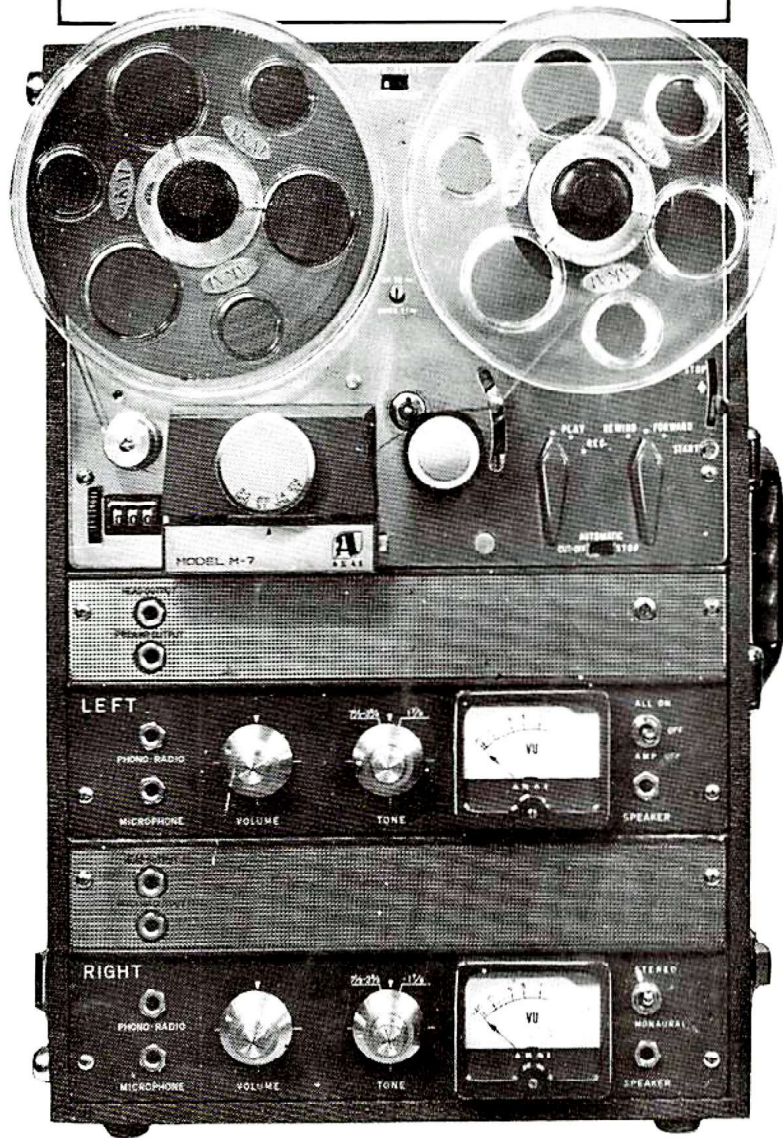


# MODEL M-7 OPERATOR'S MANUAL



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# I GENERAL INFORMATION

## 1. SPECIFICATIONS

FREQUENCY RESPONSE	:	40 to 13,000 CPS at 1-7/8"/sec ( $\pm$ 4 db 40~10,000) 40 to 20,000 CPS at 3-3/4"/sec ( $\pm$ 3 db 40~18,000) 30 to 23,000 CPS at 7-1/2"/sec ( $\pm$ 3 db 50~21,000) Measured with the 3M(Scotch) recording tape nos. 111-A, 150 and 200				
SIGNAL TO NOISE	:	40 db below recorded level signal				
WOW AND FLUTTER	:	Less than 0.13% at 1-7/8"/sec J.I.S. (Less than 0.35% at 1-7/8"/sec R.M.S.) Less than 0.10% at 3-3/4"/sec J.I.S. (Less than 0.25% at 3-3/4"/sec R.M.S.) Less than 0.06% at 7-1/2"/sec J.I.S. (Less than 0.15% at 7-1/2"/sec R.M.S.)				
EQUALIZATION	:	Correct equalization for playback of tapes recorded to the NARTB curve				
CHANNEL SEPARATION	:	Better than 80 db at 1000 CPS +3 VU				
DISTORTION	:	Within 3% at 1000 CPS 0 VU (total harmonic)				
HEADS	:	Inline 4-track stereo/monaural record-play, 4-track erase and 4-track x'-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 2 track stereo (playback only)				
RECORDING SYSTEM	:	Cross field type recording based on the new theory of trailless recording bias system. Inline 4-track stereo and 4-track monaural recording.				
MOTOR	:	Hysteresis synchronous, 2-speed motor 3000-1500 RPM at 50 cycles 3600-1800 RPM at 60 cycles capacitor start, dynamically balanced				
TAPE SPEED	:	7-1/2, 3-3/4 and 1-7/8 inches per second (15"/sec with an accessory capstan and pinch wheel)				
RECORDING TIME	:	1.	4-track stereo	1-7/8	3-3/4	7-1/2
			1200 ft tape	4 hrs	2 hrs	1 hr
			1800 ft	6	3	1.5
			2400 ft	8	4	2
		2.	4-track mono			
			1200 ft	8	4	2
