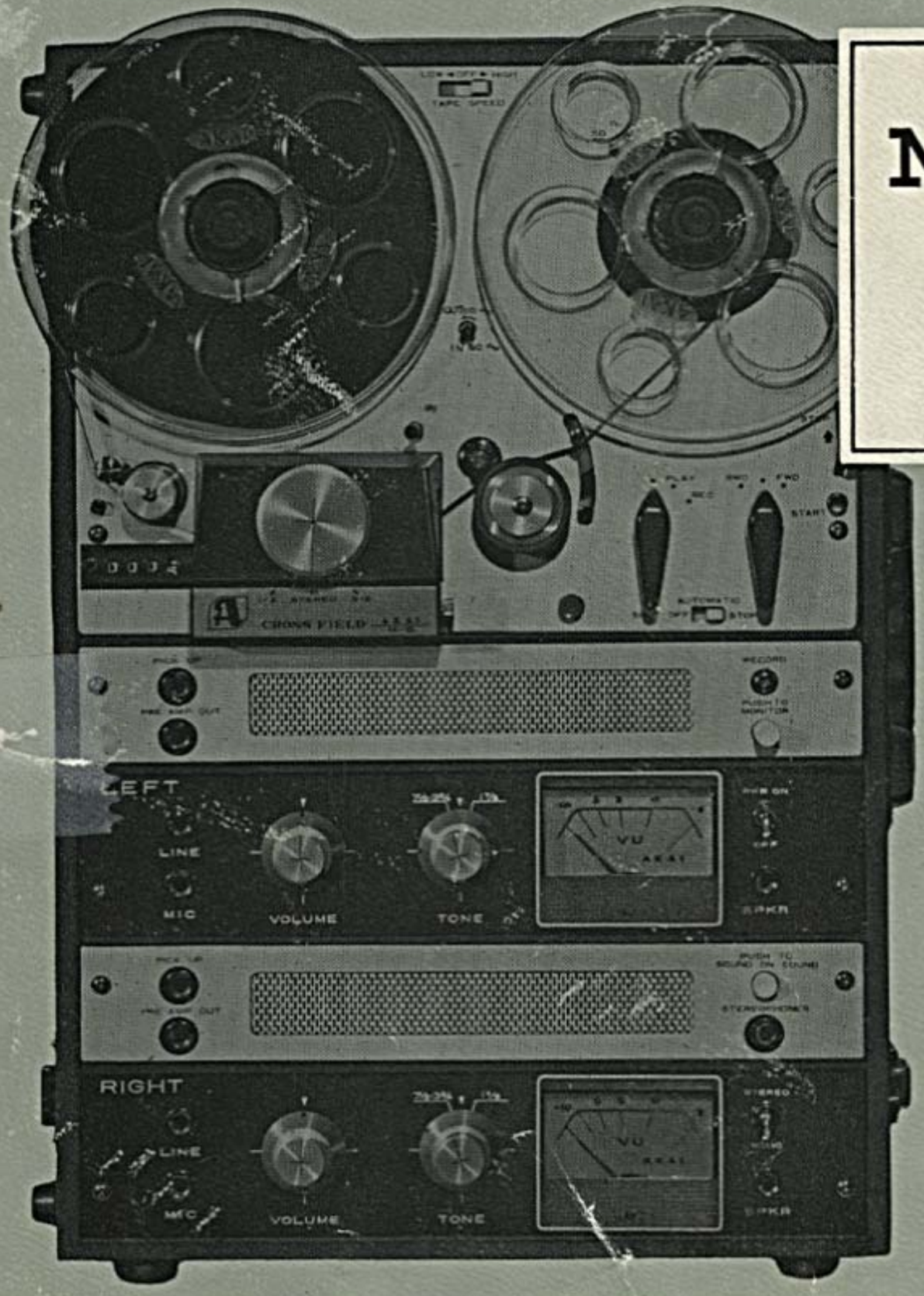


MODEL M-8

OPERATOR'S MANUAL

CROSS FIELD HEADS

VERTICAL CENTER SPEAKERS

SOUND ON SOUND

4-TRACK · 4-SPEED

STEREOPHONIC SOUND

RECORDER AND REPRODUCER

TABLE OF CONTENTS

III SUPPLEMENTAL INFORMATIONS

IV MAINTENANCE PROCEDURES

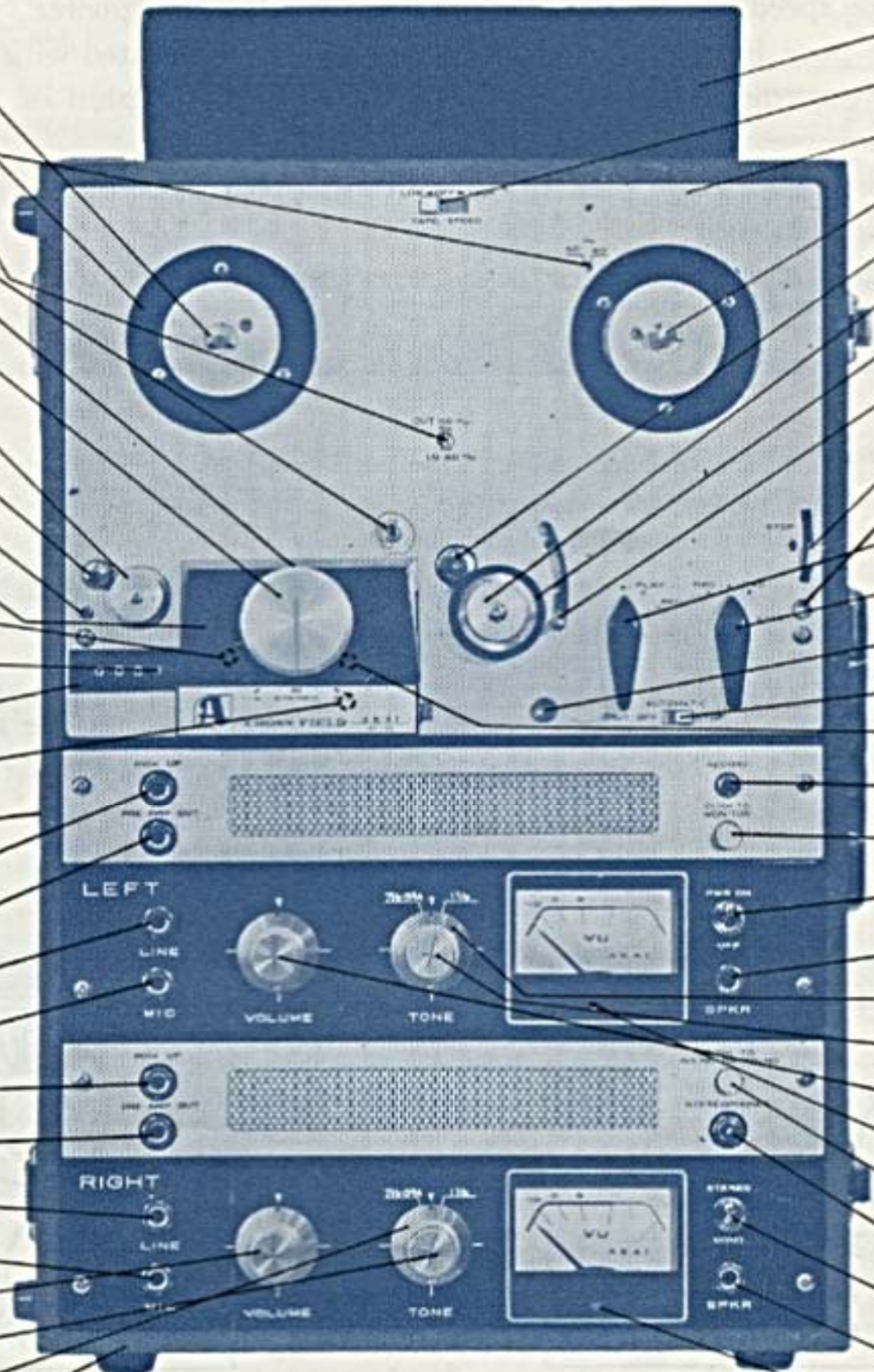
V ACCESSORIES

VI SCHEMATIC

SPECIFICATIONS

FREQUENCY RESPONSE	:	30 to 25,000 cps at 7-1/2 ips ±3 db. 40 to 21,000 cps at 7-1/2 ips ±3 db. 40 to 18,000 cps at 3-3/4 ips ±4 db. 40 to 10,000 cps at 1-7/8 ips Measured with 3M (Scotch) recording tape types 111-A, 150 and 200
SIGNAL TO NOISE	:	40 db below recorded signal level
WOW AND FLUTTER	:	Less than 0.15% at 7-1/2"/sec R.M.S. Less than 0.25% at 3-3/4"/sec R.M.S. Less than 0.35% at 1-7/8"/sec R.M.S.
EQUALIZATION	:	Correct equalization for playback of tapes recorded to the NARTB curve
CHANNEL SEPARATION	:	Better than 80 db at 1,000 cps, +3 VU
DISTORTION	:	Within 2% at 1,000 cps, 0 VU (total harmonic)
HEADS	:	Inline 4-track stereo/monaural record-play, 4-track erase and 4-track cross-field bias heads. All functions are controllable by a single head switch having positions for : 4 track stereo 1-4 track mono 3-2 track mono
RECORDING SYSTEM	:	Cross-field type recording based on the theory of a trailless recording bias system. Inline 4-track stereo and 4-track monaural recording.
MOTOR	:	Hysteresis synchronous, 2-speeds motor, dynamically balanced. 3,000-1,500 RPM at 50 cycles 3,600-1,800 RPM at 60 cycles
TAPE SPEED	:	7-1/2, 3-3/4 and 1-7/8 inches per second (15"/sec with an accessory capstan and pinch roller)
POWER OUTPUT	:	6 watts at maximum on each channel, total 12 watts
TUBES USED	:	6267 (EF86)×2, 12AD7 (12AX7)×2, 6BQ5×2, 6X4×2, 6AR5×1
SPEAKERS INCLUDED	:	Two 4-inch speakers for vertical stereo sound effect
FAST FORWARD AND REWIND TIME	:	75 seconds for either operation using a 1,200 feet recording tape at 60 cycles (90 seconds at 50 cycles)
POWER REQUIREMENTS	:	100-240 VAC, 50-60 cps, 100 VA., frequency compensation by shifting capstan drive belt on fly-wheel
WEIGHT (NET)	:	47.3 pounds. (21.5 kg)
DIMENSIONS	:	20"H×13"W×9"D deep overall, case closed (510 H×340 W×226 mm)

CONTROL LOCATION



1. Feed Reel Spindle
2. Guard Circle
3. Cycle Conversion Switch
4. Capstan Storage Post
5. Retaining Screw
6. Track Selector Knob
7. Tape Guide Roller
8. Tape Cleaner
9. Release Button
10. Head Cover, Main
11. Erase Head
12. Index (Revolution) Counter
13. Reset Button
14. Cross-Field Head
15. DIN (One Connection) Jack
16. Pick Up Input (Left Channel)
17. Pre-Amp Output (Left)
18. Line Input (Left)
19. Microphone Input (Left)
20. Pick Up Input (Right Channel)
21. Pre-Amp Output (Right)
22. Line Input (Right)
23. Microphone Input (Right)
24. Volume Control (Right)
25. Equalizer Switch (Right)
26. Tone Control (Right)
27. Carrying Case
28. Sound Mirror
29. Speed Change & ON/OFF Switch
30. Top (Deck) Panel
31. Take-Up Reel Spindle
32. Capstan Shaft
33. Pinch Roller Cap
34. Pinch Roller
35. Automatic Shut Off Lever
36. Instant Stop Lever
37. Start Button
38. Record, Play Switch
39. Rewind, Fast-Forward Switch
40. Record Safety Button
41. Auto Stop, Shut Off Switch
42. Record/Play Head
43. Pilot Lamp (Recording Indicator)
44. Internal Speaker ON/OFF Switch
45. Power Switch
46. Speaker Output Jack (Left)
47. Tone Control (Left)
48. Equalizer Switch (Left)
49. Volume Control (Left)
50. Volume Unit Meter (Left)
51. Sound on Sound Switch
52. Stereo Headphone Jack
53. Function Switch
54. Speaker Output Jack (Right)
55. Volume Unit Meter (Right)

CROSS FIELD HEAD

In the usual recording device as the tape speed is decreased, the tonal quality becomes poorer and unsuitable for music recording. However, such long existing trouble (particularly poor high tone reproduction) has been eliminated with the appearance of the cross-field head, which permits sufficiently stable high fidelity recording of music at the remarkably lower speed of half the former low transport of 3-3/4 inches per second.

What is superior about cross-field recording? How does it differ from typical recording methods as far as construction is concerned? On these, explanation is given below in sequence:

In the typical recording system, the signal current and the bias current are combined together and applied to the recording head. (Refer to Diagram 1.)

It is well known that the purpose of bias current is recording at high sensitivity with a signal applied on the tape, with no distortion and minimizing noise generation.

However, the bias current providing such an advantage also has an undesirable character. That is, the wide magnetic field of the bias current affects the recorded signal, resulting in weakening or even erasing the signal. This phenomenon is particularly noticeable at high frequencies.

For the reasons given above, the typical recording system is limited when concerned with high fidelity recording at lower tape speeds, unless some great improvement can be made on application of bias current.

In the cross-field system, the signal current is applied to the recording head while the bias current is applied to the bias head. These two heads are located in different positions, as determined interrelatively, so that the magnetic field of the bias will not affect the signal recorded on the tape, even when sufficient bias is applied. This allows the recorded signal to remain on the tape with high fidelity.

Diagram 1. Ordinary recording system

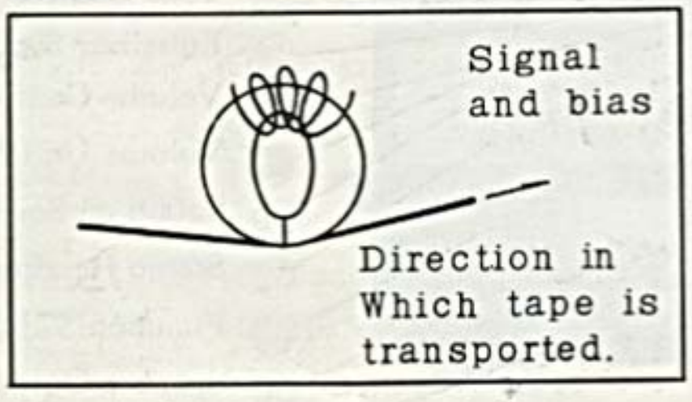
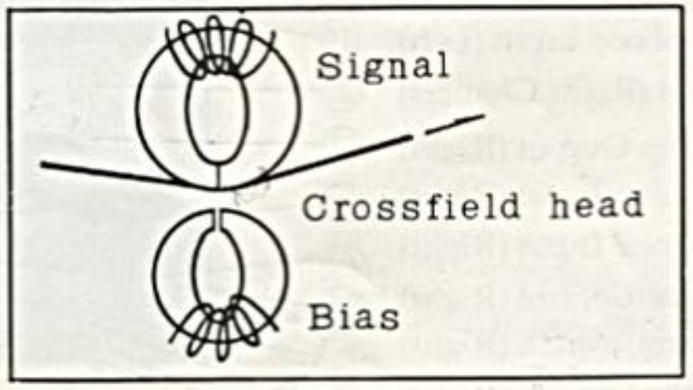
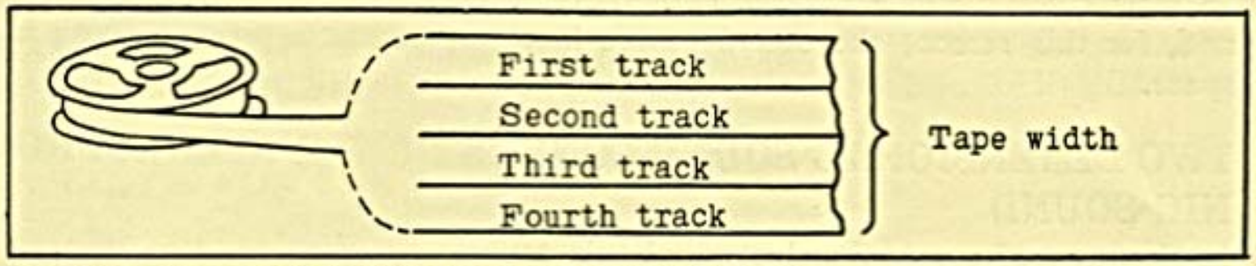


Diagram 2. Cross-field recording system



RECORDING ON FOUR TRACKS

The Model M-8 employs a most advanced four track system, where the width of a tape is divided into four sections for recording, so that tape may be more efficiently utilized.



Erasing and recording/playback heads can be moved to the required track by turning the track selector knob.

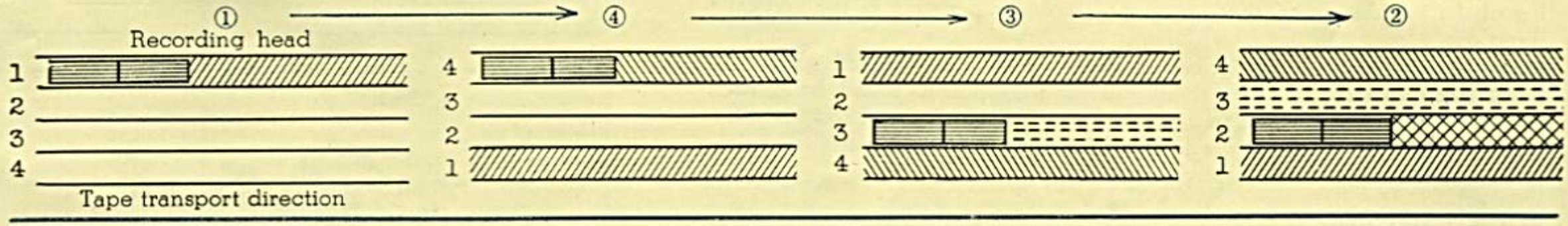
Recording of monaural sound should be done in the sequence of 1-4-3-2 (tracks).

