
Access Time: Any cart; under 100 milli-seconds
Primary Stop Cue: 1000 Hz.
Secondary (Aux) Sensor: 150 Hz.
Third Tone Sensor: 3960 Hz. (Logging decoder)
Sensors Output: Positive logic true
Cartridge Programming: 6 Bit positive true BCD logic with pre-set & "next" strobes
Solenoid Power: 24 independent rectifier/switching units.
Audio Output: $+15 \text{ dBm}$ peak re 160 nW/m
Balanced for 600-ohm load.
Audio Performance: $\pm 2 \text{ db}, 50 - 12 \text{ kHz}$
Noise:
- $-49 \text{ dB below } 0 \text{ dBm Mono}$
- $-45 \text{ dB below } 0 \text{ dBm Stereo}$
Amplifier Distor: Less than 1% at 0 dBm, 1000 Hz.
Cross Talk: Stereo channels: $-50 \text{ dB} @ 1 \text{ kHz}$
Power Rqd.: 117 v. 60 hz. 2 amp.
240 v. 50 hz. 1 amp.
Mounting Space: 19" W x 17½" H. x 19" D
48.3 x 44.5 x 48.3 cm.
Equipment Weight: 120 lbs.
55 kilo.

Model: CS-24M MONO. Cat. #150-0205-001 150-0281-001M
CS-245 STEREO. #150-0205-001 150-0281-002S

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill 61701 U.S.A.
The TONE GENERATOR is a compact all solid state unit designed for mounting in 3½ inches of rack space. Illuminated front panel button provided with rear terminal for remote operation. Freq. stability is plus or minus 1.5Hz. Low harmonic content. Adjustable length of the tone or extended tone operation. Utility relay provided for secondary equipment operation if desired. Self contained power supply. Unit connects directly to recorder input.

Cat. No. 150-0184-001

State of the art, logic oriented, using all I.C. components in a phase lock loop circuit. Hi Z bridging. All front panel service with two indicator lights for sensing action. Internal power supply with auxiliary relays for external use. Interface directly to logic level signals. Adjustable time delay and frequency . . . instant restart option and 20Hz operation are available. The SMC TS-25 eliminates virtually all interface problems. Mounts in standard 19” rack in 3½” vertical space. Each TS-25 controls two reel-to-reel players.

Cat. No. 150-0161-001

This equipment is designed to serve as an alarm system upon the loss of audio material after an adjustable time delay. The SA-1 is self-contained requiring 117 v. AC and audio mono or stereo from -10 to +10 VU. Input is high impedance single ended bridging. Panel controls include level adjust, test button and alarm reset. Audio alarm unit and relay for external signal are included.

Cat. No. 150-0183-001
FEATURES...

- Two alternate "start" signals at 60 second intervals
- Controls any two audio sources
- Provides audio switching for source when commanded
- External connection sockets
- Power fail locks out announcement
- Self-contained power supply
- Relay contact and logic start signals
- Controls EOM output signal
- 60 Hz time base standard, 50 Hz optional
- ODD, EVEN, POWER indicators
- Run and Hold controls
- Odd & Even monitor jacks

TIME ANNOUNCER CONTROL
MODEL TAC-1

Specifications

Audio Switching: Passive opto-resistive
Insert Loss: 2 db
Response: DC to 30 KHz.
Cross Talk: -55 db @ 1 KHz, 0 DBM
Noise: -60 DBM.
Controls: ODD & EVEN Hold/Run switches
Power Fail reset
Indicators: ODD & EVEN next
One minute LED
Command LED
Start LED
Cat. No. 150-0008-001-60 Hz
150-0008-002-50 Hz

Time Base: Line frequency divided
Power: 105/125 V. 50/60 Hz 20-watts
(Specify line frequency)
Size 3½" x 19" x 11"
8.9 CM x 48.3 CM
x 27.9 CM
Weight: 13 lbs.
5.9 kilo

SONO-MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
FEATUR ES . . .
• Two Cartridge capacity
• All three cart sizes
• Direct drive hysteresis motor
• Ideal time announcer with TAC-1 Control
• Logic level remote control
• Output & control sockets
• No relays used
• Ball bearing slide out track
• Quiet solenoid operation
• Premium glass epoxy plug-in boards
• Three control tone sensing standard