			1800 ft	12	6	3
			2400 ft	16	8	4
POWER OUTPUT	:	6 watts at max. on each channel, total 12 watts				
TUBES USED	:	6267 (EF86) $\times$ 2, 12AD7 (12AX7) $\times$ 2, 6BQ5 $\times$ 2, 6X4 $\times$ 2, 6AR5 $\times$ 1				
FAST FORWARD & REWIND TIME	:	75 seconds for either operation using a 1200 ft recording tape at 60 cycles (90 seconds at 50 cycles)				
POWER REQUIREMENTS	:	AC 100 to 220 volts, 50-60 CPS, 100 VA Cycles interchangeable by shifting capstan drive belt on flywheel				
WEIGHT (NET)	:	21.5 kg. (47.3 pounds)				
DIMENSIONS	:	510 H $\times$ 340W $\times$ 226 $\frac{7}{8}$ " deep overall, case closed (20"H $\times$ 13"W $\times$ 9"D)				

## 2. INTRODUCTION

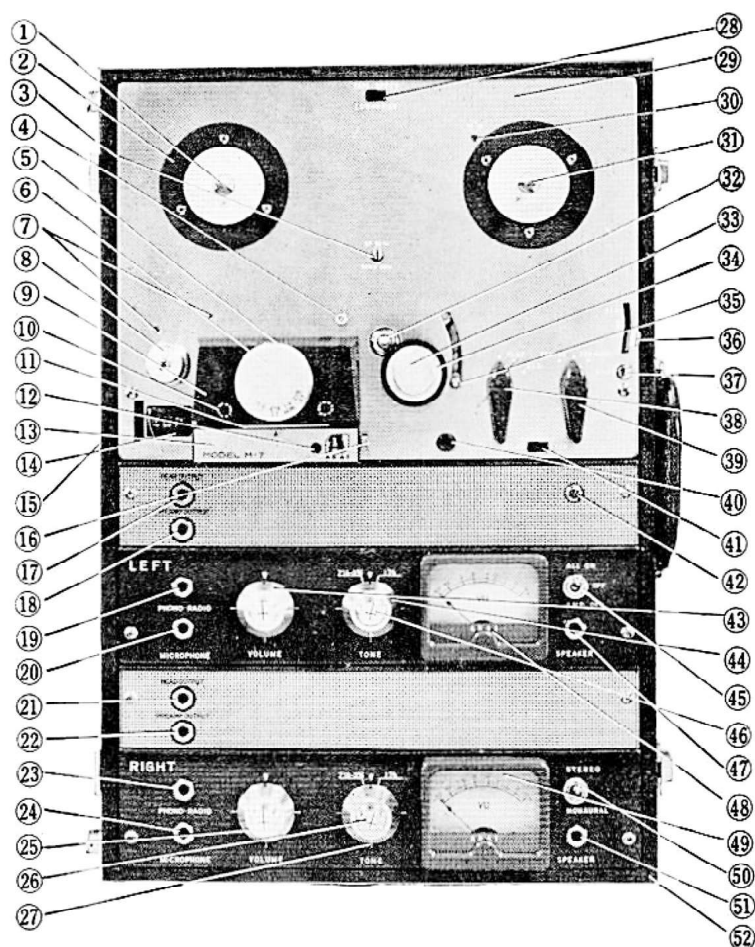
The Akai Model M-7 is a completely new 4-track Tape Recorder and Reproducer especially designed to provide high fidelity performance at the slow tape speed of 1-7/8 or 3-3/4 inches per second. In addition to the most efficient design of the electronic components, the Akai's exclusive Cross-field type tape head provides for extension of frequency response and the new tape transport mechanism, which has been engineered to minimize wow and flutter or irregular tape motion during operation at the slow tape speeds. At the higher tape speed of 7-1/2 inches per second, therefore, the listener will enjoy an extremely clear sound recording and reproduction by means of the combination of a heavy gauge flywheel and a newly developed high speed Hysteresis Synchronous Motor with two separate coil windings for momentary switching of tape speed. It is capable of 4-track stereo and monaural recording. It will play 4-track monaural, full-track mono, 2-track stereo and 4-track stereo tapes as desired.

