

MAGNETIC TAPE RECORDER BY

*Byer*

OPERATING INSTRUCTIONS

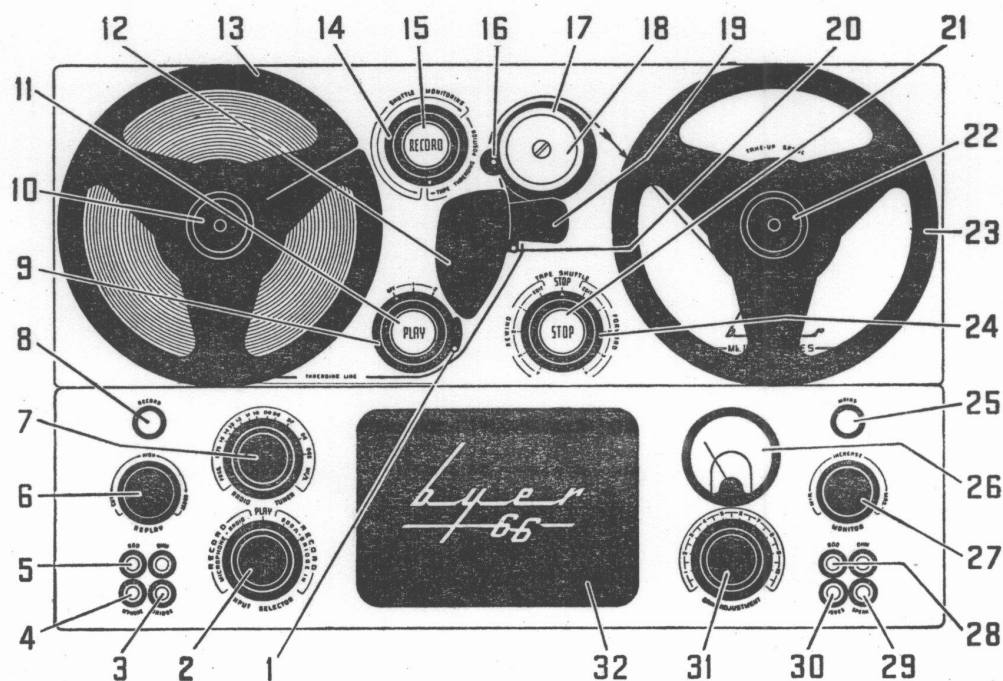
MODEL

**66**

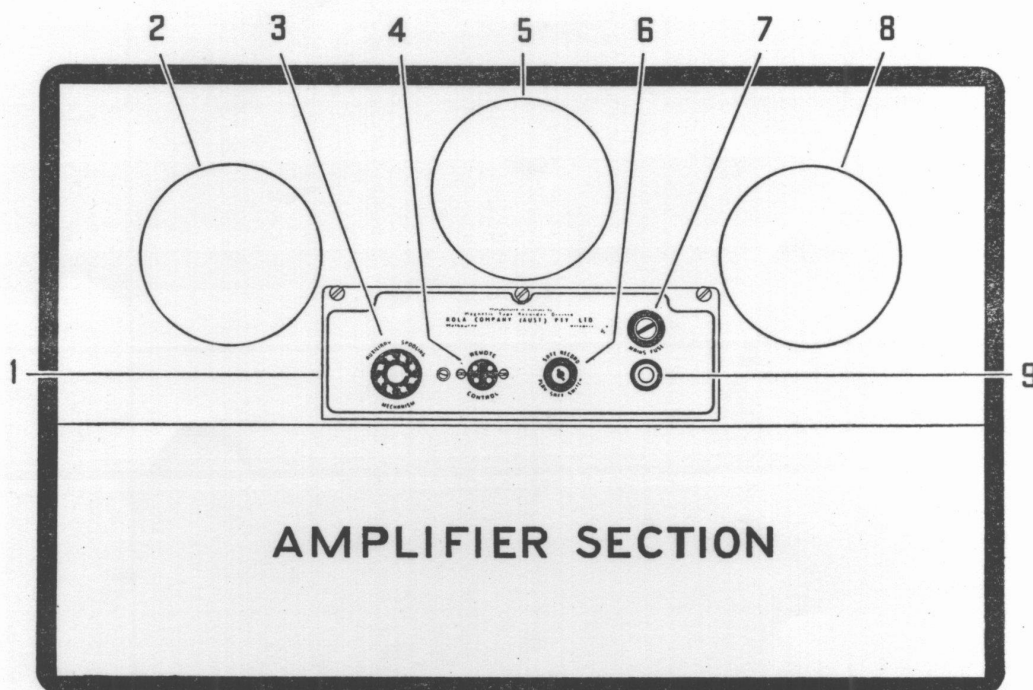


BYER INDUSTRIES PTY. LTD.  
8 DORCAS STREET, SOUTH MELBOURNE,  
VICTORIA AUSTRALIA.