MODEL 721R
MONO RACK MOUNT
MODEL 722R
STEREO RACK MOUNT
USE WITH TAC-1 CONTROL FOR TIME ANNOUNCER

Specifications
Tape Speed: 7½ Inches per second (19.05 CM/SEC
Output: 600 ohms balanced
12 dBm before clipping
Normally 0 dBm @ NAB Reference
Playback Distortion: Less than 1% @ 0 dBm,
400 Hz NAB Reference
Frequency Response: ± 2dB, 50 Hz to 15 kHz
Equalization: NAB, adjustable for head wear
Other equalization on special order.
Wow/Flutter: 0.15% DIN maximum
Noise: Mono, 57 dB below 3% THD @ 400 Hz
49 dB below NAB Reference
Stereo, 52 dB below 3% THD, 400 Hz
45 dB below NAB Reference
Cat. No. 150-0140-001-Mono-60Hz -003 50Hz
150-0140-002-Stereo-60Hz -004 50Hz

Speed Accuracy: 0.2%
Remote Control: All operating functions
Head Configuration: In accordance with NAB specifications
Primary cue tone: 1000 Hz ± 75 Hz
Secondary cue tone: 150 Hz ± 10 Hz
Third Tone: (Logging or Tertiary)
Power: 117 V. 60 Hz., 75 Watts
120/240 V. 50 Hz. Available on order
Dimensions: Rack mounts,
19" W x 5¼" x 20½” D
48CM x 13.31CM x.52CM
Weight: 40 pounds (18.1 Kg.)
TM-4 TAPE METER FEATURES . . .

• Measure tape-head signals and monitor with built-in head phone amplifier.
• Measure signal/noise ratios.
• Measure AC ripple in power supplies.
• Measure DC voltages used in powering IC circuits.
• Monitor hum, cue signals, etc. with head phones.

TEST EQUIPMENT

Specifications

The Model TM-4 is a multi-function test instrument intended primarily for checking the various circuit parameters of cartridge tape recorder-players. The TM-4 is a sensitive AC meter with five ranges from 0.003 volts to 3 volts. The input impedance is approximately 70,000 ohms and the frequency response is ± 1 dB from 30 Hz to 100 KHz.

Three individually calibrated DC ranges of 6, 12, and 30 volts have sensitivity of 5000 ohms/volt.

The TM-4 is internally powered with a 9-volt battery. The condition of the battery is satisfactory if the needle indicates above the triangle mark at the 5 point on the scale when selector switch is in Test Bat position. The accuracy of TM-4 is independent of battery voltage over the useful life of the battery.

The OFF position selector switch electrically clamps the meter movement and protects it from damage due to rough handling.

The five AC voltage scales are used when the input test lead is connected to J1 jack at top end of the TM-4.

The three DC voltage scales are used when the input test lead is connected to J2.

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
A Extender test board for dual 22 pin circuit boards use in SMC automation equipment. Edge contacts are spaced on standard 0.156" centers. Board is 4½" x 9". Catalog No. 150-0218-001

B Cartridge tape head gage block is made of lucite (to prevent head scratches) and is designed to show correct head penetration distance, correct track location, and head perpendicularity (zenith). The center line, upper and lower limits of standard tape path are precision engraved on the head side of the gage to eliminate parallax. Catalog No. 150-0277-001

C TTL logic test probe is a service must to check circuit board performance. Three colored signal lights in the tip show the basic high, low, and pulse states found in logic circuits. Power for the test probe is taken from the board under test with color coded clip leads. Catalog No. 153-0059-001
FEATURES...

• 250 Time Instruction capacity

• Hour, minute, second, and 10 function flags are stored instructions

• Keyboard time set and data entry.

• Stored instructions may be displayed on front read-out in chronological order from any time keyed in.

PDC-5 PROGRAM CLOCK

Specifications

The PDC-5 24-hour programmable clock uses micro-processor control of up to 250 time instructions. Time instructions are hours-minutes and seconds and a flag 0 through 9. Normally flag 0 is used as update command to DP-2 automation programmer. The other flags may be used independently for other functions. Optional flag start interface unit, FSI-6 may be used to give relay contact action from PDC-5 flags.

Memory capacity: 250 instructions

- 6 digits time;
- 1 digit flag.

Flag capacity: 0 through 9

Time base: AC line frequency

Crystal base during battery support time

Flag data: Flag 1 thru 9, active low, 200 microsecond.

Time data: BCD parallel with time strobe.

Cat. No. 150-0270-001 (60 Hz)

150-0270-002 (50 Hz)

Time instructions may be entered into PDC-5 memory in any order and they will be executed in chronological order. Keyboard provides time set, data entry, search, and delete functions. The PDC-5 has built-in line power supply and requires optional battery supply to retain time and memory during line interruption.