## 3. EXCLUSIVE FEATURES

- 1) Cross-field recording device for the extended range of sound recording and reproduction.
- 2) The newly designed high speed Hysteresis Synchronous Motor with two separate coil windings insures a steady tape handling at all times and is capable of instantaneous tape speed switching.
- 3) The Automatic Shut-off device will stop the tape transport only or will completely shut-off the function of the recorder by setting the Selector Switch as desired.
- 4) Professional large Volume Unit Meter for easy determination of the optimum recording level.
- 5) Powerful amplifier gives the maximum listening pleasure even in an auditorium.
- 6) DIN (European type — one connection) Jack eliminates the complexity of interconnecting the recorder with external equipment, i.e., stereo amplifier—speaker system, AM/FM tuner, transcription turntable, phonograph etc.
- 7) Designed for either vertical or horizontal operation. Special reel retainers are supplied to hold the feed and take-up reels in position.
- 8) All operating controls are interlocked to prevent accidental selection of an incorrect operating method.
- 9) A three digit Index Counter is used to provide reference numbers for locating selection of a recording on a given tape.
- 10) Instant Stop Lever and Start Button for momentary operation of the unit.
- 11) Dual Head, Pre-amplifier and Speaker Output Jacks. Dual Phono/Radio and Microphone Input Jacks. Power and Function Switches. All of these features provide versatile operation of the recorder.
- 12) The special air exhaust protects the unit from excessive heat even after continued operation and extends the life of component parts, such as vacuum tubes and transformers.
- 13) The single self-contained speaker (5×7", oval) may be used for monaural sound monitoring when use of the extension speaker is not desired.
- 14) Equipped with an Equalizer Switch on each channel of the amplifiers for correct compensation of recording characteristics at a different tape speed.
- 15) Handy conversion of the AC line voltage and cycle as illustrated in succeeding paragraphs.