① Recording when the tape is transported with the track selector set to 1-4 monaural is made on the first track.

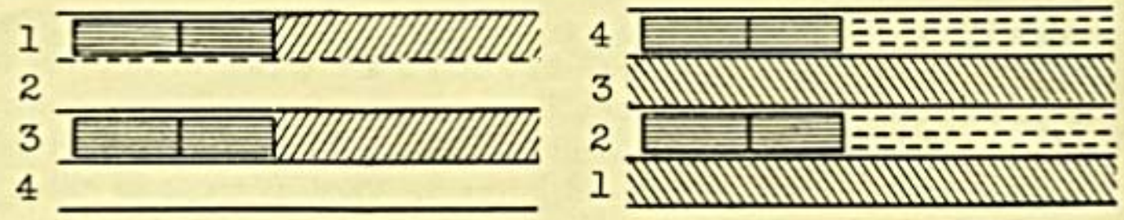
④ Recording on the fourth track is made when returning the record/play switch to its neutral position at the end of a tape and reversing the positions of both the left and right reels. The tape is turned over so that the fourth track comes into the position formerly occupied by the first track. Under this condition, the recording may be continued.

③ Recording on the third track after changing the positions of both tape reels (and when the track selector is turned to the position of 3-2 monaural) can be made. Again reversing the reels after the third track is completed allows recording on the second track.

② The above completes recording on all four tracks.



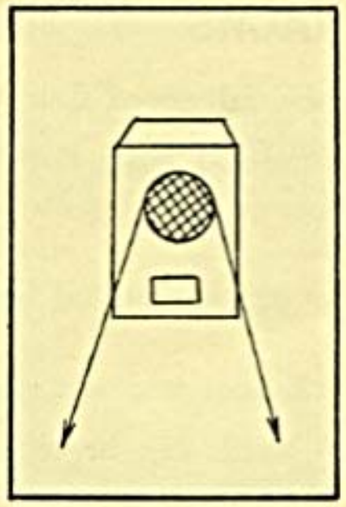
Stereophonic recording uses two tracks at a time, so that position reversal of both reels can be done only once, first recording on the first and the third tracks and then on the second and fourth tracks.
In this case, the track selector is set to the position for stereo.



VERTICAL STEREO SYSTEM

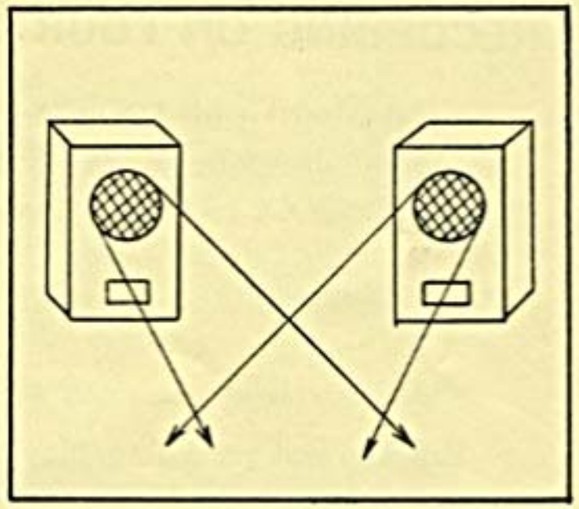
SINGLE DIMENSIONAL SOUND-MONOPHONIC SOUND

In most cases, a single speaker is used for monophonic sound reproduction and, for this reason, the sound source is considered as a point existing in space.



TWO DIMENSIONAL SOUND-CONVENTIONAL STEREOPHONIC SOUND

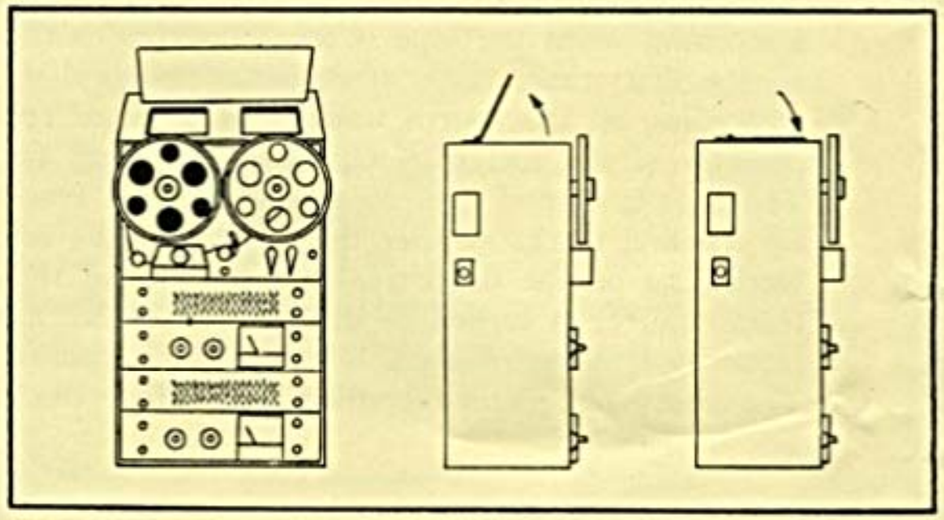
In the case of conventional stereophonic sound reproduction, two separate speakers are arranged on the left and right hand side of the listening room. The sound source is spread throughout the room and is considered as a horizontal line in space. To emphasize stereo separation however, these two external speakers should be separated widely which sometimes results in a dead phone in the middle.



THREE DIMENSIONAL SOUND-VERTICAL STEREOPHONIC SOUND

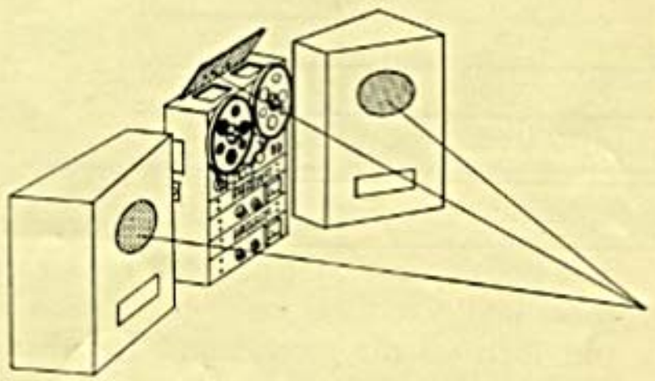
At last, Akai is advanced research and development engineering group has produced an exclusive three dimensional sound reproduction system based on the latest theory of acoustics, where a third sound source in the vertical direction is added to the abovementioned horizontal line in space. Two center speakers are mounted on the upper side of the M-8 so that sound waves coming from the built-in speakers are reflected by sound mirror or the ceiling of the listening room, thus creating a third sound source in the vertical direction.

If the M-8 is placed vertically between the two widely separated speakers, it will not only serve as a center fill, but the stereophonic sound being reproduced through a total of four vertical and horizontal sound sources will be spread throughout the entire listening room. Truly realistic stereophonic sound can be enjoyed everywhere in the room.



SOUND MIRROR

Adjust the angle of Sound Mirror while listening to stereophonic sound until the best VERTICAL STEREO EFFECTS are obtained. In order to achieve the best result in a small room, as a rule, the Sound Mirror is opened until the sound is reflected upon ceiling but in a large room which has a high ceiling the Sound Mirror should be used. Vary its angle in either direction to decide the best position.



CAUTION

IMPORTANT: READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE OPERATING YOUR MACHINE:

① THE USE OF NEW TAPE WILL RESULT IN THE BEST RECORDINGS. ALWAYS USE A NEW TAPE OF THE HIGHEST QUALITY i.e. AKAI TAPE OR OTHER TAPES OF FINE QUALITY. THIS IS ESPECIALLY IMPORTANT WHENEVER MAKING RECORDINGS AT SLOW TAPE SPEED, OTHERWISE "DROP-OUT" OF SOUND OR UNEVEN TAPE MOVEMENT MAY RESULT.

② THE SYMPTOMS LISTED BELOW DO NOT NECESSARILY INDICATE MECHANICAL FAILURE OF YOUR TAPE RECORDER. IF YOUR MACHINE EXHIBITS ANY OF THESE SYMPTOMS, CHECK FOR THE TROUBLE AS INDICATED.

(1) Loss of sensitivity and tone quality may be due to:
- A. Dirty recording head. This will prevent prerecorded material from being erased completely.
- B. Dust on recording head. Clean the head gently with a soft cotton swab soaked in rubbing alcohol or carbon tetrachloride.
- C. Reversed tape. Check to see that the dull side of the tape lies toward the heads.
- D. A.C. power voltage of less than the standard voltage to which your machine is set.

(2) Irregularity in the tape advance may be due to:
- A. Heavy dust adhering to heads.
- B. Oil on the capstan.
- C. Loose capstan mounting screw when playing at 7-1/2 I.P.S.
- D. Sticky or dusty tape surface.

(3) If your machine will not record, check to see that the followings are in correct position:
- A. Record-play switch.
- B. Microphone plugs.

NOTE:

(1) Before operating your recorder, be sure to clean the surface of the head.
(2) Unused tape may become soft and sticky. Therefore, it is advisable to run the tape once from the feed reel to the take-up reel before threading it for use
(3) Lubricate the M-8 after every 600 hours of use. Refer to the LUBRICATION CHART for other lubrication points.

③ THE FOLLOWING NOTES ARE PROVIDED FOR YOUR CONVENIENCE:

(1) If any trouble develops, please take your machine to our nearest authorized agent in your area or inquire at the Service Dept. of the Akai Company in Tokyo, Japan.
(2) The M-8 requires constant voltage for optimum performance.
(3) The standard 1,200 feet length of tape on a 7″ reel plays up to 32 minutes at 7-1/2″/sec. in one direction, if it is fully wound.
(4) Do not twist the power cable or mike cord when coiling them, otherwise the wires may become disconnected from terminals. Every cord should be coiled from its base to prevent twisting.
(5) If the sound sources are so far from the microphones that the volume control must be turned up to maximum, some hum or noise will inevitably be recorded. In such case, it is recommended that a test recording be made before a final recording is attempted. To avoid recording hum, attach a ground wire to the deck.
(6) It is advisable to turn down the VOLUME CONTROLS to "0" before moving the Track Selector Knob from its original position on either recording or playback.

Before operating the M-8, make sure that the AUTOMATIC SHUT OFF SWITCH is set at the position marked "STOP". The recorder will not function whenever the shut off switch is set in the position marked "SHUT OFF".

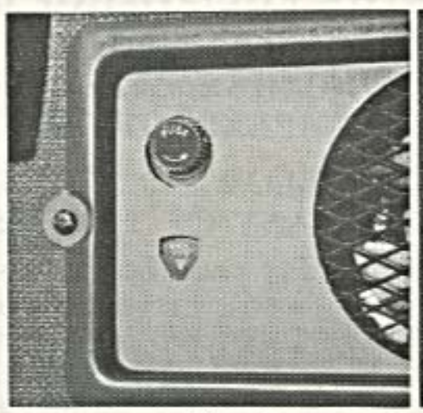
PREPARATIONS

POWER VOLTAGE ADJUSTMENT

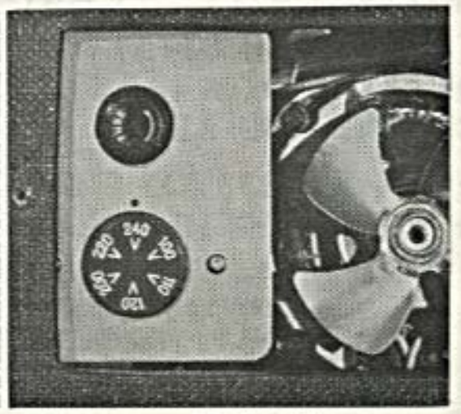
With the universal transformer provided on the ventilation panel of the back side of the recorder (adjacent to the FUSE POST) the user can adjust to the required voltage. This self contained step-down transformer accepts various AC power sources used throughout the world. Generally, the voltage is preset for the forwarding territory. (Seen through the window in the ventilation panel.)

The user is requested to check the pre-adjusted voltage before using the recorder. If another voltage is required, re-adjusting can be made in accordance with the following instruction:

1) Remove the ventilation panel. (See picture No. 2.) Then pull up the VOLTAGE CONVERSION SWITCH KNOB and re-set to the desired voltage by matching the FIGURE and the POINTER.
2) The voltage conversion switch has a plug-in system and is divided into 6 steps, 100/110/120/200/220/240. For example, if you desire to adjust to 220 volts, re-set to the figure of 220, matching the point.



No. 1



No. 2

CAUTION :
Disconnect power plug from AC outlet before resetting the machine. To maintain optimum performance and to prolong the life of your recorder, it is essential that the line voltage be kept within 10% deviation from the standard voltage.

POWER CYCLE CHANGE

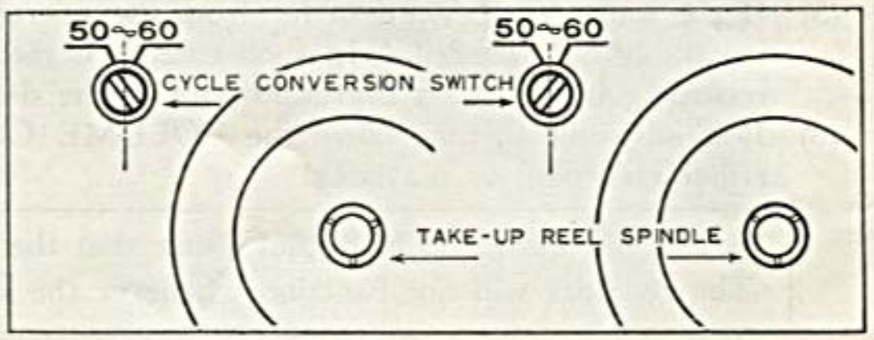
The cycle conversion switch (1) is located at the center of the recorder top panel.
The cycle conversion switch (2) is located at the left upper side.

CAUTION :
Do not operate the cycle conversion when the motor is not running.
The switch (1) must be rotated back to its original position after it has been moved either OUT or IN. Using a screw driver, rotate the cycle conversion switch (1) counter clockwise approximately one-eighth of a turn. The switch can then be moved either OUT or IN.
50 cycle operation is obtained by moving the switch OUT, (Fig. 1 ⓐ) and 60 cycle operation, by moving the switch IN (Fig. 1 ⓑ). It is also necessary to set the cycle conversion switch (2) to the correct position.

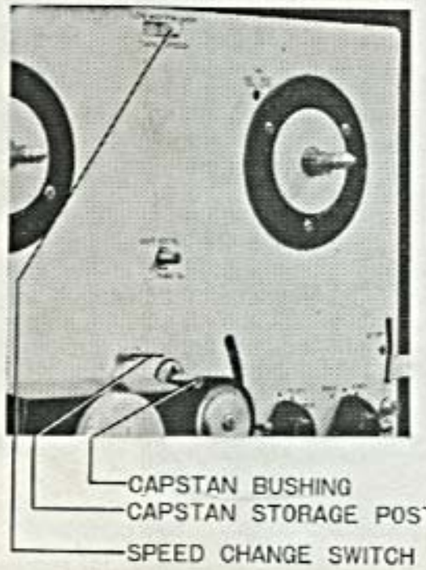
(1) ⓐ

ⓑ

(2)



SELECTION OF TAPE SPEED



TAPE SPEED	POSITION OF SPEED CHANGE SWITCH			CAPSTAN BUSHING		U S E
INCHES PER SECOND	LOW	OFF	HIGH	YES	NO	
1-7/8	○	※			○	Long time recording of Jazz, Speech, Lecture, etc.
3-3/4	○	※		○		High fidelity recording of Popular or Classical music, etc.
7-1/2		※	○	○		Recording music with maximum clarity. Playback of pre-recorded tape.
15		※	○	◎		Mainly for high-speed duplication of recorded tape.

The M-8 operates usually on 3 tape speeds, 7-1/2, 3-3/4 and 1-7/8 ips. Refer to the chart above for selecting an adequate tape speed. Tape speed is determined by the motor speed and by use of a capstan bushing on the tape drive capstan shaft.

RECORDING TIME

4-TRACK STEREO			
TAPE LENGTH	TAPE SPEED		
	1-7/8	3-3/4	7-1/2
1200ft	4 hrs	2	1
1800	6	3	1.5
2400	8	4	2
4-TRACK MONO			
1200	8	4	2
1800	12	6	3
2400	16	8	4

1-7/8 ips. The 1-7/8 ips tape speed is obtained by setting the speed change switch to the position marked "LOW". The capstan bushing is not used and is mounted on the storage post.

3-3/4 ips. The 3-3/4 ips tape speed is obtained by setting the speed change switch to the position marked "LOW". The capstan bushing is mounted on the capstan shaft and is locked automatically in position by the notches provided.

7-1/2 ips. The 7-1/2 ips tape speed is obtained by setting the speed change switch to the position marked "HIGH". The capstan bushing is used.

15 ips. This tape speed is provided for convenience. The speed change switch is set at "HIGH" and use of an accessory 15 ips capstan is required, which is indicated in the chart by the double circle. Also replace the pinch roller with the smaller one.

CAUTION : The capstan bushing for 7-1/2 ips tape speed will not come off during operation if it is mounted tightly on the capstan shaft. It, however, may come out rather easily when the unit is not in operation. Care should be taken, especially when carrying the recorder, in order not to loose the capstan bushing. The bushing must be kept on the storage post by means of a mounting screw whenever not in use.