Power required: 115/230 V.

50/60 Hz.

Battery support: 8 to 10 V.

@ 1 A.

Physical: 19" x 5¼" x 11"

48 x 13.3 x 27.9 cm.

10 lbs. (4.5 kilo)
FEATURES . . .

- 675 Time Instruction capacity.
- Day, hour, minute, and second and 10 function flag instructions
- Keyboard time set and instruction entry.
- Print-out direct to 20-MA printer of stored instructions.

Specifications

Powerful time control function provided by the PDC-4 includes direct addressing of any step in the DP-2 automation programmer on a time basis. Instructions may be entered into the PDC-4 memory for any of 7 days or on day 0 if instruction is used every day. Nine discrete flags may be used to time-command external functions independently from DP-2 program.

Memory capacity: 675 instructions
- 1 digit day
- 6 digits time
- 1 digit flag
- 4 digits address

Day capacity: 0 thru 7
Flag capacity: 0 thru 9
Address capacity: 0000 thru 9999

The PDC-4 has built-in line power supply and requires optional battery supply to retain time and memory during line interruption. Time base is line frequency or crystal when on battery supply. Optional video display accessory available to print all instructions stored in chronological order at 110 or 300 baud.

Address data: Active high TTL BCD parallel
Flag data: Flag 1 thru 9, 200 microsecond active low
Time data: BCD paralleled with time strobe
Power reqd: 115/230 V., 50/60 Hz.
Physical: 19" x 5 3/4" x 11"
- 110 x 13.3 x 27.9 cm.
- 10 lbs. (4.5 kilo)

Cat. No. 150-0072-001: Optional Video Display board for PDC-4

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
FEATURES

• Logical programming without clumsy dedicated controls or slow interrogative programming modes
• 4,000 event memory with flexible sub-routine capability
• Fail-safe underprogramming security built in
• Uses fewer complex components for high reliability
• Instant multi-day programming from highly efficient memory
• Built-in diagnostic routine
• Power fail support system
• Fully compatible with all high quality format services and audio processors
• No source or interface cards required as all audio channels are furnished as standard

Specifications

The ESP-1 digital programmer, for the first time offers the vast majority of broadcasters a simple yet fully flexible programmer at the lowest cost. Designed around readily available MIL-SPEC components, the ESP-1 provides all the features and abilities of earlier more expensive programmers and operates in a logical non-complex sequence. Staff training is held to a minimum because the ESP-1 adapts to your operation without requiring you to adapt to its limitations. All functions are standard from auto stop and start to link, subroutine, network and fade functions. The ESP-1 does not require dedication of vast quantities of steps for over-programming as it is automatically under-programming proof, providing error free operation. The ESP-1 is fully compatible with the SMC DS-20/A audio switcher and PCD-5 programmable clock and provides full arming look-ahead capabilities, even in the subroutines. Built in multi-function test facilities using the keyboard and display panel permit testing of the major sections of the system. Designed and built with micro-processor techniques, the ESP-1 utilizes smaller, less complex plug-in circuit boards with sockets for IC devices to permit rapid field servicing. Now for the first time a programmer providing simplicity, economy and security without sacrifice of ability or compromise in quality.
Specifications - ESP-1

Memory Capacity: 4000
Sub-routine: to 999
Power Required: 8 - 10 V @ 3A.
          -15 V @ ½ A.
          + 15 V @ ½ A.
Fan: 120 V AC @ ¼ A.

Word length: 16 Bit
Output Signal: Active High, Tri-State
Control Capacity: 99 Source X 99 Tray
Panel Size: 19” x 5¼” (48 x 13 cm)
Console Projection: 7” (18 cm)

Function Codes

P100: Time Update.          Marker flag for time clock program update
P200: Fade.                Fade flag to audio
P300: Auto Start.          Begin program flag
P400: Auto Stop.           End program flag
P500: Switcher Start.      Audio enable
P700: Backfill Start.      Backfill Start
P800: Network End.         Net program end flag
Axxx: Call Subroutine.     Flag jump to routine xxx
Exxx: End Subroutine.      Flag jump from routine xxx to Main Program
LOOO: Link Steps.          Flag tying two or more events
HOOO: Skip.               Flag to omit steps up to end skip flag
HEOO: End Skip.           Terminate skip

ESP-1  4 K PROGRAMMER    Cat. #150-0290-001

Specifications subject to change without notice.
FEATURES

• For 250-RS or 350RS Carousel Series
• 100 Events each Carousel
• Alternating display for two carousels
• Self-contained - easy installation
• Fast-simple keyboard entry

MODEL RSC-100

PROGRAMMABLE RANDOM SELECTOR FOR CAROUSELS

Specifications

Program up to 100 cart selections for each of one or two Carousels® either model 250-RS, or 350-RS Series.

