ROLA

LEADERS

in the

Field

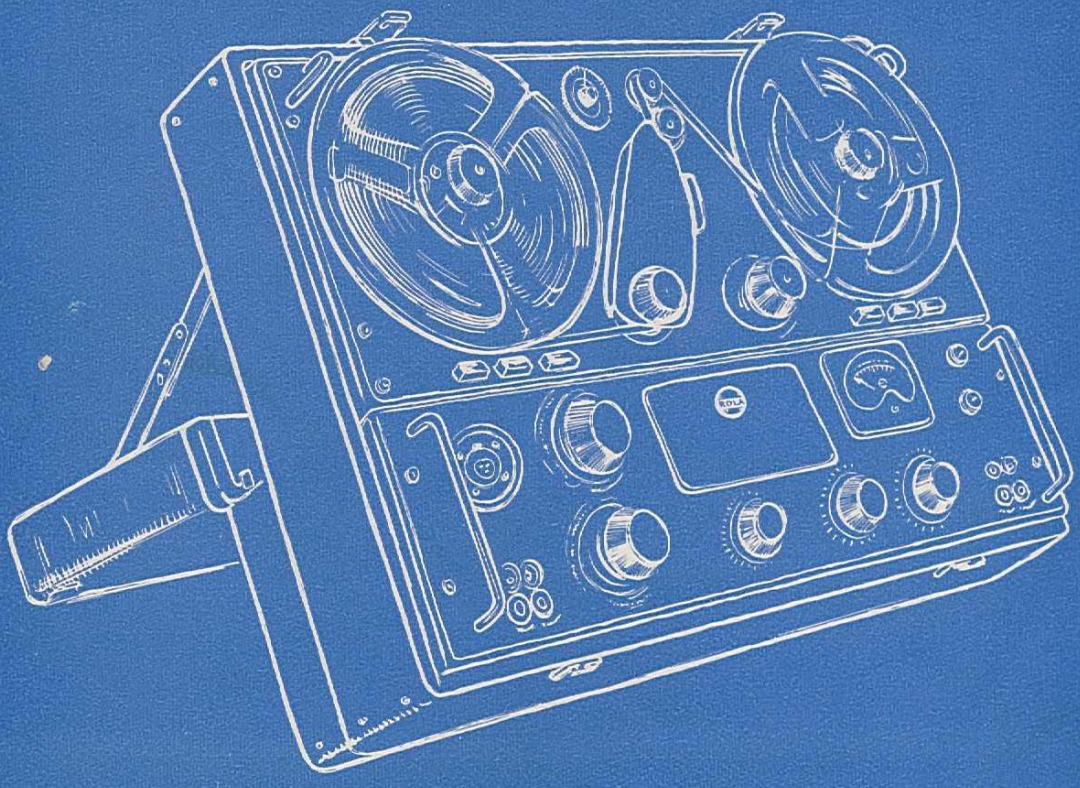
of

Sound

Reproduction

Professional

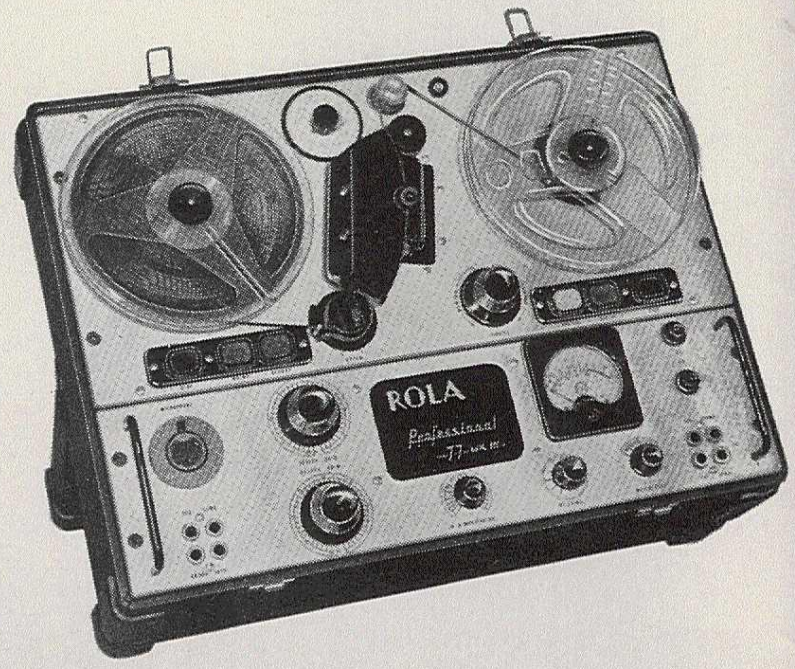
MAGNETIC TAPE RECORDING and REPLAY EQUIPMENT



The New

ROLA *Professional*

MODEL 77 Mk. III TAPE RECORDER



The design of the new Mk. III Series Model 77 is such as to ensure complete reliability of operation and its specifications such as to provide outstanding performance. Its functional design and the operational facilities which are provided cannot be matched by any recorder in its class.