1. TAPE OVER-RUN SWITCH
2. INPUT SELECTOR
3. UNBALANCED BRIDGE INPUT
4. MICROPHONE INPUT
5. BALANCED 600-OHM ZERO LEVEL INPUT
6. HIGHS CUT/BOOST CONTROL (REPLAY ONLY)
7. RADIO TUNER DIAL
8. "RECORD" INDICATOR
9. MAINS SWITCH AND SPEED SELECTOR
10. SPOOL CAP
11. "PLAY" PRESS BUTTON
12. TRIPLE HEAD ASSEMBLY
13. SUPPLY REEL
14. SHUTTLE MONITORING CONTROL
15. "RECORD" PRESS BUTTON
16. CAPSTAN
17. PRESSURE ROLLER
18. COVER DISC
19. HEAD SHIELD
20. TAPE LIFT PIN
21. "STOP" PRESS BUTTON
22. SPOOL CAP
23. TAKE-UP SPOOL
24. TAPE SHUTTLE CONTROL
25. "MAINS" INDICATOR
26. LEVEL METER
27. MONITOR VOLUME CONTROL
28. BALANCED 600-OHM ZERO LEVEL OUTLET
29. EXTERNAL SPEAKER OUTLET
30. HEADPHONES OUTLET
31. GAIN ADJUSTMENT
32. MONITOR SPEAKER



1. CONTROL BOX
2. TAKE-UP MOTOR
3. AUXILIARY SPOOLING MECHANISM SOCKET
4. REMOTE CONTROL SOCKET
5. CAPSTAN MOTOR
6. PLAY-SAFE SWITCH
7. MAINS FUSE
8. SUPPLY MOTOR
9. RECORD BIAS ADJUSTMENT SCREW



**BYER MK. II SERIES**  
**MODEL "66"**  
**GENERAL PURPOSE MAGNETIC TAPE RECORDER**

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**INTRODUCTION**  
**AND**  
**GENERAL DESCRIPTION**

The purpose of this booklet is to give the necessary information required for the successful operation of the Byer "66" Magnetic Tape Recorder.

To the professional recordist or to those experienced in the use of recording equipment, some of the instructions will appear superfluous, but the layman operator will find the contents helpful until such time as he becomes conversant with the instrument.

The Model "66" is normally composed of two units contained in a single carrying case — the Tape Transport Mechanism and the Amplifier. The two units are interconnected by flexible leads for operation as a complete tape recording and reproducing system or, if desired, the Amplifier Unit may be used as a Hi-Fi Amplifier.

The basic Model "66" is a full or half track unit designed for either 3¾ in. and 7½ in. or 7½ in. and 15 in. per second operation.

## HEAD ASSEMBLY:

The Byer "66" is fitted with three separate heads mounted in a single head block assembly.

These heads perform the functions of Erasing, Recording and Playing the tape. In this respect the machine follows the best professional practice by avoiding the many disadvantages inherent in the use of the old style compromise RECORD/PLAY heads.

Where it is considered desirable to monitor the replay of a recording whilst it is actually being made, this may be carried out by means of the "Simultaneous Replay Monitor Amplifier" which is available as an accessory.

For optimum results, correct **Azimuth Setting** or **Head Gap Alignment** is essential in both the RECORD and the PLAY heads, but as this adjustment has been carefully made to international standards during manufacture, the **SETTING SHOULD NOT BE ALTERED** unless absolutely necessary, and then only the PLAY Head should be adjusted. **The RECORD Head should not require adjustment under any circumstances.**

Should it become necessary to alter the Azimuth Setting of the PLAY Head to compensate for tapes recorded on machines with an incorrect Azimuth Setting, this adjustment can be carried out with the "Azimuth Adjusting Tool," which is available as an accessory.

Incorrect alignment will be evidenced by a lack of high frequency response or a "woolliness" in the sound and, in extreme cases, by a lowering of volume.