The RSC100 will add random select to your Carousels with minimum cost. Simple field installation.

Unit is self-contained and has keyboard entry to program each 100 step memory. Data may be changed at any time and is battery protected for short power off situations.

Carousel identity number may be matched to its automation system number by circuit board jumpers.

RSC-100 display shows Carousel identity number, memory step number and cartridge selection number.

Display and programming mode keys allow operator to check or change memory data or to have alternating display of memory data.

Memory steps can be programmed “00” to allow late entries.

A “next” mode allows operator to advance to any specified step.

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
Size: 3½" x 19" Panel
x 11" depth.

Weight: 15 lbs.

Power: 115/230 50-60 Hz

Battery: 6 "c" cells

Capacity: 100 programmable selections for each of two Carousels.

ORDERING DATA

RSC-100 Cat. No. 150-0319-001

Cable Set for 250/252RS Carousel
Cat. No. 155-0086-001

Cable Set for 350/352RS Carousel
Cat. No. 155-0087-001

RS Switch Kit Cat. No. 150-0178-001
(Required if Carousel is not equipped with - RS Switch Assy.)
The SMC DP-2 Digital Program System

The DP-2 Automation Programming System is a fully integrated combination of an advanced microprocessor computer and digitally controlled audio switcher and processor; utilizing non-volatile PROM and ROM integrated circuits into which the software instructions are fixed. The user changes only the event information and the instruction codes to cause the machine to do different things... fade, join net, etc. The entire unit (including software programs) is designed and written by SMC engineers. Also, because instructions are stored in plug-in units, new and more powerful programs can be furnished to users at any time as the technology advances.

Other features of the system include a complete lineup of user applied options such as additional keyboard/controllers, data terminals, video displays, automatic logging, interfacing to other computers, selective dumping, master clock for external functions, remote control, standard teletype, automatic transmitter logging, automatic network recording and playback, and a digital cassette dump/load. The DIGITAL PROGRAMMER expands from the 2,000 programmable events to 8,000 programmable events. The 2,000 event unit features 500 steps of sub-routine; the 4,000, 6,000, and 8,000 event units all have 1,000 steps of sub-routine. All models include up to 40 audio channels (20 normally) and a fully programmable clock for net joins.

1005 West Washington Street
Bloomington, Illinois 61701
Phone 309-829-6373
TWX # 510-352-2506

Printed in U.S.A 9/77
"SIMPLE" DOES NOT MEAN "DUMB"

Everyone wants the most for the dollar spent when they purchase a programming system. Sometimes it is easy to mistake 'most' for 'busy'. Too often a lack of visual gadgetry is described as 'dumb' when the word should be 'simple'. A programming system like the ESP-1 is capable of fulfilling 95% of all the system needs now, and in the future, of all the stations in the world. Be sure when you consider any system that it is flexible, expandable, simple to learn, simple to operate, and that it will run any format you can conceive. Then be sure that the system is not encumbered with gadgets that will be useless in day-to-day operation. You will find that the ESP-1 meets all these criteria and is still the LOWEST PRICED system with any capability on the market today.
THE "SIMPLE" CONTROL

* POWERFUL — FOUR THOUSAND MEMORY EVENTS — PLUS —
  More than enough memory for 95% of all stations.

* FLEXIBLE — FULL SUBROUTINE CAPABILITY —
  Called by Alpha-Numeric Labels. Use as you need them.

* FULL TIME — TWO HUNDRED FIFTY-SIX EVENT DIGITAL CLOCK —
  Standard at no extra cost for Network, Fades, Updates, Etc.

* EXPANDABLE — NEVER BUY ANOTHER SOURCE CARD —
  20 stereo source cards in place. Add only what you need.

* ENGLISH — EXCLUSIVE ESP–1 ‘LABEL–TABLE’ TELLS ALL —
  In English you are asked for information, told of errors.

* HELP — DIAGNOSTIC PACKAGE GIVES YOU A CLUE —
  A series of programs that helps isolate a system problem.

* SIMPLE — THREE BUTTONS AND A CALCULATOR-STYLE KEYBOARD —
  No confusing displays, no computer language, no hassle.