AMPLIFIER DESIGN

The Amplifier design provides —

The Mk. III "77" Amplifier has been designed to provide all the facilities and the flexibility of operation normally expected in complex console-type recorders.

- SIMULTANEOUS REPLAY MONITORING.
- DIRECT COMPARISON OF ORIGINAL AND RECORDED SIGNALS AT ANY SPEAKER VOLUME BY MEANS OF AN A-B CONTROL.
- METER AND LINE SWITCHING TO EITHER "RECORD" OR "PLAY" CHANNELS.
- INDEPENDENT CONTROL OF "RECORD" AND "PLAY" AMPLIFIERS.
- SWITCHING FROM "PLAY" TO "RECORD" WITHOUT ANY PAUSE IN TAPE MOTION AND WITHOUT ANY CLICKS OR ELECTRICAL THUMPS BEING HEARD OR RECORDED.
- SWITCHING SO THAT THE METER READS D.C. VOLTAGE, A.C. MAINS VOLTAGE, BIAS VOLTAGE, AND VALVE CURRENTS.
- CHOICE OF EITHER LOW NOISE CARBON POTENTIOMETER GAIN CONTROLS OR STEPPED ATTENUATORS CAPABLE OF VARYING THE GAIN IN STEPS OF 1.5 DB BETWEEN 45 DB BELOW FULL GAIN TO INFINITY.

FACILITIES

TRIPLE HEADS	Erase, Record, Playback — Removable for service individually or as an assembly.
DUAL SPEED OPERATION	7½ and 15 inches per second.
LEVEL METER	3" V.U. Metering.
MONITOR LOUDSPEAKER	Inbuilt Rola Model 5-4C Loudspeaker with its own level control.
ELAPSED TIME INDICATOR	Indicates recording time in minutes on a linear scale.
INPUTS	50 ohms Microphone. Balanced 600 ohms. Balanced "Bridge-In".
OUTPUTS	Balanced 600 ohms. Unbalanced 15 ohms. *All Inputs and Outputs on front panel.*
GAIN	In excess of 85 db (from microphone input to zero level — + 8 dbm at 600 ohms).
RECORDING BIAS	Variable control.
FAST RESPONSE TO CONTROLS	Starting time is "instantaneous" — full, stable, tape speed is attained in less than 1/10th second. In stopping, the tape moves less than one inch at 15 inches per second. Exact cueing is routine with the Rola Mk. III Series.
OPTIONAL EXTRAS	*Auxiliary Spooling Mechanism* which allows the use of 10½ inch NAB Professional Type spools. *Remote Control Equipment* which permits the recorder to Record, Play, or Shuttle. *Automatic Cueing Equipment* (see Page 5).