## CONTROL PANEL:

The Control Panel at the rear of the Tape Transport Mechanism mounts the following facilities:—

**A.C. Mains Fuse:** This fuse can be removed for renewal or inspection by unscrewing the solid bakelite cap in an anti-clockwise direction and withdrawing the glass fuse container.

**Head Demagnetiser:** After a period of time, the PLAY Head may, under certain conditions, become magnetised. This condition is indicated by a surface noise similar to needle scratch in disc playing equipment, and to remedy the effect, an inexpensive "Head



Demagnetiser" is available as an accessory.

There are two models. One is intended to plug into a socket on the rear of the control box unit, on recorders carrying serial numbers 1 to 470.

The other is fitted with a three-pin plug for operation direct from the A.C. mains and may be used with any unit.

**Play/Safe Switch:** This switch is fitted as a safety device for protection against accidental erasure of tape. When the key is switched to the SAFE position and, if necessary, removed, the machine will operate only as a PLAY unit and **WILL NOT RECORD OR ERASE.**

**Remote Control Socket:** The machine may be operated remotely by means of the "START/STOP REMOTE CONTROL MECHANISM" available as an accessory.

A further control — REWIND REMOTE CONTROL MECHANISM — is also available, but to permit its use, minor modifications to the machine become necessary. This unit incorporates three press buttons — one to start, one to stop and one to rewind.

**Auxiliary Spooling Mechanism Socket:** To enable the Model "66" to be used with 10½ in. NAB Spools, a separate accessory — AUXILIARY SPOOLING MECHANISM — is available. This is a fully motorised unit which mounts above the Tape Transport Panel and plugs directly into the appropriate socket on the Control Box, thus transferring the power from the normal spooling motors to the heavy duty motors fitted to this deck.

## **SPOOLS:**

The use of 7 in. NARTB Type Spools is strongly recommended. This spool, made in Australia exclusively by "Byer," has been developed by professional users as the most satisfactory for all purposes, and minimises the effects of varying tension ratios between a full and an empty spool. Its design follows very closely the external and hub diameters of the NAB professional spool.

**BYER MK. II SERIES**  
**MODEL "66"**  
**GENERAL PURPOSE MAGNETIC TAPE RECORDER**  
**OPERATING INSTRUCTIONS**

**Before attempting to operate, read these instructions carefully and check the mains supply voltage against the specification plate on rear panel of Tape Transport.**

**PREPARING FOR OPERATION:**

1. With the recorder in an upright position, release the fasteners and open REAR cover to full extent, ensuring that the stays are in the locked position.
2. Tilt back the recorder until the rear cover supports the machine.
3. Remove the front cover.
4. Plug the mains lead into the A.C. mains supply and switch on at power point. Switch the MAINS switch to position 1 (Low Speed Operation) or position 2 (High Speed Operation). When the MAINS switch is set at positions 1 or 2 the bezel lamp marked MAINS on the amplifier panel should glow.
5. Load reel of tape on to SUPPLY REEL spindle (left), and thread tape as indicated by THREADING LINE, ensuring that the tape is wound on to both spools with the oxide coating (dull surface) to the inside.  
For further details, see paragraph on Tape Threading on Page 13.
6. Power to the Tape Transport is controlled by the MAINS and SPEED CHANGE switch on the front panel.  
The MAINS switch turned to position No. 1 selects the lower speed and to position No. 2, the higher speed.  
Equalisation is automatically switched with capstan motor speed.

**SAFETY INTERLOCK SYSTEM:**

The Byer "66" is fitted with a precautionary interlocking system of controls to prevent accidental spoilage of tapes. The effects are dealt with under the appropriate control headings on the following pages, and as a reminder whilst actually operating the machine, they are set out on the front panel of the tape transport mechanism.

The following are points to be watched when operating the machine:—

**YOU CANNOT:**

- (a) Record with **PLAY-SAFE** Key in Safe;
- (b) Shuttle whilst **INPUT SELECTOR** is set to any **RECORD** function;
- (c) Record or Play unless **TAPE SHUTTLE** is set to **STOP**.
- (d) Record with **INPUT SELECTOR** at **PLAY** or vice versa;
- (e) Maintain operation unless the tape is threaded.

In addition, the movement of the **MAINS** and **SPEED CHANGE** switch, the **TAPE SHUTTLE** control or the **INPUT SELECTOR** whilst the machine is recording or playing will automatically stop the operation.