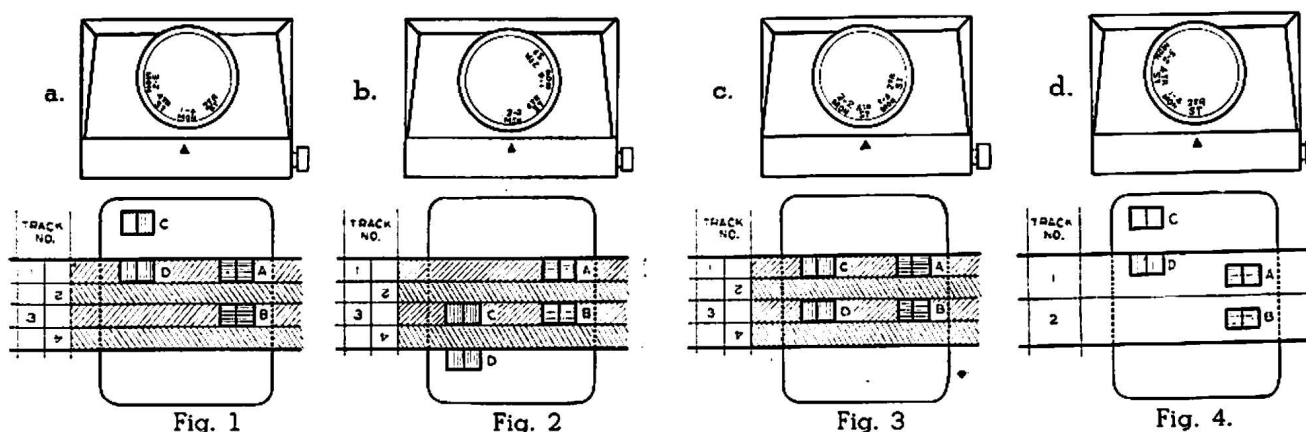
## 4. ILLUSTRATION - CONTROL LOCATION



- |   |   |
|---|---|
| ① FEED REEL SPINDLE                         | ②7 TONE CONTROL (RIGHT)                     |
| ② GUARD CIRCLE                              | ②8 SPEED CHANGE SWITCH                      |
| ③ CYCLE CONVERSION SWITCH 1                 | ②9 TOP (DECK) PANEL                         |
| ④ CAPSTAN HOLDER                            | ③0 CYCLE CONVERSION SWITCH 2                |
| ⑤ RETAINING SCREW                           | ③1 TAKE-UP REEL SPINDLE                     |
| ⑥ TRACK SELECTOR KNOB                       | ③2 CAPSTAN SHAFT                            |
| ⑦ HUM LEVEL ADJUSTMENT                      | ③3 METAL CAP FOR PINCH ROLLER               |
| ⑧ TAPE GUIDE ROLLER                         | ③4 PINCH ROLLER                             |
| ⑨ HEAD COVER, MAIN                          | ③5 AUTOMATIC SHUT-OFF LEVER                 |
| ⑩ ERASE HEAD                                | ③6 INSTANT STOP LEVER                       |
| ⑪ RECORD/PLAY HEAD                          | ③7 START BUTTON                             |
| ⑫ CROSS-FIELD HEAD<br>(RECORDING BIAS ONLY) | ③8 RECORD, PLAY SWITCH                      |
| ⑬ HEAD COVER, SUB                           | ③9 REWIND, FAST-FORWARD SWITCH              |
| ⑭ INDEX (REVOLUTION) COUNTER                | ④0 RECORD SAFETY BUTTON                     |
| ⑮ DIN (ONE CONNECTION) JACK                 | ④1 AUTO STOP, SHUT-OFF SELECTOR<br>SWITCH   |
| ⑯ MOUNTING SCREW,<br>SUB HEAD COVER         | ④2 PILOT LAMP<br>(MOTOR FUNCTION INDICATOR) |
| ⑰ HEAD OUTPUT (LEFT CHANNEL)                | ④3 VOLUME CONTROL (LEFT)                    |
| ⑱ PRE-AMP OUTPUT (LEFT)                     | ④4 TONE CONTROL (LEFT)                      |
| ⑲ PHONO/RADIO INPUT (LEFT)                  | ④5 POWER SWITCH                             |
| ⑳ MICROPHONE INPUT (LEFT)                   | ④6 EQUALIZER SWITCH (LEFT)                  |
| ㉑ HEAD OUTPUT (RIGHT CHANNEL)               | ④7 SPEAKER OUTPUT JACK (LEFT)               |
| ㉒ PRE-AMP OUTPUT (RIGHT)                    | ④8 VOLUME UNIT METER (LEFT)                 |
| ㉓ PHONO/RADIO INPUT (RIGHT)                 | ④9 VOLUME UNIT METER (RIGHT)                |
| ㉔ MICROPHONE INPUT (RIGHT)                  | ⑤0 FUNCTION SWITCH                          |
| ㉕ VOLUME CONTROL (LEFT)                     | ⑤1 SPEAKER OUTPUT JACK (RIGHT)              |
| ㉖ EQUALIZER SWITCH (RIGHT)                  | ⑤2 CARRYING CASE                            |

## 5. DESCRIPTION OF AND INSTRUCTIONS FOR 4 TRACK HEAD

Varied functions of the multi purpose head are as illustrated and described below :



### REMARKS

- |                    |                                    |
|--------------------|------------------------------------|
| — ERASE HEAD       | POSITIVE TRACK - TRACKS NO. 1 & 3. |
| — RECORD/PLAY HEAD | NEGATIVE TRACK - TRACKS NO. 2 & 4. |

### ① RECORDING

Set the desired Track on the track selector knob to the pointer and turn the RECORD, PLAYBACK SWITCH to "REC" position, depressing the RECORD SAFETY BUTTON.