Mk. III 77 EQUIPMENT CAN ALSO BE SUPPLIED IN

SPECIFICATIONS

OPERATING METHOD	Press button, electro-mechanical interlock. Separate "Stop", "Play", "Record" and "Shuttle" buttons.
OPERATING INDICATION	Pilot lights illuminate the press button corresponding to the function selected.
TAPE SPEEDS	7½" and 15" per second (standard). 3¾" and 7.5" per second (to order).
SPOOL SIZE	Cine type 7" (B.S. 1568:1960). The lid can be fitted to the portable case with these spools in place. With the Auxiliary Spooling Mechanism, Professional-type 10½" Spools (B.S. 1568:1960) can be used.
TAPE DRIVE	Three motors, Capstan directly driven by a synchronous dual-speed motor with integral flywheel. Take-up and re-wind by separate high-torque induction motors.
STARTING AND STOPPING TIME	Less than 0.1 second.
TIMING INDICATION	Tape Timing indicator driven directly from the tape.
TIMING ACCURACY	—0 + 0.25% of nominal speed.
SPOOLING	Continuously variable. Less than 1 minute required to spool 1,200 ft. of tape in either direction at maximum speed.
FLUTTER AND WOW	Less than 0.2% at 3¾ i.p.s., 0.15% at 7½ i.p.s. and 0.12% at 15 i.p.s.
HEADS	Separate "Erase", "Record" and "Play" Heads. For simplified head interchange the triple head assembly is designed so that either the complete assembly or individual heads can be readily removed.
AZIMUTH ADJUSTMENT	Individual, positive vernier screw on each head mounting.
AMPLIFIER DISTORTION	Record—Less than 2% from 600 ohm at +18 dbm input to output level of +21 dbm. Play—Less than 2% for an output level of +21 dbm. All measurements at 1,000 cps.
OVERALL FREQUENCY RESPONSE	At 3¾" per second 50 — 8,000 cps ± 2 db; 40 — 10,000 cps ± 4 db. At 7½" per second 50 — 10,000 cps ± 2 db; 40 — 15,000 cps ± 4 db. At 15" per second 40 — 15,000 cps ± 2 db; 30 — 18,000 cps ± 4 db.
RECORDER CHARACTERISTICS	The "Record" and "Play" characteristics are in accordance with the CCIR specifications as laid down in B.S. 1568:1960. In addition provision has been made for the replay of tapes recorded to the American NAB characteristic. NAB record can be supplied to special order.
EQUALISATION	Controls are provided for correcting the frequency response of both record and replay channels independently to compensate for varying tape characteristics.
SIGNAL-TO-NOISE RATIO	At both 7.5" and 15" per second not less than 52 db below the 2% T.H.D. level of a signal recorded on the tape and replayed at an output of +8 dbm.
INPUTS	1. Balanced 600 ohms. 2. Balanced "Bridge-In". 3. Suitable for 50 ohm microphone. Not less than 75 db at +8 dbm Line Output.
INPUT CONNECTORS	600 ohm and Bridge-In — Standard twin-jacks. Microphone—Trimax S3F socket. (Standard.)
OUTPUTS	Balanced 600 ohms. Unbalanced 15 ohms.
LEVEL METERING	Standard 3" V.U. Meter. Switched to read: (a) Record Level. (b) Line Output. (c) 600 ohm Line Input.
CIRCUIT METERING	A metering switch allows the V.U. meter to be used to indicate valve currents, Bias, Mains and DC Supply Voltages.
MONITORING	A separate built-in monitor amplifier and speaker are provided. The monitor amplifier can be connected to either the replay or record circuits by means of an "A/B" monitor control. The output of the monitor amplifier is available at front panel jacks for use with an external speaker if required.
REMOTE CONTROL	Press-button control of all functions.
SAFETY SWITCH	"Play-Safe" switch makes it impossible to accidentally erase tapes when key is removed from lock.
PANEL SIZE	Tape Transport: 19" x 8¾". Amplifier: 19" x 5¼".
MOUNTING	Standard 19" Rack.
WEIGHT	In portable case approx. 55 lbs.

CONSOLE FORM TO SUIT STUDIO REQUIREMENTS

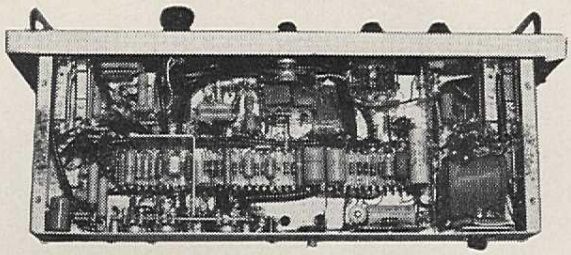
THE ENGINEERING BEHIND THE SOUND

To build magnetic tape recorders that are both fine and practical, Rola engineers have aimed for two objectives in the design of every component and accessory.

First was the direct problem of function. Each part has had to make its contribution towards fidelity, timing or utility and convenience. Elimination of inherent circuit noises, levelling out of unwanted mechanical motions and creation of desired starting, stopping and tape handling characteristics have presented challenging design and manufacturing problems. Persistence and ingenuity have solved them.

Second was reliability and durability. This consideration has received persistent attention throughout Rola design. As a result Rola recorders not only meet the highest specifications, but they maintain their outstanding performance through thousands of hours of service — reason enough why engineers have implicit faith in Rola machines.

MK. III SERIES — TAPE TRANSPORT MECHANISM



DECK STABILITY

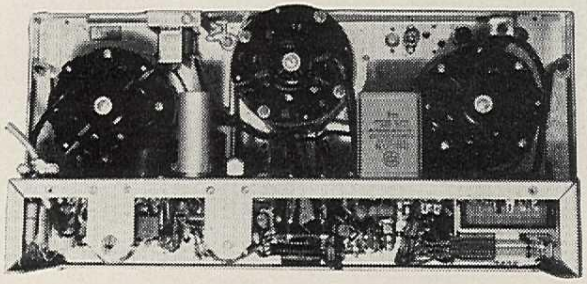
To ensure that the wow and flutter content is kept to a minimum and the timing accuracy held to close limits, the utmost care has gone into the design and manufacture of each and every deck component. Accurate tape tracking, the third vital factor in desk design, is also ensured by the use of a cast aluminium base-plate on which all the components which control the tape path are rigidly mounted. In this way 'tape hiss' and azimuth instability, due to the tape 'wandering' over the heads, is reduced to a minimum.
Steady driving motion is furnished by a synchronous capstan motor, the shaft of which becomes the actual drive capstan. This method of drive eliminates all mechanical linkages — there are no belts, pulleys, gear or puck-wheels to wear or become oil-fouled, thus introducing wow and flutter.
Concentricity of capstan diameters is held to a tolerance of a quarter of one ten-thousandth inch.