The internal amplifier (s) of the M-8 may be used for playback of recording discs by connecting a record player. If the speed change switch is set to its center position marked "OFF", the motor will not rotate and only the amplifier (s) are operative.

STEREO PLAYBACK PROCEDURES

CHECK POINTS BEFORE OPERATION

Check the power voltage to which your M-8 is set. See the back of the recorder and reset the voltage selector switch according to the instructions given on page 9. Also check power cycle and change settings of the corresponding switches in accordance with the instructions on the same page.

CONNECTING TO AC SOURCE

Uncoil the AC cord in the compartment and connect the AC plug to an AC power source.

POWER SWITCH & FUNCTION SWITCH

Set the function switch on the right (lower) amplifier to the position marked "STEREO" and set power switch on the left amplifier (upper) to the position marked "ON". The capstan shaft will rotate and the pilot lamps in the VU meters will light. The function switch enables you to select either stereo or monaural operation.

EQUALIZER SWITCH

Set the pointer of the equalizer switches on both amplifiers to 7-1/2, 3-3/4 or 1-7/8 as required. The equalizer switch is provided for correct compensation of recording and playback characteristics.

TRACK SELECTOR KNOB

To play a 4-track recorded tape, set the pointer of the track selector knob to the position marked "STEREO". Also a 2-track stereo tape can be played back at this position with the volume control knob on the left amplifier set at a little higher level than that of the right amplifier.

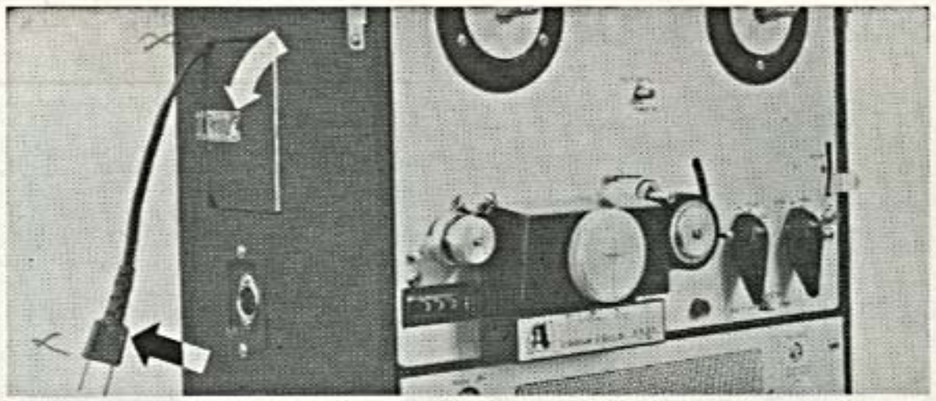
AUTOMATIC STOP & COMPLETE SHUT OFF

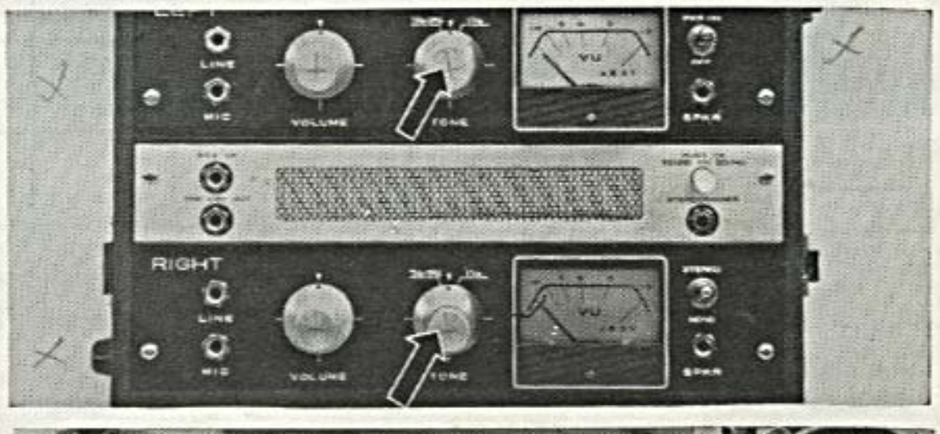
One of the exclusive features of the M-8 is the automatic shut off function of the unit. Whenever the tape comes to the end, or is broken by accident, the pinch roller will automatically be released from the capstan to prevent permanent deformation of its soft rubber surface.

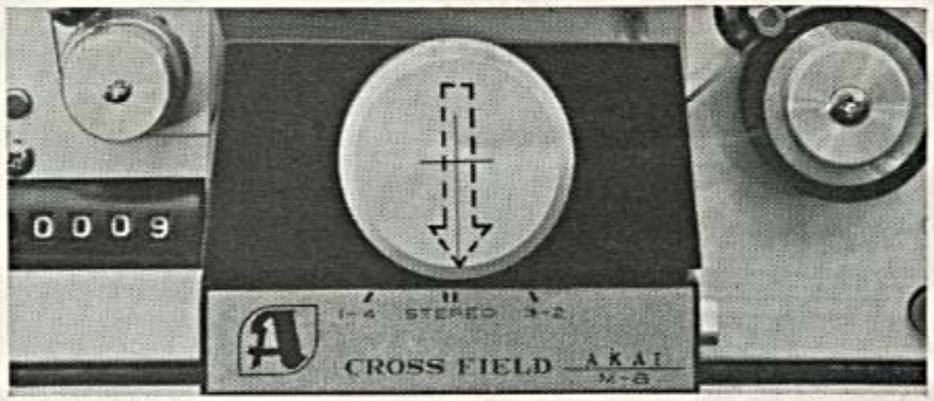
Setting the AUTO STOP, SHUT OFF SELECTOR SWITCH to the position marked "STOP" will halt the tape movement only while the internal amplifiers are still operative. In this case, no "warming-up" time is required and the unit is always ready for the next operation.

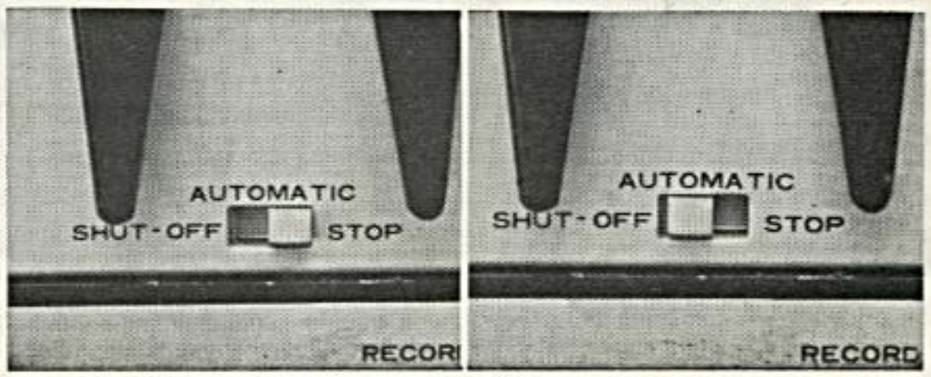
See the picture on the left.

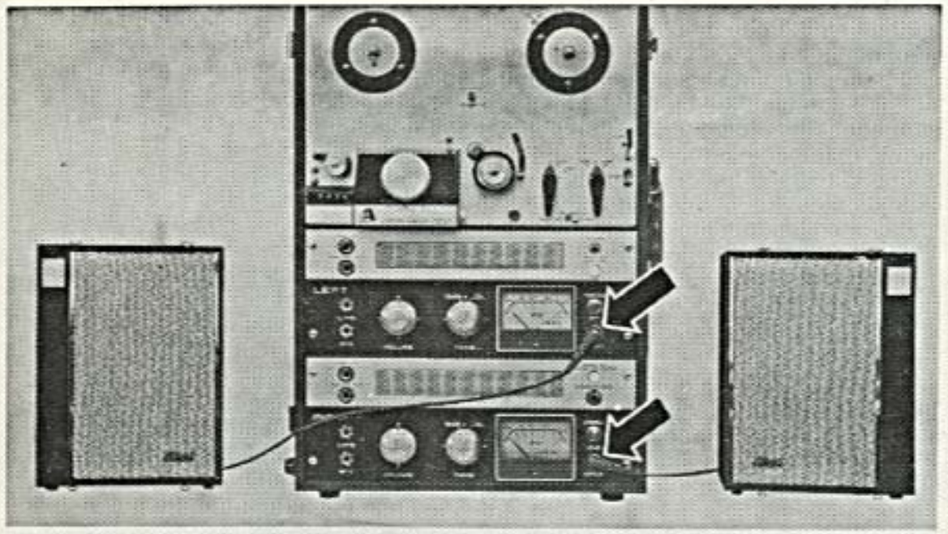
Should automatic shut off of the entire unit be required, simply set the SELECTOR SWITCH to the position marked "SHUT OFF", as shown in the picture on the left. This will automatically cut off all functions at the end of the tape.

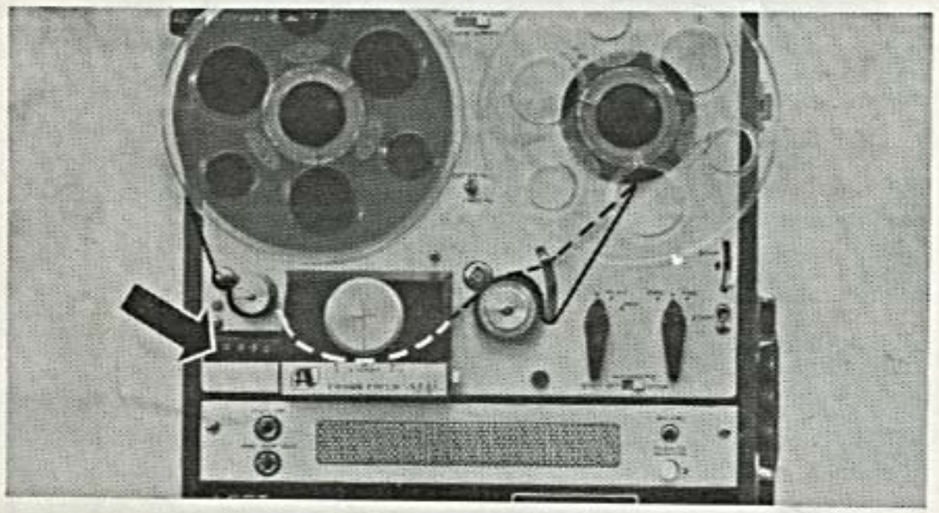


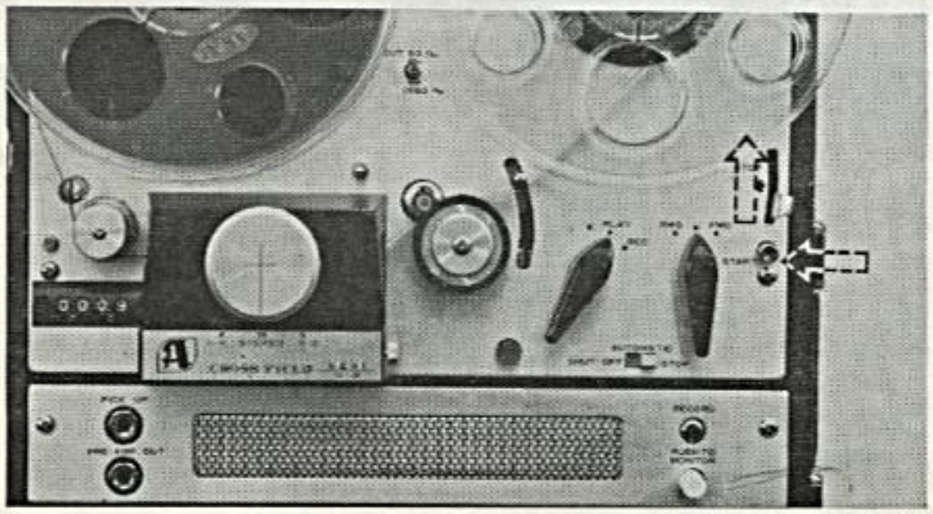












Before operating the M-8, insure that the AUTOMATIC SHUT OFF SWITCH is set to the position marked "STOP". The recorder will not function when the shut off switch is set to the position marked "SHUT OFF".

HOW TO CONNECT EXTERNAL SPEAKERS

Insert the plug from the left speaker into the "SPKR" jack on the left amplifier and the plug from the right speaker into the "SPKR" jack on the right amplifier. Both speakers should be separated at least 7 feet for the best stereophonic sound effect.

TAPE LOADING PROCEDURE & AUTOMATIC STOP LEVER

Place a recorded tape reel on the feed (left) reel spindle and thread the tape as illustrated by the dotted lines after placing an empty reel on the take-up (right) reel spindle. To keep reels from falling off when using the M-8 in the upright position, place the rubber reel caps on the spindles.

IMPORTANT: When use of the automatic stop or shut off is required, thread the tape through the automatic stop lever as shown in the picture on the right. If the automatic operation is not required, thread the tape directly to the take-up reel as illustrated by the dotted line.

INDEX COUNTER

A 4-digit index counter is used to provide reference numbers for easy location of recording materials on a given tape. Push the re-set button of the counter to return any numbers appearing on the counter to zero (at the beginning of a tape).

INTERNAL SPEAKER ON/OFF SWITCH

This is a push-button switch and is used to disconnect internal speakers of the M-8. When the button is depressed, it will lock and the internal speakers are disconnected. In this case, sound reproduction is made only through the external speakers. To enjoy vertical sound effect, make sure that the button is not depressed. The button will come out by pushing it once again.

RECORD/PLAY SWITCH AND INSTANT STOP LEVER

Push the instant stop lever upward until it locks, and then turn the record/play switch to the position marked "PLAY".

START BUTTON

To start playback, push the start button which is located immediately below the instant stop lever.

VOLUME AND TONE CONTROLS

Turn the volume control knobs on both amplifiers clockwise. Refer to the VU meters for a suitable playback level of recorded sound. Also adjust tone controls to suit. Turning the tone control clockwise from its center position will increase treble response and turning the control counterclockwise will increase bass response. You are now listening to the program recorded on tracks No. 1 and 3.

REVERSING REELS

After all the tape has been transported to the take-up reel, return the record/play switch to stop tape. Remove both reels from the spindles and place the now full take-up reel on the feed (left) spindle and the now empty reel on the take-up (right) spindle.

If this is a 2-track recorded tape, turn the rewind/fast-forward switch to "REWIND".

Push the instant stop lever and turn the record/play switch to "PLAY".

Push the start button to start playback of tracks No. 2 and 4.

FAST-FORWARD AND REWIND

Fast-forward or rewind operation is made by turning this switch to the proper position. Use the fast-forward or rewind operation for a rapid selection of recorded materials on a given tape.

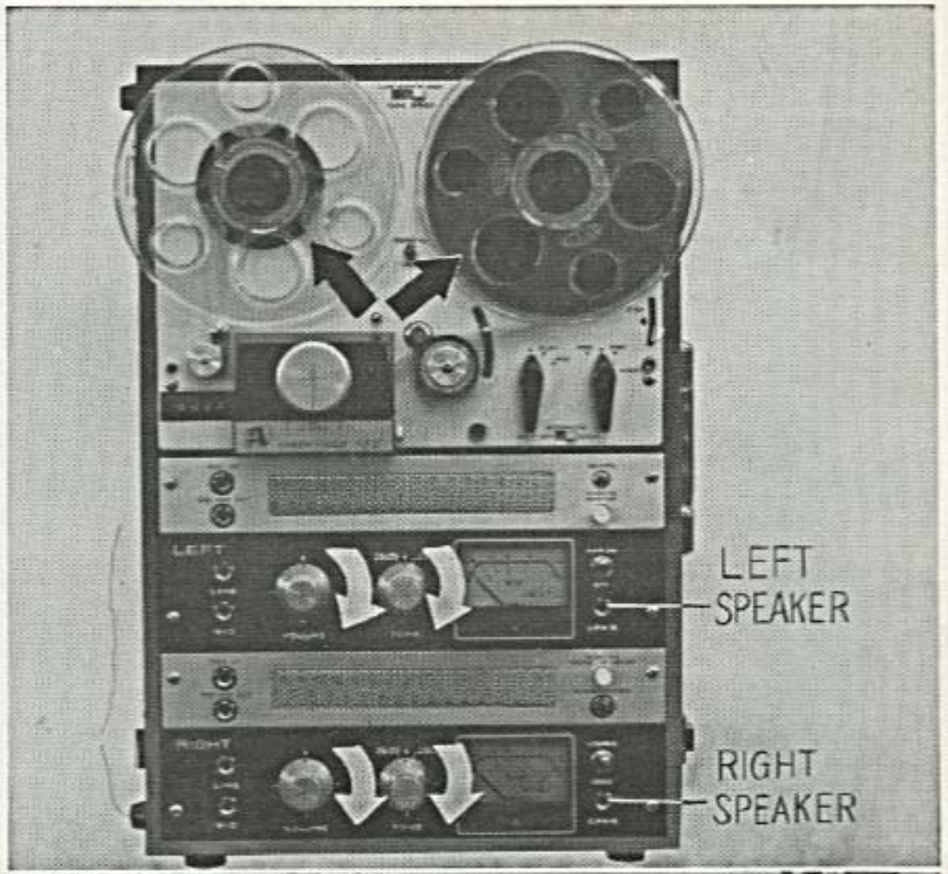
DUAL PREAMPLIFIER OUTPUT

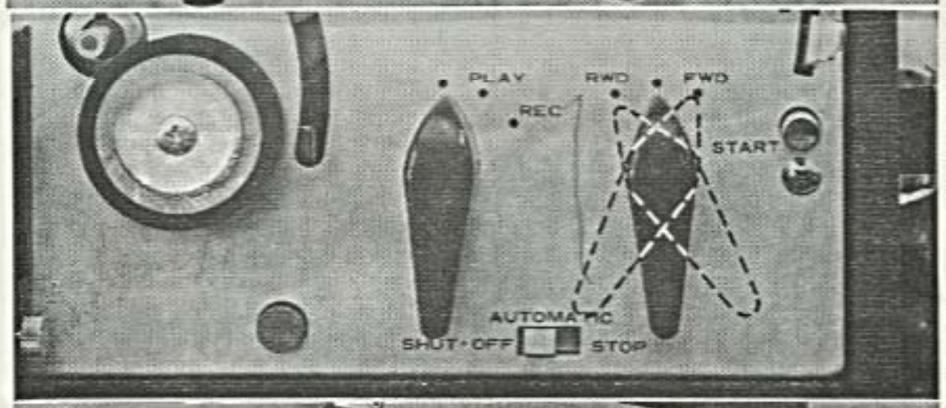
The preamplifier output can be used to feed a signal from the preamplifier of the M-8 to an external amplifier. In this case, connect the jack (s) to the auxiliary input jack (s) or to the crystal pick-up input jack (s) of the external amplifier by using shielded cable (s). The maximum output voltage at the preamplifier jack is 0.7 volt.

