



MODEL **X-355** OPERATOR'S MANUAL

CROSS FIELD HEAD
SOLID STATE AMPLIFIER
4-TRACK STEREOPHONIC
SOUND RECORDER
AND REPRODUCER

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1. SPECIFICATIONS

I GENERAL INFORMATIONS

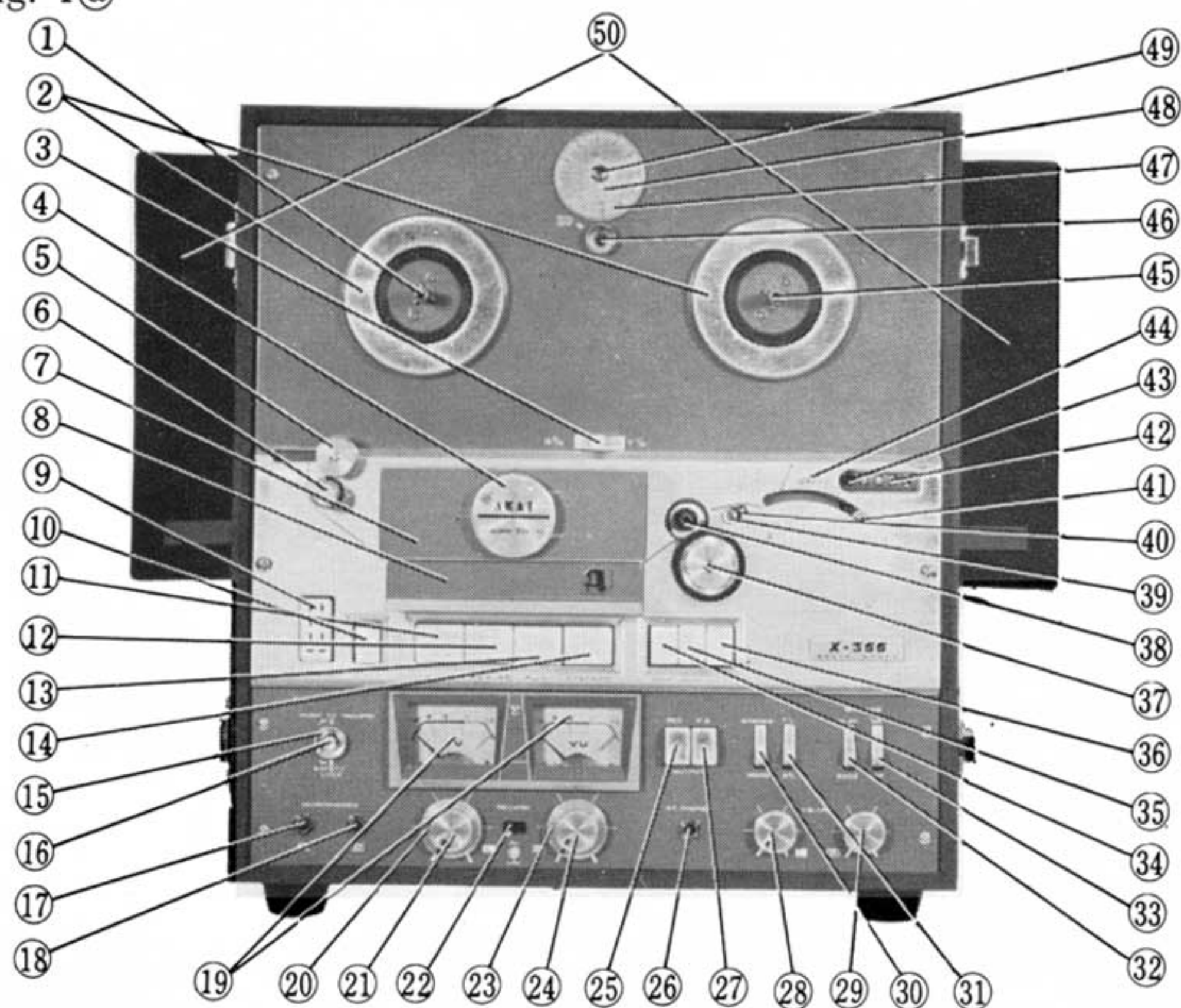
Tape Speed	:	3-3/4, 7-1/2 and 15 ips.	
Frequency Response	:	30 to 24,000 cps ± 3 db at 7-1/2 ips. 30 to 18,000 cps ± 3 db at 3-3/4 ips.	
Signal to Noise Ratio	:	Better than 47 db at normal play.	Better than 45 db at reverse play.
Wow and Flutter Playback only)	:	Less than 0.08% RMS at 7-1/2 ips. at normal, reverse play.	Less than 0.14% RMS at 3-3/4 ips.
Equalization	:	Correct equalization for playback of tapes recorded to the NAB curve.	
Cross Talk	:	Less than -82 db (Monaural)	Less than -45 db (Stereo)
Distortion (Total Harmonics)	:	Within 4.0% at 1,000 cps 0 VU at 10 watts.	
HeadCross-Field	:	* Recording Head : Inline 4 Track Stereo and Monaural, low impedance 135 ohms at 1,000 cps. * Playback Head : Inline 4 track stereo and monaural, low impedance 1,000 ohms at 1,000 cps, installed on an automatic shift device. * Erase and Bias Head : Inline 4 track stereo, low impedance 750 ohms at 90 kc.	
Motor Used	:	Hysteresis synchronous 2 speed (4-8 pole) motor for capstan drive. Two 4-pole induction motors for fast-forward and rewind.	
Timing Accuracy	:	$\pm 0.3\%$ at all tape speeds.	
Recording Sensitivity	:	Input of more than 0.5 mV in MICROPHONE jack. Input of more than 50 mV in LINE INPUT jack.	
Power Output	:	25 watts at Music Power on each channel, total 50 watts. 20 watts at Undistorted Power Output on each channel, total 40 watts.	
Transistor Used	:	2SB 443 (A) $\times 4$ 2SB 75 (B) $\times 12$ } Pre-amplifier 2SB 75 (A) $\times 2$ 2SB370A(A) $\times 2$ } Main amplifier 2SB338 (A) $\times 4$ } Rectifier SPN-01 $\times 2$ Rectifier 12C-2 $\times 1$ Silicone Diode $\times 3$ 2SB370A (B) $\times 2$ Oscillator	
Fast-Forward and Rewind Time	:	45 seconds for either operation using a 1,200 feet recording tape at 50 cycles, 36 seconds at 60 cycles.	
Internal Speakers	:	6-1/2" round, wide range speakers, one on each channel.	
Power Requirements	:	AC 100 to 240 volts, 50-60 cps, 60 VA (at non signal) to 170 VA (at maximum output)	
Weight (Net)	:	28.5 kg (62.7 pounds)	
Dimensions	:	440H $\times$ 407W $\times$ 310D mm Overall, case closed. (17-3/8"H $\times$ 16"W $\times$ 12-1/8"D)	

2

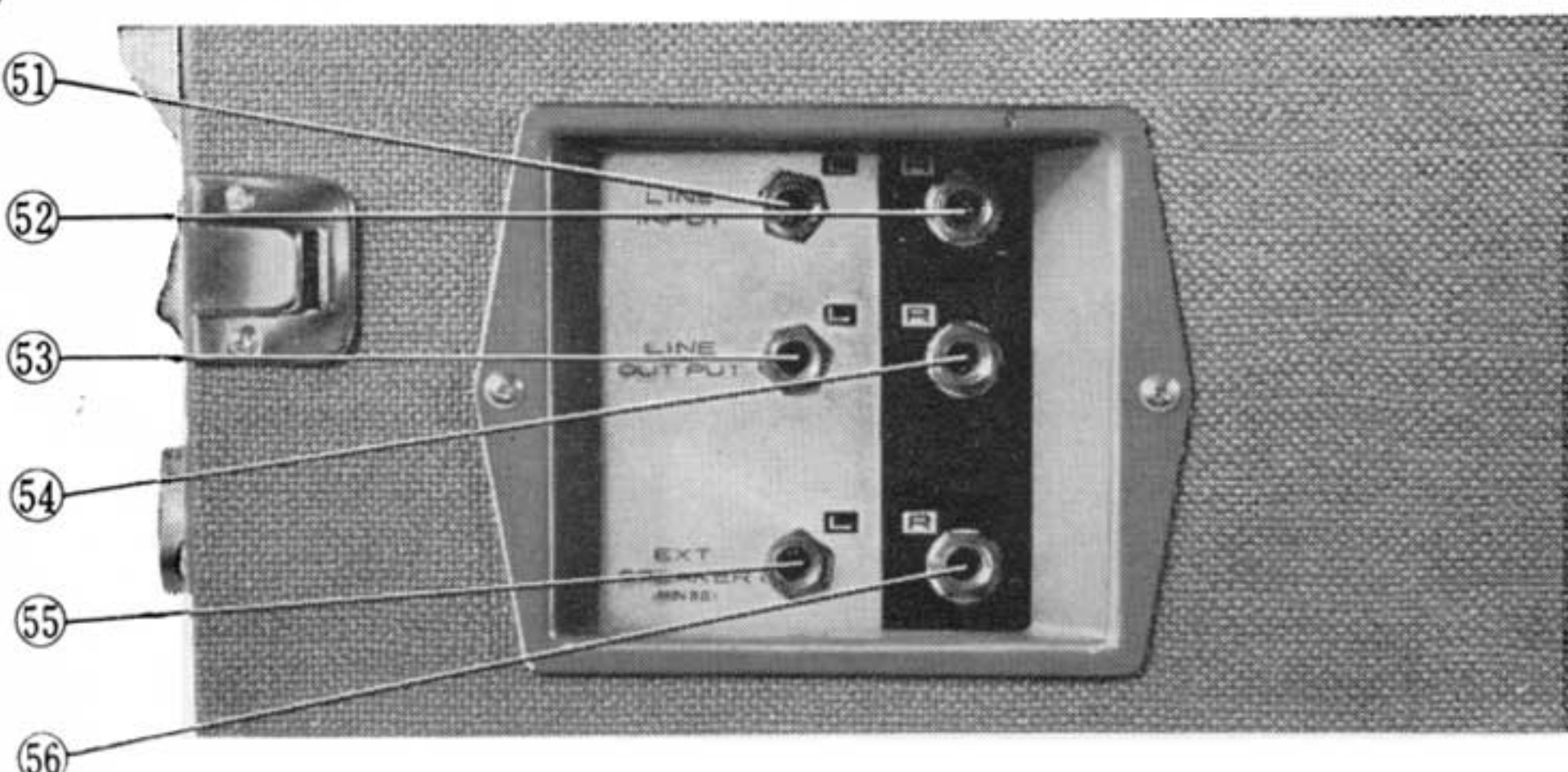
GENERAL INFORMATIONS

2. NOMENCLATURE

Fig. 1(a)



(b)



- | | |
|-------------------------------------|----------------------------------|
| ① Supply Reel Shaft | ②⑧ Volume Control (Left) |
| ② Guard Circle | ②⑨ Volume Control (Right) |
| ③ Speed Change Switch | ③⑩ Function Switch |
| ④ Track Selector Knob | ③⑪ Equalizer Switch |
| ⑤ Tape Guide | ③⑫ Tone Switch |
| ⑥ Tape Guide Roller | ③⑬ Speaker Switch |
| ⑦ Upper Head Cover | ③⑭ Repeat Button |
| ⑧ Lower Head Cover | ③⑮ Reverse Button |
| ⑨ Remote Control Socket | ③⑯ Shut-Off Button |
| ⑩ Power Button | ③⑰ Pinch Wheel |
| ⑪ Stop Button | ③⑱ Capstan Shaft |
| ⑫ Rewind Button | ③⑲ Reverse Pin (I) |
| ⑬ Play Button | ④① Reverse Pin (II) |
| ⑭ Fast-Forward Button | ④② Tension Arm |
| ⑮ Record Safety Lock | ④③ Index Counter |
| ⑯ Record Safety Button | ④④ Reset Button |
| ⑰ Microphone Jack (Left) | ④⑤ Tape Holder |
| ⑱ Microphone Jack (Right) | ④⑥ Take-up Reel Shaft |
| ⑲ VU Meter | ④⑦ Dial Off Button |
| ⑳ Line Volume Control (Left) | ④⑧ Tape Count Meter |
| ㉑ Microphone Volume Control (Left) | ④⑨ Set Dial |
| ㉒ Recording Indicator Light | ④⑩ Manual Reverse Button |
| ㉓ Line Volume Control (Right) | ⑤① Speaker Reflectors |
| ㉔ Microphone Volume Control (Right) | ⑤② Line Input Jack (Left) |
| ㉕ Record Output Button | ⑤③ Line Input Jack (Right) |
| ㉖ Stereo Headphone Jack | ⑤④ Line Output Jack (Left) |
| ㉗ Playback Output Button | ⑤⑤ Line Output Jack (Right) |
| | ⑤⑥ External Speaker Jack (Left) |
| | ⑤⑦ External Speaker Jack (Right) |

3. CROSS-FIELD HEAD

GENERAL INFORMATION

Cross-field head creates a sensation in the tape recorder world by making a wide range of recording which has never been heard before any tape recorder.

Using this cross-field head, Model X-355 provides a surprising recording performance (30-24,000 cps at a tape speed of 7-1/2 ips and 30-18,000 cps at 3-3/4 ips).

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 sequences:

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.

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 inter-relatively, so that the magnetic field of the bias will not affect the signal recorded on the tape, even when a sufficient bias is applied. This allows the recorded signal to remain on the tape with high fidelity.