* LOW-COST — SAVE AT LEAST TEN PERCENT ON SYSTEM COST —
  No system is easier, or programs better. Why pay more?
ESP – 1 "MUSIC MACHINE"

The SMC/Sono-Mag programming system pictured above is a unit that is typical to many radio stations. Your system might vary a little, or be somewhat larger, but the basic components and programming ability are included here.

SYSTEM CAPABILITIES

Memory: 4000 events; microprocessor controlled. Full subroutines.
Sources: 20 stereo, with all source cards in place. Monitor and source cue included.
Time: 256 event fully programmable digital real-time clock for Net, fades, updates, externals.
Music: Four stereo auto rewind/play units 1½ hours maximum each before rewind.
Spots: Three random select Carousels with capacity for up to 72 commercial accounts.
Misc.: Two large trays for deadroll-to-net, Id's, ETC, and one complete time-announce set. In three racks with all filler panels.

This system is sold on an installed basis only. A maintenance kit and factory spares, and all manuals are included in the price. The only item you pay above this is shipping from Bloomington, Illinois.

Pricing: You will be happily surprised. Call your SMC man or the Sales department at the factory 309-829-6373.
Financing: After 10% down with normal credit, we can have your system financed up to 60 months.
Extras: There are many accessories available for the ESP unit including a very low cost Clear-Text logging package with CRT encoding.
Think about a SIMPLE system...

You don't have to read this. But a few minutes spent on this page might mean saving a lot of money and programming pain.

State-of-the-Art is not Simple. Wrong. Simple is State-of-the-Art. It is a lot easier to design something complex because you just keep throwing one thing on top of another. Simple design is thinking very carefully about the real need of the user and then designing a specific piece of equipment.

I only want the best for my station. That is why you should carefully consider the ESP-1. Quite often it is more important to have enough budget for random or instant tray storage than to have an impressive looking console, or multiple displays.

Are you saying there is no place for Video-type systems? No. In fact, SMC/Sono-Mag makes the best of the large systems. Each has its place, but you should have a choice and you should take time to consider both approaches.

Why do you use a simple keyboard, rather than a video screen and a typewriter keyboard?
* Typewriter keyboards on other systems use only 10% of the keys. The rest just cause confusion.
* Video based systems that load on the 'interactive' idea are very, very slow.
* Video based systems depend on the screen. Either you invest in a second terminal, or else you are out of business if the screen tube fails.
* Video based systems add about 30 to 50% more electronic components to a system control and add greatly to troubleshooting procedures.
* Because of their complexity, video based systems take longer to learn and are harder to train new people to operate.
* There is no real value to most of the information shown on a screen when operation is considered on a day-to-day basis.
* The ESP-1 can do a better programming job, with less chance for operator error, with a much simpler maintenance procedure for a very large savings in systems cost.

What can an ESP-1 really do?
* Program several individual days in a typical station.
* Handle up to 20 sources without expensive 'source cards'.
* Run up to 256 Individual programmable real-time updates, Net, fades, etc.
* Handle up to 8 external time functions like net delay recording.
* Run up to 20 random or instant access cart machines without interfaces.
* Provide more programming memory than 95% of all systems sold last year.
* Operate the most complex format(s) you could devise with full subroutines.
* Let the operator load the program changes about 50% faster.
* Shows you in English descriptive 'Labels' that guide your programming.
* Save you at least 10% on your system cost.

Tell me about the 'Labels': It's very simple. Instead of using a clumsy, expensive screen, the ESP-1 simply uses the 10-digit display to spell out in English some 'prompting' messages. In the display you might see the word 'STEP' which asks you: "Which step do you want to Display or Go-To. If you enter a source that is not allowed, you would see 'SOURCE'. An incorrect tray might show 'TRAY'. If two events using the same random source are programmed together you would see 'BAC TO BAC'. There are others, like 'TEST', etc. Simple isn't it?
Are there really only three buttons? Yes. Other than the standard calculator-type keyboard on the right the only other buttons are: Now/Next; Go-To; and Display. A very simple design.

What about subroutines: The subroutines are handled in a very simple but very efficient way. You decide on the number of subroutines and their content. You give them a simple letter and three digit code label. Then, everytime you want to run a subroutine you call for it by its label. You have up to 1000 steps in subroutine.

What do I put in main memory? Typically, most of the information that you will have in main memory will consist of spot 'sets' or clusters each followed by a return to subroutine.