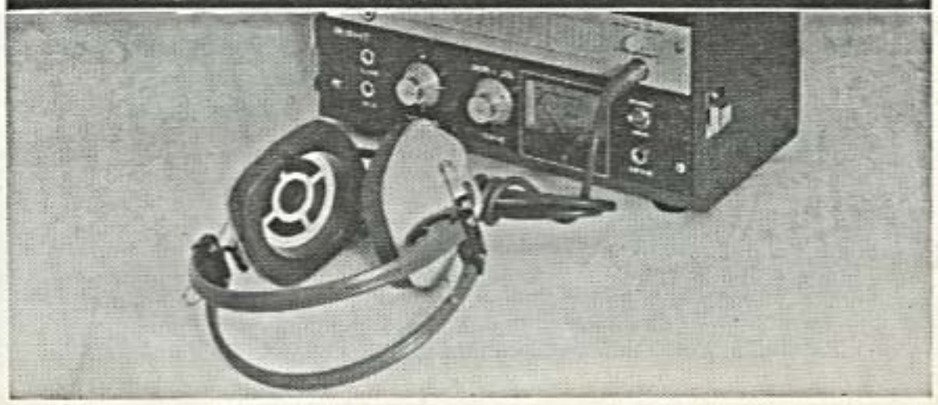
NOTE: Do not leave the plug (s) from the external amplifier connected to the preamplifier jack (s) when recording.

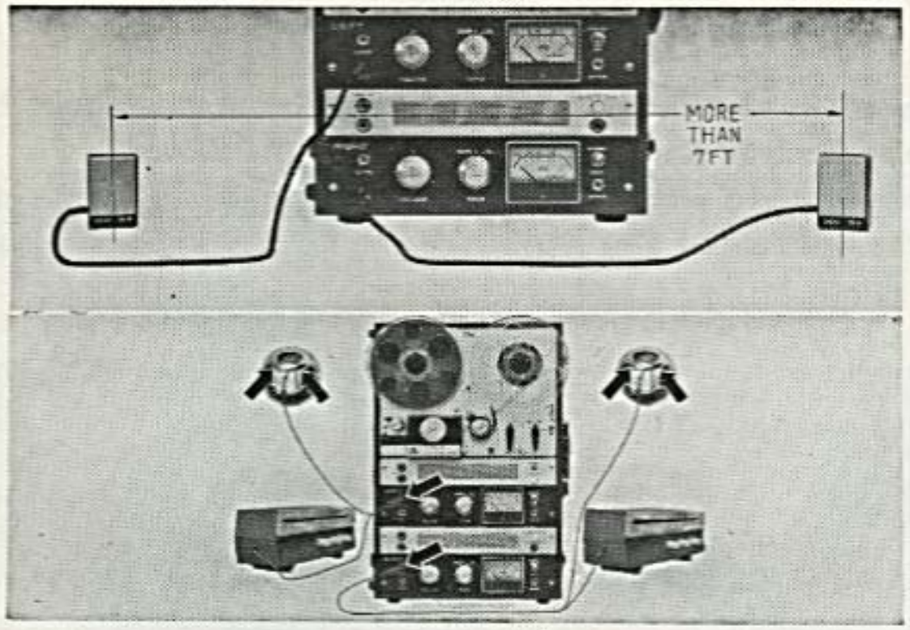
STEREO HEADPHONE JACK

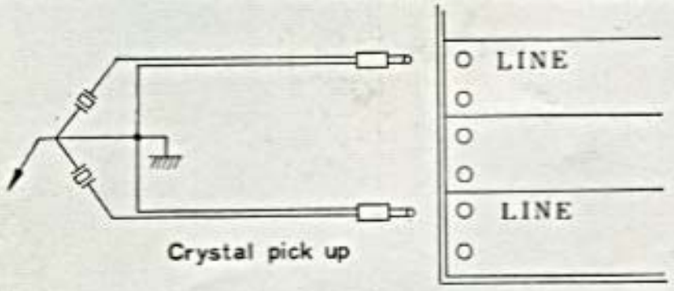
A stereo headphone set of low impedance type may be used for listening to stereo programs without disturbing others. If your stereo headphone has just one plug of the standard stereo connection type, connect it to this jack. If your headphone is equipped with two separate plugs, connect them to the jacks marked "SPKR" on both amplifiers.

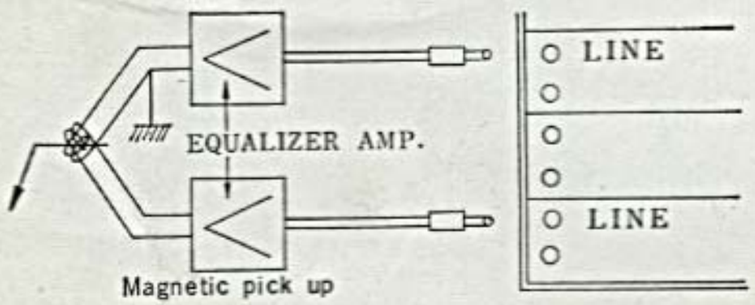


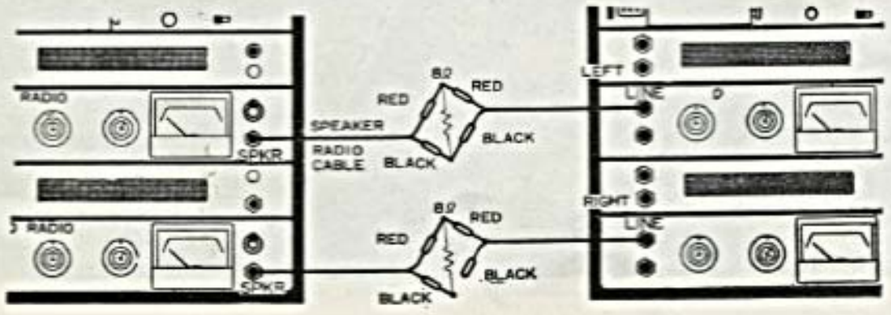












STEREO RECORDING

RECORDING WITH MICROPHONES

Insert the microphone plugs into the MIC input jacks.
Maintain separation of more than 7 feet between the microphones for stereo recordings.

RECORDING FROM STEREO BROADCASTS

Recording from stereo broadcasts can be made by connecting the LINE input jacks to the speaker terminals (voice coil terminals) or to the jacks marked "TAPE RECORDING" of radio sets, as shown. The CONNECTION CABLES, which are supplied as standard accessories, may be used for this purpose.

RECORDING FROM STEREO RECORD PLAYER

If your record player is equipped with a crystal or ceramic type cartridge, connect the output terminals of the record player directly to the LINE jacks of the M-8. The input voltage required for optimum recording level at the LINE jacks is between 0.5 and 1 volts.
If a magnetic or variable reluctance type cartridge is used in the record player, connect the output terminals of the player to a separate amplifier and then to the LINE jacks for proper equalization and additional amplification.

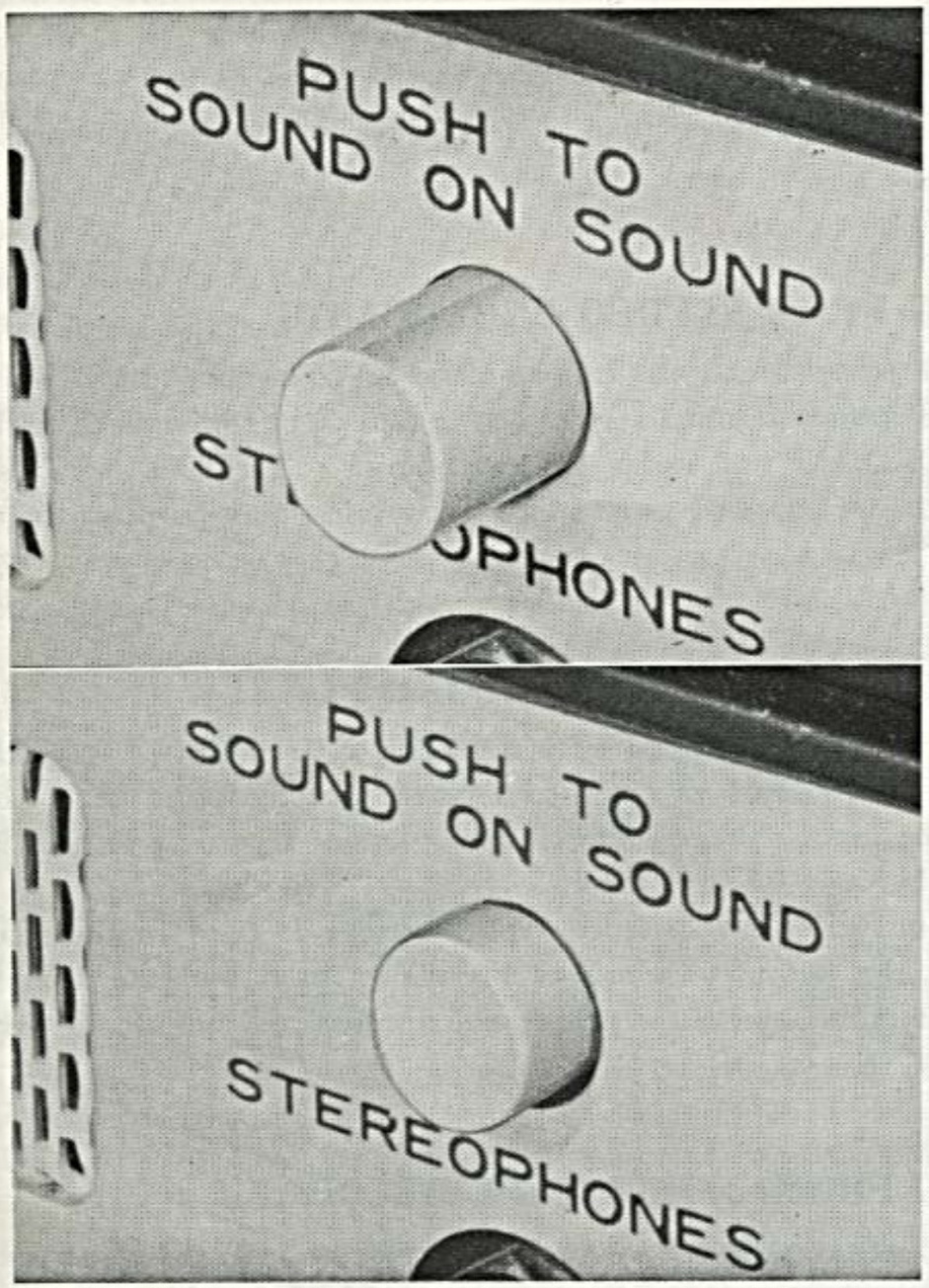
RECORDING FROM OTHER TAPE RECORDER

A stereo tape duplication can be accomplished by connecting two recorders as shown. Use the accessory CONNECTION CABLES for this purpose. It is recommended that 8 ohm resistors be used in the circuit as shown for best results.

* Disconnect black clip on the right amplifier as illustrated if hum develops while making recording in this manner.

CAUTION

①

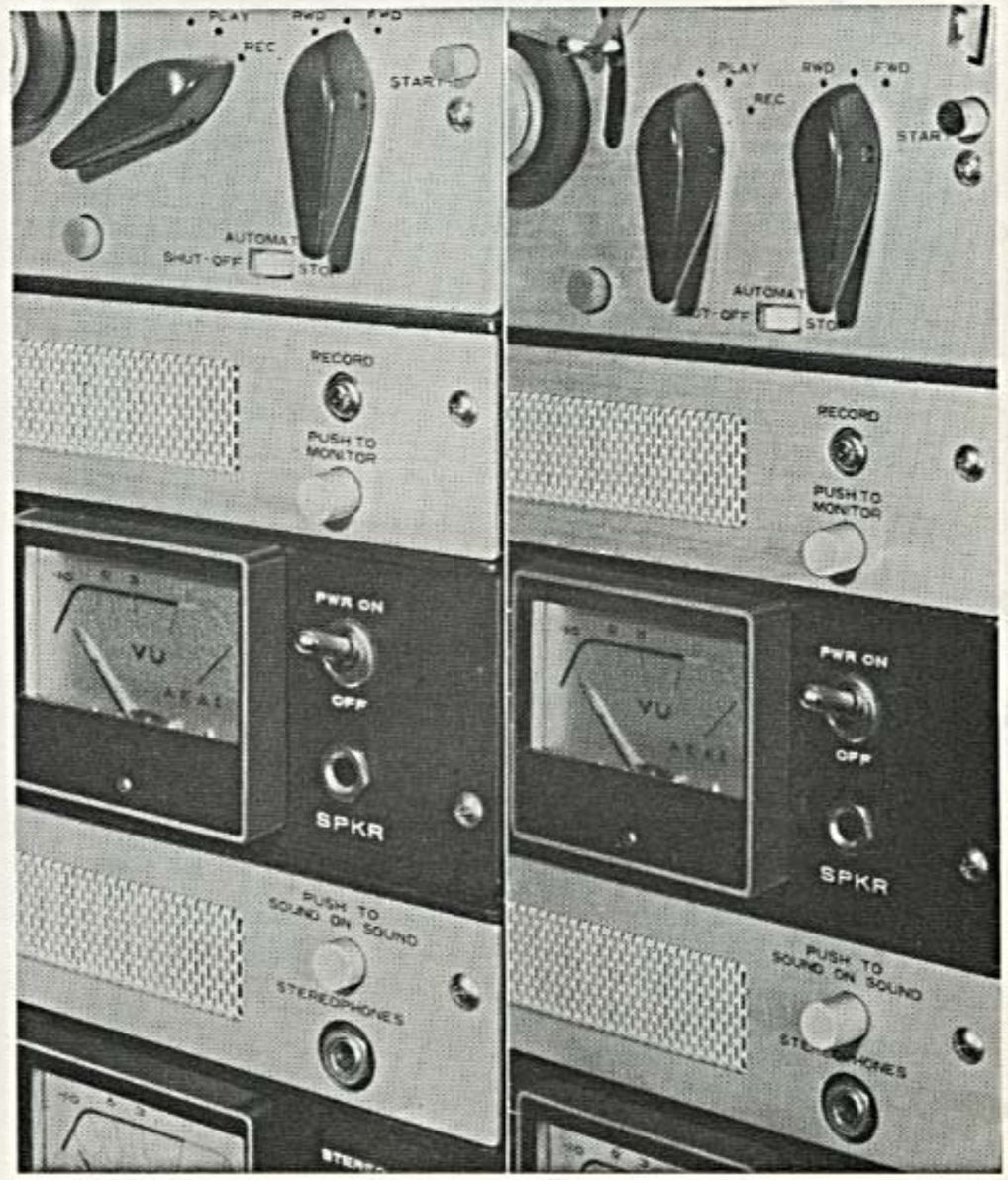


②

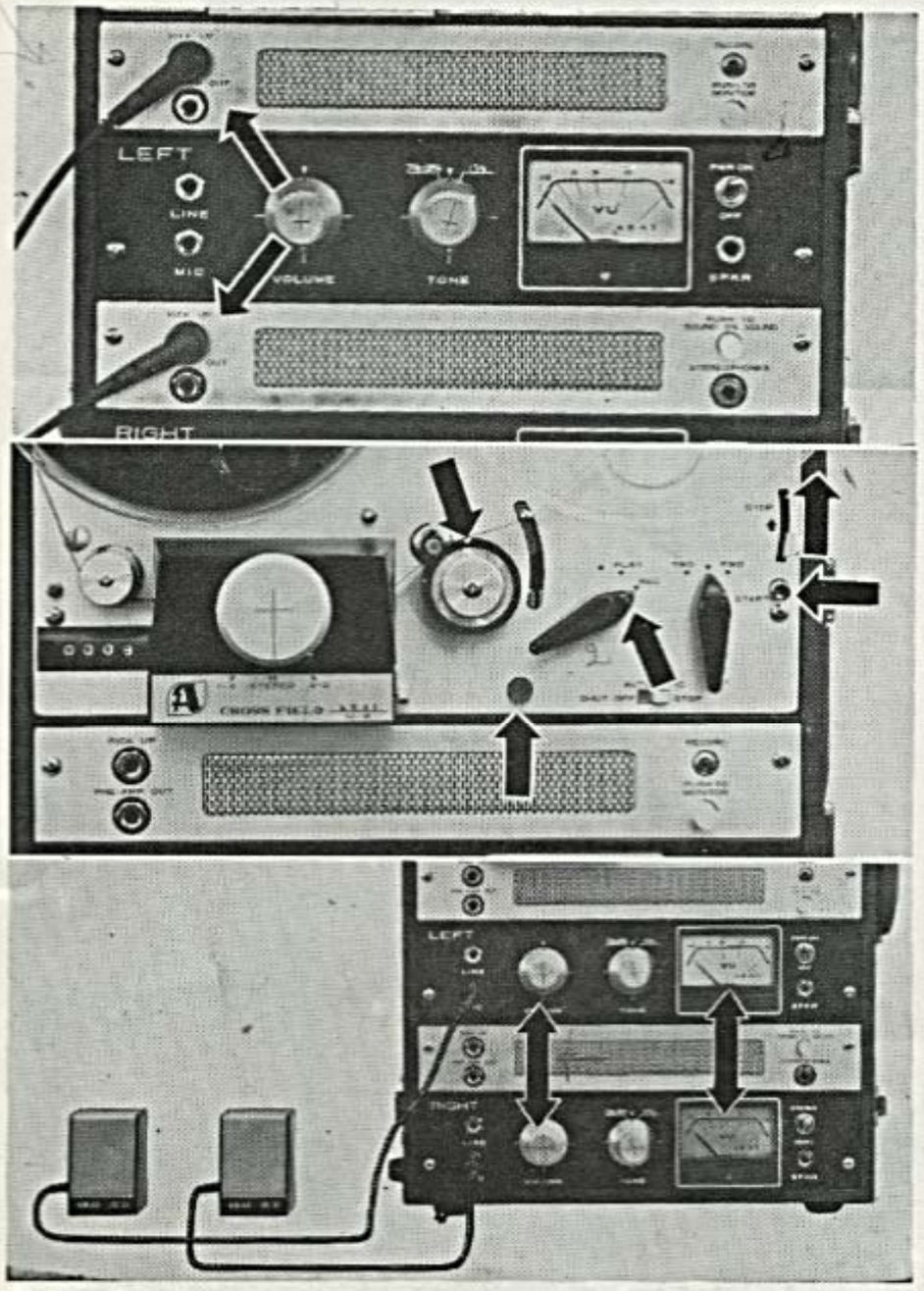
Please be sure to check and see that the push button of sound-on-sound is not remain depressed (As shown in Fig. 1) before you make a stereo recording. Should the button remains depressed recording on the right channel can not be achieved on a stereo recording. (As shown in Fig. 2)

Furthermore, in case the button is depressed by mistake after the record/play knob is placed in a record mode (As shown in Fig. 3) it also makes stereo recording (right channel) impossible unless you release the button and also return the record/play knob to a position (As shown in Fig. 4) and place it again in a record mode.