- a. For "Monaural recording on tracks No. 1-4", set the track selector knob marked "1-4" to the pointer as shown in Fig. 1; the ERASE HEAD "D" and the RECORDING HEAD "A" are then operative. In this position, you may record on POSITIVE TRACK No. 1 and when the tape is reversed again, record on NEGATIVE TRACK No. 4.
- b. For "Monaural recording on Track No. 3-2", set the track selector knob marked "3-2" to the pointer as shown in Fig. 2; the ERASE HEAD "C" and the RECORDING HEAD "B" are then operative. In this position, you may record on POSITIVE TRACK No. 3 and when the tape is reversed again, record on NEGATIVE TRACK No. 2.
- c. For "4-track stereo recording", set the track selector knob marked "4TR ST" to the pointer as shown in Fig. 3; the ERASE HEAD "C" & "D" and the RECORD HEAD "A" & "B" are then all operative.

The first stereophonic recording is made on the POSITIVE TRACK (Tracks No. 1 and 3) and the second stereophonic recording is made on the NEGATIVE TRACK (Tracks No. 2 and 4) after you have turned the tape reels over.

- d. No recording can be made in "2TR ST" position in any instance because this position is for 2-track stereo reproduction only.

### ② PLAYBACK

Set the desired track on the track selector knob to the pointer and turn the RECORD, PLAYBACK SWITCH to "PLAY" position.

- a. For "Monaural playback on Tracks No. 1-4", set the track selector knob marked "1-4" as shown in Fig. 1; only the PLAYBACK HEAD "A" is then operative. In this position, you may reproduce POSITIVE TRACK No. 1 and when the tape is reversed again, reproduce NEGATIVE TRACK NO. 4.
- b. For "Monaural playback on Tracks No. 3-2". set the track selector knob marked "3-2" as shown in Fig. 2; only the PLAYBACK HEAD "B" is then operative. In this position, you may

reproduce POSITIVE TRACK No. 3, and when the tape is reversed again, reproduce NEGATIVE TRACK No. 2.

**c. PLAYBACK FOR 4 TRACK STEREO**

For four track stereo tape made on a 4 track stereo machine, reproduction is achieved by setting the track selector knob marked "4TR ST" to the pointer as illustrated in Fig. 3. In this position the PLAYBACK HEADS "A" and "B" run through Tracks No. 1 and 3 and when the reel is turned over, run through tracks No. 4 and 2.

**d. PLAYBACK FOR OLD TYPE 2 - TRACK STEREO TAPES**

Old type 2 - TRACK STEREO TAPES can be reproduced by setting the track selector knob marked "2TR ST" to the pointer as shown in Fig. 4. In this position, the PLAYBACK HEAD "A" and "B" run through the middle portions of both Tracks No. 1 and 2.

## **6. 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 SCOTCH BRAND TAPE. 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 the 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 closest to the heads.
  - D. A.C. power voltage of less than the standard voltages to which your machine is adjusted.
- (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  $7\frac{1}{2}$  I.P.S.
  - D. Sticky or dusty tape surface.
- (3) If your machine will not record, check to see that the following are in correct position:
  - A. Record-play switch.
  - B. Microphone plugs.