ACCESSIBILITY

The design of the deck is such that extreme accessibility is available to all contacts, relays and switches. Hence, servicing time is minimised and normal maintenance is easily and simply carried out.

MAGNETIC HEADS

Extreme high frequency response with low noise level, together with uniform performance over thousands of operating hours, results from the unique laminated design of the Record and Playback Heads.



Each head is separately mounted on an accurately-machined mounting plate. The method of head fixing allows simple "screwdriver" azimuth adjustment, and is designed to retain initial adjustment over long periods of operation. For optimum results each head is capable of independent adjustment on its mounting. Precision lapping of the "gap" surfaces is responsible for achieving and maintaining the desired performance characteristics, whilst correct shielding design with mu-metal housings ensures low noise and flat low frequency response.

SPOOLING FACILITIES

Tape handling on the Mark III Series is the ultimate in simplicity and effectiveness. Both supply and take-up reels operate direct from separate variable-speed high torque motors. The standard unit is capable of accommodating 7" cine reels, whilst the use of an ancillary self-powered spooling deck enables 10½" N.A.B. spools to be utilised. Fast forward and rewind speeds are capable of being continuously varied from zero to full speed by the use of a rotary control.

CUEING AND EDITING

The design of the tape deck is such that it provides for ready access to that portion of the tape over the replay head gap. Provision is also made so that the tape may be wound manually over the replay head to enable accurate positioning.
During spooling the tape is held away from contact with the heads, but the spacing between the tape and heads may be adjusted manually to allow for monitoring by the internal or an external speaker.

ELAPSED TIME INDICATOR

The elapsed time indicator provided is accurately calibrated in minutes for both tape speeds. The indicator is driven directly from the tape and has a linear scale allowing it to operate during both spooling and "Play" or "Record". Zero resetting is simple.

DESIGN FEATURES

- RIGID CONSTRUCTION
- PRESS-BUTTON OPERATION
- TRIPLE MOTOR DESIGN
- VARIABLE SPEED SHUTTLING
- FULL EDIT FACILITIES
- TAPE OVER-RUN SWITCH
- EXTREME SERVICEABILITY
- PRECAUTIONARY INTERLOCK SWITCHING
- "FAIL-SAFE" BREAKING
- "TWIST-LOCK" SPOOL CAPS
- "WRAP-ROUND" TAPE THREADING
- REMOTE CONTROL
- UNIQUE TRIPLE HEAD ASSEMBLY
- LOCKED AZIMUTH ADJUSTMENT
- LONG-WEARING LAMINATED HEADS
- AUTOMATIC TAPE LIFT
- FULL OR HALF TRACK HEADS
- COMPLETE SOLENOID OPERATION
- NO MECHANICAL LINKAGES
- "PLAY-SAFE" SWITCH (ensures absolute safety on playback)

The Auto-Q

AUTOMATIC TAPE CUEING UNIT

The Rola Auto-Q has been designed by Rola Engineers to provide flexible and low-cost automatic tape cueing facilities to users of any Rola or Byer Mk. II and Mk. III Recorders. When used with any of these machines it provides complete automatic tape cueing at a cost less than one-quarter that of a special tape-cueing machine.

The Auto-Q operating with a Model 77 Mk. III Recorder.

Features of the Rola Auto-Q are:—

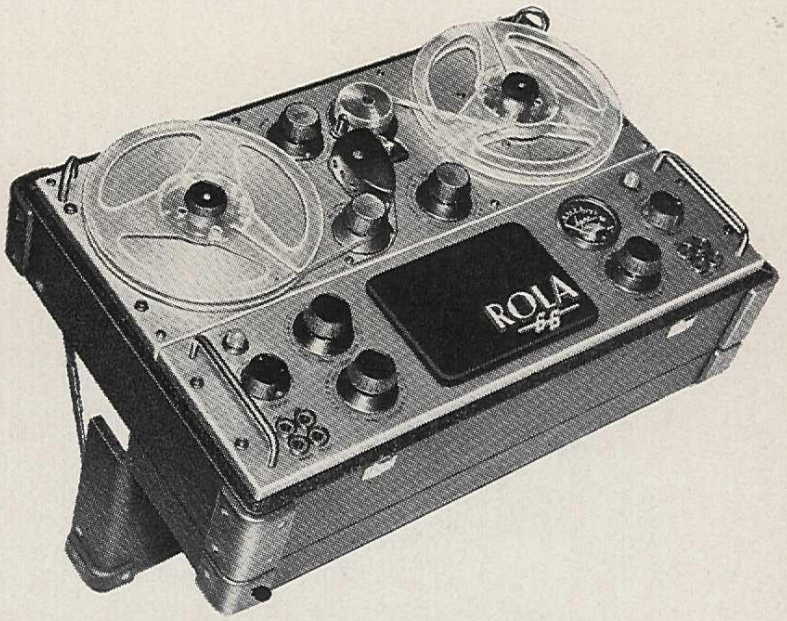
- Recording and play-back characteristics remain the same as those of the machine with which it is used.
- The machine's Fast Forward and Re-wind can be utilised by the Auto-Q to facilitate and speed up the compilation of tapes.
- The inputs and outputs of the Auto-Q are bridging impedances and are suitable for use on either balanced 600 ohm or bridge programme lines. When used in conjunction with Model 77 Recorders it can be used for direct recording from a 50 ohm microphone.
- The fully transistorised circuitry of the Auto-Q ensures maximum reliability of operation.
- Installation has been made extremely simple. The Auto-Q can be connected by twin patching plugs to jacks on the front of the unit and the recorder, or for permanent use, by connections from the terminal strip on the rear. This strip also carries provision for complete remote control facilities.
- The Auto-Q fits the standard 19" rack, or, for portable use, can be mounted with the recorder in a special carrying case.