Do I have to program that way? Absolutely not! The idea of the ESP-1 is that you program it the way you want. If you want to use all sequential, or time based or any combination of Main/Sub/Time...then do it!

What if I make a program error? The ESP-1 'Label-Table' will let you know in English on the Display. If you have any sort of error and are away from the system, there is an audible 'bleep' that lets you know something is wrong. And, there are other safeguards. Among them, it is not possible to 'underprogram' the ESP-1. There is a safety subroutine that takes over in these situations.

In summary: In spite of its operating simplicity, and its very low cost, the ESP-1 is a highly sophisticated computer operated program controller that is designed specifically for the typical radio station operation.

You may be committing a programming error if you don't have an ESP-1!

Thank you for your time...
The SMC-OTARI reel tape playback is a fully integrated automation audio source system. All the essential electronic circuits are incorporated within the unit. No additional tone sensors or re-wind controllers are required. This self-contained unit provides better performance with savings in initial cost and rack mounting space.

Tape handling with the SMC-OTARI transport is smooth, and operator error safe. Fast forward and fast reverse modes are electronically interlocked with play mode to prevent tape damage. Tape threading is clean, fast and without any slot paths.

Transformer voltage controlled torque motors are used with external, fully adjustable band brakes. Brakes are fully power fail safe.

The capstan motor is hysteresis synchronous and indirectly drives a precision flywheel capstan system. This provides important inertial mass to the tape drive with resultant lower wow and flutter performance. The capstan bearing is of the long sleeve type for reduced axial deflection, and freedom from shipping damage.

The tape pinch roller is long life polypropylene wearing surface with ball bearings.

The tape head is a wide pole, permalloy design that combined with the optimum location of motor magnetic fields, possible with indirect drive, gives superb frequency response and very low noise figures. Head azimuth adjustment is accessible through front cover.

Tape head pre-amplifiers are located at the head mount for maximum performance as relates to noise figures and RF field interference. Equalization for both tape speeds is switch selectable on the pre-amplifier board and individually adjustable. Two amplifier level controls are front panel accessed.

All electronic circuits, including power supply, are plug-in glass epoxy printed circuit boards.
Tape Speeds: 3.75 & 7.5 IPS (9.5 & 19 CM/SEC)
Speed Error: 0.15% using 1.5 mil. tape
Flutter: 0.06% (NAB weighted)
Reel Size: 7-in. or 10½-in. EIA or NAB
Tracks: Two channel stereo (half tracks)*
Rewind Time: 125 seconds; 10½-inch reel

Performance:
Freq. Response: ±2 dB 30 to 16 KHz, 7.5 IPS
               ±2 dB 30 to 12 KHz, 3.75 IPS
Output:       +18 dBm at clip (600 ohm load)
Load:          600 ohms, unbalanced
Noise: (total wideband) -54 dB; at +8 dBm output from 160 nW/m 1 KHz. signal
Crosstalk:    -50 dB at 1 KHz.
Distortion:   1% Max. @ 200 nW/m, 1 kHz, +8 dBm.
Tone Sense:   25 Hz ±1 Hz. Phase lock loop requires 0.5 second minimum tone.
Stop Delay:   Adjustable from approximately 0 to 5 seconds after end of 25 Hz tone.
EOM Signal:   Active high TTL output for length of 25 Hz tone. May be inhibited with external command.

*May be jumpered on ASB-1 PCB to provide Mono output

Optional Features: (Combined with above)
Right Channel
Tone Sensor: 25 Hz sensor on Right channel.
Right tone
search command: Active high TTL pulse required to (a) start tape; (b) keep left channel tone from stopping.
Automatic Rewind: Provides automatic rewinding of tape to supply reel when reflective aluminum foil operates sensor, and re-cue to first 25 Hz tone at beginning of tape.
Busy Signal: Provides pulse output if externally commanded to play at any time machine is rewinding or cueing up.

Operating Requirements:
Power: 117 V. 60 Hz 100 watts Pulley & Belt change for 50 Hz.
Environment: 40 to 104 F. (5 to 40 C.)
             20 to 80 per cent R.H.
Weight: 45 lbs. (20.4 kg.)
Rack Space: 17¼ inch (43.8 cm.) including reels.
FEATURES . . .

- Logic level remote control
- No relays used
- Ball-bearing cross shaft
- Desk cabinet or rack mount
- Glass epoxy plug-in boards
- Three control tone sensing standard
- Quiet solenoid operation

SMC AUDI-CORD
REPRODUCERS
MODEL 101S MONO PLAY
WITH 3 TONES #153-0097-001
model 106S STEREO PLAY
WITH 3 TONES #153-0098-001
RACK MOUNT -002 OPTION.