③ ④



Care should be taken in order not to connect the plugs from a record player to the PICK UP JACKS. No recording can be made if plug(s) are connected to the PICK UP JACKS.



RECORDING PROCEDURES

Before recording, insure that the following are set correctly.

1. POWER VOLTAGE AND CYCLE : Refer to "PREPARATIONS" given on page 9.
2. TAPE SPEED : Refer to page 10 and set tape speed accordingly.
3. POWER SWITCH : Must be set to "ON".
4. FUNCTION SWITCH : "STEREO"
5. EQUALIZER SWITCH : As desired. Refer to the instructions for stereo playback on page 11.
6. TRACK SELECTOR KNOB : "STEREO"
7. AUTOMATIC STOP, SHUT OFF SELECTOR SWITCH : "STOP"
8. EXTERNAL SPEAKERS : Not required. Disconnect speaker cables.
9. TAPE LOADING THROUGH AUTOMATIC STOP LEVER : As desired. Refer to the instructions for stereo playback.
10. INDEX COUNTER : Zero
11. RUBBER REEL CAPS : Use on both reels if the M-8 is to be operated in a vertical position.

Thread the tape as illustrated in the picture on the left. Push the instant stop lever upward until it locks and then turn the record/play switch to the "RECORD" position while depressing the record safety button.

When recording, the pilot lamp (recording indicator – neon lamp) is "ON" and indicates that the M-8 is in a recording condition.

The loudness of sound passing through both microphones or coming in through the LINE input iacks can be balanced by the volume control knobs on the left and right amplifiers by observing the VU meters. Care should be taken that the pointers of both VU meters do not exceed the "0" VU level except in raee cases.

After an optimum recording level is determined, push the start button to start recording on tracks No. 1 and 3.

It is suggested that a test recording be made before starting full-scale recording.

Tone control has no effect during recording as it is automatically disconnected by starting recording.

Note : If the microphones are used near the recorder, acoustic feedback may result. To avoid this, push the internal speaker on/off switch to disconnect the internal speakers.

STEREO RECORDING ON TRACKS NO. 2-4

After all the tape has been transported to the take-up reel or at the end of recording on tracks No. 1 and 3, gradually turn the volume controls counter-clockwise to zero. This will eliminate the possibility of recording a click noise when returning the record/play swith. Return the record/play switch while depressing the record safety button to stop tape transport. Remove both reels from the spindles and place the now full take-up reel on the feed (left) spindle and the now empty feed reel on the take-up (right) spindle. Push the instant stop lever and turn the record/play switch to "RECORD" while depressing the record safety button. Push the start button to start recording continuously on tracks No. 2 and 4. (Depressing the record safety button when turning the record/play switch will prevent head magnetization.) Return the record/play switch to stop tape when the automatic stop lever is not in use.

Note : If the tape is recorded only one way on tracks No. 1 and 3, it may by cut at any position for editing.

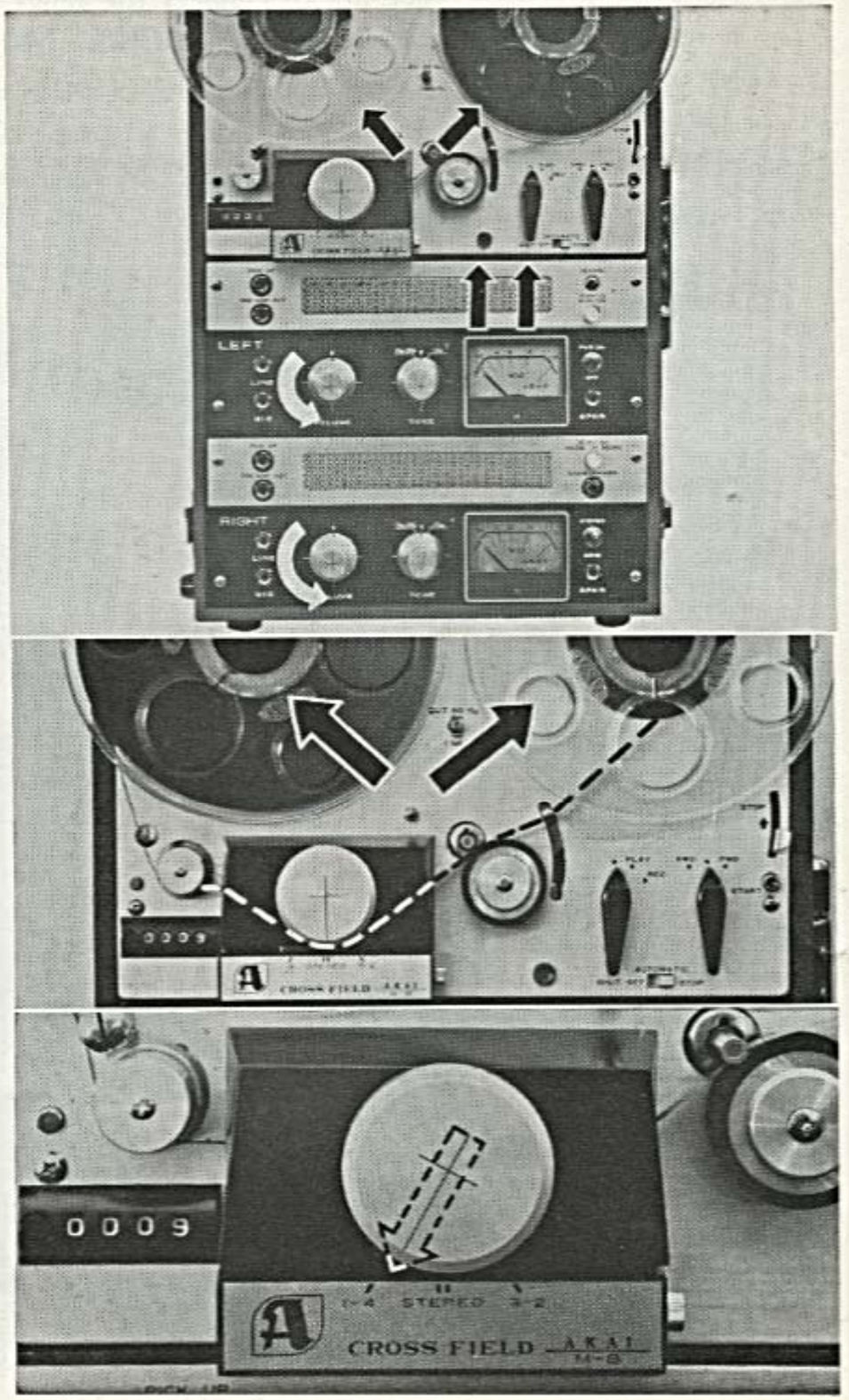
MONAURAL RECORDING ON TRACKS NO. 1-4

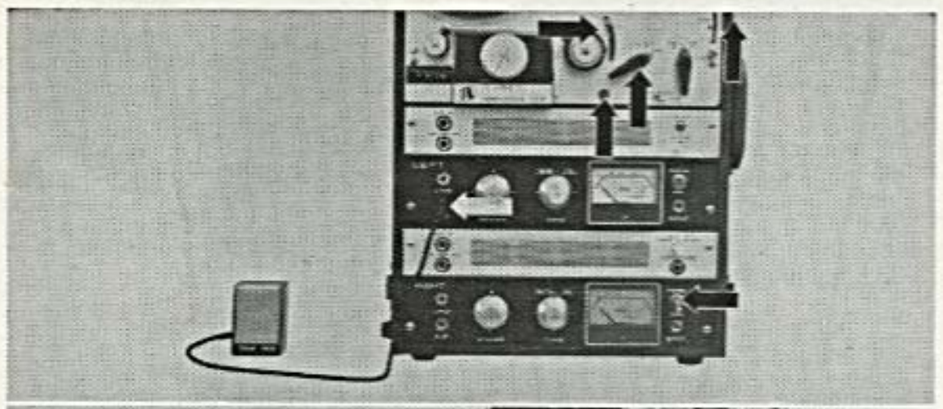
Only the left (upper) amplifier is used for monaural operation. The right (lower) amplifier is turned off by setting the function switch to "MONO". The first recording is made on track No. 1 and the second recording is made on track No. 4 by reversing the tape.

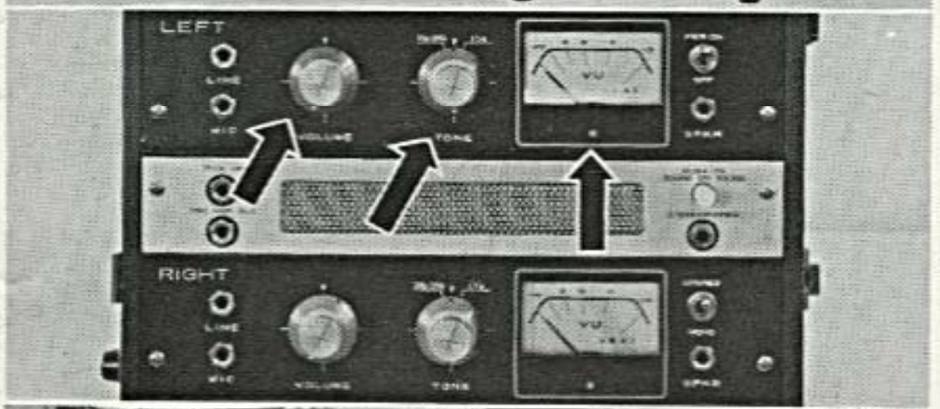
RECORDING PROCEDURES

Before recording, insure that the following are set correctly.

1. POWER VOLTAGE AND CYCLE: Refer to "PREPARATIONS" given on page 10.
2. TAPE SPEED : Refer to page 11 and set tape speed accordingly.
3. POWER SWITCH : "ON"
4. FUNCTION SWITCH : "MONAURAL"
5. EQUALIZER SWITCH (left amplifier): As desired. Refer to the instructions for stereo playback on page 12.
6. TRACK SELECTOR KNOB: "1-4"
7. AUTOMATIC STOP, SHUT OFF SELECTOR SWITCH: "STOP"
8. EXTERNAL SPEAKER : Not used.
9. TAPE LOADING THROUGH AUTOMATIC STOP LEVER: As desired. Refer to the instructions for stereo playback on page 12.
10. INDEX COUNTER : Zero
11. RUBBER REEL CAPS : Use on both reels if the M-8 is to be operated in a vertical position.







Connect a microphone to the MIC input jack of the left amplifier. To record from a radio set, record player, external amplifier, or from another tape recorder monaurally, use the LINE input jack of the left amplifier.

Thread the tape as illustrated in the picture on the left. Push the instant stop lever upward until it locks and then turn the record/play switch to the position marked "RECORD" while depressing the record safety button.

Adjust the volume control of the left amplifier to an optimum recording level while observing the VU meter. The pointer of the VU meter should not exceed the "0" level except in rare instances. The tone control has no effect when recording.

Note: If the microphone in used near the recorder, acoustic feedback may result. To avoid this, push the internal speaker on/off switch to disconnect the internal speaker.

After a correct recording level is determined, push the start button to start recording on the track No. 1.

At the end of recording on track No. 1, reverse both tape reels as mentioned in the previous pages for the next and successive recording on track No. 4.

If desired, the tape may be rewound on the feed reel by turning the fast-forward/rewind switch to "REWIND" (for editing).

MONAURAL RECORDING ON TRACKS NO. 3-2

All the settings of controls and switches are exactly the same as mentioned in the foregoing paragraph for monaural recording on tracks No. 1-4 on page 18, except the track selector knob. The track selector knob should be set to the position marked "3-2".
The third recording is made on track No. 3 and the fourth recording is made on track No. 2.
Follow the same procedure shown above for recording on tracks No. 1-4.

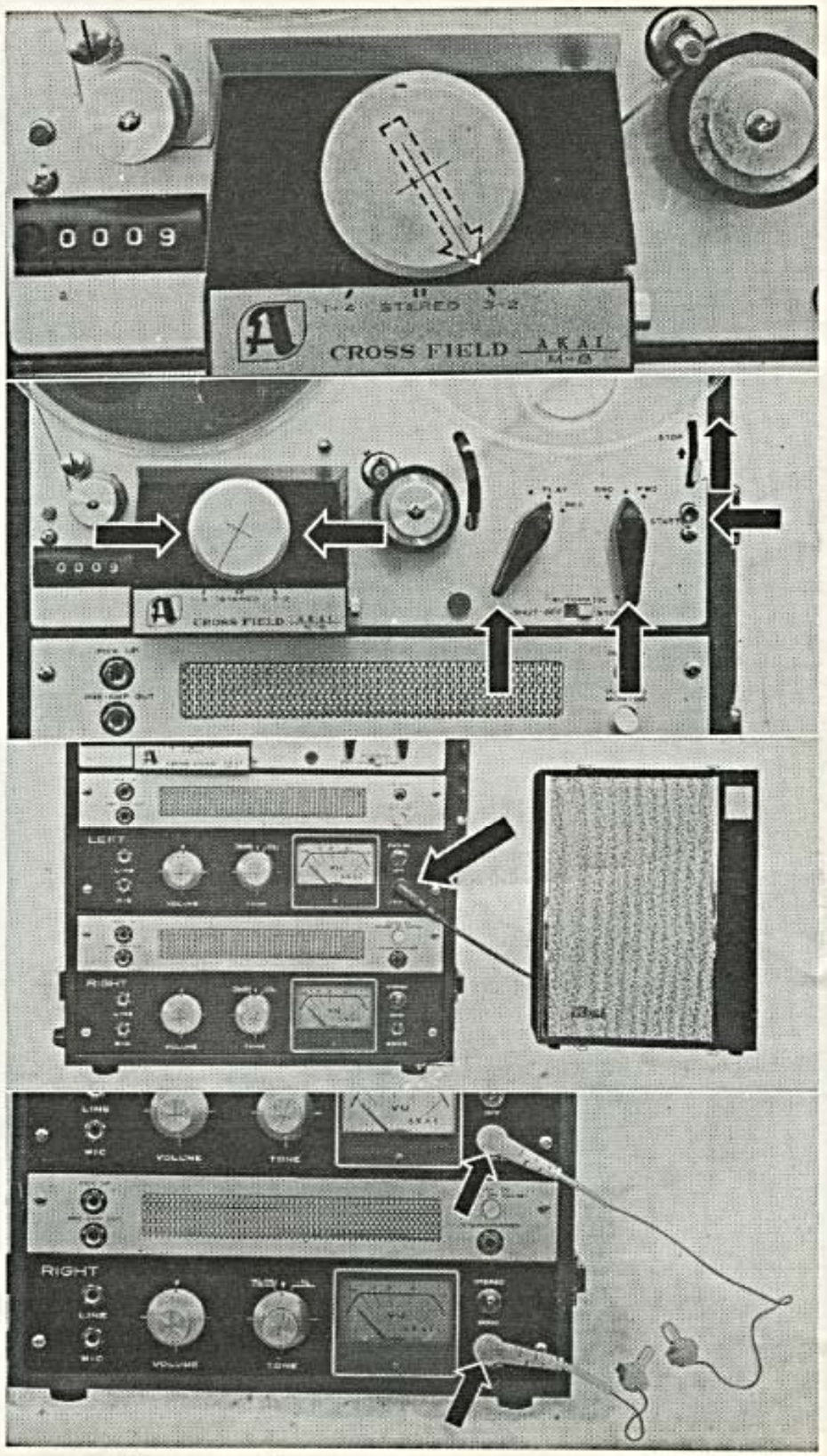
MONAURAL PLAYBACK

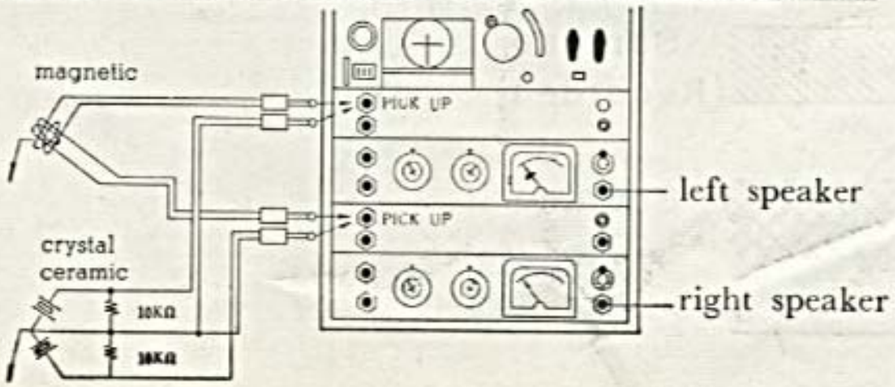
To playback a pre-recorded 4-track monaural tape, set the track selector knob to either the "1-4" or "3-2" position according to the track on which a desired program has been recorded. Thread the tape in the normal manner and push the instant stop lever upward until it locks. Turn the record/play switch to the position marked "PLAY" and depress the start button.
Adjust both volume and tone controls of the left amplifier to suitable positions. For superb sound reproduction, connect a large external speaker to the SPKR jack on the left amplifier. The internal speaker on/off switch should not be depressed if sound reproduction through the internal speaker is desired.