**FAST FORWARD AND REWIND:**

Fast Forward and Rewind operations are accomplished by means of the **TAPE SHUTTLE**.

Turned to the right for **FAST FORWARD** and to the left for **FAST REWIND**, the speed of these operations is progressively variable in Positions 1, 2, 3 or 4, in either direction. However, to overcome spool inertia it is desirable to turn the **SHUTTLE CONTROL** to the full forward or rewind position before selecting the desired shuttling speed.

In Position 1, the slowest shuttling speed is selected and in addition the transfer of tape from one spool to the other will continue until approximately  $\frac{1}{4}$  of the tape is wound on to the spool toward which it is fed, when it will automatically slow down and stop.

In Position 2, the next higher shuttling speed is selected and approximately  $\frac{1}{2}$  of the tape will be fed to the spool before the machine slows to a stop.

In Position 3 a still faster shuttling speed is selected and now approximately  $\frac{3}{4}$  of the tape will be transferred before the shuttling automatically ceases.

In Position 4 full speed shuttling in either direction is selected without any slowing down of the tape motion, and at this speed 1,200 ft. of tape can be transferred from one spool to the other in 45 seconds.

The **EDIT** position is explained in the Paragraph headed "**SHUTTLE MONITORING**" on Page 13.



Because of the safety interlocking system the **TAPE SHUTTLE** control must be set to **STOP** before the record or play functions can be operated. It must be remembered also that the movement of this control during record or play will automatically stop the machine.

#### **TAPE OVER-RUN SWITCH:**

Situated immediately beneath the head block assembly is a safety device which, unless held closed by the pressure of tape passing over it will not allow the machine to maintain operation. Therefore, should no tape be threaded on the machine or, in shuttling, should the tape over-run and all be wound in error from either spool, or should the tape between the capstan and the supply reel be interfered with in any way, the tape over-run switch will automatically stop the machine.

#### **SHUTTLE MONITORING:**

This control is used in conjunction with the **TAPE SHUTTLE**; turning the control anti-clockwise brings the tape closer to the **PLAY** head, and if used in this position during **FAST FORWARD** and **REWIND** it is possible to search aurally for any given spot on the tape.

Having arrived at the approximate position on the tape as described above, set the **TAPE SHUTTLE** control to either of the **EDIT** positions.

This enables the operator to accurately "cue" or "edit" the tape by manually rotating either spool in either direction.

It will be observed that with the Tape Shuttle control at **EDIT**, the brakes are released and that there is a constant tension on the tape itself. This makes final "Positioning" a simple, single handed operation.

**NOTE.**—After locating the position required, return the **SHUTTLE MONITOR** control to the **TAPE THREADING POSITION**, as constant shuttling with the tape in contact with the **PLAY** and **RECORD** heads will cause them to wear at an excessive rate.

#### **TAPE THREADING:**

When threading (loading) a tape on to the machine, rotate the **SHUTTLE MONITOR** control to the **TAPE THREADING** position to move the pressure roller away from the capstan and the head shield away from the **PLAY** head, as well as to bring the tape lift pin from its recess in the head block. Although this is not absolutely essential for the threading of the tape, it is recommended in order to simplify this operation.

It will be observed that under these conditions, there is a clear tape path around the guide roller, over the tape lift pin and triple head assembly, between the capstan and pressure roller, and around the pressure roller across the take-up spool.

This method of loading has been termed "Wrap-Round Tape Threading."

#### **LEVEL METER:**

Visual indication for level control is by means of a db meter. Correct recording level is obtained by operating the GAIN ADJUSTMENT in the appropriate direction until the pointer deflects to the zero marking on the scale on "peaks" or loud passages. Movement into the red section of the scale is not harmful, but consistent full scale deflection should be avoided.

#### **RECORDING:**

Before commencing to record on to the tape it is desirable, if possible, to have a brief test run to ensure the correct recording level. (See LEVEL METER above.) Remember that any interference with the INPUT SELECTOR whilst recording or playing will automatically stop the operation.

#### **TO RECORD FROM:**

##### **(a) Microphone—**

(Nominally High Impedance, but Low Impedance input available at extra cost.)

1. Plug microphone of correct impedance into the appropriate jack.
2. Turn MONITOR control to MINIMUM. Feed-back (an unpleasant howling from the speaker will result if this is not done).  
Aural monitoring of the Incoming Signal can be achieved by plugging head-phones into the appropriate Output Jack on the lower right-hand side of the amplifier panel.
3. Turn INPUT SELECTOR to MICROPHONE.
4. Ensure that PLAY/SAFE Key is in the RECORD position and TAPE SHUTTLE control is set to STOP.
5. Experiment for optimum recording level by means of the GAIN ADJUSTMENT.
6. Press RECORD button and the machine will commence to record.