ROLA

GENERAL PURPOSE

MODEL 66

TAPE RECORDER



NEW VERSATILITY

Designed as a general-purpose model, the Rola Model 66 offers flexibility and excellence of reproduction, together with all the modern features of the Mk. II Series Tape mechanism.

FOR BROADCAST STUDIOS

For outside or in, the Rola Model 66 is a heavy-duty all-purpose machine. It combines high fidelity, accurate timing, durability and freedom from noise to a degree never before available at the price. For stations presently equipped with the more expensive models, the Model 66 provides a "fool-proof" portable of matching quality.

FOR MUSICIANS, CONSERVATORIUMS, SCHOOLS

It is a machine for music rehearsals where sound of constant pitch and imperceptible distortion is desired. It can be started and stopped at any place throughout its full tape lengh and still be in tune with the band, orchestra or soloist.

FOR AUDIO VISUAL EDUCATION

Model 66's can be the "master recorders" of the school or school system. They provide quality where quality is needed — in music, and in tapes for re-copying for radio broadcast, for competition or for demonstration. Yet the Model 66 is rugged and readily portable from one classroom to another.

FOR HIGH FIDELITY ENTHUSIASTS

Its matchless Rola fidelity makes it a possession of envy among "adventurers in recorded sound", and persons who know and appreciate truly fine reproduction of music.

FAST RESPONSE TO CONTROLS

Starting time is "instantaneous" — full stable tape speed is attained in less than 1/10th second. In stopping, the tape moves less than one inch at 15 inches per second. Exact cueing is routine on a Rola Mk. II Series.

FACILITIES PROVIDED IN THE ROLA MODEL 66

TRIPLE HEADS	Erase, Record, Play-back. Full or half track optional.
DUAL SPEED OPERATION	Either 3¾ and 7½ inches per second or 7½ and 15 inches per second.
LEVEL METER	dB calibrated for visual monitoring.
MONITOR LOUDSPEAKER	Inbuilt Rola loudspeaker with its own level control.
INPUTS: Microphone	High Impedance. Requires input signal of less than 1 mV for normal recording level (+8 dbm at 600 ohms).
Bridge-In	Single Jack. Requires input signal of 80 mV.
600 ohms	Twin Jack. Requires input signal of —12 dbm (200 mV).
OUTPUTS: 600 ohms	Twin Jack.
External Speaker	Single Jack to 15 ohm voice coil.
Headphones	Single Jack. *All Inputs and Outputs on Front Panel.*
OPTIONAL EXTRAS	*Auxiliary Spooling Mechanism* which allows the use of 10½ inch NAB Professional type spools. *Remote Control Equipment* which permits the recorder to Start, Stop and Re-wind. *Automatic Cueing Equipment* (see Page 5). *Radio Tuner* — 1,650-550 K.C. When fitted forms integral part of amplifier.