**NOTE:**

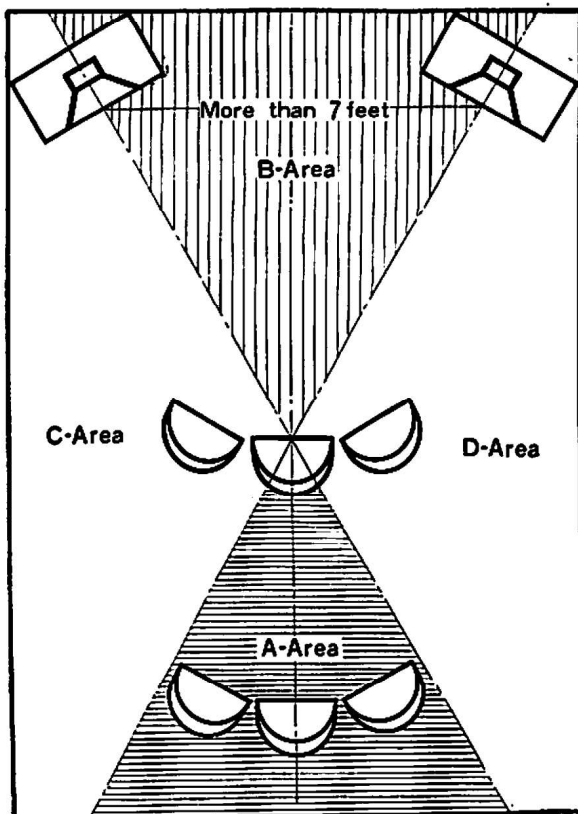
- (1) Before operating your recorder, be sure to clean the surface of the head as illustrated in page 17.
- (2) Unused tape may become soft and sticky, therefore it is advisable to run the tape once from the feed reel to the take-up reel before threading it for use.
- (3) Lubricate the Tape Recorder after every 600 hours of use. An oil hole is located at the base of the CAPSTAN SHAFT.  
Refer to 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) Your Akai Tape Recorder Model M-7 requires constant voltage for optimum performance.
- (3) The standard 1,200 feet length of tape on 7" reel plays up to 32 minutes at 7.5"/sec., speed in one direction.
- (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 the 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 a hum, attach a ground wire from 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.

## 7. HOW TO PLACE TWO SPEAKERS

For best playback results, set up your Stereo Hi-Fi Speaker System as illustrated below.



1. Place the two speakers so that each speaker is facing towards CENTER OF ROOM as illustrated in Figure at left and connect them to "SPEAKER JACKS" on the Tape Recorder Model M-7 by using speaker cable.

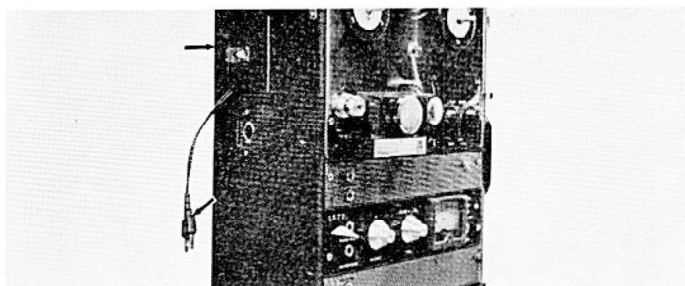
The Model M-7 can be placed anywhere you like.

2. It is most desirable to place the two speakers more than 7 feet apart.
3. For the best stereophonic effect, it is suggested that the listener be within the A-Area.
4. The C and D Areas are not good for Stereo listening.
5. While the B Area has a stereophonic effect, the location is too close to the speakers.



# I OPERATING INSTRUCTIONS

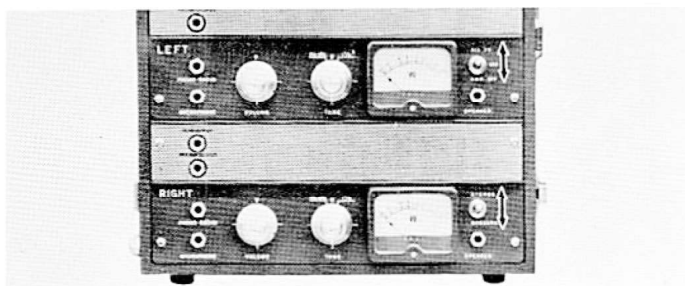
## 1. STEREO (4 TRACK) PLAYBACK



Uncoil the Power Cord in the compartment. Connect power plug to AC OUTPUT.

"ALL ON".....Both the Motor and Amplifiers will operate.

