byer

SOUND QUALITY

Presenting the Mk. II SERIES

ULTRA HIGH FIDELITY MAGNETIC TAPE RECORDERS

MAGNETIC TAPE RECORDER DIVISION — ROLA COMPANY (AUST.) PTY. LTD.

MODEL 66 - GENERAL PURPOSE RECORDER

NEW VERSATILITY

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

FOR BROADCAST STUDIOS

For outside or in, the Byer 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 Byer 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 length and still be in tune with the band, orchestra or soloist.

FOR AUDIO VISUAL EDUCATION

Byer 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 Byer Model 66 is rugged and readily portable from one classroom to another.

FOR HIGH FIDELITY ENTHUSIASTS

Its matchless Byer 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 Byer Mk. II Series.

FACILITIES PROVIDED IN THE BYER 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	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.
RADIO TUNER	1650-550 K.C. Optional Extra. When fitted forms integral part of amplifier.

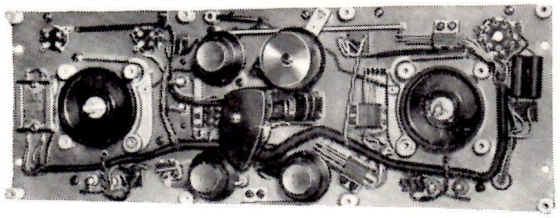
The Engineering Behind the Sound

To build magnetic tape recorders that are both fine and practical, Byer 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 toward 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 Byer design. As a result Byer 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 Byer machines.

MK II SERIES - TAPE TRANSPORT MECHANISM



The tape transport mechanism, common to both the Model 66 and the Model 77, embodies every proven feature to give a uniformity of performance and a simplicity of operation not obtainable in any other tape recorder.

STABILITY OF TAPE MOTION

Accuracy of recorded material timing and freedom from distracting flutter and wow both depend upon extreme stability of tape motion, and since the components in the tape drive system determine the accuracy of this motion, the utmost care has gone into their design and manufacture. Steady driving motion is furnished by a synchronous capstan motor, the shaft of which, by means of a precision ground insert, 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 Byer capstan diameters is held to a tolerance of a quarter of one ten thousandth inch.

ACCESSIBILITY

For inspection and service, the front cover panel of the Mk. II Series tape transport mechanism is readily removable and the rear control box housing cover is hinged to provide extreme accessibility to all components.

HIGH PERFORMANCE MAGNETIC HEADS

Extremely high frequency response with low noise level, together with uniform preformance over thousands of operating hours, result from the unique laminated design of the Byer record and play-back heads. Precision lapping of the "gap" surfaces to a microscopic flatness is responsible for achieving and maintaining the desired performance characteristics, whilst thorough shielding of the record and play heads with a Mumetal housing protects them from stray electrostatic and electromagnetic fields.

TAPE SHUTTLE AND BRAKING

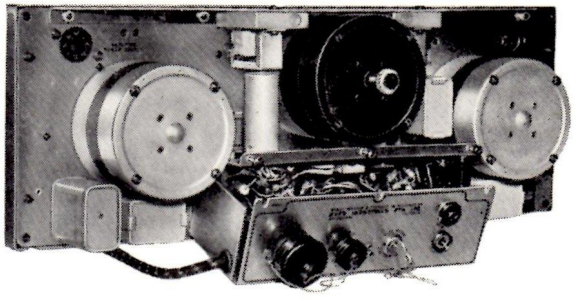
Tape handling on the Mk. II Series is the ultimate in simplicity and effectiveness. Both supply and take-up reels operate on separate variable-speed torque motors. Braking is by means of solenoid-operated, self energising, "fail-safe" brakes.

SIMPLICITY AND CONVENIENCE OF OPERATION

Press buttons for the record and play functions and for stopping the tape motion, the variable speed shuttling control, "wrap-round" tape threading and a complete, precautionary, interlocking system, provide the simplest and most convenient method of tape control yet devised.

EASE OF CUEING AND EDITING

Exact locating of cues and spots to be edited is facilitated by the controls of the Mk. II Series Tape Transport Mechanism. Equally important is the sturdy construction of the unit which ensures that it will stand up under the repeated starting, stopping and fast rewinds required in extensive editing work.



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" BRAKING
- "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)

MODEL 77 - PROFESSIONAL RECORDER

byer SOUND QUALITY

THE BYER STANDARD OF PERFECTION

The Byer Model 77 Professional Magnetic Tape Recorder, incorporating the Byer Mk. II Series Tape Transport Mechanism, affords the greatest scope possible for the planning and production of all types of recorded material.

AMPLIFIER DESIGN

The 77 amplifier has been designed in four separate sections — a design which provides for the highest degree of flexibility of operation yet achieved in a tape recorder and allows for . . .

- 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 MAIN 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.

These features, together with adherence to C.C.I.R. Specifications, make the Byer Model 77 a recorder which will duplicate and even improve upon the facilities available with the most complex and expensive machines.