Diagram 1. Ordinary recording system

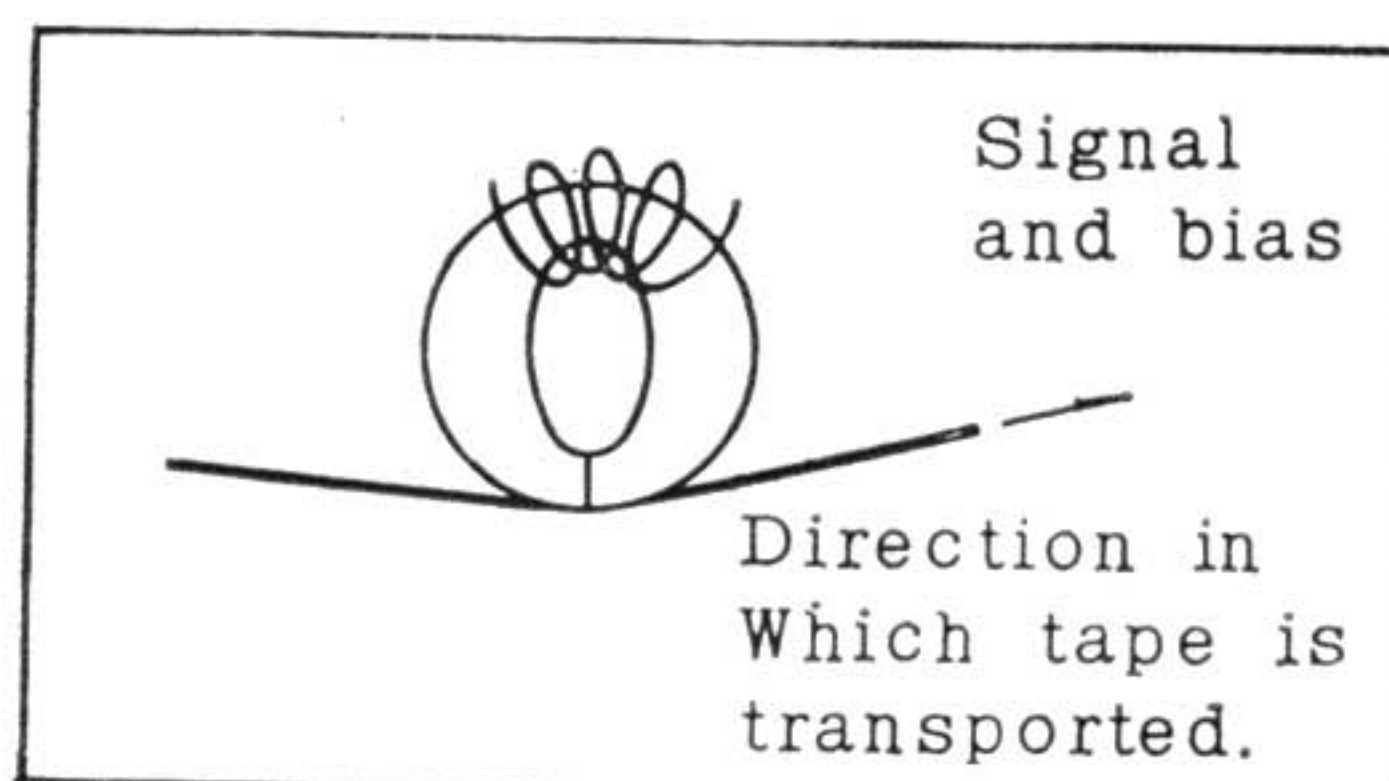
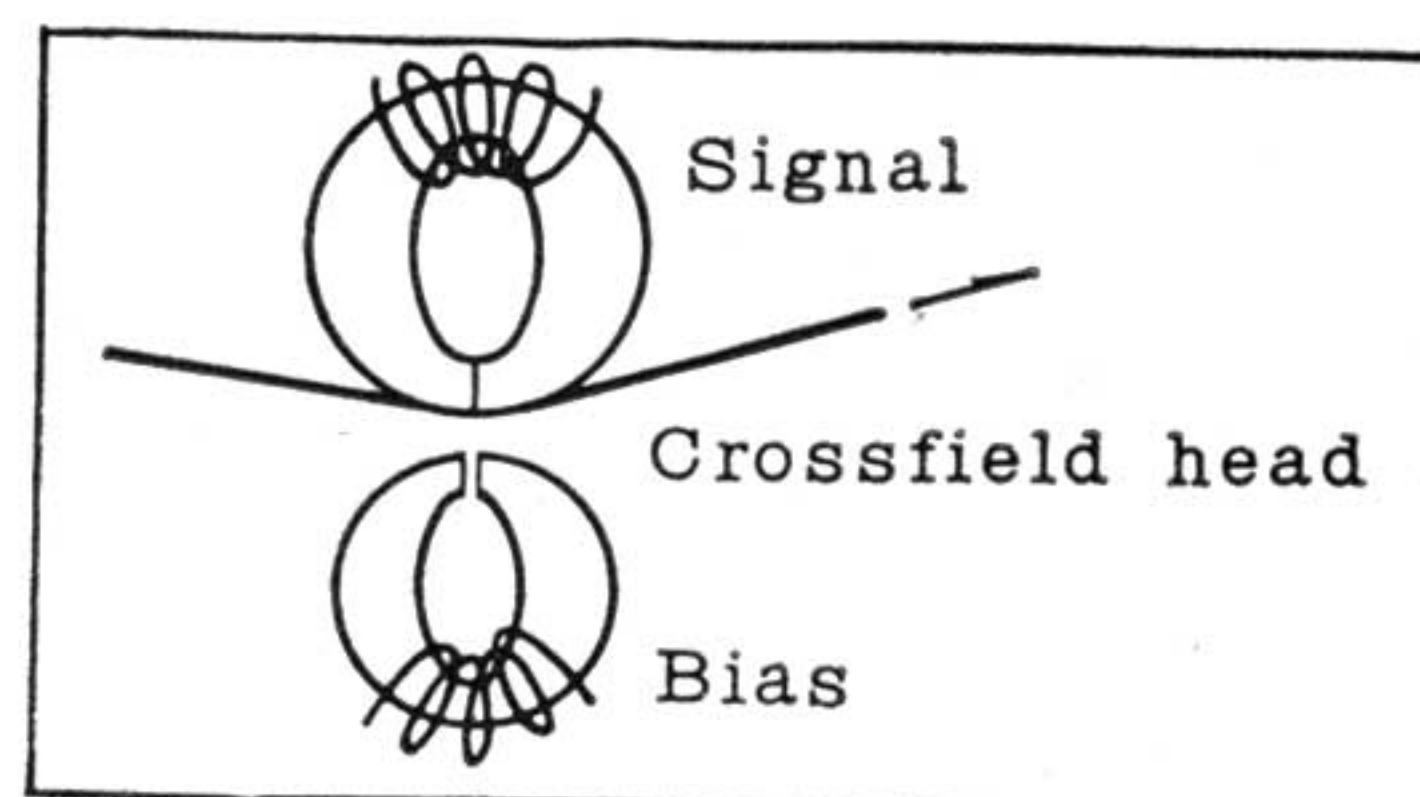


Diagram 2. Cross-field recording system



4

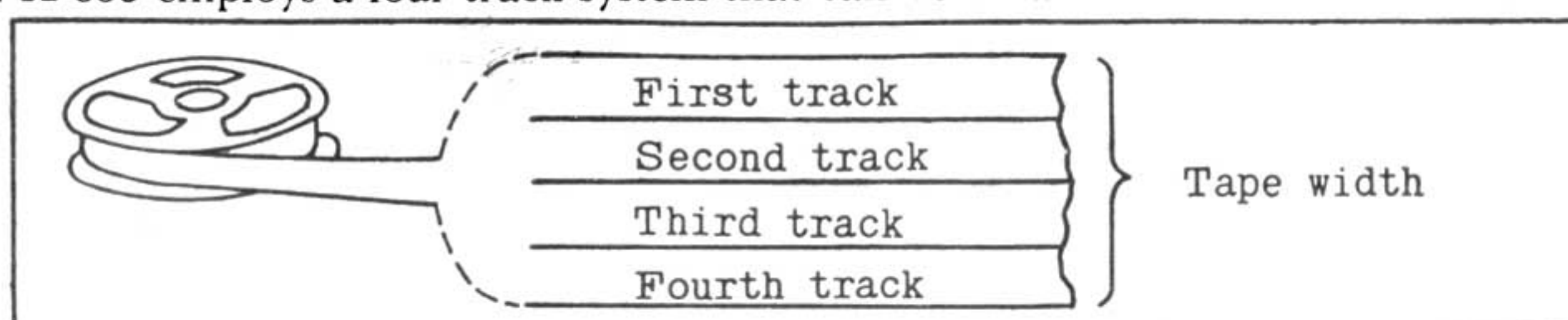
GENERAL INFORMATION

4. 4-TRACK RECORDING/PLAYBACK

The AKAI X-355 employs a four track system that can be used for either stereo or monaural recording and playback.

Fig. 2

Ⓐ

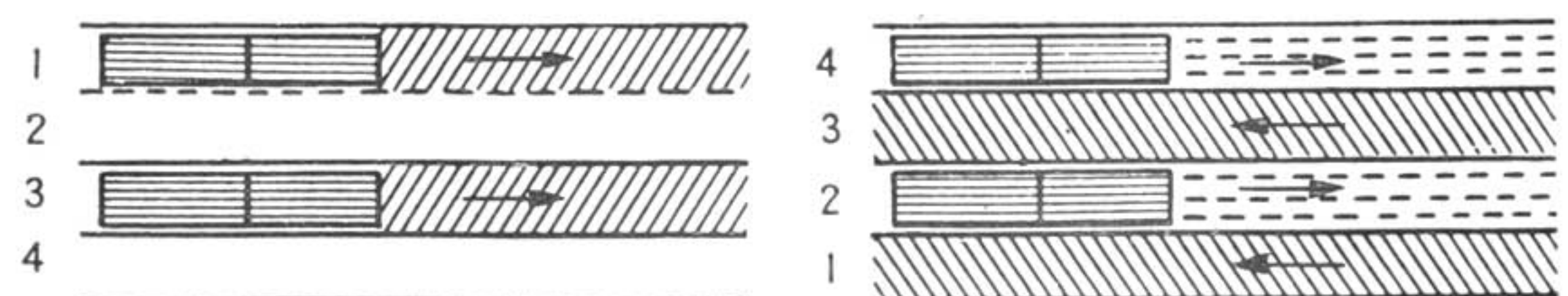


The desired track or tracks are selected by the TRACK SELECTOR KNOB. ④

4-Track Stereo Recording/Playback

Stereophonic recording/playback requires the simultaneous use of two tracks. Set the TRACK SELECTOR KNOB ④ to "STEREO". The first stereophonic recording/playback takes place on tracks 1 and 3, and the second on tracks 2 and 4 after the reels have been turned over.

Ⓑ



4-Track Monaural Recording/Playback

The monaural recording/playback track sequence should be 1-4-3-2.

(A). Set the TRACK SELECTOR KNOB ④ to "1-4".

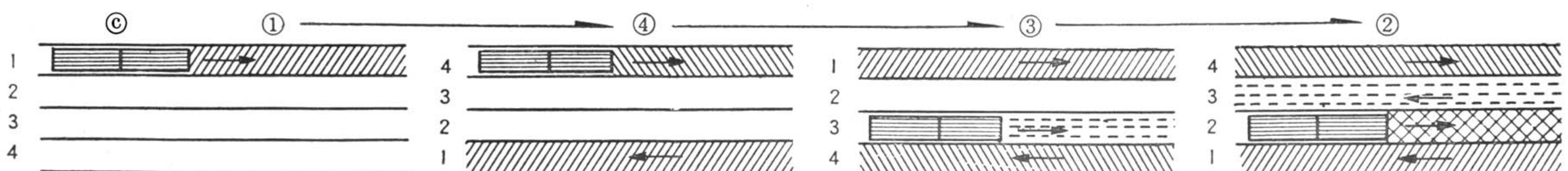
The first monaural recording/playback takes place on track 1, and the second on track 4 after the tape reels have been turned over.

(B). Turn the tape reels over.

(C). Set the TRACK SELECTOR KNOB ④ to "3-2".

The third monaural recording/playback takes place on track 3, and the fourth on track 2 after the tape reels have been turned over.

The X-355 does not record in the reverse direction. Using reverse playback, it is not necessary to turn the tape reels over. When the X-355 begins reverse playback, the playback head is automatically shifted to the remaining tracks.



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IMPORTANT : READ THE OPERATING INSTRUCTIONS CAREFULLY BEFORE OPERATING YOUR RECORDER.

The symptoms listed below do not necessarily indicate a malfunction of your tape recorder. If your machine exhibits any of these symptoms, take the indicated action.

- A. Loss of sensitivity or tone quality may be due to :
 - Dusty or dirty heads - clean the heads.
 - Reversed tape - place the dull side of the tape toward the heads.
 - Improper voltage - check voltage input and adjustment.
- B. Irregularity of the tape transport may be due to :
 - Grime adhering to the heads - clean the heads.
 - Oil on the capstan - clean the capstan.
 - Dirty tape surface - use a clean tape.
 - Bent take up reel - straighten the take up reel.
- C. If your machine will not record, insure that the following are in the correct position :
 - RECORD SAFETY BUTTON ⑩
 - Microphone plugs
- D. If your machine will not reproduce, insure that the following are in the correct position :
 - PLAYBACK OUTPUT BUTTON ⑳
 - SPEAKER SWITCH ㉓

Lubricate the X-355 after every 1,000 hours of use.

If any problem arises, take your machine to the authorized AKAI agent in your area or to the Service Department of the AKAI Company in Tokyo, Japan.

6

GENERAL INFORMATION

6. VOLTAGE AND CYCLE CONVERSION

1. Voltage

The VOLTAGE SELECTOR switches are located on the back of the recorder right above the fuse holder. To select an operating voltage, remove the voltage selector cover plate and set the proper voltage on the two switches so that the desired voltage shows through the cover plate window. The rotary switch must be pulled out, rotated, and reset at the desired position.

IF THE RECORDER IS OPERATED ON THE INCORRECT VOLTAGE, SERIOUS DAMAGE MAY RESULT.

CAUTION : Change fuse according to voltage.