MONITORING

To make a precise monaural recording, it is suggested that a monitoring earphone be connected to the SPKR jack provided on the left amplifier.
Use another earphone of the same type connected to the SPKR jack on the right amplifier for stereo.

Note: An earphone of high impedance type such as a crystal earphone should always be used for this purpose. Care should be taken not to connect a low impedance headphone to the SPKR iack when recording.





RECORDING TELEPHONE CONVERSATIONS

Long distance telephone calls or important business calls may be recorded by using Akai's simple-to-operate Telephone Pick Up.

RECORDING WITH ENDLESS TAPE

To record unexpected events, commercials, educational exercises, etc., use the Akai Endless Tape. To place the tape on the Recorder, pull the tape from the left "OUTLET" so that the loop is large enough to be threaded around the head and capstan as illustrated.
After operation, the tape can be wound in the tape magazine by pulling the tape out slowly from the left "OUTLET" and allowing the tape to automatically wind on the magazine from the right "INLET".

PICK UP JACKS

The M-8 is equipped with two PICK UP JACKS on the amplifier panel. Connecting a record player to the PICK UP JACKS and combining with an external speaker system, the amplifiers of the M-8 may by used as high fidelity stereo/monaural amplifiers. (As in the picture on the left.)

1) Set the INSTANT STOP LEVER to the "STOP" position and connect the pick up output of the record player to the PICK UP JACKS.
2) Set the SPEED CHANGE SWITCH to the center position (marked "OFF"), cutting off the motor circuit.
   Adjusting the volume and tone control knobs of the amplifiers, high fidelity stereo/monaural reproduction is made through the external speaker system.

TECHNIKAL INFORMATION

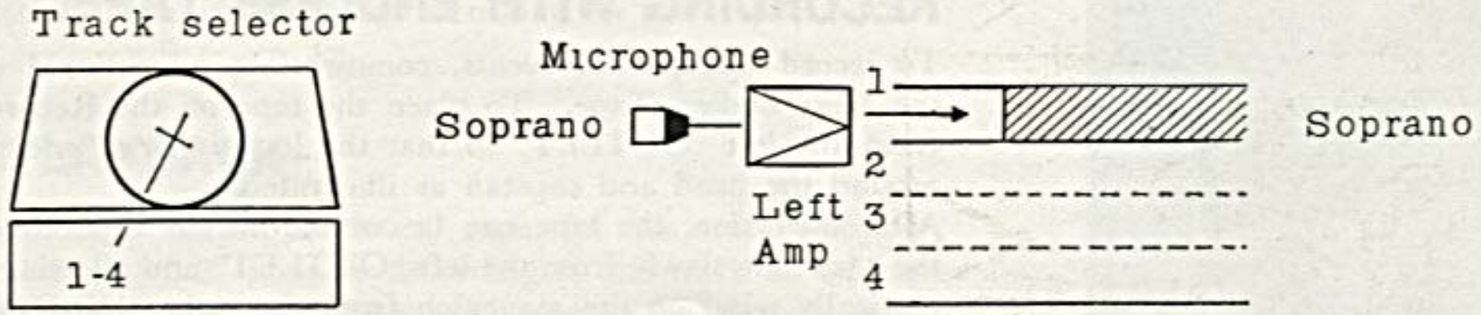
A record player equipped with a magnetic (or variable reluctance) cartridge can also be used for this purpose without difficulty. However, if your record player has a crystal (ceramic) cartridge, a carbon resistor of 10 kilohms is required on each channel, being connected in parallel with output terminals of the crystal cartridge, as illustrated on the left. This provides a flat frequency response.

USE OF SOUND ON SOUND

With the Model M-8, recording of sound on sound can be easily made. A wide application of sound on sound recording includes (for instance) the study of a foreigen language, a trick recording, a duet by one person, or a quartet of musical instruments, etc.

The case of singing a song in duet style by one person is taken up (for instance).

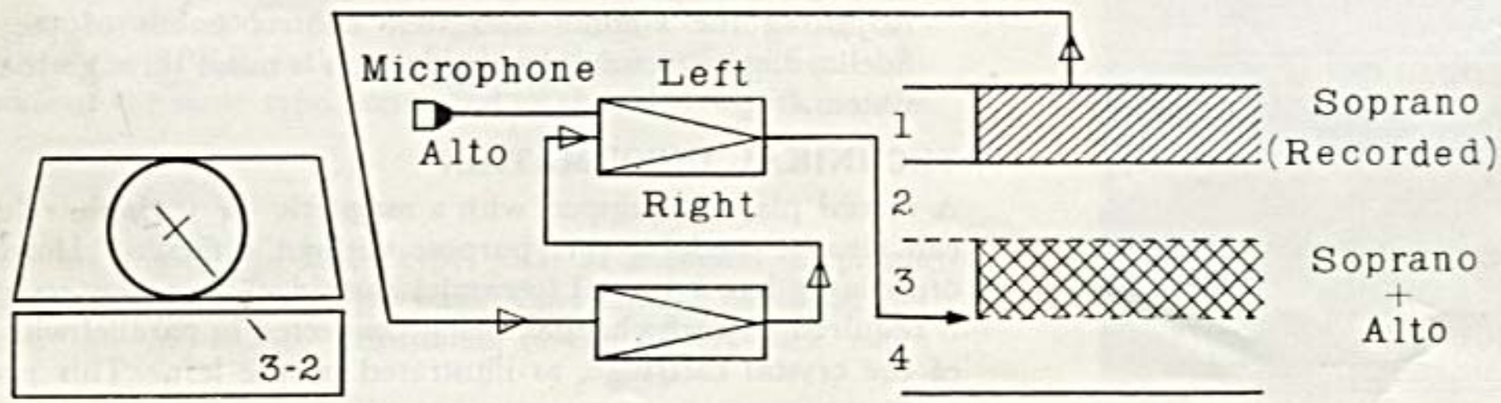
(1) Place the tape on the recorder and set the tape counter to "0". Record the soprano on the first track with the proper recording level of near 0 VU.



(2) After recording, rewind the recorded portion, turn the track selector to position 3-2, and depress the pushbutton for sound on sound. In this case, a crystal earphone is inserted into the speaker jack of the left channel amplifier for monitoring and the internal speaker should be cut off with the speaker switch. For setteng the proper level, the following procedures are taken.:

Start the recording with the left channel amplifier volume set as before. As the volume of the right channel amplifier is slowly turned up, the soprano which has been recorded in (1) on the first track is heard through the earphone. Adjust the volume of the right channel amplifier so that the VU meter of the left channel amplifier points the proper level near 0 VU.

When the volume is excessively turned up, self-oscillation may occur. This is due to the first recording level being too low. To avoid such trouble and for good sound on sound recording, the above instruction should be strictly followed. The above completes the necessary adjustment. Rewind the tape again and record alto this time, listening to the soprano from the first track through the earphone. This operation is illustrated in the following:



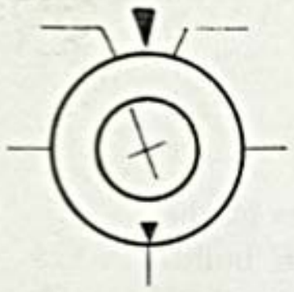
The soprano is reproduced by the right channel amplifier (electrically connected with the left channel amplifier), mixed with the alto input from the microphone, and recorded on the third track.

(3) When this portion is rewound, the third track is reproduced and a duet of soprano and alto can be heard. When the first track is reproduced, the soprano, alone can be enjoyed. In the same manner, when the first and the third tracks are interchangeably selected (dy the track selector), such recording of sound on sound can be made repeatedly, thus permitting a person to produce even quartet or sextet singing.

(REMARKS CONCERNING SOUND ON SOUND RECORDING.)

① The tone control of the right amplifier should be set in the following position for obtaining the best results.

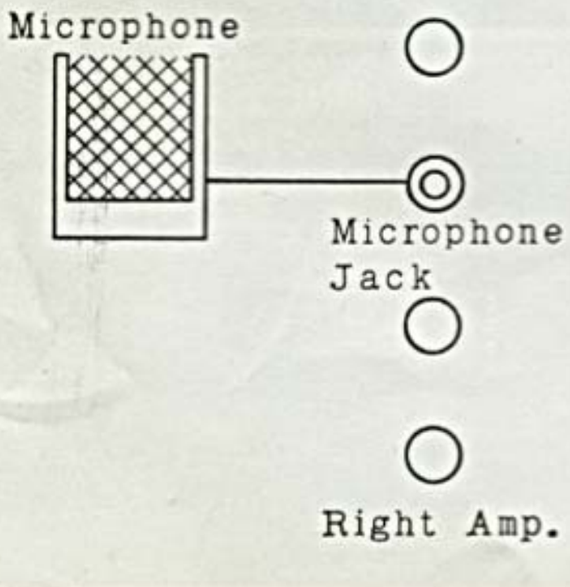
② When an internal speaker is operated, acoustic feedback may be caused, depending on the recording condition. Therefore, it is recommended that the crystal earphone be used instead of the internal speaker, of which the switch should be turned off.

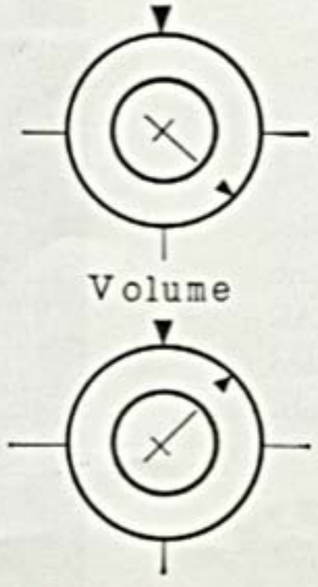


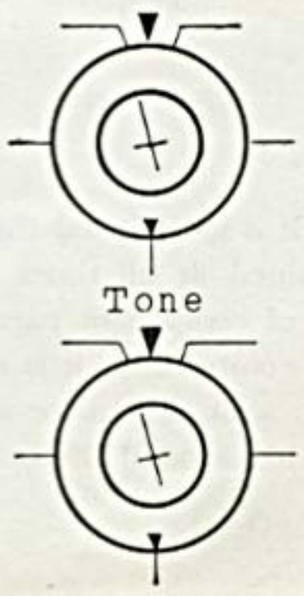
③ Following completion of a sound recording, the depressed pushbutton of the sound on sound operation must be further depressed, allowing it to return to the normal position. (Should the button remain depressed, stereophonic recording operation is not possible. Care shuld be taken!)

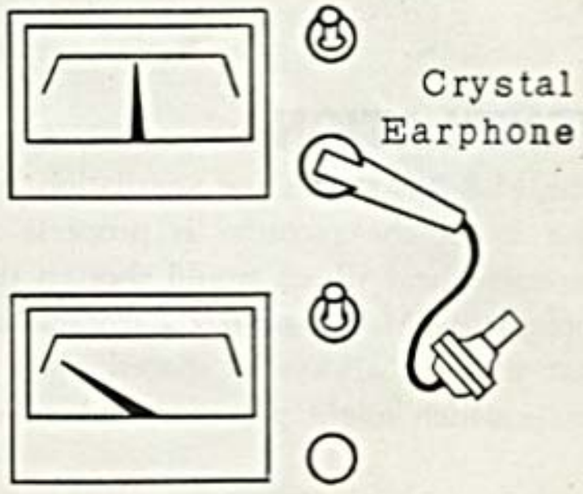
Reference examples:

Typical positions of volume and tone controls.









TAPE CLEANER

A squeaking noise may annoy the operator while recording or reproducing. This may be caused either by poor tape or by ambient conditions of temperature and humidity. When foreign material adheres to the recording tape, this material piles up at the recording head, affecting volume or quality of sound.

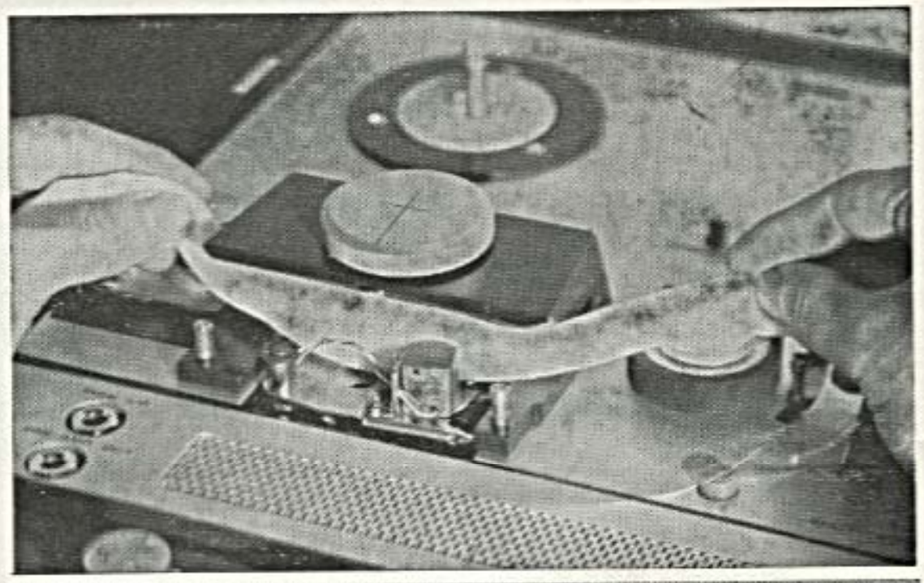
The Model M-8 is provided with a tape cleaner, a felt pad properly soaked in silicone oil to eliminate noise. When wishing to cleam the tape, the tape cleaner button should be depressed. When not needed, the tape cleaner should be turned clockwise and locked. If the felt pad is contaminated so that it does not produce good cleaning of the tape, loosen the upper screw and turn the felt pad to the unused side. When both surfaces of the pad are contaminated, the pad should be replaced with a new one. Upon replacing, one or two drops of silicone oil (included) should be placed on the felt for apsorption.

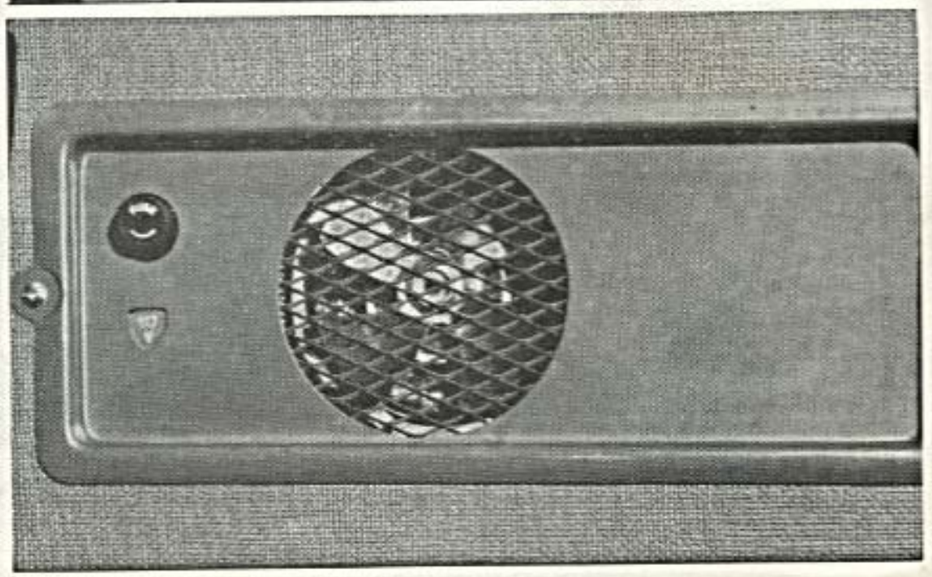
Note: When an excessive amount of silicone oil is applied, the tape surface may become discolored and sticky.

CLEANING TAPE HEADS

In time. the record and erase heads will accumulate small quantities of the brownish-red oxide with which recording tapes are coated. The oxide build-up may become severe enough to hold the tape away from the minute rec-ording head gap or may magnetically short-circuit the gap. The effect is reduced high frequency response and, in severe cases, reduced volume across the entire range of frequencies.