ACCESSORIES

To adapt Byer recorders to special physical or operational requirements, various Byer accessories are available.

They include:

Remote Control Units.

Echo, Reverberation and Acoustic Delay Units.

Editing and Duplicating System Control Units.

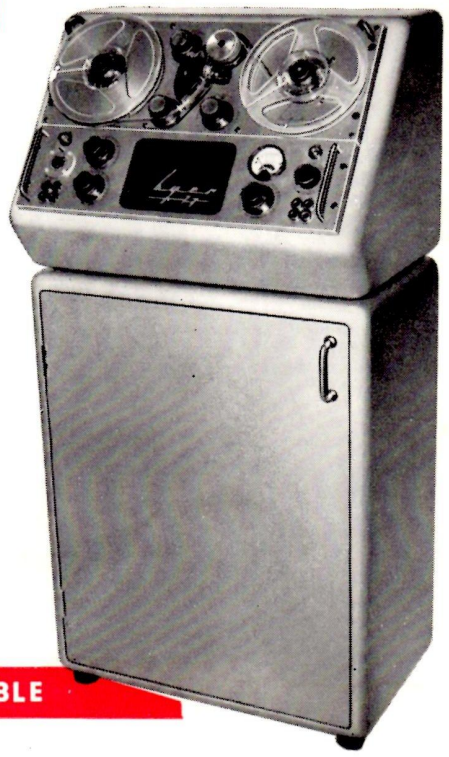
Auxiliary Spooling Mechanism.

The last-named permits the use of 10½-inch NAB spools with Byer Mark II Series equipment. It is a fully motorised unit which mounts above the tape transport panel and plugs into the appropriate socket on the control box, transferring the power from the normal spooling motors to the heavy duty motors with which it is fitted.

This unit is shown at the top of the rack-mounted equipment pictured overleaf.

FACILITIES PROVIDED IN THE BYER MODEL 77

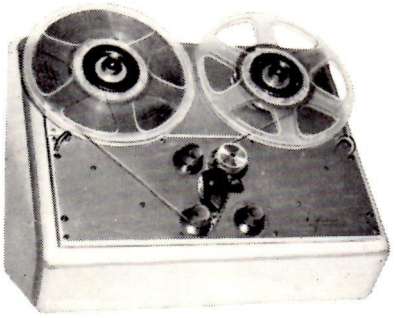
TRIPLE HEADS	Erase, record, playback.
DUAL SPEED OPERATION	7½ and 15 inches per second.
LEVEL METER	VU metering.
MONITOR LOUDSPEAKER	Inbuilt Rola loudspeaker with its own level control.
INPUTS:	
Microphone	50 ohms.
Balanced transformer	600 and 10,000 ohms.
OUTPUTS:	
	600 ohms to line (balanced). 3.5 ohms 2 watt monitor output.
	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 Byer Mk. II Series.



AVAILABLE ALSO AS A SINGLE CASE PORTABLE

byer

MAGNETIC RECORDERS



TAPE REPRODUCER

The Byer Model 33 Tape Reproducer has been designed for playback purposes only. It is intended for the replay of pre-recorded tapes, and the auditioning and editing of programme transcriptions.

As it is equipped with a replay head only, important tapes are safe even if handled by an inexperienced operator.

TAPE TRANSPORT

Since the Model 33 is a tape playing unit, no Erase or Record heads are provided, and the 'Record' press button has been eliminated. Special spooling motors are fitted. In all other respects, the Tape Transport is a standard unit as used in the Model 66 Tape Recorder.

AUXILIARY SPOOLING MECHANISM

This unit mounts directly above the Tape Transport and permits the use of 10½" N.A.B. spools. Connection to the Tape Transport is by means of the socket marked "Auxiliary Spooling Mechanism" on the control box at the rear of the Tape Transport.

Heavy-duty spooling motors are incorporated to provide adequate take-up and hold-back tension when using the larger spools.

THE AMPLIFIER

The amplifier is a standard replay amplifier giving an output to line of 600 ohms at zero level (+ 8 dbm). Signal to noise: 50 dB below normal recording level.

The professional application of sound recording extends over a very wide field ranging from its use by individual specialists in science and the arts to the large organisations engaged in the radio, television and film industries. Musicians use sound recordings to improve instrument tone, zoologists to study bird and animal life and scientists to control unwanted noise.

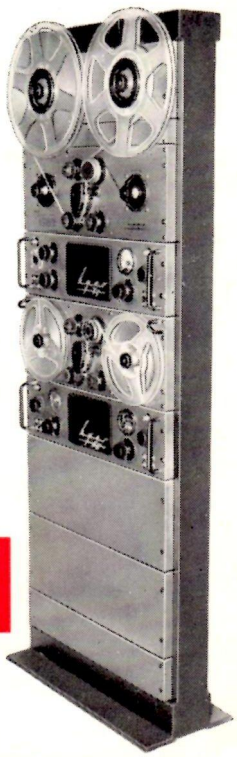
Research laboratories use sound recording not only for transcription and archive purposes, but also as a convenient means of investigating all kinds of periodic and transient phenomena occurring in and beyond the audio spectrum.