FUSE :	100 V to 120 V	3 A
	200 V to 240 V	1.5 A

Fig. 3

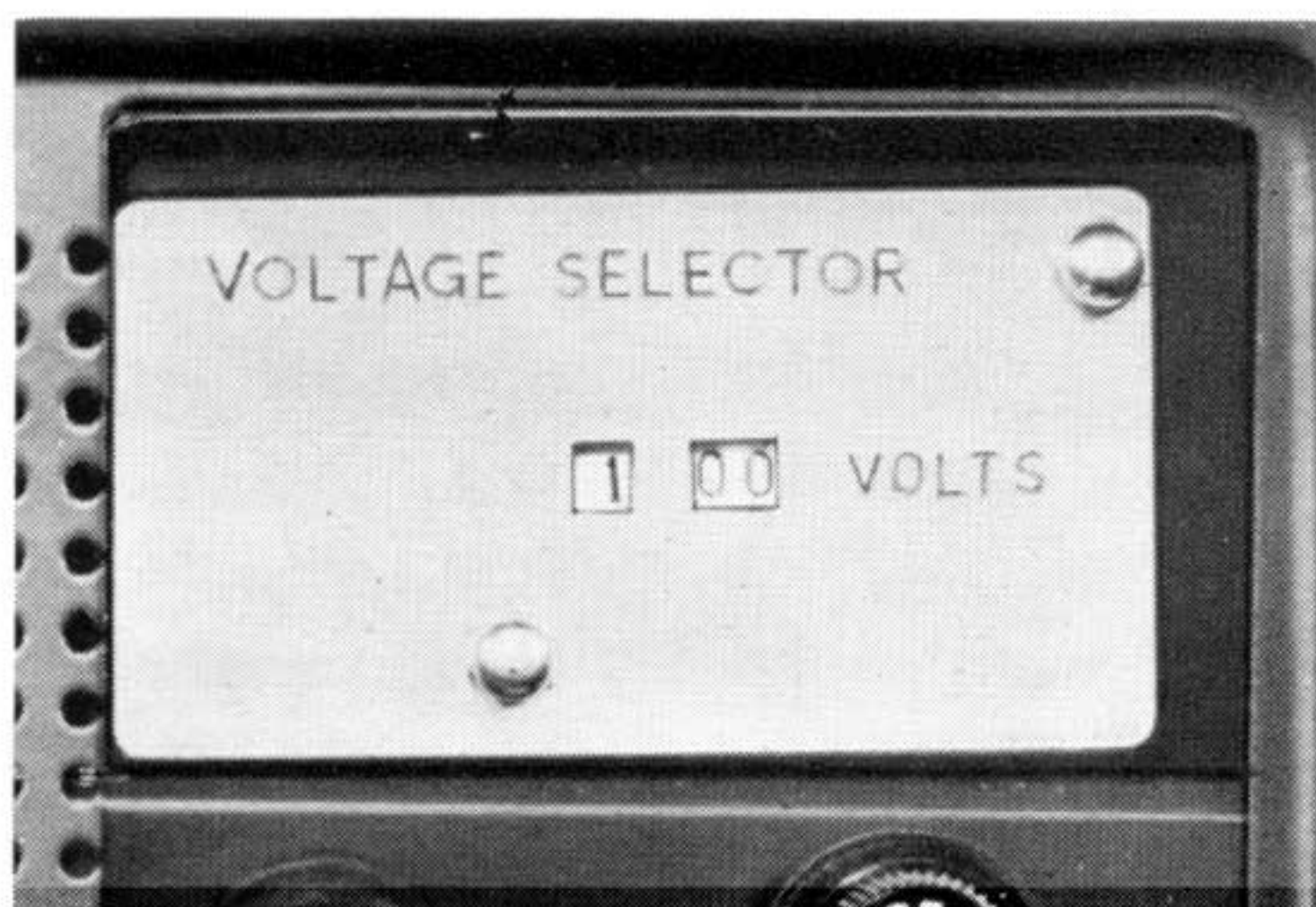
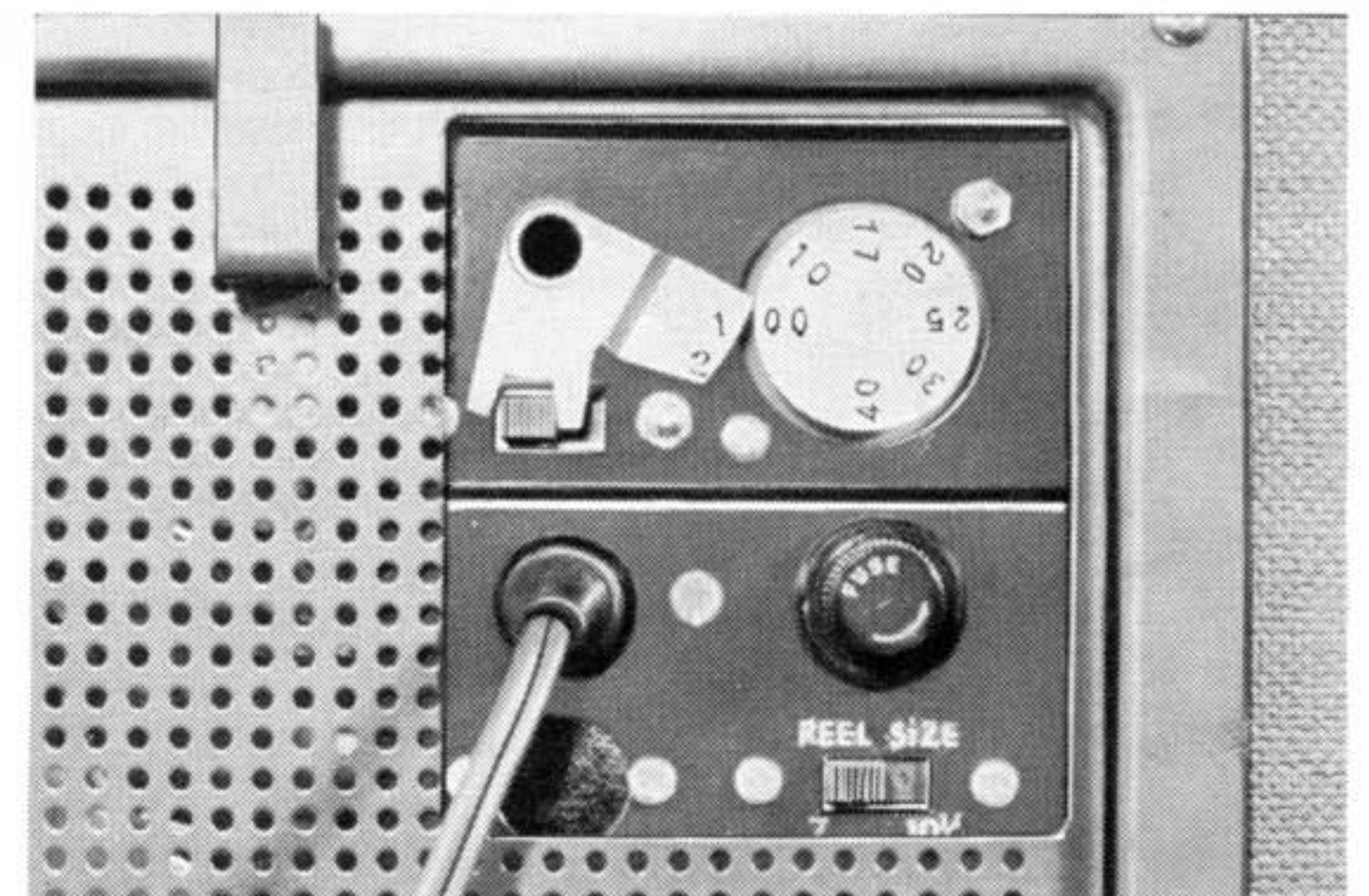


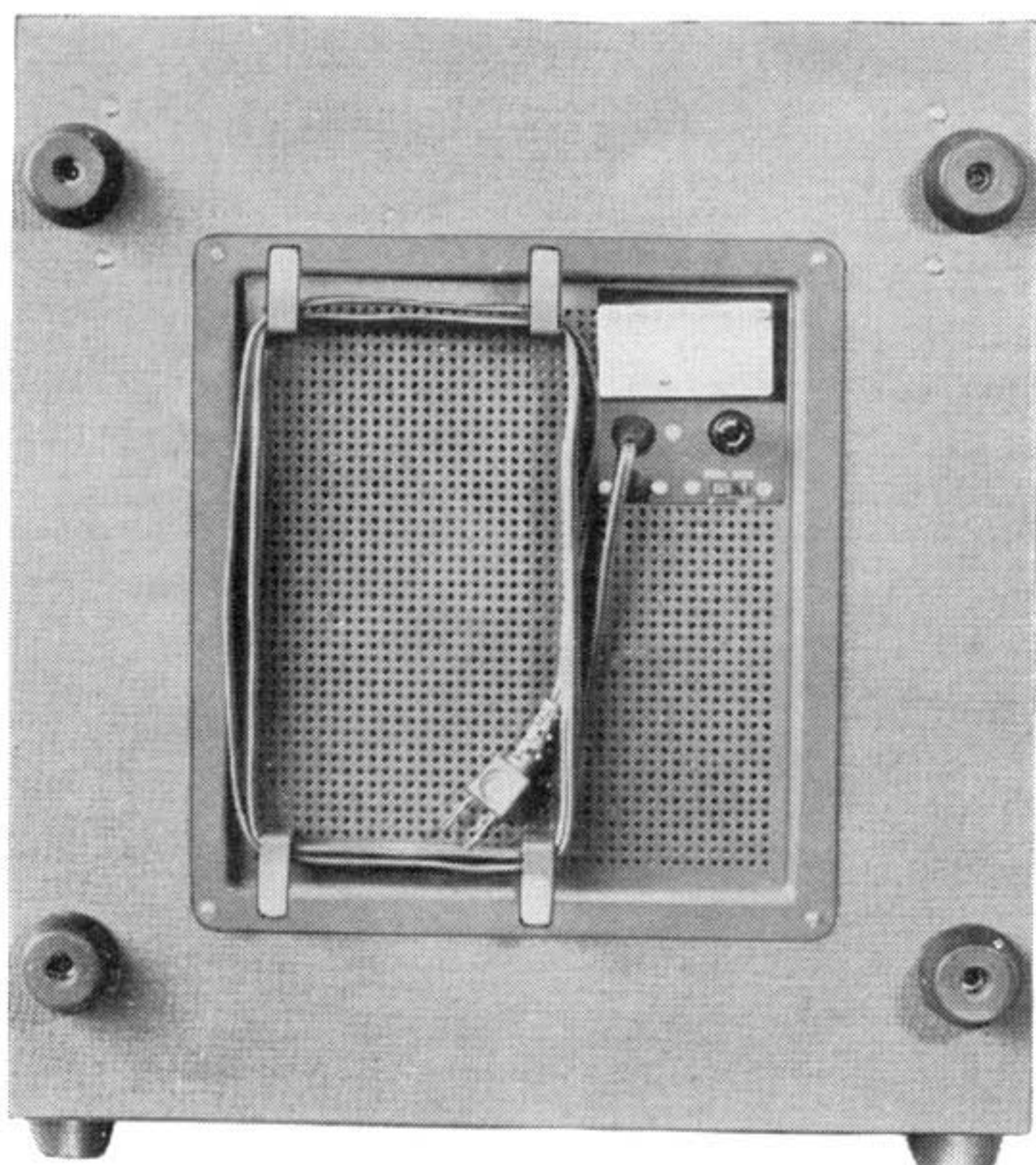
Fig. 4



2. Cycle

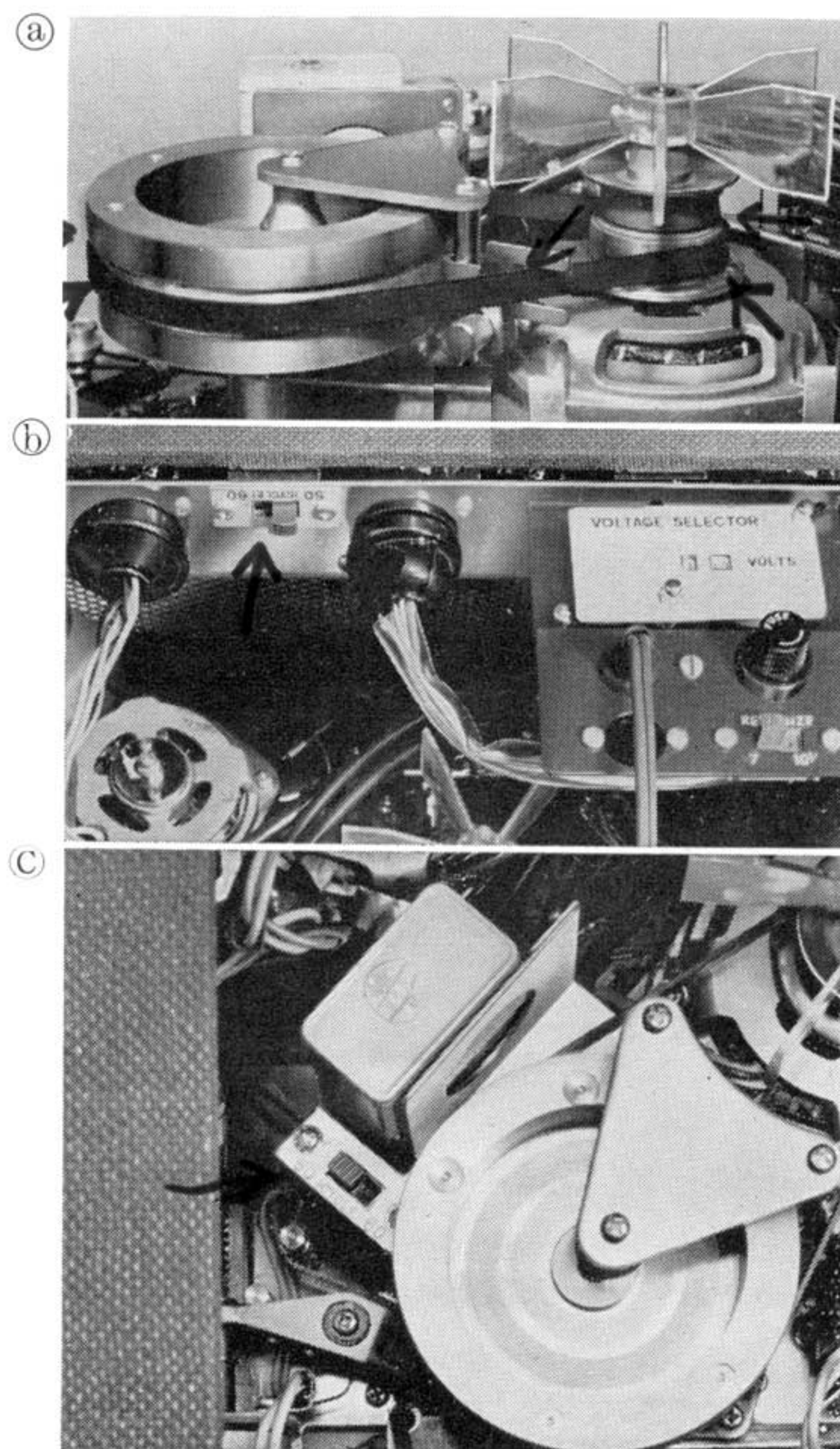
The X-355 can be operated on either 50 or 60 cycle alternating current. The rear cover panel (Figure 5) of the recorder must be removed to make a cycle conversion. For 50 cycle operation, loosen the knurled screw on the belt guide and position the belt so it rides on the lower driving tracks of the flywheel and motor bushing (Figure 6). For 60 cycle operation, loosen the knurled screw and position the belt so it rides on the upper driving tracks of the flywheel and motor bushing (Figure 7). After the belt is properly positioned for either operation, tighten the knurled screw and reset the two slide switches located near the flywheel and the voltage selector cover panel.