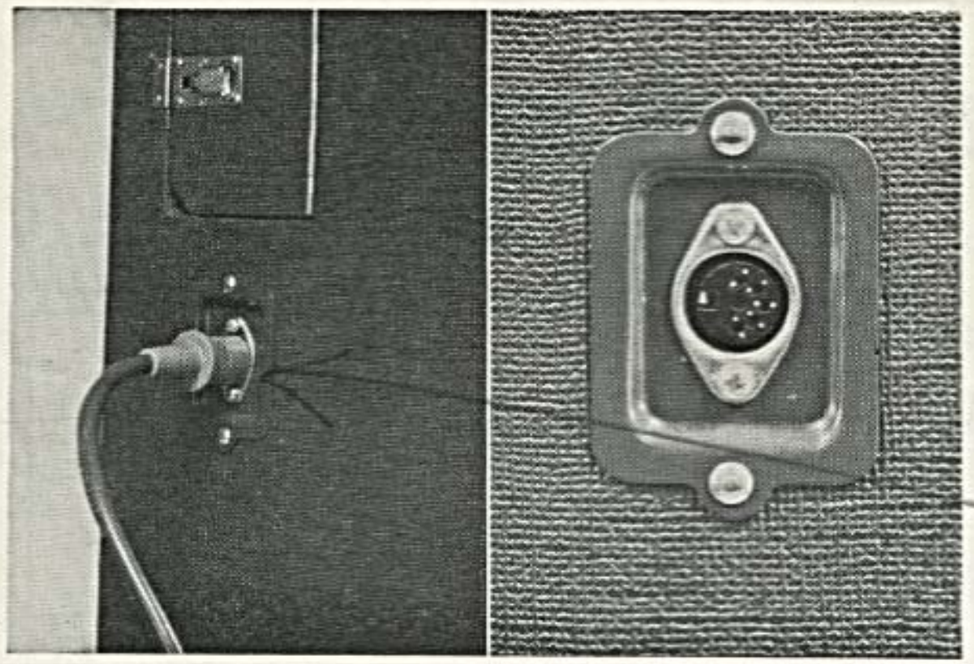
The heads must be cleaned periodically with a soft cotton swab soaked in alcohol.





VENTILATION

The M-8 has an unique ventilation system. It is so designed that air circula-tion inside the recorder is properly maintained at all times and that no excessive heat which would shorten the life of component parts results. Al-though the M-8 is perfectly tropicallized in construction, it is recommended that the unit always be spaced away from a wall, screen, or any othes ob-stacle which might prevent good air circulation around the unit.



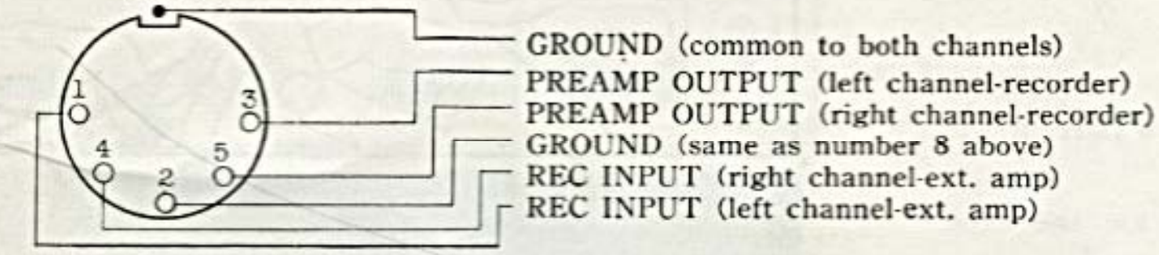
DIN (ONE CONNECTION) JACK

The DIN Jack is located on the left side of the M-8 and is provided for interconnecting the recorder with an external stereo amplifier that has the same connection jack. This system wil make easy record and playback of stereophonic programs possible through an external stereo amplifier as the complexity of connecting or disconnecting more than 4 separate plugs from the recorder's panel side is not needed.

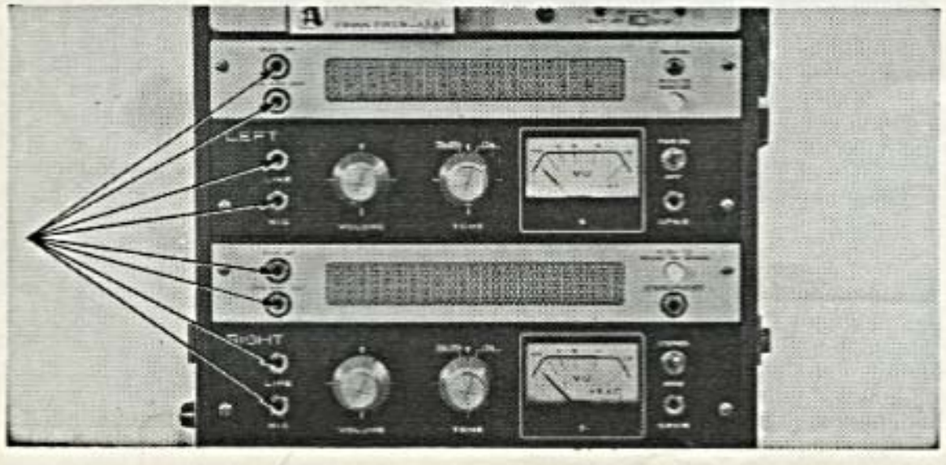
If your amplifier is not equipped with the DIN jack and use of this one-connection system is required, consult a radio expert for necessary modification of your amplifier.

1 Din Jack from AKAI M9

JC8



Front View of DIN Jack



TAPE ERASING

To erase pre-recorded material, first determine that there is no connection to a LINE jack and a MIC jack. turn the volume control to "0".

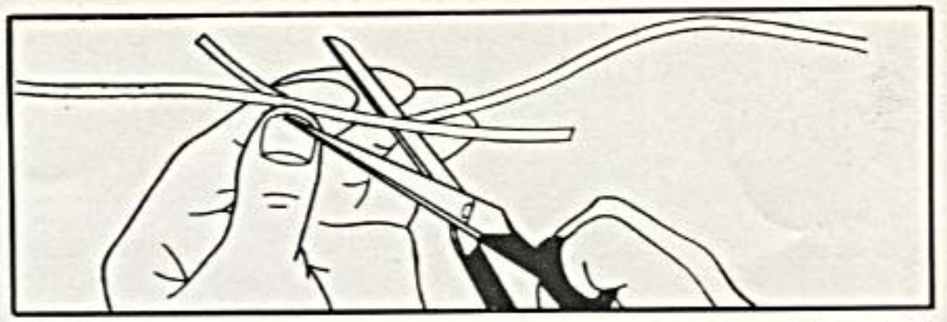
Place the tape to be erased on the left spindle and thread it in a normal manner. Then set the pointer of the track selector as desired.

Set the recorder to "RECORD" in a noamal manner. Any materials previously recorded on tape will automatically be erased as tape advances.

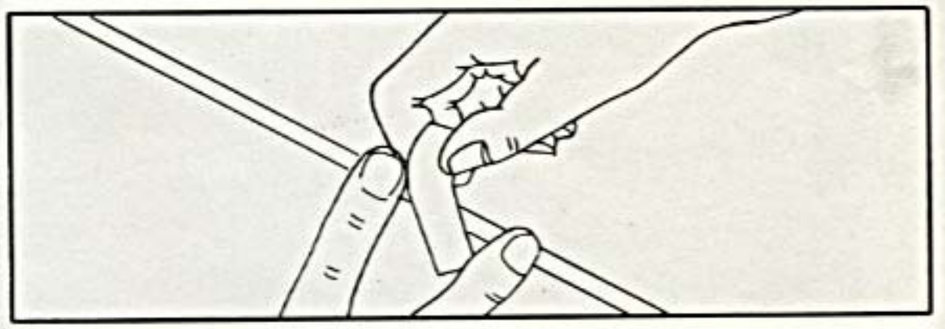
To shorten erasing time, use of accessory Tape Eraser No. ATE-7 is recommended.

TAPE SPLICING AND EDITING

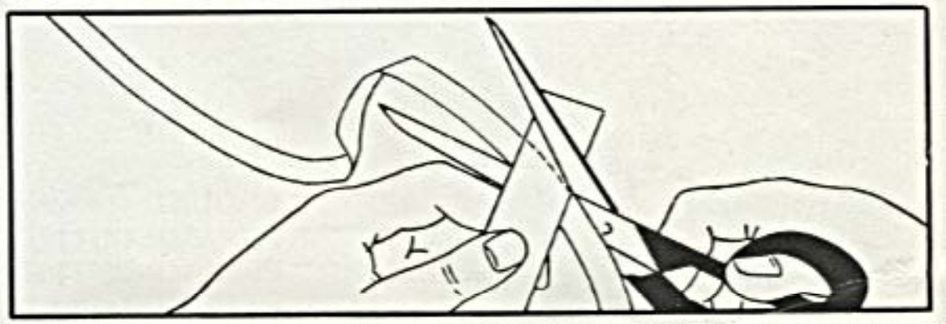
Cut tape diagonally with an overlap so ends line up. (Cutting tape on a diagonal will eliminate detection of splice when recording.)



Cover aligned ends with SPLICING TAPE.
Press firmly, exerting pressure to secure ends evenly and securely.

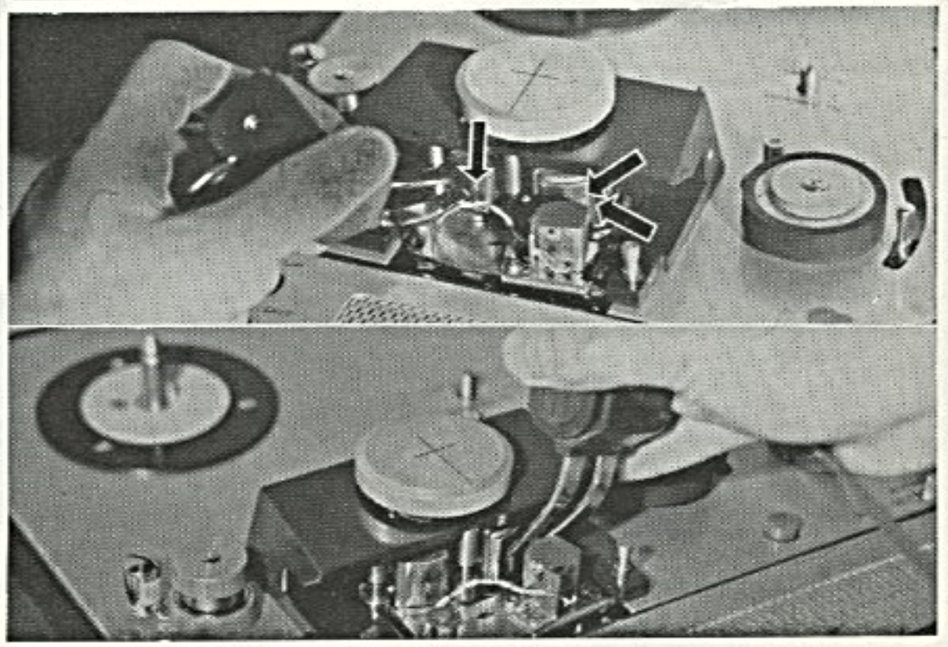


Trim off excess SPLICING TAPE.
(Cut into the recording tape backing very slightly as illustrated by the dotted lines. This eliminates possibility of a sticky splice.)



HEAD DEMAGNETIZATION

In the course of normal use, the steel pole pieces which form a part of the recording and play back heads become slightly magnetized.
The effect of the slight head magnetization is to partially erase the tape (with high frequencies suffering most).
As a general rule, slightly magnetized heads can be detected by noticing loss of normal high frequency response which cannot be corrected through head alignment. Severe magnetization, which may result if magnetized tools are used in the vicinity of the heads, will result in noise or considerable distortion of the sound of tapes being played (in addition to loss of high frequency response).
It is recommended that a portable demagnetizer be used periodically.
Head de-magnetization can be accomplished by touching the head lightly with the de-magnetizer and making several small circular motions over all head surface areas as well as the head housing (after removing the head cover).



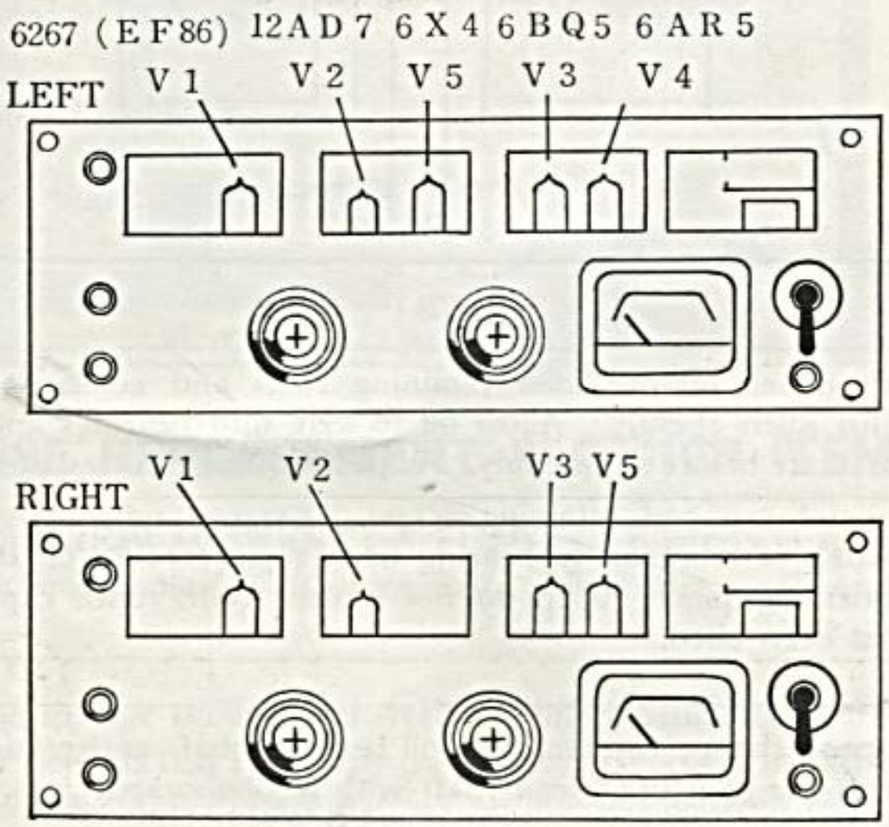
TUBE REPLACEMENT

Tubes are accessible by removing the two screws which mount the tube compartment panel on both the left and right amplifiers and lifting the panel clear.

For malfunctions listed in the trouble shooting chart, replace the tube indicated in the TUBE LOCATION CHART.

Care must be taken when replacing tubes to avoid bending tube pins.

Tubes and sockets have blank positions which must be aligned when tubes are re-inserted.



V1 : 6267 (EF86) Low noise pentode.
V2 : 12AD7 (same as 12AX7) High μ dual triode.
V3 : 6BQ5 Power output stage.
V4 : 6ARS Bias erase oscillator.
V5 : 6X4 Rectifier tube.

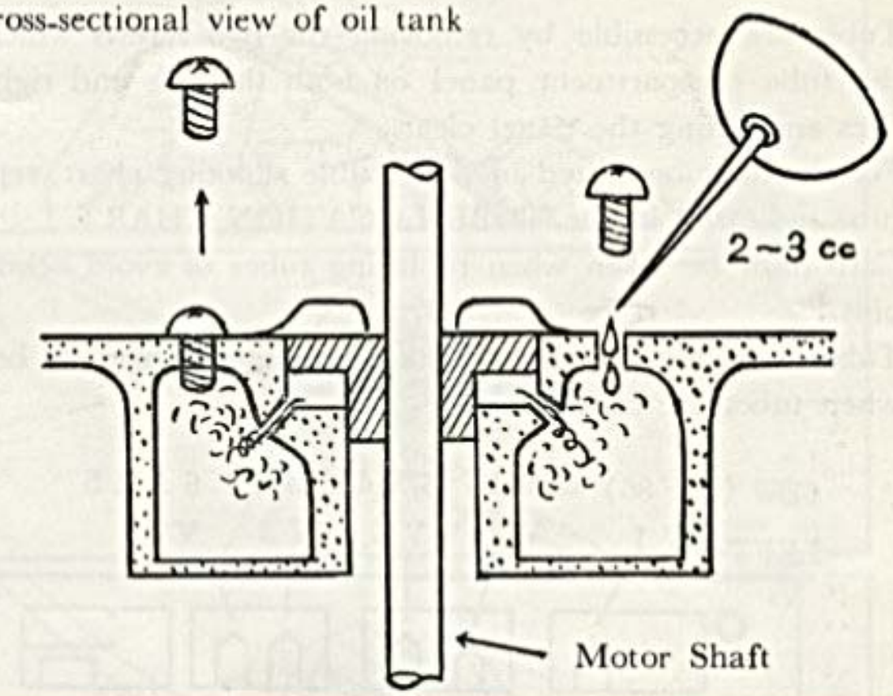
MOTOR LUBRICATION

For maximum service life and optimum performance, it is recommended that the drive motor of the M-8 be removed and lubricated after every 600 hours of operation, as illustrated below.
First, remove the Motor Plate, Motor Bushings, Belt Retainer, and Washer as shown. Next, remove both of the ball-head screws which are mounted on the oiling holes of the cast motor frame. Oil the motor carefully until the oil tank is saturated with the specified lubricant. Replace and tighten the ball-head screws. Reassemble and install the motor block as before.