Modern rocketry is made possible only with the aid of telemetry, industrial automation relies upon the transmission of pre-stored information to actuate the complex machines which function without human aid.

All this is being done with the aid of magnetic tape, which engineers have been quick to realise provides the ultimate medium for the recording of sound and other information.

In fact, magnetic tape provides an electronic memory which in many respects completely out-performs its human prototype. The more important and exacting the job, the more the user entrusts his reputation and, in some cases, his livelihood, even his life, to magnetic tape recording and reproducing equipment. He must use apparatus of outstanding performance and unquestioned reliability.

From its commencement Byer has consistently led the tape recorder industry in this country. Byer machines are the best available — they offer the greatest value and operate at the lowest cost per hour. As a result, Byer tape recorders are preferred over all others. All Australia's major broadcasting networks and leading gramophone record makers are Byer users. Professional preference has established Byer as Australia's standard of excellence in sound recording.



ALL MK II SERIES PANELS ARE MANUFACTURED TO STANDARD P.M.G. TYPE RACK SIZES

Mk. II SERIES

GENERAL PERFORMANCE CHARACTERISTICS AND SPECIFICATIONS

	MODEL 66	MODEL 77
OPERATING METHOD	Press button — electro mechanical interlock.	Press button — electro-mechanical interlock.
TAPE SPEED	3¾" and 7½" or 7½" and 15" per second.	7½" and 15" per second.
SPOOL SIZE	NARTB 7"-10½" NAB with large spool mechanism fitted.	NARTB 7"-10½" NAB with large spool mechanism fitted.
TAPE DRIVE	Three motors — synchronous capstan and two high torque spooling.	Three motors — synchronous capstan and two high torque spooling.
TIMING ACCURACY	± 0.1% (± 1.8 seconds in 30 minutes).	± 0.1% (± 1.8 seconds in 30 minutes).
FAST FORWARD AND REWIND TIME	45 seconds for 1,200 ft. reel.	45 seconds for 1,200 ft. reel.
FLUTTER AND WOW	Better than — 0.3% at 3¾" per second. 0.25% at 7½" per second. 0.2% at 15" per second.	Better than — 0.2% at 7½" per second. 0.15% at 15" per second.
HEADS	Separate "Erase", "Record" and "Play" 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.*	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 40-10,000 c.p.s. ± 3 dB. 35-12,000 c.p.s. ± 4 dB. 30-14,000 c.p.s. ± 6 dB. At 15" per second 40-15,000 c.p.s. ± 3 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.	At 7½" per second 40-10,000 c.p.s. ± 2 dB. 30-14,000 c.p.s. ± 4 dB. At 15" per second 40-15,000 c.p.s. ± 2 dB. 30-18,000 c.p.s. ± 4 dB.
SIGNAL TO NOISE RATIO	Not less than 40 dB unweighted at normal recording level.	Not less than 52 dB below 2% T.H.D. level.
INPUTS	1. High Impedance Microphone (Low Impedance Optional Extra). 2. 600 ohm zero level (Twin Jacks). 3. Bridging Input. 4. Internal Radio Tuner.	1. Microphone Input 50 ohms. 2. Balanced 600 ohms. 3. Balanced Bridge In.
OUTPUTS	1. 600 ohms zero level (Twin Jacks). 2. 15 ohm voice coil. 3. Earphone Monitor.	1. Balanced 600 ohm. 2. 3.5 ohm (for monitor purposes).
METERING	dB Level Meter on both Record and Replay.	VU Meter with switching to either Record or Replay (normal or simultaneous).
POWER OUTPUT	4.5 watts at less than 1% distortion. 6 watts at less than 2.5% distortion.	To 600 ohm line — greater than + 18 dbm at less than 1% distortion. To Monitor Speaker 2 watts at 2.5% distortion.
POWER REQUIREMENTS	210-250 volts A.C. 50 cycles.	210-250 volts A.C. 50 cycles.
POWER CONSUMPTION	158 Watts.	150 Watts.
WEIGHT	45 lb.	47 lb.
DIMENSIONS	Panel size — Tape Transport 19" x 7". Amplifier 19" x 5¼". Case Overall 20¼" x 14" x 7½".	Panel size — Tape Transport 19" x 7". Amplifier 19" x 5¼". Case Overall 20¼" x 14" x 7½".

Magnetic Tape Recorder Division

ROLA COMPANY (AUST.) PTY. LTD.

8 Dorcas Street, South Melbourne, Victoria, Australia. MX5171

Caltex House, 167-187 Kent Street, Sydney. BU6147