Fig. 5



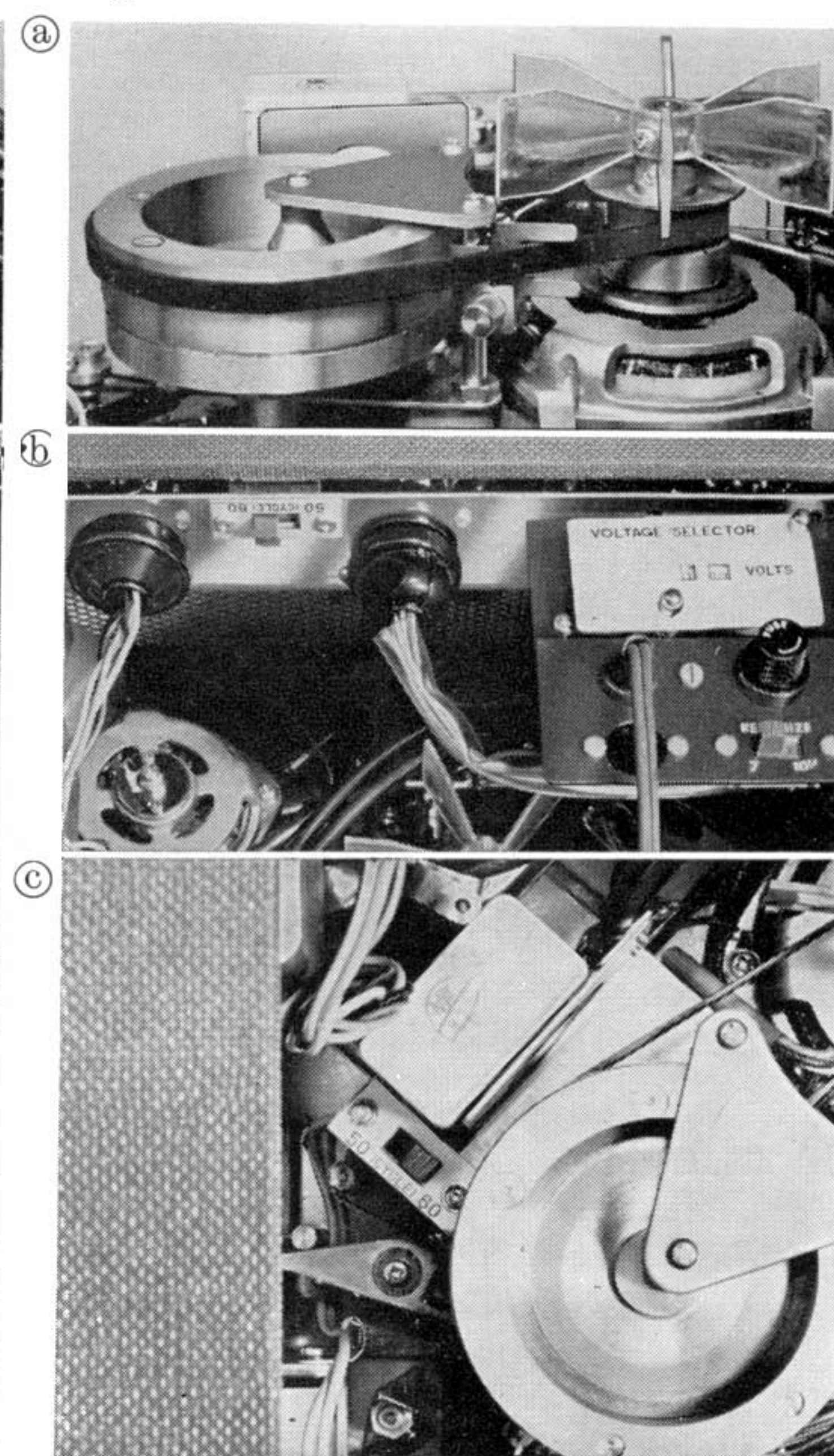
50 Cycle

Fig. 6



60 Cycle

Fig. 7



OPERATING INSTRUCTIONS

Place the reel with tape on the SUPPLY REEL SHAFT ① and an empty reel on the TAKE-UP REEL SHAFT ④. Pull down on the LOWER HEAD COVER ⑧ and thread the tape as shown by the dotted line in Figure 8. After the tape has been threaded, push the LOWER HEAD COVER ⑧ back up into position. When the recorder is used in the vertical position, the Rubber Reel Holders must be used. Best recording results are obtained with new tape.

Stereo

Connect the power cord and load a tape.

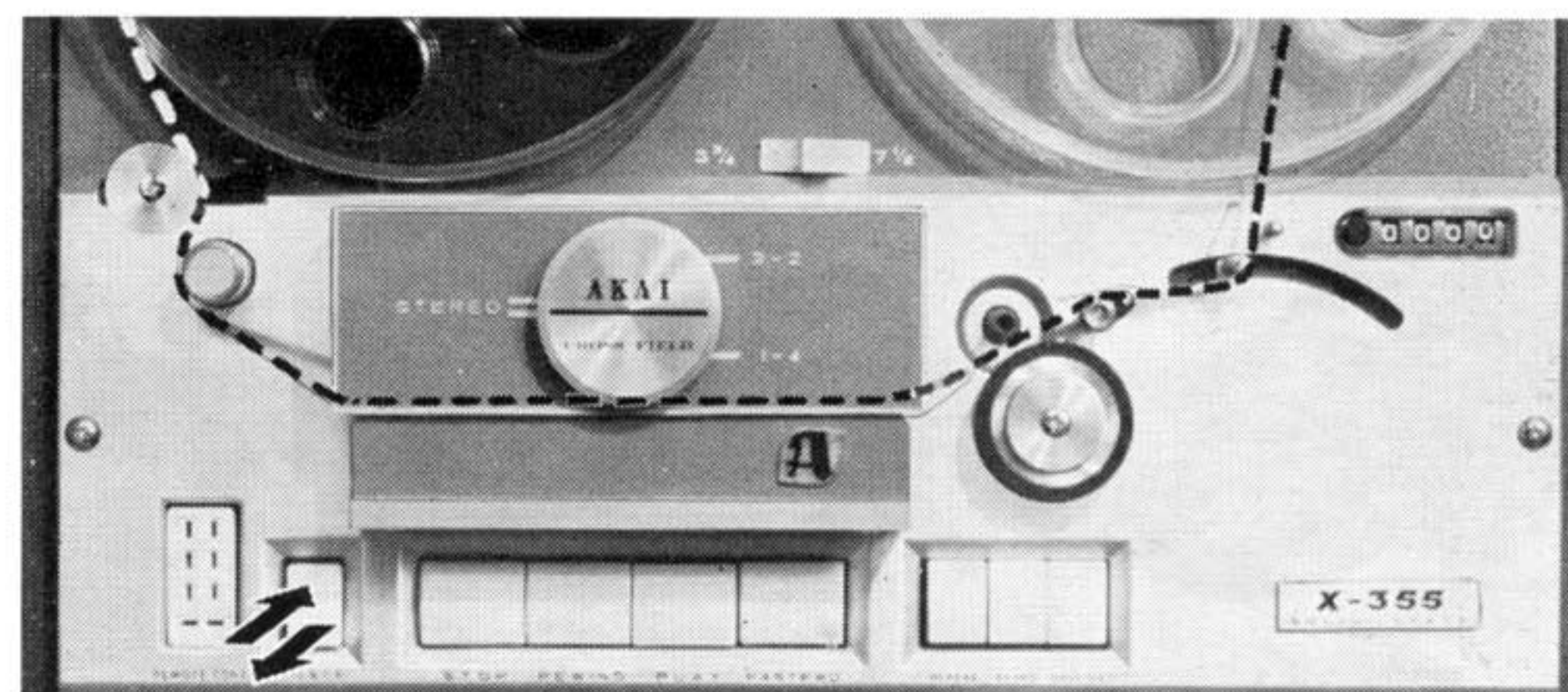
- Push the POWER BUTTON ⑩.
- Set the TRACK SELECTOR KNOB ④ to "STEREO".
- Set the SPEED CHANGE SWITCH ③ to $7\frac{1}{2}$ or $3\frac{3}{4}$ as requested.
- Set the FUNCTION SWITCH ③① to "STEREO".
- Set the EQUALIZER SWITCH ③① to $7\frac{1}{2}$ or $3\frac{3}{4}$.
The EQUALIZER SWITCH ③① and the SPEED CHANGE SWITCH ③ must have the same setting.
- Push the PLAYBACK OUTPUT BUTTON ②⑦.
- Set the SPEAKER SWITCH ③③ to "ON".
Open the SPEAKER REFLECTORS ⑤① to forty-five degrees.
- Push the PLAY BUTTON ①③.
- Adjust the VOLUME CONTROL KNOBS ②⑧, ②⑨ to desired volume.
- Set the TONE SWITCH ③② to "FLAT" or "BASS" as desired.

Monaural

For monaural playback, substitute the following steps for steps (B) and (D) of the stereo procedure, and follow the rest of the stereo procedure.

- Set the TRACK SELECTOR KNOB ④ to "1-4" or "3-2" as required.
- Set the FUNCTION SWITCH ③① to "MONO".
Only the left channel amplifier is used for monaural playback.