GENERAL SPECIFICATIONS

All transports are interchangeable between similar type machines (mono or stereo) and are front removable for service and cleaning.
A unique pressure regulating solenoid coupling system which improves tape skew and eliminates adjustments.
Very rugged head mounting with top adjustments that stay put.
Thick aluminum deck overlayed with a stainless steel wearing surface.

100 SERIES PLAYBACK PERFORMANCE

Rated Audio Output  +8 dBm
Amplifier Overload Capability +18 dBm min., +20 dBm clipping
Amplifier Distortion 0.5% max. total harmonic @ +18 dBm
Hum and Noise -50 dB re 160 nWb/m @ 1 kHz-mono
(Wideband) -47 dB re 160 nWb/m @ 1 kHz-stereo
W.B. S/N (Typical Tape) -48 dB re 160 nWb/m @ 1 kHz-mono
-46 dB re 160 nWb/m @ 1 kHz-stereo
Equalization Dual Hi-Lo
Frequency Response ±2 dB to NAB Standard Tape, 50 Hz to 15 kHz
Phase Stability ±90 degrees, long term @ 12 kHz
(Splitting Cord Transport is designed for long term phase stability. However, it is appreciated that phase differential over long term use is difficult to achieve unless stringent maintenance is applied.)
Sinking (Open Collector) Logic 100 ma. max., +40 VDC open circuit max.
Optional Cue Switching 0.15% weighted peak, Max.
Cue Switching Loads 8 5/8" W x 5 1/4" H x 15" L
Flutter 115V - 60H, 50 Hz option
Dimensions  Phone 309-829-8373
Power TXW No. 510-352-2506

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill. 61701 U.S.A.
PRINTED IN U.S.A. 12-78
FEATURES . . .

- Logic level remote control
- No relays used
- Ball-bearing cross shaft
- Direct drive hysteresis motor
- Desk cabinet or rack mount models
- Premium Glass epoxy plug-in boards
- Three control tone sensing standard

SMC AUDI-CORD RECORDERS
MODEL 126S STEREO RECORD/PLAY
WITH TIMER — #153-0095-001
MODEL 121S MONO RECORD/PLAY
WITH TIMER - #153-0096-001
RACK MOUNT - 002 OPTION.

GENERAL SPECIFICATIONS

Front accessible controls for all day to day adjustments, with tilt open front panel.
Multi-purpose 6-position record metering system with automatic switching from record to play modes, and cue track monitoring.
Precision internal frequency response test facilities.
Dual record (Hi-Lo) equalization.
Bias and tone recording indicators.
SMC automation compatible.
Optional precision digital recording timer with true recorded time indication, either overlap or non-overlap modes when secondary cue is used.

120 SERIES RECORDER PERFORMANCE

Rated Audio Input (for 160 nWb/m)

-24 dBm, 600 ohms, (50 MV.RMS) min. 2.5 Volts Max.
5100 ohms, Balanced
0.5% total harmonic, 18 dB above 160 nWb/m.
1kHz
1% Typical at 160 nWb/m, 1 kHz
Dual Hi-Lo
100 kHz, nominal
± 2 dB, verified by metering internal
Selectable for front or end of E.O.M.
4 Digit, Seconds and Tenths
± 2 second (Plus transport timing accuracy)
All 3 NAB Tones are Standard
16" W x 15" L x 5¾" H
115V - 60Hz, 50Hz option

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, III. 61701 U.S.A.

Phone 309-892-6373
TWX No. 510-352-2506
PRINTED IN U.S.A. 12-78
FEATURES . . .

- Logic level remote control
- No relays used
- Ball-bearing cross shaft
- Direct drive hysteresis motor
- Desk cabinet or rack mount models
- Premium glass epoxy plug-in boards
- Three control tone sensing standard

SMC AUDI-CORD DELAY
RECORD/REPRODUCE
MODEL 132S MONO RECORD/PLAY
WITH - ERASE - RECORD - PLAY
3 TONES. #153-0099-001
RACK MOUNT -002 OPTION.

GENERAL SPECIFICATIONS

The model 132S is designed with a switch selected erase function that allows recording of network programs for later replay. When controlled by an external time clock, previous recorded material will be erased and new material recorded. Since the erase function is active only in the record mode, material on the tape may be replayed as often as desired. Only program material is erased and the cue and secondary aux signal (and logging data) need be applied only the first time. With the erase function turned off, the 132S works the same as any standard recorder.