CAUTION: Use the specified lubricant (ESSTIC No. 50, TURBINE OIL No. 90, or equivalent) for this purpose. Any lubricant of good quality other than that specified can also be used but will result in more frequent lubrication.
Do not over-lubricate; wipe off excess immediately. Otherwise, the lubricant may be scattered during operation and deterioration of rubber parts in the recorder may result.

NOTE: Lubricate the oil tank on the bottom side of the motor in the same manner.

Cross-sectional view of oil tank



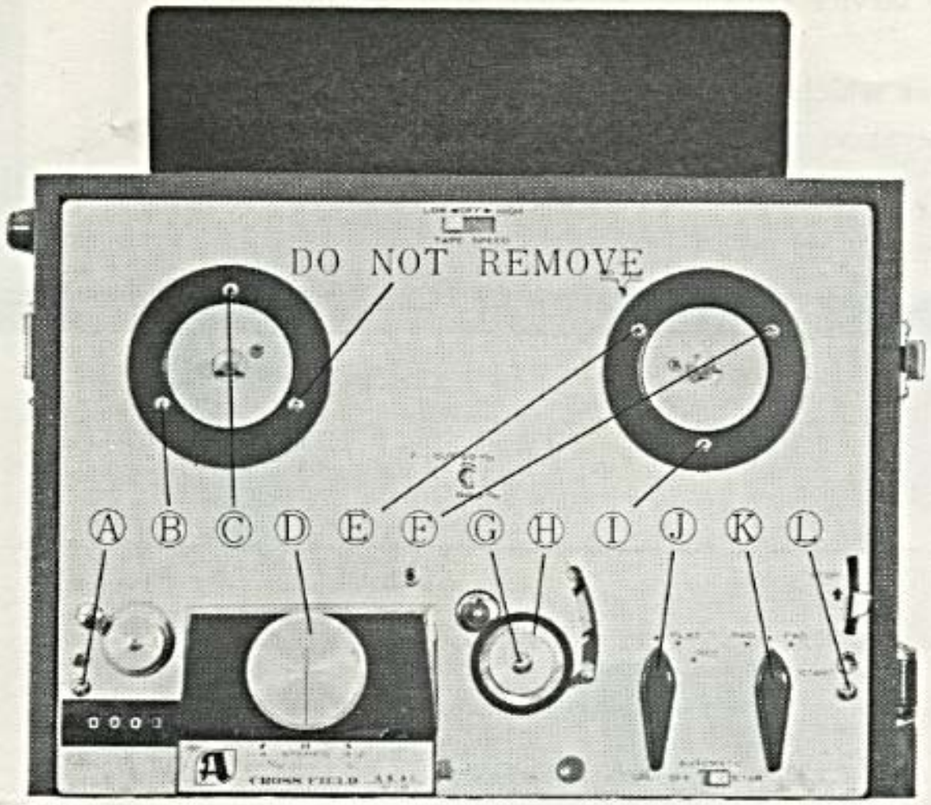
LUBRICATION CHART

LUBRICATION POINT	AMOUNT OF LUBRICANT	LUBRICANT	NOTES
Rewind Idler Bearing, Wind Take-up Idler Bearing.	2 drops on each idler bearing.	# 1	Remove top panel, remove idler retaining rings and composition washers; lift idlers slightly. Allow oil to soak into bearings and to flow down shaft before reassembly. Wipe off excess immediately.
Pinch Roller Bearing.	See note.	# 2	Remove metal cap and retaining screw. Remove roller. Apply liberal coating of lubricant to bearing bore, replace roller on shaft. When lubricating pinch roller, do not replace roller until capstan bearing has been oiled.
Motor.	See above.		
Drive Capstan Shaft.	Saturate felt washer in chrome retaining cap.	# 1	Remove speed change capstan, flow oil between shaft and retaining cap through the aparture, clean shaft with alcoholsorked cloth.
Roller or all levers and cams.	As noted.	# 2	Apply a liberal film of lubricant to each roller surface as needed.

LUBRICANTS: # 1-Light machine oil.
2-Light machine grease.
CAUTION: DO not over-lubricate.

Lubricate the M-8 every 3 months in heavy duty service, every 6 months in moderate service, or annually in light service.

REMOVING TOP PANEL



When removal of the deck top panel is required for repair or maintenance, follow the instructions given below:

1. Remove all mounting screws identified in the picture at the left from Ⓐ thrn Ⓛ, using a Phillips-head screw driver.

2. The track selector control knob can be removed by loosening the screw Ⓓ. Before removing the knob, remember the original direction of the pointer engraved on it.

FUSE REPLACEMENT & OTHER ITEMS

FUSE REPLACEMENT: A FUSE POST is provided on the back of the M-8. Remove the cap of the FUSE POST, and replace the fuse with a 2 ampere, 3 AG type unit. Disconnect power and turn power switch off before replacing fuse.

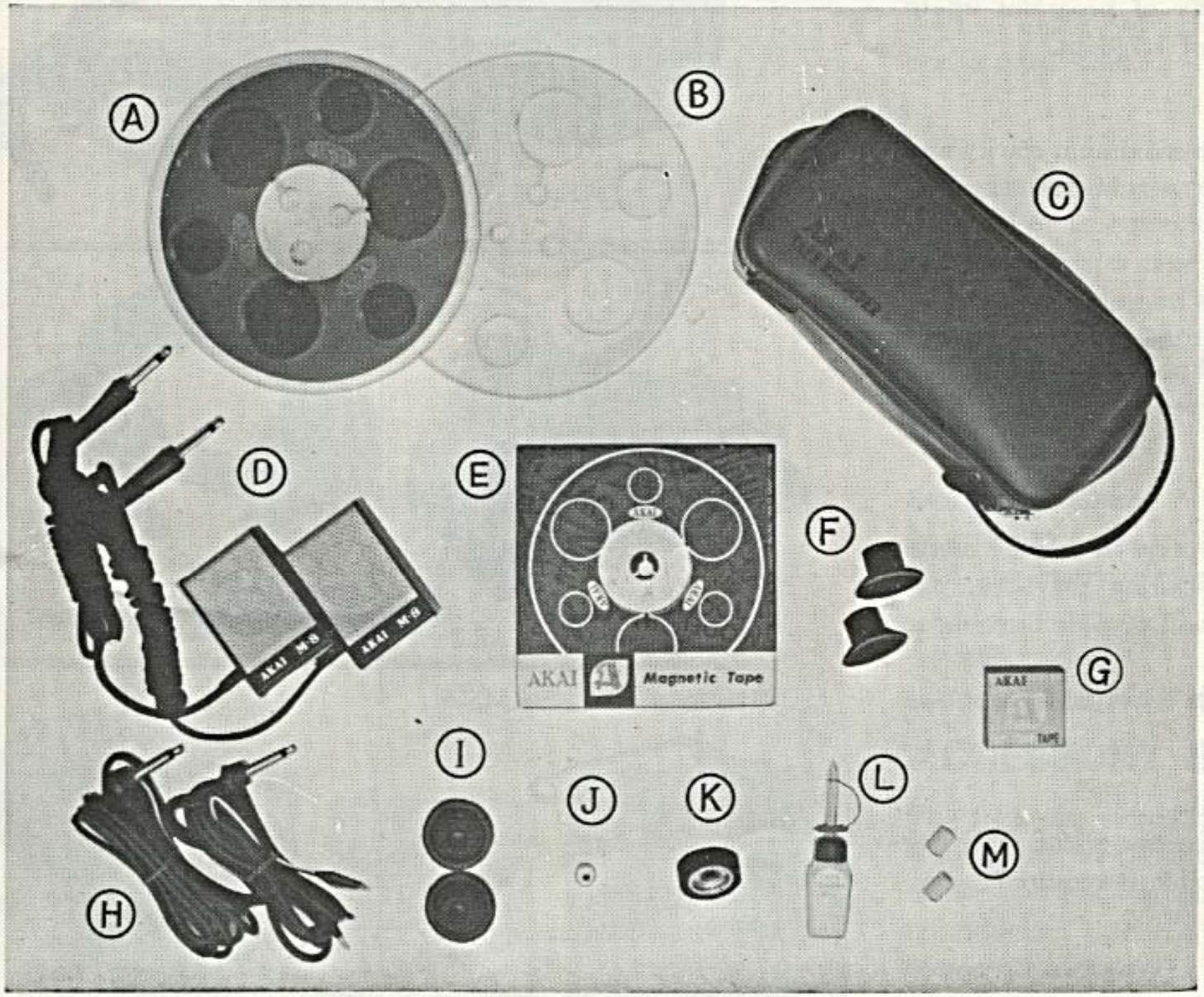
NOTE:
Tape spillage occurs when reels of different diameters are used. The use of identical reels is necessary for correct tape handling.
TAPE EDITIEG: If only one track is recorded, the tape may be edited by cutting out unwanted portions or by joining selections from another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use. For very precise editing, turn REC/PLAY SWITCH to the "PLAY" position and push INSTANT STOP LEVER. Turn reel by hand to locate the word or sound. The tape is then cut or marked at this point.

NOTE:
Only such corrective maintenance measures as are listed in the preceding paragraphs should be attempted by the user. Any other service which may be required should only be performed by service personnel familiar with the mechanical and electrical requirements of magnetic recorders.
The TROUBLE-SHOOTING CHART serves as a guide to procedures which are felt to be within the limits of the "user-performed" service. When any difficulty is encountered in the operation of the recorder, consult the chart, locate the symptom, and proceed as directed. If the symptom persists after corrective action has been taken, consult your nearest dealer for service recommendation.

TROUBLE SHOOTING CHART

SYMPTOM	CAUSE	CURE
A. Motor does not run, pilot lamps in VU meter (LEFT & RIGHT) do not light.	1. AC cord on the Recorder not properly connected. 2. Fuse blown.	Connect AC cord. Replace fuse.
B. Lamps in VU meter light but no speaker hum exists even at full volume.	1. Speaker cable disconnected. 2. Defective tube.	Reconnect speaker cable. Replace defective tube.
C. No record or play but speaker hums at full volume.	1. Head cable disconnected.	Reconnect head cable.
D. Only hum recorded on tape.	1. Mike cable disconnected.	Reconnect mike cable.
E. Unit plays okay, recording distorted and poorly erased.	1. Defective bias oscillator tube. 2. Deposit of dust on head.	Replace. Clean the head gently with soft cotton swab.
F. Wow or flutter at 7-½"/sec .or 3-¾"/sec. Insufficient drive.	1. Defective drive idler. 2. Oil on drive capstan. 3. Defective main belt. 4. Defective motor or capacitor.	Replace. Clean capstan. Refer to serviceman. Refer to serviceman.
G. Poor high frequency response or noisy playback.	1. Heads misaligned. 2. Heads magnetized.	Align heads. Demagnetize heads.
H. Cycle Conversion Switch does not move smoothly.	1. Shortage of oil on the Cycle Conversion Switch.	Place one or two drops of light machine oil on the Cycle Conversion Switch spindle.
I. Tape spills off when winding or rewind ing.	1. Different reel size.	Use reels of same diameter.
J. The unit does not rewind tape.	1. Broken or worn rewind idler.	Replace rewind idler.

ACCESSORIES SUPPLIED



- Ⓐ 7″ reel with tape 1
- Ⓑ 7″ empty reel 1
- Ⓒ Case for all accessories 1
- Ⓓ Dynamic microphones 2
- Ⓔ 1-7/8 ips demonstration tape 1
- Ⓕ Rubber reel caps for reels 2
- Ⓖ Splicing tape 1
- Ⓗ Connection cables 2
- Ⓘ Rubber reel retainers 2
- Ⓙ 15 ips capstan bushing 1
- Ⓚ 15 ips pinch wheel 1
- Ⓛ Tape cleaning oil (Silicone oil) 1
- Ⓜ Extra felt pad for replacement 2

Note : Rubber reel retainers Ⓘ are supplied strictly for the purpose of holding reels inside the case lid.
Do not attempt to use them for holding reels on the recorder.

ACCESSORIES AVAILABLE

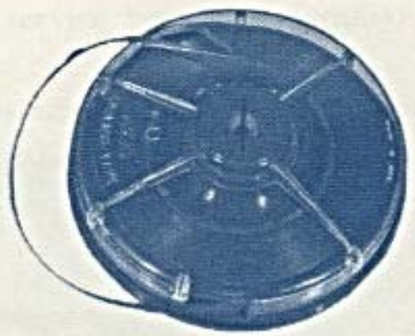
Endless Tape Magazine Accessories **No. AE-1**
200 feet of recording tape is contained in a handy plastic magazine and both ends of the tape are spliced together. It, therefore, forms a large loop of tape and can be used for continuous recording or play of programs up to 20 minutes stereophonically at the lowest tape speed of 1-7/8 ips.

Telephone Pick-up Accessories **No. AP-2**
This is designed to record telephone conversations with maximum clarity and sensitivity. Just press on to the back of a telephone. A rubber suction cup holds the Pick-Up in position.

Tape Splicer Accessories **No. AS-3**
Splicing of recording tapes is a hard job to accomplish when a pair of scissors is used for this purpose. This Tape Splicar is a small pocketable device and not only provides ease of tape splicing but also preserves the original quality of recordings.

Monitor Earphone Accessories **No. AM-4 & AM-4P**
The Monitor Earphone is used both for recording and play. It is quite useful for monitoring programs being recorded on tape. During playback, just plugging it into the recorder's Speaker Output Jack will provide listening to high fidelity sound without disturbing neighbors.
A high impedance crystal type in two different models is available, as shown in picture.

Microphone Stand Accessories **No. AMS-5 & AMS-5L**
These are small table models but are indispensable accessories for recording (especially when placement of the microphone on a table is required).


AE-1

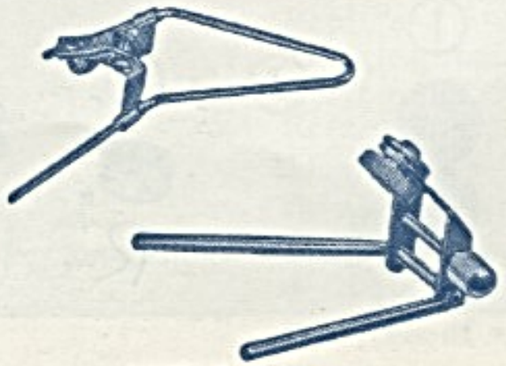

AP-2


AS-3

AM-4


AM-4P

AMS-5L


AMS-5


AH-6

ATE-7

ASE-9

Head Demagnetizer Accessories **No. AH-6**

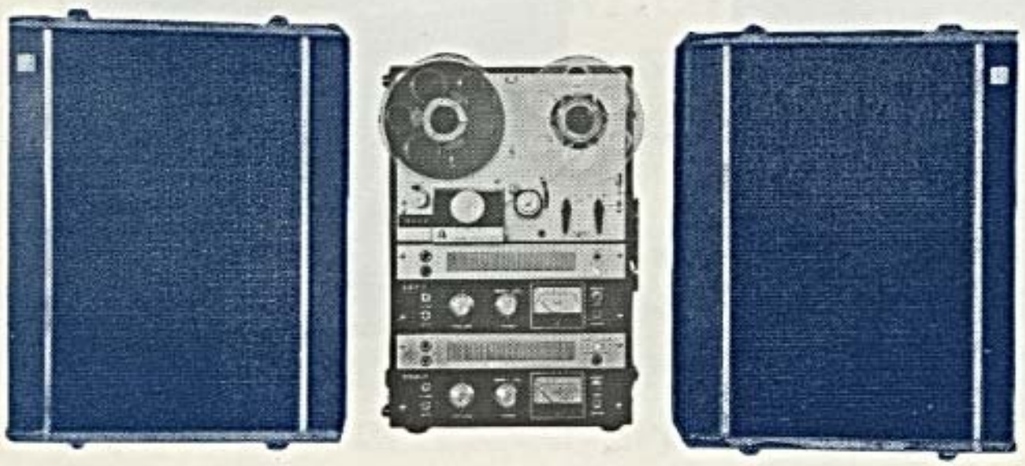
In the course of normal use, the steel pole pieces which form a part of the tape heads become slightly magnetized. The effect of the slight magnetization is to partially erase the tape (with high frequencies suffering most). A periodical application of the Head Demagnetizer is the best way to maintain the original quality of your costly tapes. The AH-6 has a built-in on-off swich and a neon bulb.

Tape Eraser Accessories **No. ATE-7**

This erases any previously recorded materials completely in a few seconds and accomodates tape reels from 3″ to 10-1/2″ in diameter. It is designed to provide maximum erasing efficiency. It has a pop-up shaft to hold the tape reel in position and also serves as a power switch and on-off indicator of the unit.

Stereo Headphone Accessories **No. ASE-9**

In order to enjoy true stereophonic effects with the Akai tape recorder model M-8, the Stereo Headphones ASE-9 are recommended.



ACCESSORY SPEAKERS

The following stereo speaker systems model SS-110 and SW-130 are specially designed to match impedance to Akai's M-series stereo tape recorders and to obtain the best results. You will always be able to derive true Hi-Fi sound reproduction with the combination of the SS-110 or SW-130 and any Akai Stereo Tape Recorder.

MODEL **SS-110**

TECHNICAL DATA :

Speaker	:	10″ coaxial (with built-in 2-1/2″ tweeter)
Impedance	:	8 ohms
Max. Power Input	:	10 watts
Frequency Response	:	50~17,000 cps
Dimensions	:	20-1/8″W × 19″H × 15-3/4″D
Weight	:	35.3 lbs. (set)

MODEL **SW-130**

TECHNICAL DATA :

Speaker	:	12″ Woofer & 3-1/2″ Tweeter
Impedance	:	8 ohms
Max. Power Input	:	25 watts
Frequency Response	:	50~18,000 cps
Dimensions	:	16-1/2″W × 22-1/2″H × 12-1/8″D
Weight	:	28.9 lbs. (piece)