1. TAPE LOADING



2. PLAYBACK

Fig. 8

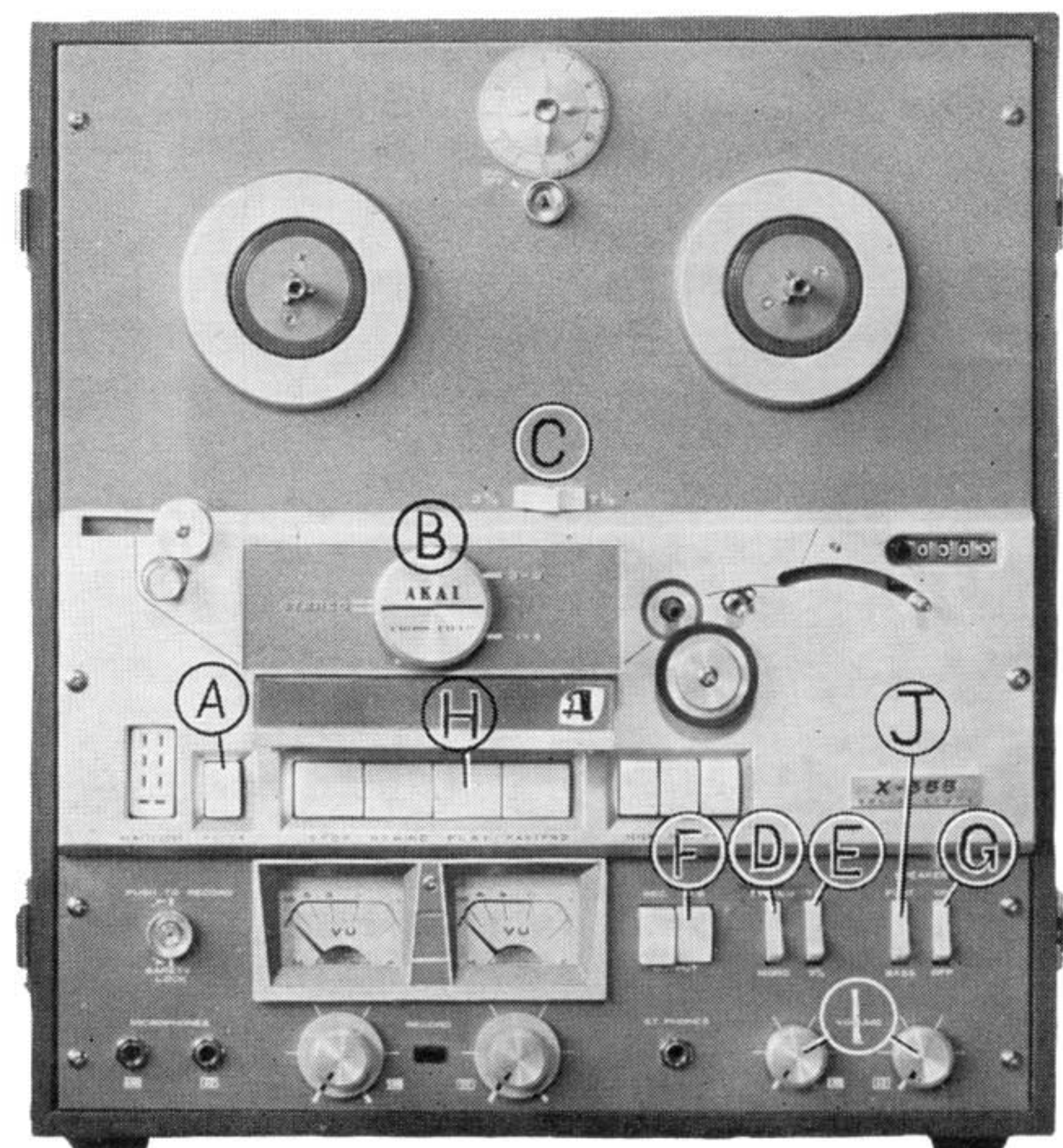


Fig. 9

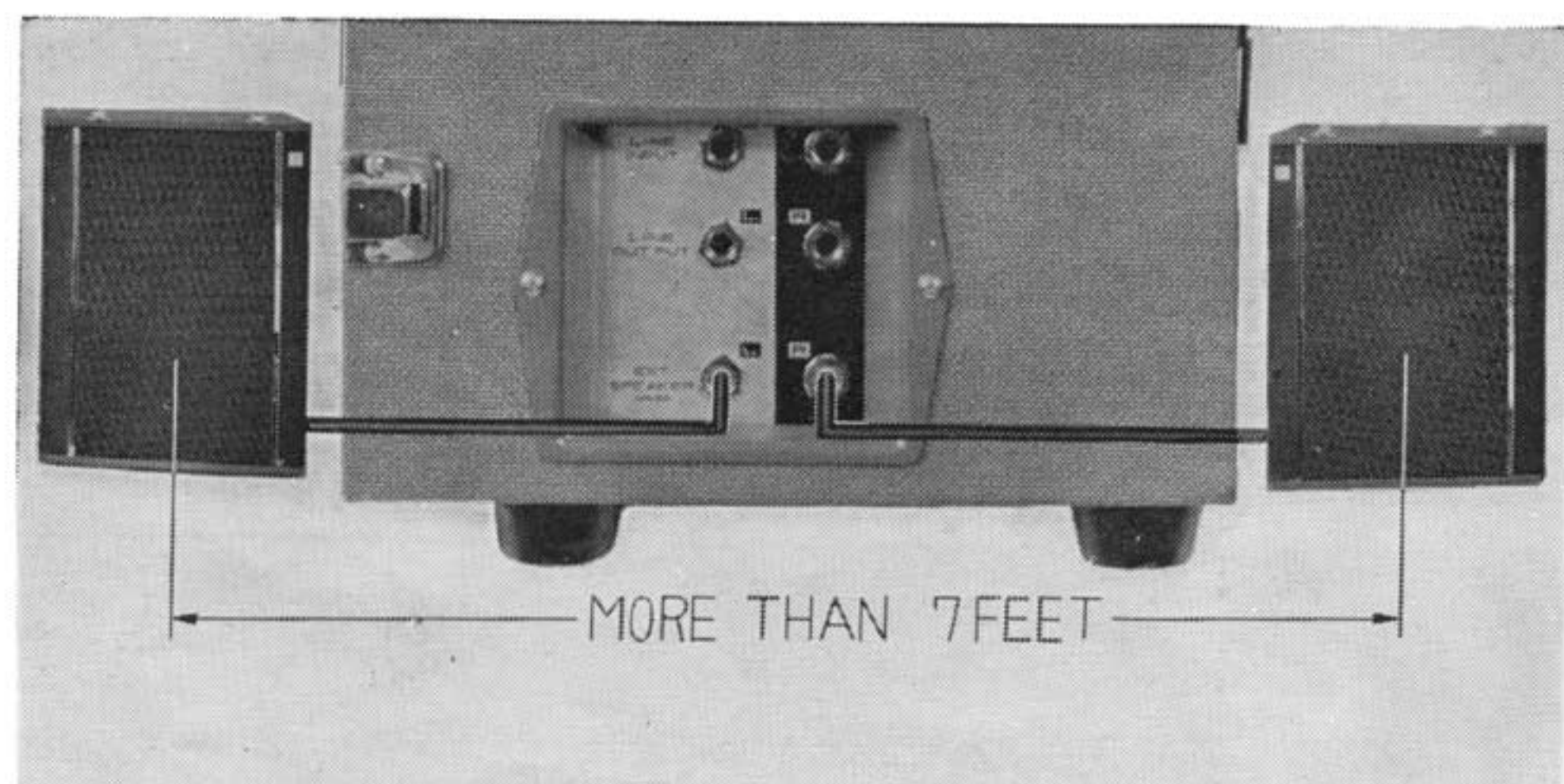


Fig. 10

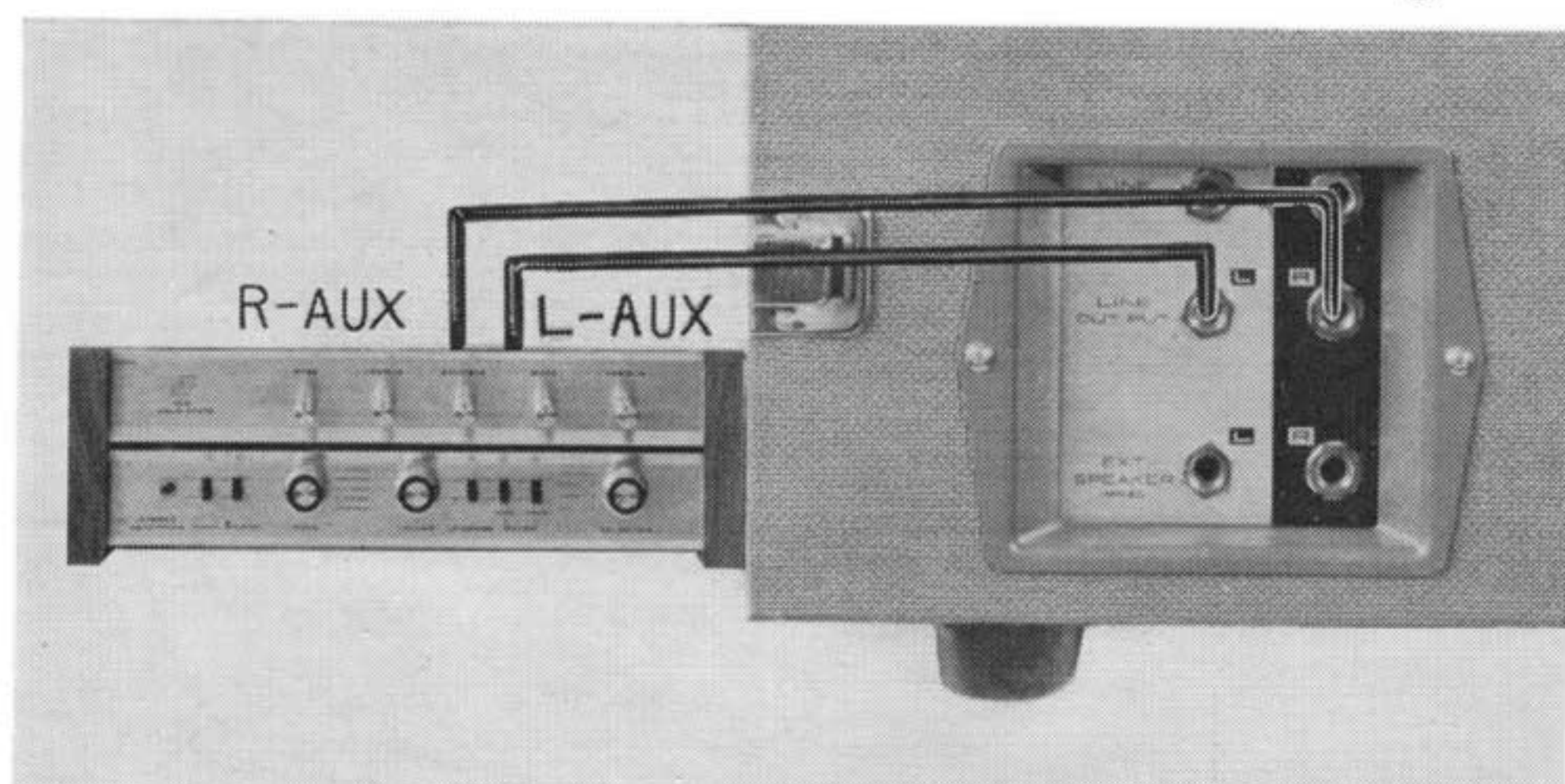


Fig. 11

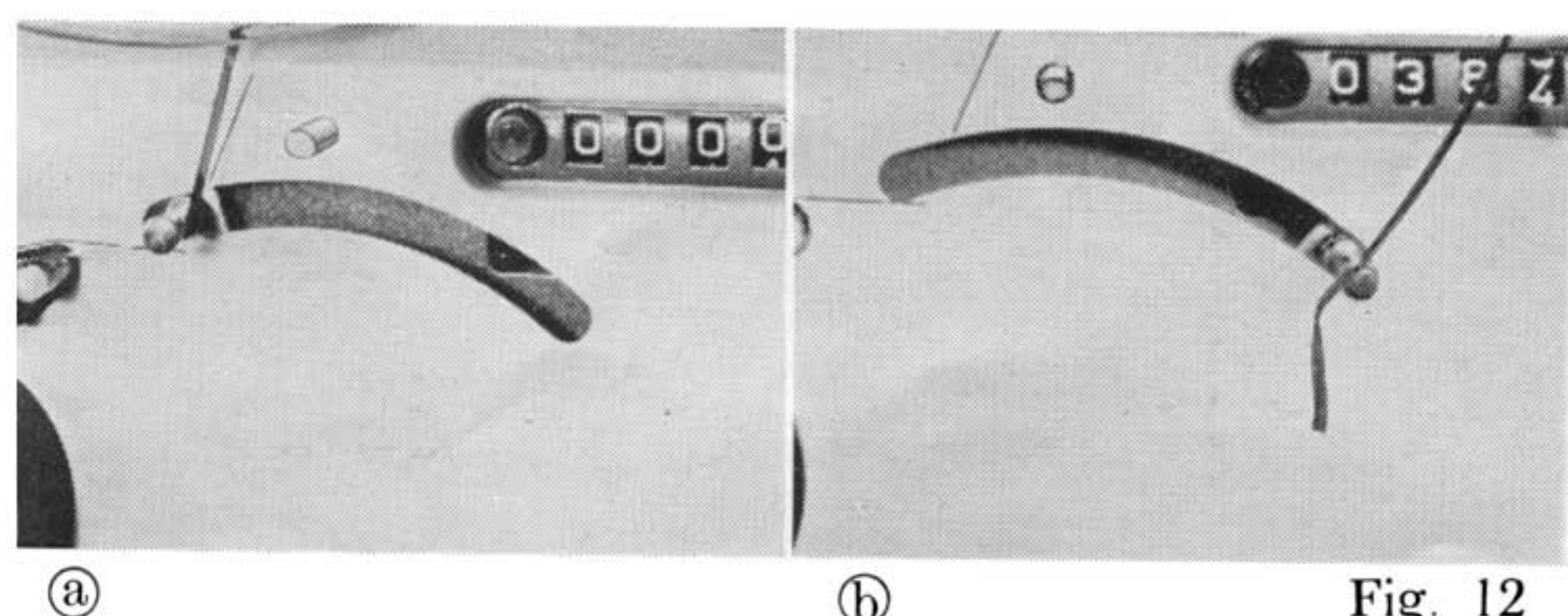


Fig. 12

Though your AKAI X-355 has two internal speakers, a pair of either 8Ω or 16Ω high fidelity external speakers will enable you to enjoy the best sound reproduction.

- A. Insert the plugs from the external speakers into the LEFT and RIGHT EXTERNAL SPEAKER JACKS (55), (56).

When the speaker plugs are in the speaker jacks, the respective internal speakers are inoperative.

- B. Set the SPEAKER SWITCH (33) to "ON".

For stereo playback, the external speakers should be separated by at least seven feet (Figure 10).

If an external stereo amplifier is used for playback, connect the LEFT and RIGHT LINE OUTPUT JACKS (53), (54) to the Left and Right Aux Jacks of the Amplifier (Figure 11).

4. AUTOMATIC STOP (DECK ONLY)

The TENSION ARM (41) is connected to a micro-switch that automatically stops the deck if the tape should break, pile up, or pass entirely through to the take up reel. Under normal operating conditions, the arm will be held in the approximate position indicated in Figure 12(a). If the arm reaches the position as shown in Figure 12(b), the micro-switch will function and stop the deck.

OPERATING INSTRUCTIONS

5. AUTOMATIC SHUT-OFF (DECK AND AMPLIFIERS)

When the SHUT-OFF BUTTON (36) is pushed in (Figure 12(c)), the deck and the amplifiers are connected to the TENSION ARM (41) micro-switch. If the tape should break, pile up, or pass entirely through to the take up reel, the TENSION ARM (41) will reach the position shown in Figure 12(b) and the deck and amplifiers will be turned off automatically.

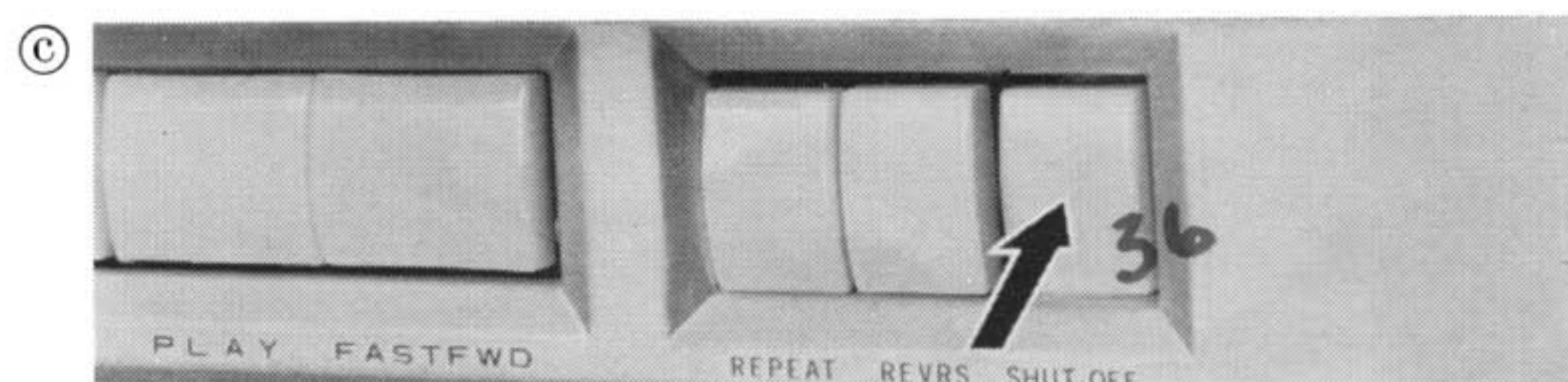
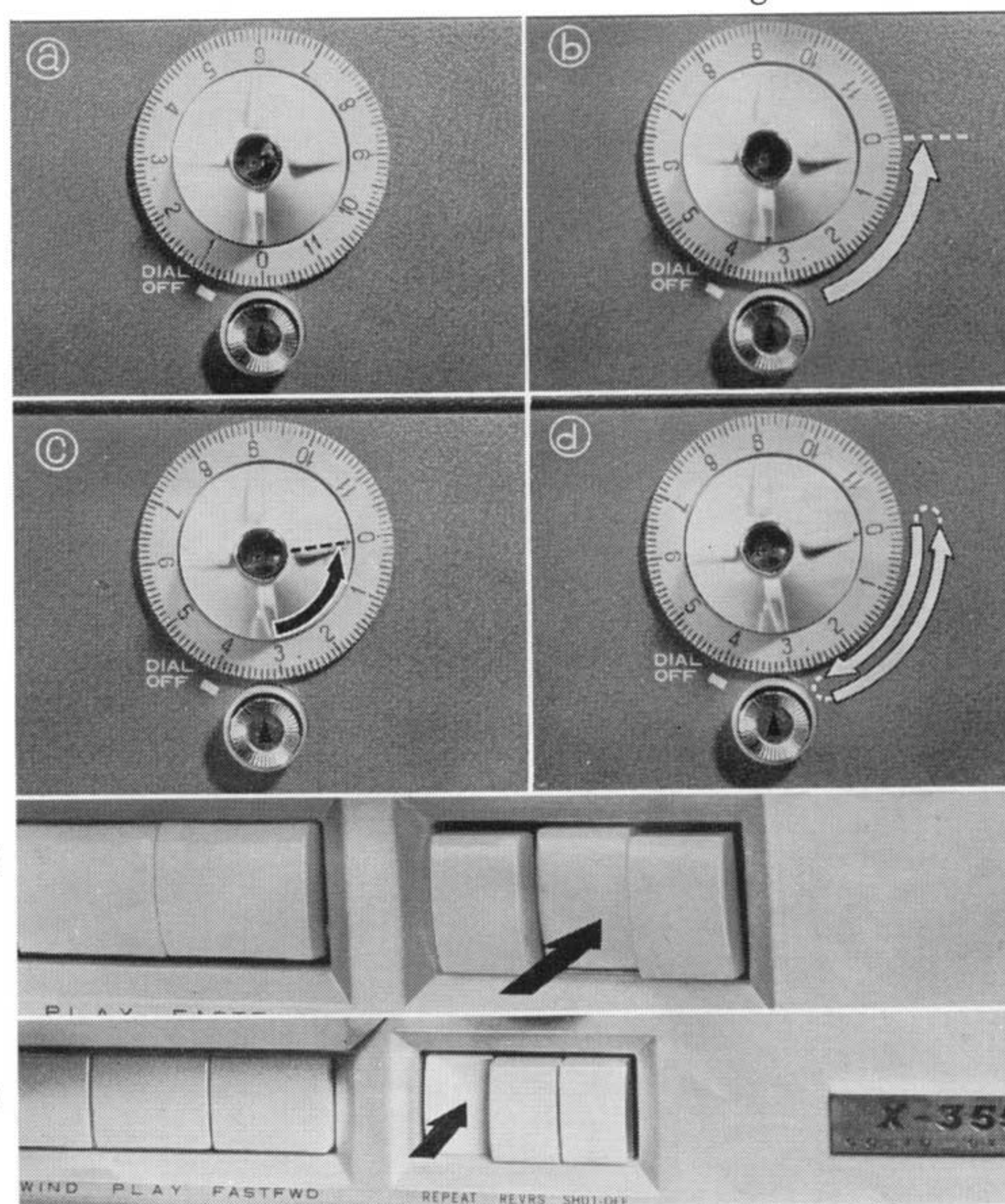


Fig. 13

6. AUTOMATIC REVERSE (METER)

Automatic reverse is used for playback only. When the meter is used for automatic reverse the X-355 will give continuous playback in both directions between any two points (A and B) selected on the tape.