7. At conclusion fade out by means of GAIN ADJUSTMENT and press STOP button.

**(b) Radio—**

The Radio Tuner is an optional accessory in the Byer "66," but for the purpose of instruction it will be assumed that a tuner is fitted.

1. Turn INPUT SELECTOR to RADIO.
2. Correctly tune Radio to desired station.
3. Set GAIN ADJUSTMENT for optimum recording level.
4. Adjust MONITOR control to desired volume. (This does not affect recording level.)
5. Ensure that PLAY/SAFE key is in the RECORD position and TAPE SHUTTLE control is set to STOP.
6. Press RECORD button and the machine will commence recording.
7. At conclusion fade out by means of GAIN ADJUSTMENT and press STOP button.

**(c) 600 Ohm Zero Level Input—**

This facility, utilising twin jacks, is for recording from any external source having an output of 600 ohms, such as another Byer "66" or Byer "77," or perhaps some other type of professional recording equipment.

1. Turn INPUT SELECTOR to 600 ohm position.
2. Plug in signal source to appropriate twin jacks.
3. Set GAIN ADJUSTMENT to optimum recording level.
4. Adjust MONITOR control to desired volume.
5. Ensure that PLAY/SAFE key is in the RECORD position and TAPE SHUTTLE control is set to STOP.
6. Press RECORD button.
7. At conclusion, fade out by means of GAIN ADJUSTMENT and press STOP button.

**(d) Bridge Input—**

This is a high impedance unbalance input, suitable for connection across most unbalanced sources such as output from a radio tuner, high gain pick-up or domestic-type tape recorder. This input could be used in conjunction with a high fidelity preamplifier fitted with suitable output terminals.

1. Turn INPUT SELECTOR to BRIDGE IN.
2. Plug in signal source to appropriate input jack.
3. Set GAIN ADJUSTMENT for optimum recording level.

4. Adjust MONITOR control to desired volume.
5. Ensure that PLAY/SAFE key is in the RECORD position and TAPE SHUTTLE control is set to STOP.
6. Press RECORD button.
7. At conclusion fade out by means of GAIN ADJUSTMENT and press STOP button.

#### **PLAYING:**

There are four controls and three sets of outputs on the amplifier panel associated with the playing of tapes on the Byer "66," these being:—

- (a) INPUT SELECTOR.
- (b) GAIN ADJUSTMENT.
- (c) MONITOR volume.
- (d) REPLAY, HIGHS, CUT & BOOST.
- (e) 600 OHM OUTPUT.

This outlet, utilising twin jacks, has been designed for use with professional and high class audio equipment, and delivers an output of approximately + 8 dbm at zero reading on the level meter.

- (f) SPEAKER.

To permit the use of an external loudspeaker, this outlet is for direct connection to the voice coil of a 15 ohm loudspeaker.

The volume level of the External loudspeaker is adjusted by means of the GAIN ADJUSTMENT Control on the amplifier panel.

When the External speaker is in use the volume level of the Monitor loudspeaker can be adjusted independently by means of the MONITOR control.

- (g) PHONES.

This outlet by-passes the MONITOR volume control and provides for headphone monitoring of in-coming and recorded signals.

#### **TO PLAY A RECORDER TAPE—**

1. Set INPUT SELECTOR to PLAY.
2. Turn MONITOR control to MAXIMUM.
3. Ensure that TAPE SHUTTLE is set to STOP.
4. Plug in external speaker if required.
5. Press PLAY button.



6. Adjust Listening Volume by means of GAIN ADJUSTMENT.
7. Adjust HIGHS, CUT/BOOST control as desired.
8. When concluded, press STOP button.

#### **EDITING:**

On the Byer "66" editing is rendered extremely simple by the controls provided for this purpose. The TAPE SHUTTLE and SHUTTLE MONITOR controls permit rapid location of any desired position on the tape which, once selected, can be marked on the tape (over the PLAY head) by means of a "Chinagraph" or similar pencil, after gently pulling down the head shield.

Similarly, unwanted sounds and passages may be cut out with scissors and the tape rejoined as outlined in the following paragraph headed "SPLICING."