130 SERIES RECORDER PERFORMANCE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Audio Input (for 160 nWb/m)</td>
<td>-24 dBm, 600 ohms, (50 MV.RMS) min. 2.5 Volts Max.</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>5100 ohms, Balanced</td>
</tr>
<tr>
<td>Amplifier Distortion</td>
<td>0.5% total harmonic, 18 dB above 160 nWb/m.</td>
</tr>
<tr>
<td>System Distortion</td>
<td>1kHz</td>
</tr>
<tr>
<td>Equalization</td>
<td>1% Typical at 160 nWb/m, 1 kHz</td>
</tr>
<tr>
<td>Bias Oscillator Frequency</td>
<td>Dual Hi-Lo</td>
</tr>
<tr>
<td>Response Test Accuracy</td>
<td>100 kHz, nominal</td>
</tr>
<tr>
<td>Record Timer Stop Mode</td>
<td>± 2 dB, verified my metering internal</td>
</tr>
<tr>
<td>Optional Record Timer</td>
<td>Selectable for front or end of E.O.M.</td>
</tr>
<tr>
<td>Record Timer Accuracy</td>
<td>4 Digit, Seconds and Tenths</td>
</tr>
<tr>
<td>Cue Tone Oscillators</td>
<td>± .2 second (Plus transport timing accuracy)</td>
</tr>
<tr>
<td>Dimensions (Record-Play)</td>
<td>All 3NAB Tones are Standard</td>
</tr>
<tr>
<td>Power</td>
<td>16” W x 15” L x 5¾” H</td>
</tr>
<tr>
<td></td>
<td>115V - 60H 50H Option</td>
</tr>
</tbody>
</table>

SONO MAG CORPORATION
1019 W. Washington St., Bloomington, Ill, 61701 U.S.A.
Dear Broadcaster:

Thank you for your response to SMC advertising...

Enclosed you will find the information you requested plus additional material you may find of interest.

Please read the material carefully. I'm sure that you will have questions or need more specific information. Just pick up the 'phone and call me at the number below. There is no obligation of any kind.

Remember that SMC is the largest manufacturer of program automation equipment in the world. We got that way by providing what our customers want. From the smallest to most powerful. And our line of premium-grade moderately priced cartridge equipment for live or automated stations is well known.

Since every application is different and since SMC builds such a wide line of controllers, it is impossible to price systems in this general information. I suggest that you call me for pricing on individual components. And, for systems I will be glad to send a proposal based on our 'phone conversation or stop in at your station when it is convenient for you.

SMC is over 35 years old. Our employees are broadcast veterans. We know management and programming as well as manufacturing and engineering. Our customer service is complete, our parts in depth. We will be here to serve you in the future as we have in the past.

Financing for terms up to five years are available at reasonable rates. We can also arrange leasing as well.

I am looking forward to your call...

Bob Popke
Regional Manager
850 Yale Lane
Highland Park, Illinois 60035
312-433-1253

SONO MAG CORPORATION
1833 West Hovey Avenue, Normal, Ill. 61761
Stereo and Mono Automation and Cleartext Logging

Radio Automation

Sono-Mag Corporation
SPECIFICATIONS - ESP-1

Memory Capacity: 4,000
Word length: 16 Bit
Sub-routine: to 999
Control Capacity: 99 sources x 99 Trays

FUNCTION CODES

T000 Simple Update
T100 Update, fade source on air and start next step
T300 Update and cancel network channel
T400 Update and start backfill source
Fxxx General purpose flags
F10X Link the next 'x' events
F200 Skip next events until an F300 is found
F300 End of skip function
F40X Delayed switcher start
F500 Disable the switcher
F600 Rewind, load and start Automatic Program Loader
F610 Load next file on Loading tape
F700 Enable Switcher
F900 Flag indicating end of memory program
b999 Underprogramming Safeguard

ESP-1 LABEL TABLE

The following English labels will appear on the ESP-1 operating display indicating:

- step - asks operator to enter a step number
- tray - advises that tray information may be incorrect
- source - advises that source number is incorrect
- bac-to - indicates that a single source has been entered twice.
- too-big - indicates that the step number is incorrect or invalid
- under-pro - indicates that memory is under-programmed (In this case Function b999 provides underprogramming protection)

To learn more about ESP contact your SMC Regional Manager or contact

Stephen S. Sampson
Sono-Mag Corporation
Bloomington, Illinois