- Push in on the DIAL OFF BUTTON (46) and rotate it clockwise until the black index mark points straight up.
- Align the "0" on the TAPE COUNT METER (47) and the red index mark on the SET DIAL (48) with the black index mark on the DIAL OFF BUTTON (46) (Figure 13(a)). This step establishes point A on the tape.
- Advance the tape, by either the PLAY BUTTON (13) or the FAST-FORWARD BUTTON (14). As the tape feeds forward, the TAPE COUNT METER (47) moves counter clockwise as shown in Figure 13(b). Push the STOP BUTTON (11) when the tape has advanced to the desired point B.
- Rotate the SET DIAL (48) until its red index mark is aligned with the "0" on the TAPE COUNT METER (47) as shown in Figure 13(c).
- Push the REVERSE BUTTON (35) (Figure 13(e)).
- Using the REWIND BUTTON (12), rewind the tape back to the starting point A. As the tape rewinds or playback in reverse, the TAPE COUNT METER (47) moves clockwise. The starting point A is reached when the "0" on the TAPE COUNT METER (47) is aligned with the black index mark on the DIAL OFF BUTTON (46).
- Push the PLAY BUTTON (13). The X-355 will now playback from point A to point B, and upon reaching point B will reverse itself and playback to point A where it will reverse itself again for playback to point B. This operation will continue automatically, as shown in Figure 13(d), until the STOP BUTTON (11) is pushed. When the PLAY BUTTON (13) is pushed again, playback will resume in the forward direction until reversal occurs at point B.

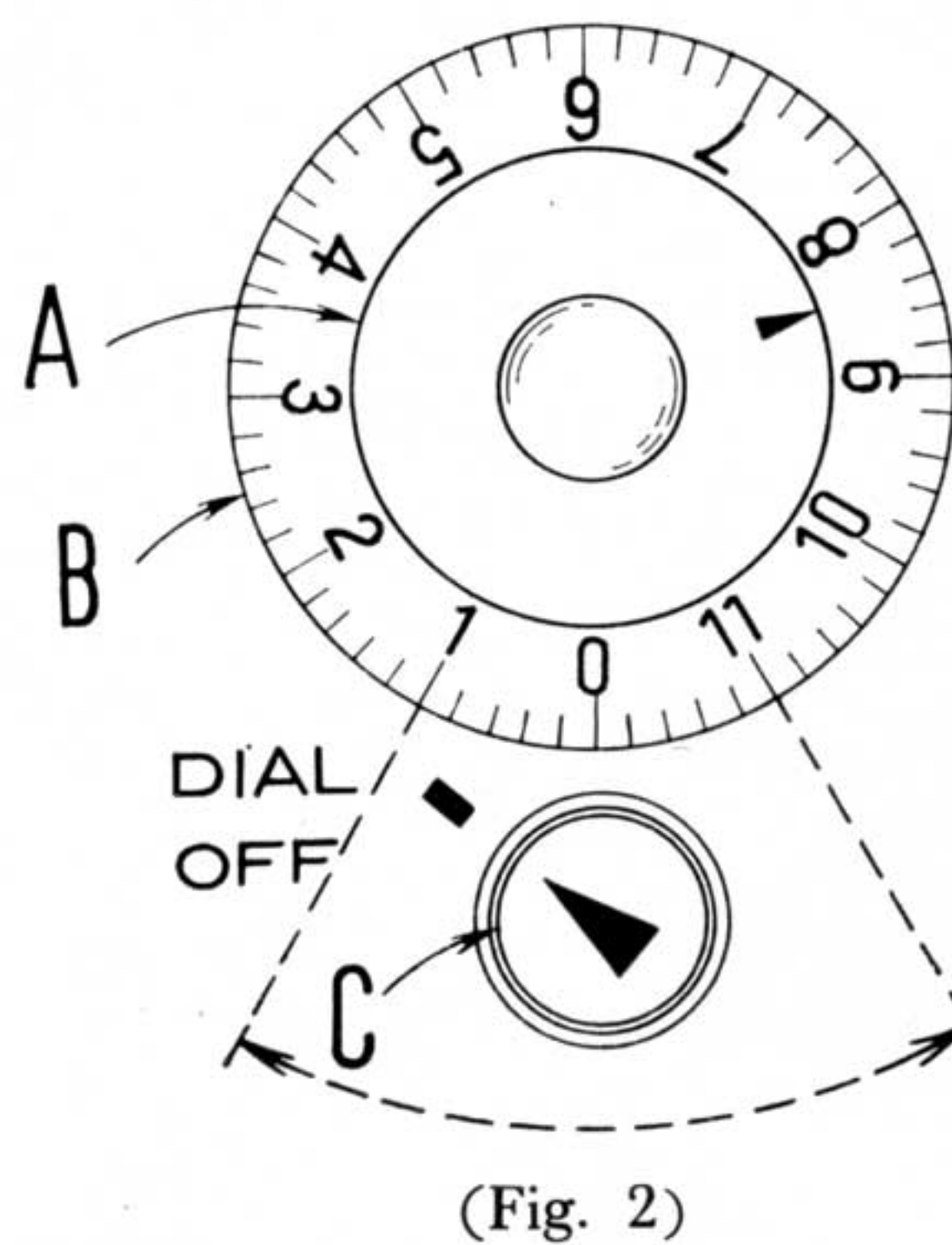
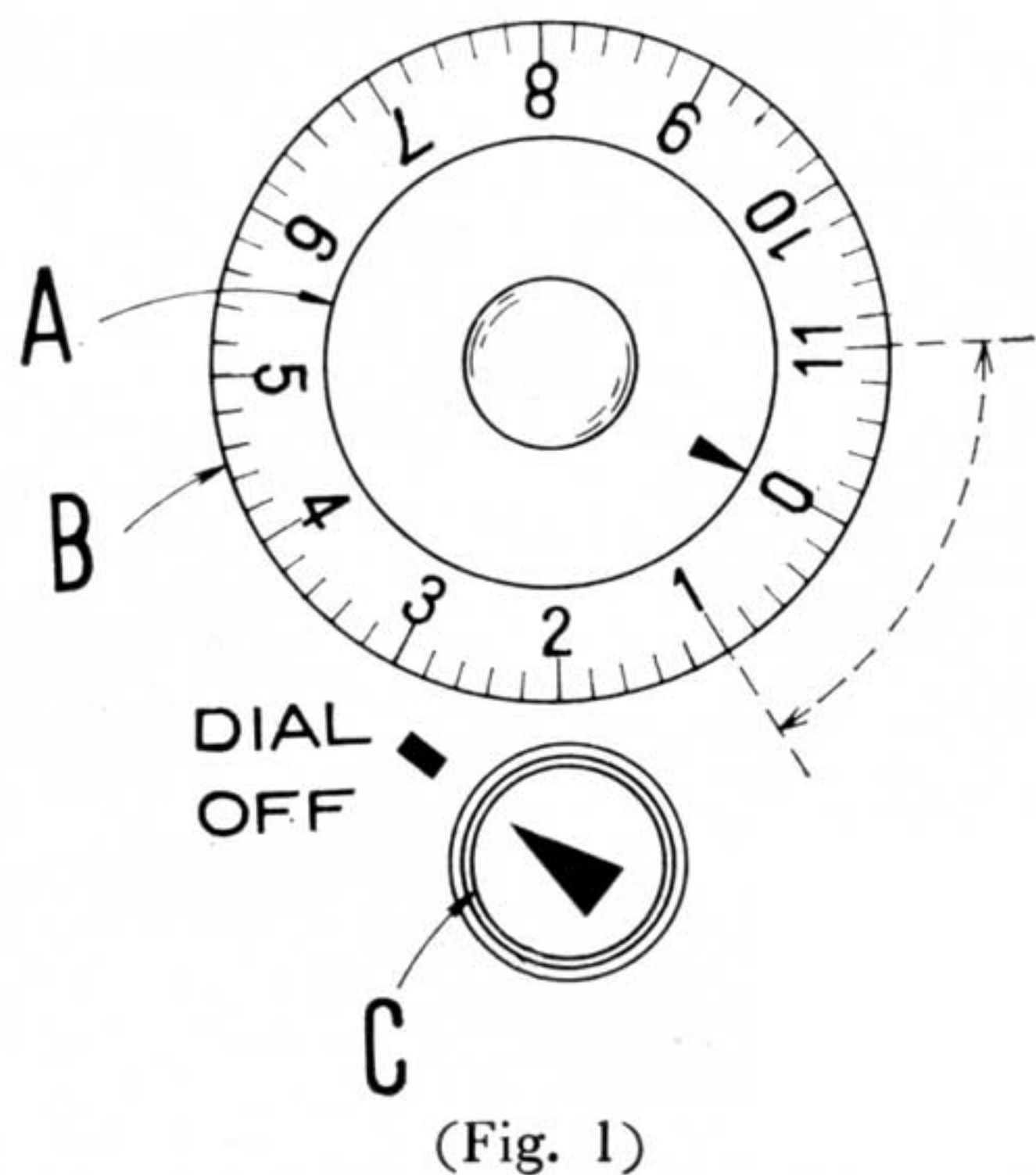


NOTE:

When you desire the reverse playback operation by using the Tin-foil Sensing Tape, be sure to check and see the Set Dial (A) and Tape Counter Meter (B) is not set within the ranges as shown below Figures 1 and 2 respectively.

If the Set Dial (A) and Tape Counter Meter (B) is set within that range neither case the reverse playback operation will work.

- (1) The red Index Pointer on the Set Dial (A) is set within the range of "1-0-11" on the Tape Counter Meter (B) as shown by the dotted line in Figure 1.
- (2) The "0" on the Tape Counter Meter (B) lies within the range as shown by the dotted line in Figure 2.



AUTOMATIC REVERSE (METER)

OPERATING INSTRUCTIONS

NOTE:

In step (C), if the PLAY BUTTON ⑬ is used to advance the tape, it is not necessary to push the STOP BUTTON ⑪ at point B. Approaching the desired point B, perform steps (D) and (E). In step (C), rotate the SET DIAL ④⑧ counter clockwise until its red index mark has slightly passed the "0" on the TAPE COUNT METER ④⑦. The X-355 will begin reverse play as soon as the "0" aligns itself with the red index mark. Steps (F) and (G) are not necessary, however, the information contained there under is applicable.

An alternate procedure for automatic reverse is to let the graduated TAPE COUNT METER ④⑦ represent 2,400 feet of tape. Approximately 2,375 feet is the maximum length of tape that can be reversed using the TAPE COUNT METER ④⑦. Note, as in Figure 13④ and steps (B) and (D), that if there were 2,400 feet between points A and B, the TAPE COUNT METER ④⑦ and the SET DIAL ④⑧ would be unable to distinguish point A from point B. The intervals between numbers represent 200 feet.

Substitute the following for steps (C) and (F).

- (C) Manually rotate the TAPE COUNT METER ④⑦ counter clockwise until the number that represents the desired tape footage between points A and B is aligned with the black index mark on the DIAL OFF BUTTON ④⑥ (Figure 13④ shows 650 feet).
- (F) Manually rotate the TAPE COUNT METER ④⑦ clockwise until the "0" is aligned with the black index mark on the DIAL OFF BUTTON ④⑥.

7. AUTOMATIC REPEAT (METER)

Automatic repeat is used for playback in the forward direction only. When the meter is used for automatic repeat, the X-355 will continuously repeat the portion of tape from point A to point B by playing back in the forward direction from point A to point B, rewinding itself to point A and playing back again to point B. The operation will continue automatically until the STOP BUTTON ⑪ is pushed. When the PLAY BUTTON ⑬ is pushed again, playback will resume in the forward direction until rewinding occurs at point B.

The procedure for automatic repeat is the same as for automatic reverse except for step (E). Substitute the following for step (E).

- (E). Push the REPEAT BUTTON ③④ (Figure 13④).

Automatic reverse or rewind with metallic sensing tape is used for playback only. The sensing tape method is convenient if the tape in use is too long to be measured by the TAPE COUNT METER ④⑦.

- Push in on the DIAL OFF BUTTON ④⑥ and rotate it counter clockwise until it pops out.
- Push the REVERSE BUTTON ③⑤ or REPEAT BUTTON ③④ if rewind is desired. This step de-activates the TAPE COUNT METER ④⑦.
- Splice a two inch piece of metallic sensing tape to the end or at the desired reverse or rewind point of the tape in use. Reversal or rewind will occur when the metallic sensing tape makes simultaneous contact with the REVERSE PINS (I) and (II) ③⑨, ④⑩. Reverse (playback) or rewind will continue until the end of the tape passes the TENSION ARM ④⑪ and the deck is shut off.



Fig. 14

9. AUTOMATIC SHUT-OFF WITH REVERSE AND REPEAT

- If the REVERSE BUTTON ③⑤ and the SHUT-OFF BUTTON ③⑥ are both pushed in, the X-355 will reverse at the point determined by the TAPE COUNT METER ④⑦ or the metallic sensing tape and playback in reverse until the end of the tape passes the TENSION ARM ④⑪ and the deck and amplifiers are shut off.
- If the REPEAT BUTTON ③④ and the SHUT-OFF BUTTON ③⑥ are both pushed in, the X-355 will rewind at the point determined by the TAPE COUNT METER ④⑦ or sensing tape until the end of the tape passes the TENSION ARM ④⑪ and the deck and amplifiers are shut off.
- If the REPEAT BUTTON ③④ and the REVERSE BUTTON ③⑤ are both pushed in the repeat function supersedes the reverse function.
- If the REPEAT BUTTON ③④, the REVERSE BUTTON ③⑤ and the SHUT-OFF BUTTON ③⑥ are all pushed in, step (B) applies.