It should be borne in mind that tape recorded with double tracks cannot be cut successfully, as the cuts made from one track will also affect the other track. Tapes recorded on a machine fitted with half track heads may be cut in the manner described above, provided only one track is of importance.

#### **SPLICING:**

To re-join tape cut in editing, lay one end of the tape on top of the other to give an over-lap of approximately  $\frac{1}{2}$  in., ensuring that the oxide coating on both ends is facing in the same direction. Cut through the tape ends with scissors at an angle of  $45^\circ$ . Remove loose pieces and butt join the ends with special Splicing Tape applied to the shiny (uncoated) side of the recording tape, trimming off the surplus splicing tape with scissors.

To simplify the splicing of tape we recommend the use of the Byer "Mitremite" Tape Splicer, which is a small and inexpensive semi-automatic splicing device.

#### **ERASING:**

Erasure is effected automatically whilst recording. A recorded tape or any portion of it may be erased without a new signal being recorded, by running it through the machine with the INPUT SELECTOR on any RECORD function and the GAIN ADJUSTMENT in the full off position.

Rapid erasure of tape may be carried out with the Byer Model BE2 Bulk Eraser, which, in a matter of seconds, will remove all traces of signal from a full reel of tape.



## BIAS ADJUSTMENT

The Bias Control is initially set at the factory to suit the majority of generally available high-quality tapes. However, it may be re-adjusted to obtain peak performance from any particular type of tape it is desired to use.

A 400 c.p.s. oscillator and a "Simultaneous Monitor Replay Amplifier" are necessary. The latter is available as an accessory to the Model "66."

The adjustment procedure is as follows:—

Set the panel meter switch to "RECORD" and feed a 400 c.p.s. signal to the appropriate input socket/sockets. Adjust the "Gain Adjustment Control" to give a reading of  $-7$  dB on the panel meter.

Connect the input of the Simultaneous Replay Monitor Amplifier to the Replay Head outlet at the rear of the transport deck and plug a set of high impedance 'phones into the output of the amplifier.

Start the machine recording at a speed of  $7\frac{1}{2}$  i.p.s. on the selected tape and adjust the Bias Control for maximum signal in the 'phones. This is the correct setting for the particular tape being used.

**BYER MK. II SERIES**  
**MODEL "66"**  
**GENERAL PURPOSE MAGNETIC TAPE RECORDER**  
**GENERAL CARE OF MACHINE**

The Model "66" has been designed and built with meticulous care, and should give long and trouble-free service.

No attempt is made here to give details of major maintenance, as this aspect is covered in a separate Service Manual available at moderate cost, but the suggestions offered will ensure that repairs and replacements are kept to a minimum.

When such repairs or replacements do become necessary, it is important that only genuine "Byer" components be used, and that the work be performed by a competent person. Expert workmanship is just as important in the repair of your recorder as in its manufacture.

The Tape Transport Mechanism, being almost entirely electrically operated, will require very little attention. However, after prolonged use it will be desirable to clean carefully the head assembly and the capstan and pressure roller to remove oxide adhesion, by carefully wiping them with a small quantity of cleaning fluid applied to a soft cloth. Similarly, the specially treated front panels and the carry case itself may also be cleaned.

The Model "66" is equipped with self-lubricating bearings throughout, which have been fully lubricated during assembly and **no lubrication procedure is therefore necessary.**

For maintenance purposes, the amplifier section can be likened to a radio receiver in so far as it incorporates similar component parts such as valves, resistors, condensers, etc., and should not require any maintenance whatsoever other than possible replacement of fuses, of which two are fitted to the Model "66."

The MAINS or A.C. Fuse is situated on the control panel at the rear of the transport mechanism. The High Tension Fuse is wired into the amplifier beneath the Power Transformer, and forms an additional protection against a power supply breakdown.

**BYER MK. II SERIES**  
**MODEL "66"**  
**GENERAL PURPOSE MAGNETIC TAPE RECORDER**  
**ACCESSORIES**

The following is a list of accessories designed for use with the Model "66," and to enable the user to perform with a single unit almost any function of which magnetic recording is capable.

Some of the items listed are not currently in production, but should you have an interest in any, please write us and we will give you details of availability and price.