SPECIFICATIONS

OPERATING METHOD	Press button — electro-mechanical interlock.
TAPE SPEED	3¾" and 7½" or 7½" and 15" per second.
SPOOL SIZE	NARTB 7"-10½" NAB with large spool mechanism fitted.
TAPE DRIVE	Three motors — synchronous capstan and two high torque spooling.
TIMING ACCURACY	± 0.1% (± 1.8 seconds in 30 minutes).
FAST FORWARD AND REWIND TIME	Less than 1 minute for 1,200-ft. reel.
FLUTTER AND WOW	Better than — 0.25% at 3¾" per second. 0.2% at 7½" per second. 0.15% at 15" per second.
HEADS	Separate "Erase", "Record" and "Play" heads.
DISTORTION	Record less than 1% (from 600 ohm input). Play less than 1% (for zero level out, i.e., + 8 dbm). *All measurements at 1,000 c.p.s.*
FREQUENCY RESPONSE	At 3¾" per second 50- 6,000 c.p.s. ± 3 dB. At 7½" per second 50-10,000 c.p.s. ± 2 dB. 35-12,000 c.p.s. ± 4 dB. 30-14,000 c.p.s. ± 6 dB. At 15" per second 50-12,000 c.p.s. ± 2 dB. 40-15,000 c.p.s. ± 4 dB. 30-18,000 c.p.s. ± 6 dB. Approximate Highs Control Range (Replay)— +4 dB to —12 dB at 12,000 c.p.s.
SIGNAL TO NOISE RATIO	Less than 50 dB (unweighted) below peak recording level (3.5% T.H.D.).
INPUTS	1. High Impedance Microphone (Low Impedance Optional Extra). 2. 600 ohm zero level (Twin Jacks). 3. Bridging Input. 4. Internal Radio Tuner.
OUTPUTS	1. 600 ohms zero level (Twin Jacks). 2. 15 ohm voice coil. 3. Earphone Monitor.
METERING	dB Level Meter on both Record and Replay.
POWER OUTPUT	4.5 watts at less than 1% distortion. 6 watts at less than 2.5% distortion.
POWER REQUIREMENTS	210-250 volts A.C. 50 cycles.
POWER CONSUMPTION	158 Watts.
WEIGHT	45 lb.
DIMENSIONS	Panel size — Tape Transport 19" x 7". Amplifier 19" x 5¼". Case Overall 20¼" x 14" x 7½".

THE *byer*

"100" SERIES CONSOLE TAPE RECORDER

FREQUENCY RANGE

—wide enough for highest fidelity requirements in both *"Record"* and *"Playback"*

The Byer "100" Series standards for frequency range are far higher than those set down for any other professional type recorder. Compensation controls are provided on both *"Record"* and *"Replay"* channels to cover the characteristics of individual tapes at both operating speeds.

SIGNAL TO NOISE RATIO

—more than adequate, enough to permit maximum dynamic range.

The Byer "100" Series has a much better signal to noise ratio than that generally specified for top-grade recorders. Below 2% Total Harmonic Distortion, it is not less than 60 dB. "Wow" and "Flutter" characteristics are also excellent and much superior to those hitherto achieved in this type of recorder.

CHANNEL FACILITIES

—suitable for wide range of application.

The Byer "100" Series is normally supplied as a full Track *"Record"* and *"Replay"* Unit, but can also be made available as a Half Track unit or as a Dual Track *"Record"* and *"Replay"* machine for Stereophonic Sound or Integration Purposes.

OPERATIONAL FLEXIBILITY

—fool-proof operation and choice of *"Replay"* characteristics are important features.

The *"Record"* and *"Replay"* characteristics of the Byer "100" Series are in accordance with C.C.I.R. specifications, but provision has also been made for replay of tapes recorded to N.A.B. standards. The control circuits employ electrically operated solenoids and relays. These can be remotely controlled if desired. The interlocking is such that accidental tape spillage is impossible. Continuously variable spooling in either direction is provided. The tape is automatically lifted off the heads during spooling. The "100" Series can accommodate 14″ spools.

BIAS AND "ERASE"

—use of separate frequencies.

Another important feature of the Byer "100" Series is the use of separate "Bias" and "Erase" frequencies, a high one for "Bias" and a low one for "Erase."

LONG LIFE HEADS

—encapsulated type laminated heads have provision for azimuth adjustment.

The *"Record"* and *"Replay"* heads of the Byer "100" Series are the latest long-life laminated type, encapsulated for long-term stability.
A vernier azimuth adjustment is provided on the *"Record"* and *"Replay"* heads and the complete triple head assembly is readily removable for simplified head interchange.

PRESS BUTTON OPERATION

—electro-mechanical interlocks eliminate operating errors and ensure complete flexibility.

The control system on the Byer "100" Series is electrically interlocked in such a way that tape breakages automatically stop the machine. The interlock also permits push-button change from one mode of operation to another while the machine is running.

FULL CUEING FACILITIES

—hinged *"Replay"* head shield permits easy access to tape.

Provision has been made in the Byer "100" Series for access to the tape over the *"Replay"* head during operation. This provides full cueing facilities, enabling the tape to be positioned on, or adjacent to, the *"Replay"* head during spooling, thus making the machine particularly suitable for tape editing.

CIRCUIT METERING

—facilities are provided for speedy checking of operating voltages and currents.

Provision is made by means of switching of the *"Record"* and *"Replay"* Level Meter for the measurement of the cathode current of all valves in the signal circuits of the recorder, as well as the bias and erase currents — and the Mains and high tension supply voltages.

ACCESSIBILITY

—normal service and maintenance have been made very easy.

Special attention has been paid in the design of the Byer "100" Series to provide complete accessibility to all components. Relays are located under an easily removable dust cover. The control box section is removed by unscrewing two knurled nuts and uncoupling the connectors to the deck assembly. The amplifier is mounted on tiltable slides, thus giving access to the under chassis components. On the mechanical deck key components are assembled as detachable units. The deck is hinged and swings back to permit access to the components mounted beneath it.