13

10. MANUAL REVERSE OR REPEAT

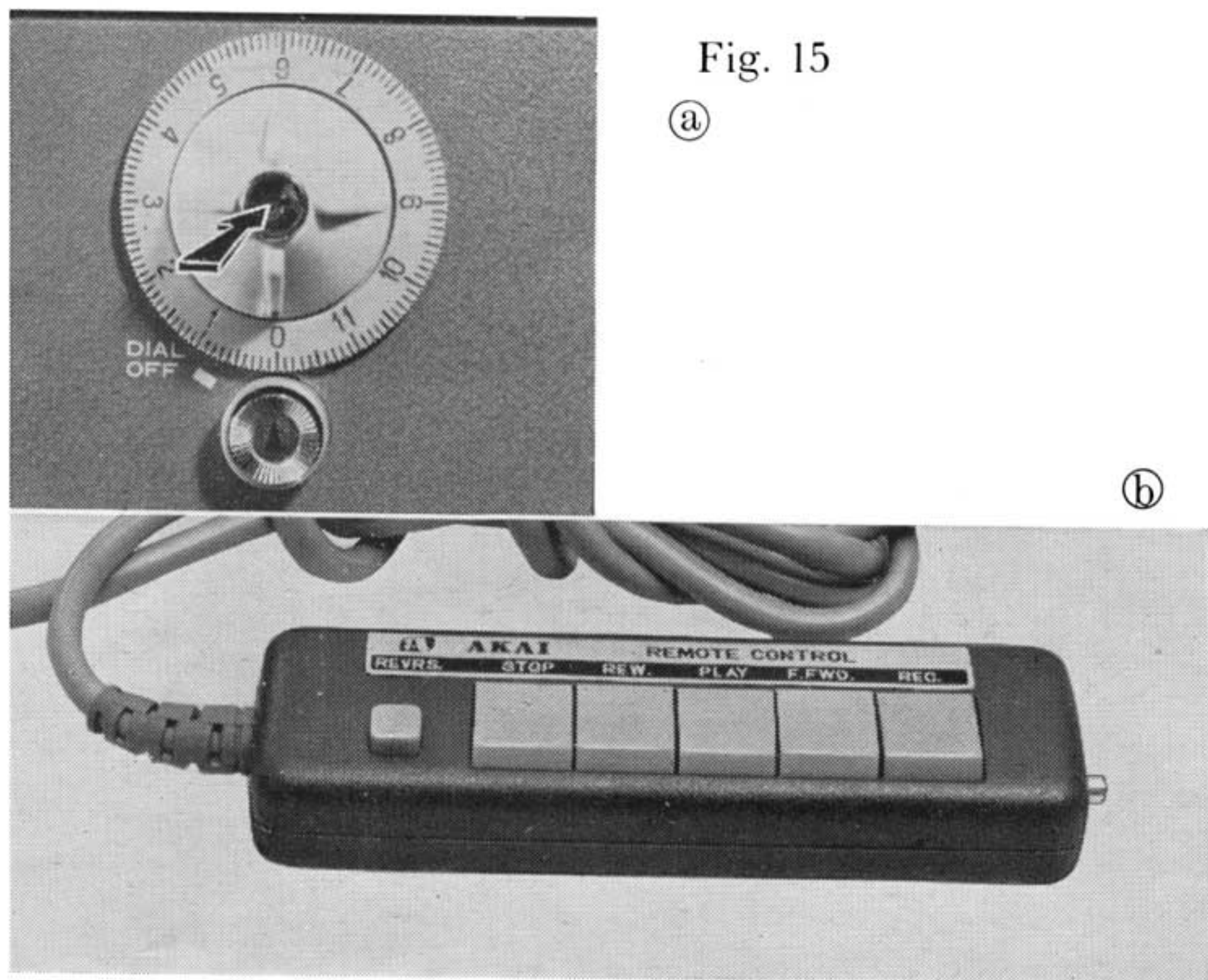


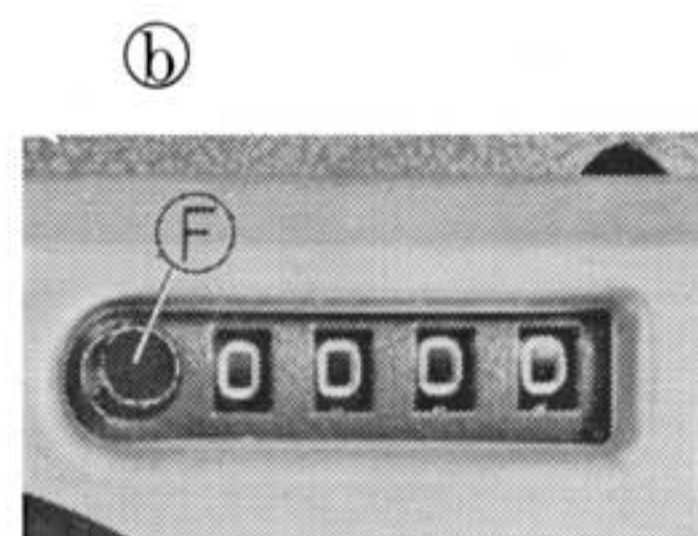
Fig. 15

(a)

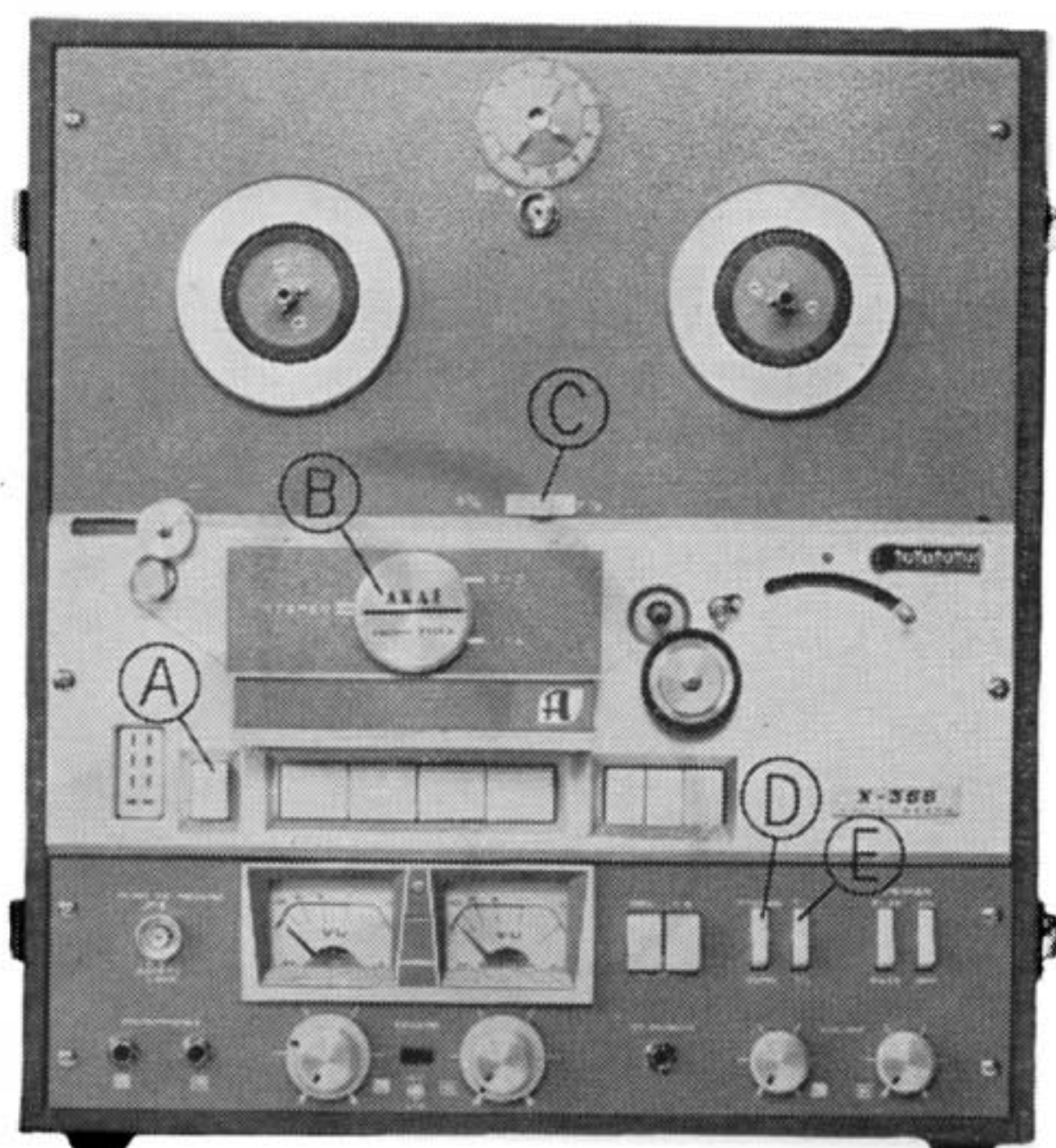
(b)

Fig. 16

(a)



(b)



OPERATING INSTRUCTIONS

Pushing the MANUAL REVERSE BUTTON ④⑨ in the center of the SET DIAL ④⑧ (Figure 15a) will put the X-355 into the reverse (playback) or repeat (rewind) function anytime before the "0" on the TAPE COUNT METER ④⑦ is aligned with the red index mark on the SET DIAL ④⑧. Manual reverse can also be accomplished by pushing the REVERSE BUTTON on the remote control attachment (Figure 15b). In order for the MANUAL REVERSE BUTTON ④⑨ to function, the black index mark on the DIAL OFF BUTTON ④⑥ must be pointing straight up (Figure 15a) and the REVERSE BUTTON ③⑤ or REPEAT BUTTON ③④ must be pushed in.

11. RECORDING

STEREO - Connect the power cord and load a tape as shown on Page 9.

- Push the POWER BUTTON ⑩.
- Set the TRACK SELECTOR KNOB ④ to "STEREO".
- Set the SPEED CHANGE SWITCH ③ to 7-1/2 or 3-3/4 as required.
- Set the FUNCTION SWITCH ③⑩ to "STEREO".
- Set the EQUALIZER SWITCH ③① to 7-1/2 or 3-3/4. The EQUALIZER SWITCH ③① and the SPEED CHANGE SWITCH ③ must have the same setting.
- Push the RESET BUTTON ④③ and set the INDEX COUNTER ④② to "0000". The INDEX COUNTER ④② provides a reference for locating a position on the tape.
- Insert the microphone plugs into the MICROPHONE INPUT JACKS ①⑦, ①⑧.

Maintain a distance of at least seven feet between the microphones (see Figure 16c). Microphone volume level may be adjusted and balanced by the MICROPHONE VOLUME CONTROL KNOBS ②①, ②④. Normal recording should not exceed "0" on the VU meters ①⑨. If an external amplifier is connected and in use, feed back can be prevented by adjusting the VOLUME CONTROL KNOBS ②⑧, ②⑨.

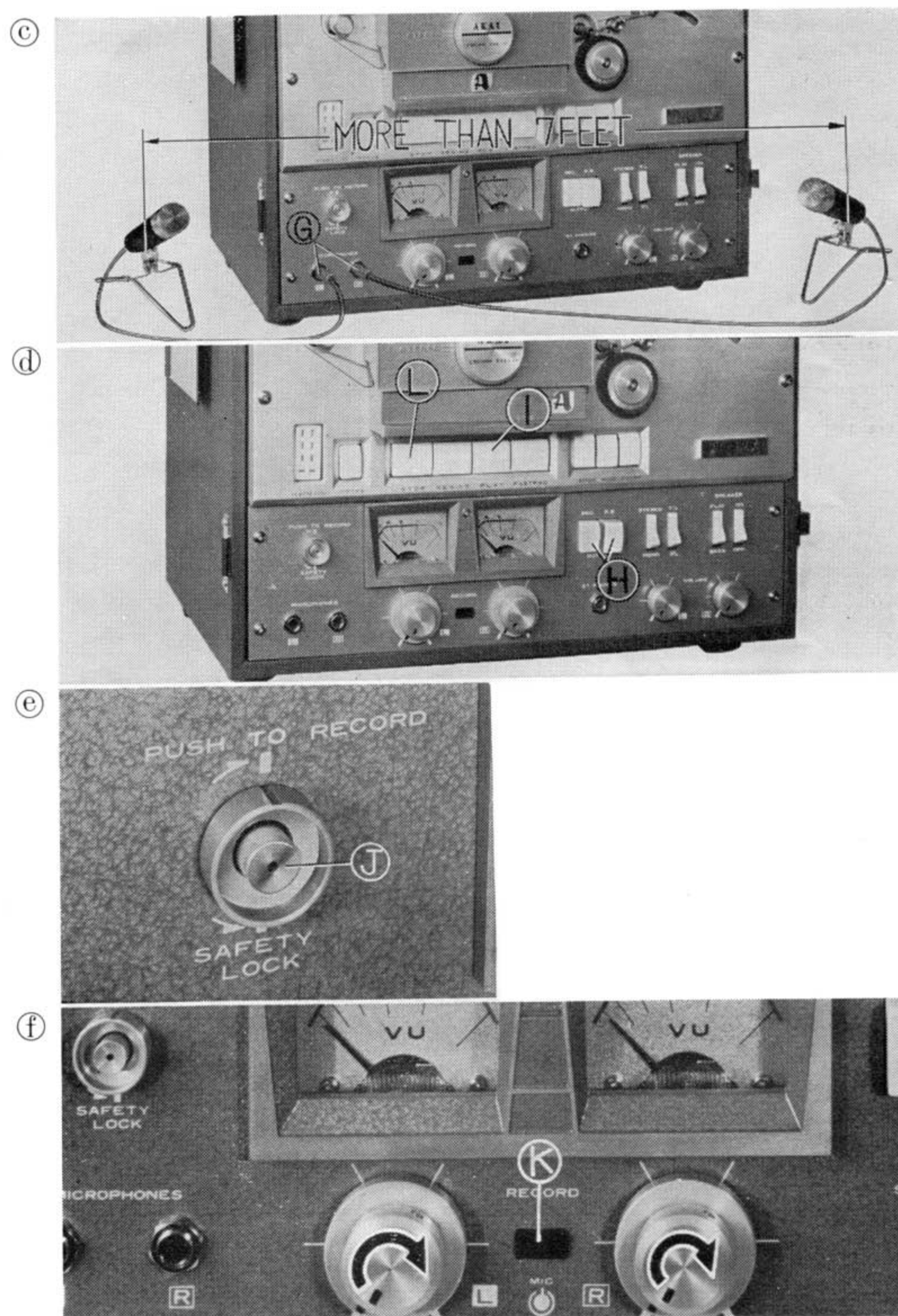
OPERATING INSTRUCTIONS

- (H) Push either the RECORD OUTPUT BUTTON ②⑤ or the PLAYBACK OUTPUT BUTTON ②⑦.
If the RECORD OUTPUT BUTTON ②⑤ is used and the SPEAKER SWITCH ③③ is “ON”, the program source may be monitored as it is being recorded.
If the PLAYBACK OUTPUT BUTTON ②⑦ is used and the SPEAKER SWITCH ③③ is “ON”, the recorded signal will be monitored as the tape passes the playback head.
The volume may be controlled by the VOLUME CONTROL KNOBS ②⑧, ②⑨.
- (I) Push the PLAY BUTTON ①③.
- (J) Push the RECORD SAFETY BUTTON ①⑥.
The RECORD SAFETY BUTTON ①⑥ is equipped with the RECORD SAFETY LOCK ①⑤ to prevent inadvertent erasure of recorded tapes. Turn the RECORD SAFETY LOCK ①⑤ clockwise until its red mark is aligned with the white mark on the recorder.
- (K) Check that the RECORDING INDICATOR LIGHT ②② is on.
If the light is not on, the X-355 will not record.
- (L) Push the STOP BUTTON ①① to stop recording.
To resume recording, the PLAY BUTTON ①③ and the RECORD SAFETY BUTTON ①⑥ must be depressed again.

MONAURAL - For monaural recording, substitute the following steps for steps (B) and (G) and add step (M). Follow the rest of the stereo procedure.