- Microphone and Stand.
- Integral Radio Tuner.
- Stop/Start Remote Control Mechanism.
- Start/Stop/Rewind Remote Control Mechanism.
- Head Demagnetiser.
- Azimuth Adjusting Tool.
- Simultaneous Replay Monitor Amplifier.
- Head Alignment Kit, comprising—
  - Simultaneous Replay Monitor Amplifier and Azimuth Adjusting Tool.
- Multi-Channel Mixer.
- Speaker Enclosure.
- Auxiliary Spooling Mechanism.
- Low Impedance Microphone Input.
- Bulk Eraser.
- Stereophonic Operation.
- Multi-Channel Operation.
- Sound-to-Film Synchroniser.
- Bi-Directional Endless Track Operation.
- Telephone Monitoring.
- Co-Incidental Track Operation.
- Waterproof Cover.

**OTHER UNITS IN THE MK. II SERIES RANGE:**

- Model 22 — Lightweight Portable Magnetic Tape Recorder.
- Model 33 — Tape Reproducer.
- Model 77 — Professional Magnetic Tape Recorder.
- Model 100 — Professional Console-Type Tape Recorder.

**BYER MK. II SERIES**  
**MODEL "66"**  
**GENERAL PURPOSE MAGNETIC TAPE RECORDER**  
**SPECIFICATIONS:**

**OPERATING METHOD:**

Press Button—electro mechanical interlock.

**TAPE SPEEDS:**

3¾ in. and 7½ in., or 7½ in. and 15 in. per second.

**SPOOL SIZE:**

NARTB 7 in. 10½ in. NAB with auxiliary spooling mechanism fitted.

**TAPE DRIVE:**

**Three Motors** — Capstan directly driven by synchronous dual speed drive motor with integral fly wheel. Take-up and rewind by separate high torque induction motors.

**TIMING ACCURACY:**

± 0.1% (± 1.8 seconds in 30 minutes).

**FAST FORWARD AND REWIND TIME:**

45 seconds for 1,200 ft. reel.

**FLUTTER AND WOW:**

Better than—

0.3% at 3¾ in. per second.

0.25% at 7½ in. per second.

0.2% at 15 in. per second.

**BIAS FREQUENCY:**

55 Kc.

**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 in./sec. — 50 to 6000 c.p.s. ± 3 dB.

At 7½ in./sec. — 40 to 10000 c.p.s. ± 3 dB.

35 to 12000 c.p.s. ± 4 dB.

30 to 14000 c.p.s.  $\pm$  6 dB.  
At 15 in./sec. — 40 to 15000 c.p.s.  $\pm$  3 dB.  
30 to 18000 c.p.s.  $\pm$  6 dB.  
Approximate Highs Control Range:—  
+ 4 dB to — 12 dB at 12,000 c.p.s.

**SIGNAL TO NOISE RATIO:**

Not less than 40 db unweighted at normal recording level.

**INPUTS:**

1. High Impedance Microphone. (Low Impedance optional extra.)
2. 600 Ohms Zero Level (twin jacks).
3. Bridging Input.
4. Internal Radio Tuner.

**OUTPUTS:**

1. 600 Ohms Zero Level (twin jacks).
2. 15 Ohm V.C. impedance.
3. Earphone Monitor.

**METERING:**

db Level Meter giving accurate level control.

**POWER OUTPUT:**

4.5 Watts at less than 1% distortion.  
6 Watts at less than 2.5% distortion.

**POWER REQUIREMENTS:**

210 to 250 Volts A.C. 50 cycle.

**POWER CONSUMPTION:**

158 Watts.

**WEIGHT:**

45 lbs.

**DIMENSIONS:**

**Panel Size** — Tape Transport 19 in. x 7 in. Amplifier 19 in. x 5¼ in.  
**Case (Overall)** — 20¼ in. x 14 in. x 7½ in.

The manufacturers reserve the right to change specifications without notice, and no liability for such change will be accepted.  
Wholly designed and produced in Australia.

**Magnetic Tape Recorder Division**  
**ROLA COMPANY (AUST.) PTY. LTD.**  
**8 Dorcas Street, South Melbourne, Victoria, Australia. MX5171.**



## **RECORDING TECHNIQUE**

No attempt is being made here to cover the complete science of recording; reference to published books on the subject should enable the user to appreciate the problems encountered in the production of high quality recordings.

The first consideration when using a microphone for recording is its position.

For recordings made in halls, classrooms, or rooms where excessive reverberation or echo is encountered, improved results can be obtained by covering the floor with rugs and the walls with drapings, but "over-damping" should be avoided. In order to reduce reverberation in the immediate vicinity of the microphone, it is advisable to place the microphone on soft material (i.e., rubber mat, felt pad, etc.).