OPTIONAL EXTRAS

—additional equipment is available to extend application of machine if desired.

Included in the optional extras which can be provided with the Byer "100" Series are two types of monitor amplifiers — a 3 watt and a 10 watt unit — and for the addition of Microphone Input and Remote Control equipment.

Lyer

"100" SERIES

SPECIFICATIONS

TAPE SPEEDS:	3¾/7½ or 7½/15 or 15/30 i.p.s. (For telemetry or other applications, machines fitted for 30/60, 60/120 or any special tape speeds can be provided.)
FREQUENCY RESPONSE:	15 i.p.s. ± 4 dB from 20 to 20,000 c.p.s. 15 i.p.s. ± 2 dB from 30 to 18,000 c.p.s. 7½ i.p.s. ± 4 dB from 30 to 17,000 c.p.s. 7½ i.p.s. ± 2 dB from 40 to 14,000 c.p.s. 3¾ i.p.s. ± 3 dB from 40 to 8,000 c.p.s.
RECORDING CHARACTERISTICS:	The standard "Record" and "Play" characteristics are in accordance with C.C.I.R. specification B.S.1568-1960 with provision for the replay of tapes recorded to N.A.B. standards. When requested, facilities for N.A.B. recording standards can be incorporated in the design.
EQUALISATION:	Controls are provided for correcting the frequency response of both "Record" and "Replay" channels independently and on both speeds to compensate for varying tape characteristics.
SIGNAL TO NOISE RATIO:	Not less than —60 dB when measured from the 2% total harmonic distortion point.
WOW AND FLUTTER:	3¾ i.p.s. less than .15%. 7½ i.p.s. less than .08%. 15 i.p.s. less than .06%.
START AND STOP TIME:	Virtually instantaneous.
PLAYING TIMES:	7½ i.p.s. with 1,200 ft. tape on 7" spool — 32 minutes. 7½ i.p.s. with 2,400 ft. tape on 10½" N.A.B. spool — 64 minutes. 7½ i.p.s. with 5,000 ft. tape on 14" spool — 133 minutes.
PLAYBACK TIMING ACCURACY:	± .1% (± 1.8 seconds over a half-hour period at 7½ i.p.s.).
REWIND TIME:	Variable, but less than 1½ minutes for a 2,400 ft. reel.
CONTROLS:	Electro-mechanical press-button interlock. Separate "Stop," "Spooling," "Play" and "Record" buttons, Fail/Safe over-run switching. Motor Speeds and Equalisation for tape speeds controlled by a common switch, whilst a reel size switch provides correct tape tension for 5" to 7" reels, and 10½" to 14" reels.
METERING:	Provision is made for measurement of cathode currents of all valves in the signal circuits of the recorder, plus bias, erase current, A.C. mains, and high tension supply voltage.
RECORD INPUT:	Normally 600 ohms balanced input, bridge-in at zero level (+8 dbm). Range +20 to —20 dbm. (Optional extras include a microphone channel —90 dbm input.)
OUTPUT TO LINE:	+8 dbm 600 ohms (up to +18 dbm available by adjustment).
AMPLIFIERS:	Separate "Record," "Playback," "Line Amplifier," and "Meter Amplifier" are employed.
PLUG-IN HEAD ASSEMBLIES:	The complete Triple Head Assembly is readily removable as a unit for simplified head interchange.
BIAS:	Use of high bias frequency and a low erase frequency eliminates design compromise necessary to achieve both optimum erase and recording performance from a single frequency source.
EDITING FACILITIES:	Switching from "Play" to "Record" without any pause in tape motion, and without any clicks or electrical interference.
MONITORING:	Independent "Record" and "Playback" amplifiers allow direct comparison of original and recorded signals by means of an A.B. switch. The standard V.U. meter can also be independently bridged across the incoming line, the record amplifier or, alternatively, the 600 ohms zero level output. Provision for mounting monitor amplifier and speaker system within the console cabinet if desired. This latter unit is available as an optional extra.
POWER REQUIREMENTS:	280 watts at 240 volts 50 cycles A.C. operation.
RACK SPACE:	Standard 19". Tape transport 18¾": Amplifier 7": Power Supply 7".
CONSOLE DIMENSIONS:	Height — 41" (including castors), Width — 29¼", Depth — 28".
WEIGHT:	250 lbs.

SPECIAL EQUIPMENTS

Below is a brief summary of some of the special record and replay equipment being made by Rola Company:

MULTI-TRACK RECORDERS

Two-track equipment is standard and 4-track equipment is available if specified. Multi-track equipment in excess of 4 tracks can be supplied under contract and specification conditions.