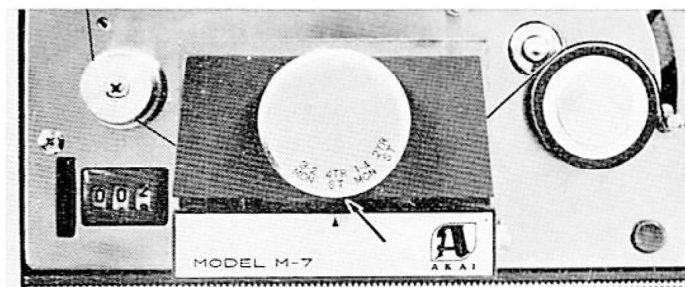
"OFF".....Entire operation of this Tape Recorder Model M-7 will stop in this position.



"AMP OFF".....Motor will operate but the Amplifiers will not function. This may be used when the HEAD OUTPUT is connected to an external Hi-Fi System.

The FUNCTION SELECTOR enables you to choose either Stereophonic or Monaural playback.

**NOTE:** Set the pointer of Equalizer Switch to  $7\frac{1}{2}$  -  $3\frac{3}{4}$  or  $1\frac{7}{8}$  (as required) when recording or playing for correct equalization.

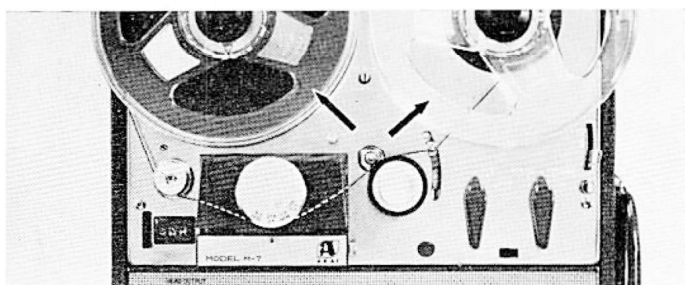


### TRACK SELECTOR KNOB

To get Four Track Stereo reproduction, set the track selector knob marked "4TR ST" to the pointer as illustrated.

### NOTE:

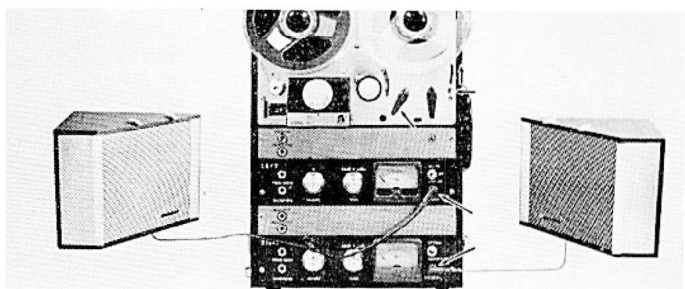
It is advisable to turn down the VOLUME CONTROLS to "0" before moving the Track Selector Knob from it's original position on either recording or playback.



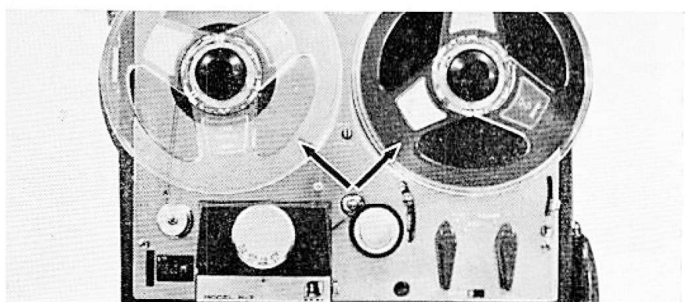
Place a 4-track pre-recorded tape reel on the left spindle.

Thread the tape as illustrated by dotted line after placing an empty take-up reel on the right spindle.

To keep reels from falling off when using the Tape Recorder in vertical position, use the rubber reel caps on the spindles.



Insert plug from the left speaker into the SPEAKER JACK on the left amplifier and the plug from the right speaker into the SPEAKER JACK on the right amplifier. Set the INSTANT STOP LEVERS to STOP. Turn the RECORD, PLAYBACK SWITCH in PLAY position, then push the START BUTTON to get excellent reproduction through the external speakers. Both speakers should always be separated at least 7 feet.



After all the tape has passed over to the right hand reel, remove reel from right spindle, turn over and place on left spindle. Follow step 4 above, for threading. Tracks No. 4 or 2 will playback in this manner.