Where reverberation cannot be easily damped, it is best for the microphone to be placed near to the artist so that the volume of direct sound is as great as possible in comparison with the reverberation.

### **RECORDING SPEECH:**

The microphone should be placed between 8 and 18 inches away, depending on the strength of the speaker's voice, and about 3 to 6 inches below the speaker's mouth. Normally, the speaker should talk directly into the microphone, but in the case of a voice with excessive sibilance (tendency to whistle) he should speak obliquely into the microphone until this characteristic is reduced to a minimum. With persons inexperienced in the use of a microphone, there is a tendency to over-emphasize, both in pronunciation and volume. It will be noticed that a good radio announcer delivers speech smoothly and with little change in volume. A certain amount of practice in order to obtain a good microphone technique is essential for results to be as natural as possible. When recording several persons, they should be grouped together as evenly as possible in an arc around the microphone.

### **RECORDING SINGERS:**

In recording singing the position of the microphone, as in recording speech, depends upon the singer's type of voice; also due consideration should be given to the level of the accompanying music (if any) in order that a clear recording of the singer's voice is obtained.

Intimate effects can sometimes be obtained by a singer with a crooning type of voice singing at a distance of 4 to 5 inches away

from the microphone; "colour" should be obtained by change of vocal expression rather than by loudness.

A singer with a powerful operatic voice should be placed about 2 or 3 feet from the microphone, and if commanding extreme volume and range, should turn away from the microphone during loud passages, rather than the operator attempting to compensate by use of the volume control.

With instrumental accompaniment, the essential problem is to obtain a pleasing balance between the volume of the singer's voice and the musical accompaniment, i.e., the accompaniment should be so placed that the vocal passages are not overwhelmed. The correct position of the microphone can be determined only by trial and error.

For a piano accompaniment, the microphone should be fitted to a floor stand and never placed on the piano, otherwise vibrations will be transmitted through the base of the microphone and will cause unpleasant distortion in the recording.

Choirs should be arranged in an arc around the microphone; the weaker voices in front, stronger ones in the rear. The sopranos, tenors, baritones, basses, etc., should be placed in the conventional manner, but, if the group is large, it is advisable to bring closer to the microphone a singer or two from each section of the choir, so that the lyrics are more easily understandable. In this case, the best position of the microphone will generally be found to be slightly above the level of the singer's heads.

#### **RECORDING INSTRUMENTALISTS:**

The position of the microphone for obtaining best results when recording instrumentalists will depend greatly upon the acoustics of the room or studio, and on the type of instruments being played.

For recording a piano, in a room where the acoustics are poor, the microphone should be placed at a distance of approximately 4 to 6 feet away. In an acoustically treated room, placing the microphone at a greater distance may produce a better recording.

When recording solos of other instruments, the characteristics of the instruments should be considered before deciding on the position of the microphone. Obviously, the strings will be placed nearer to the microphone than the brass; the exact positioning, however, can only be obtained by trial and error during rehearsal. In the case of the brass, it may be found advisable to turn the instrument slightly away from the microphone to avoid distortion.

In recording an orchestra, the problems of balance become complex. The correct position of the microphone, which may be sus-

pended, is best solved by making trial recordings. The orchestra should be arranged in a series of arcs, within the "live" area of the microphone, the string section being placed nearest the microphone, the woodwind and bass strings in a second arc behind the strings, while the third arc is generally composed of the brass and percussion instruments and the piano.

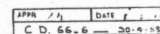
For dance bands, it is best to place the microphone from between 10 and 20 feet from the band. The positioning of the band in a series of arcs should follow the same arrangement as for other orchestras, with the saxophone section taking the place of the string section of the large orchestra.

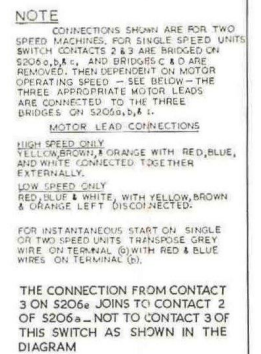
While the foregoing is based on general practice, there are few absolute rules of microphone technique. Individual voices, orchestras, acoustics and recording conditions are so varied that it is advisable that a trial and error method be adopted whenever new conditions are encountered. Best results will be obtained by rehearsing the artists, during which the correct setting of the volume control and the timing can be determined accurately.











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