FOUR SPEED RECORDERS

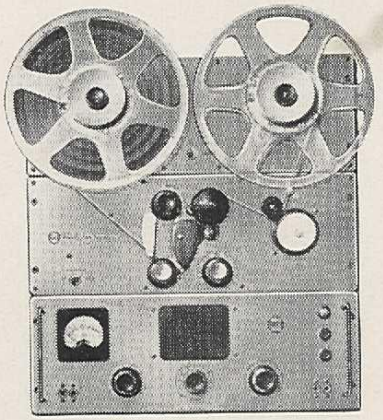
A special four-speed equipment is offered which permits recording and reproduction of material at 15, 7½, 3¾ and 1⅞ i.p.s. When used in conjunction with a frequency restoration amplifier, narrow band signals recorded at 15 i.p.s. can be replayed at 7½ i.p.s. with a resultant signal similar to the original but at exactly half the speed. As each replay speed is halved so the frequency restoration amplifier multiplies the signal to its original frequency, and by the use of a rotating head scanner, multiplex or wide-band frequencies can be analysed.

SLOW SPEED RECORDERS

For seismic studies, special slow speed machines are available. At speeds of $^{15}/_{32}$ i.p.s., earth movements are recorded on tape via a frequency modulated amplifier responding to frequency variations of the order of less than 1 cycle per second. When replayed at speeds of 60 i.p.s., these variations are transposed to frequencies within the audio range and can be studied and analysed at will. Once the phenomena has been captured on tape, the occurrence can be repeated continuously without degradation.

REPLAY EQUIPMENT

In locations where normal record facilities are not required, Rola "Replay Only" machines can be installed. For the small studio set-up, the Model 33C replay unit offers 600 ohm output level, the use of up to 7-inch spools, together with all the editing and cueing facilities of the Mk. II series equipment.

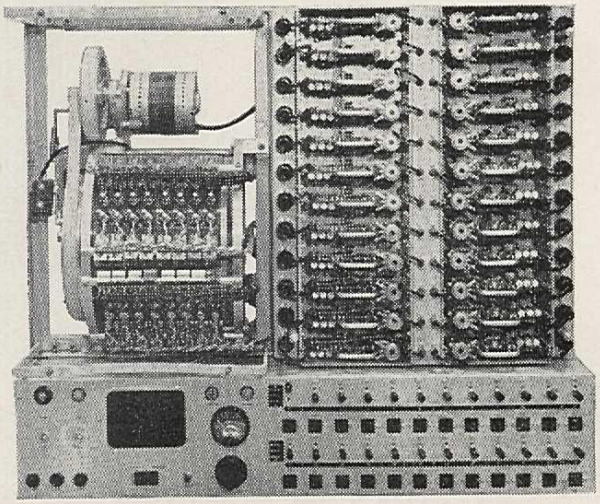


The Model 33B Mk. II Professional Replay Machine.

The Model 33B Professional replay machine will accommodate 10½-inch spools, incorporates an accurate time and footage indicator, and offers "Replay" characteristics equal to the finest Console-type equipment available. Remote control is available for both units and each model is equipped with its own power supply.

Other Rola Accessories include —

*** Remote Control Units * Auxiliary Spooling Mechanisms * Automatic Tape Cueing Equipment * Simultaneous Replay Monitors * Head Demagnetisers * Tape Splicing Equipment * Plastic Spools * Spool Containers * Recording Tapes**



MULTI-CHANNEL MAGNETIC DRUM INTERCEPT EQUIPMENT. Front view with covers removed showing on the left the magnetic drum showing two banks of erase heads, two banks of record heads and the motor drive assembly. On the right can be seen the rack holding 24 transistorised replay amplifiers with the control panel underneath.

AUTO ANNOUNCING AND/OR INTERCEPTING EQUIPMENT

This equipment has been designed for the repetition of spoken messages and was originally developed to meet the specific requirements of the P.M.G. Department's telephone exchange operations.

It has also found application in scientific, industrial and commercial fields.

Typical of these uses are for Transient Investigation, Data Recording and hotel and department store Lift Announcements.

The recording length per channel is normally 15 seconds, but other time durations can be accommodated within this design. The normal frequency response is from 200-3,500 cps ± 3db, the output is 30 milliwatts at 600 ohms impedance. Other output powers and impedances can be supplied to order. The total flutter and wow is better than 0.5% R.M.S.

Long life of the magnetic recording band is ensured by continuously applied silicon oil lubrication. The replay amplifiers are fully transistorised thus ensuring low noise and long-term stability.

General Description

The oxide-impregnated rubber recording band is carried on a precision-machined cast drum which is in turn driven via a two-stage belt drive from a single or dual-speed induction motor.

Effective braking of the drum at the conclusion of the recorded message is achieved by a cam-operated switch which first removes the A.C. drive voltage from the motor, then applies a D.C. potential to the motor windings.

The transistor replay amplifiers are constructed on bakelite boards and are easily removed for inspection. An internal level meter is provided and this can be switched across any of the replay amplifier outputs. An audio failure alarm is also provided, and is normally placed across the output of channel 1. However, a suitable track scanning alarm system can be provided where necessary.