- (B) Set the **TRACK SELECTOR KNOB** ④ to “1-4” or “3-2” as required.
- (G) Insert the microphone plug into the **LEFT MICROPHONE INPUT JACK** ⑰.
Only the left amplifier is used for monaural recording.
- (M) Turn the tape reels over to record on track 4 or track 2 as applicable. If the sound sources are so far from the microphones that the **MICROPHONE VOLUME CONTROLS** ⑳, ㉔ must be turned up high, some hum may be introduced. To avoid recording the hum, attach a ground wire to the deck.

RECORDING



12. RECORDING FROM DISCS

To record from a stereo or monaural disc, a CRYSTAL PICK-UP (0.5-1 volt) or a CERAMIC PICK-UP may be connected directly to the LINE INPUT JACKS ⑤1, ⑤2 in step (G) of the recording procedure. If a MAGNETIC CARTRIDGE is used, it must be connected to a separate pre-amplifier or external amplifier before being connected to the X-355 LINE INPUT JACKS ⑤1, ⑤2. VU level is controlled with the LINE VOLUME CONTROLS ②0, ②3.

13. RECORDING FROM AN EXTERNAL AMPLIFIER

If an external amplifier or tuner-amplifier combination is used, connect the TAPE OUTPUT leads of the external amplifier to the LINE INPUT JACKS ⑤1, ⑤2 in step (G) of the recording procedure. VU level is controlled with the LINE VOLUME CONTROLS ②0, ②3. The X-355 will record any source that can be selected on the external amplifier.

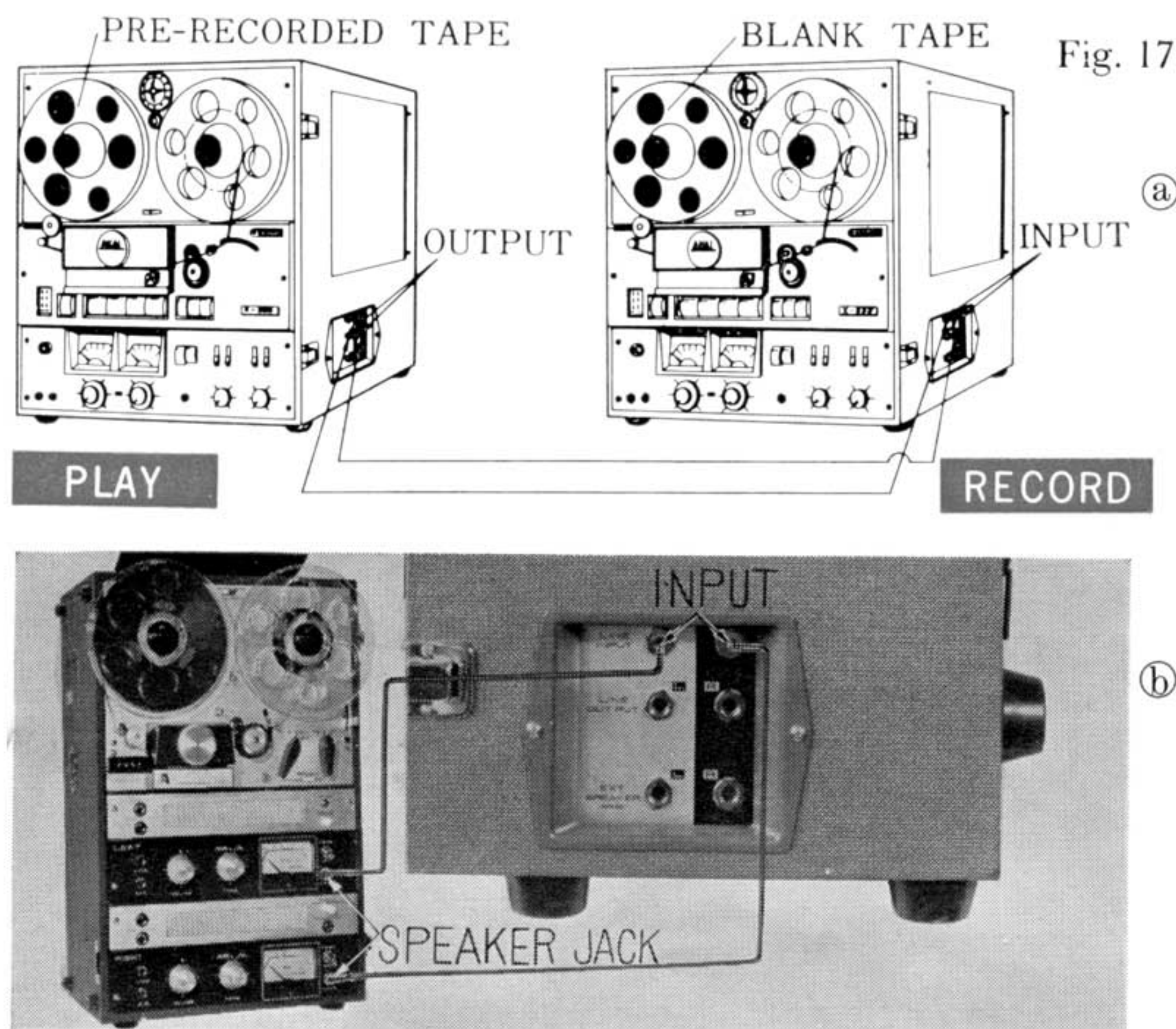


Fig. 17 **14. RECORDING FROM ANOTHER TAPE RECORDER**

If another X-355 is used, connect the **LINE OUTPUT JACKS** ⑤③, ⑤④ of the playback machine to the **LINE INPUT JACKS** ⑤①, ⑤② of the recording machine in step (G) of the recording procedure (Figure 17 a).

If one of the AKAI M-series recorders is used as a playback machine, connect its speaker jacks to the LNE INPUT JACKS ⑤1, ⑤2 of the X-355 in step (G) of the recording procedure (Figure 17 b).

VU level is controlled with the **LINE VOLUME CONTROLS** ⑳, ㉓.

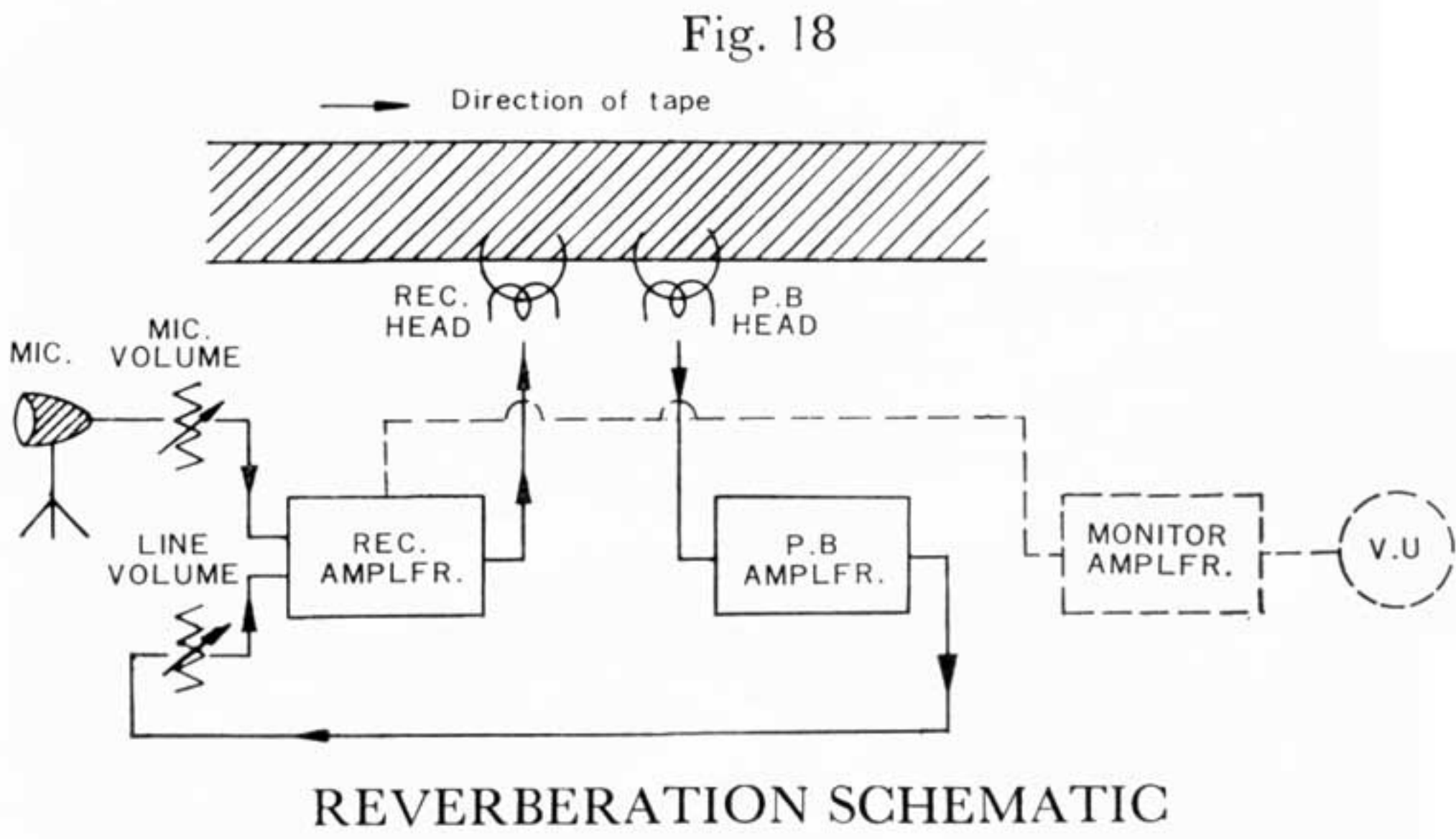
OPERATING INSTRUCTIONS

15. MONITORING

Step (H) of the recording procedure describes monitoring. If a set of stereo headphones is used they should be of the low impedance type, preferably 8 ohms. If the headphones have two separate plugs, insert them in the EXTERNAL SPEAKER JACKS 55, 56. The SPEAKER SWITCH 33 must be "ON". If the headphones have only one plug insert it into the STEREO HEADPHONE JACK 26. The SPEAKER SWITCH 33 may be "ON" or "OFF". Monitoring procedures are the same for recording or playback.

16. REVERBERATION

- (A) Set the SPEAKER SWITCH 33 to "OFF".
 - (B) Push in the RECORD OUTPUT BUTTON 25 and the PLAYBACK OUTPUT BUTTON 27.
 - (C) Confirm that there are no connections to the LINE INPUT JACKS 51, 52.
 - (D) Insert the microphone plugs into the MICROPHONE JACKS 17, 18.
 - (E) Adjust the MICROPHONE VOLUME CONTROLS 21, 24 to the proper level on the VU meters.
 - (F) Increase the LINE VOLUME CONTROLS 20, 23 to approximately maximum.
 - (G) Push the PLAY BUTTON 13 and the RECORD SAFETY BUTTON 16.
- The reverberation level may be controlled by the LINE VOLUME CONTROLS 20, 23.
- Reverberation recording can be made monaurally or in stereo.

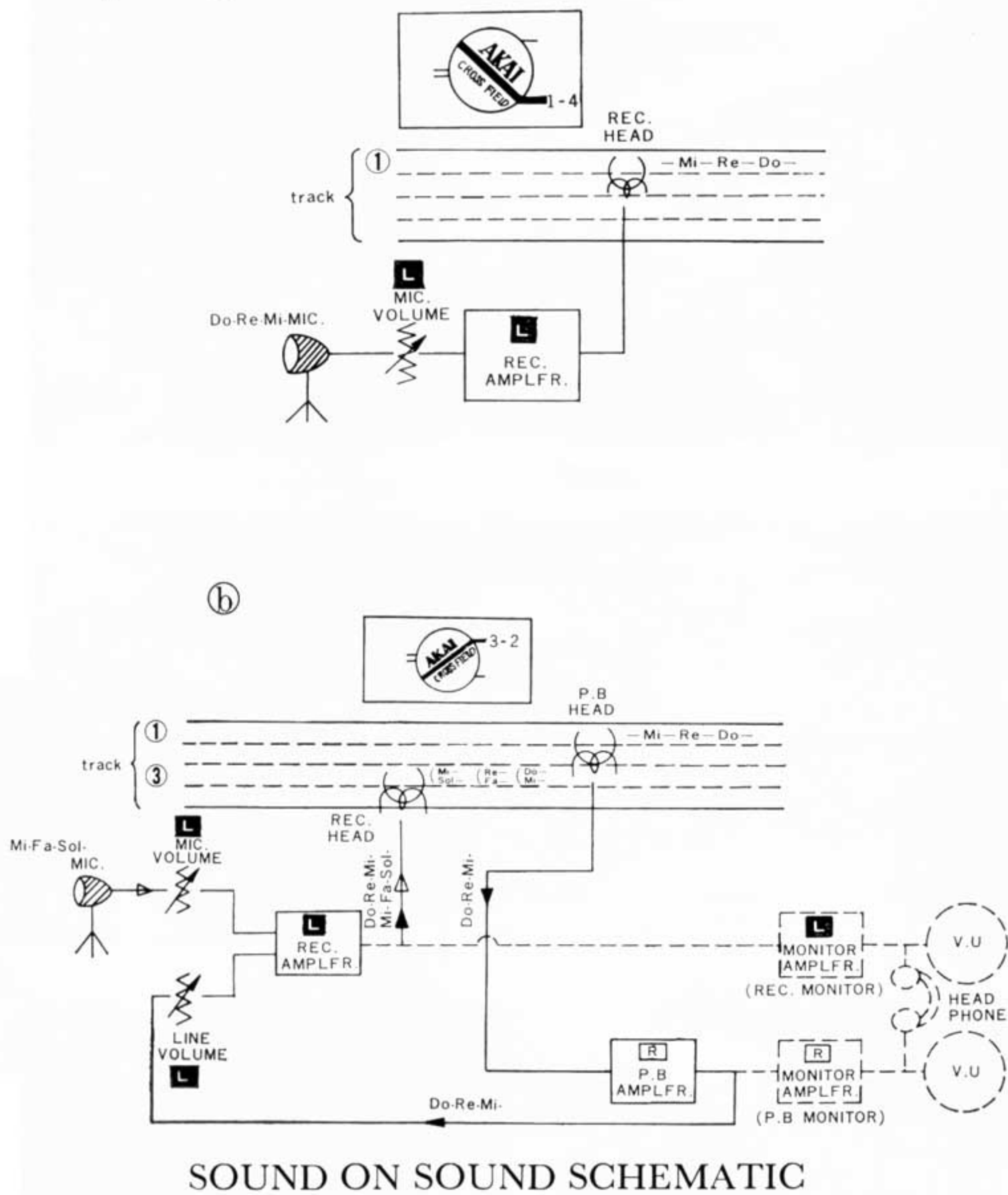


17

17. SOUND ON SOUND

OPERATING INSTRUCTIONS

Fig. 19 a



First Recording

- (A) Set the SPEAKER SWITCH 33 to "OFF".
- (B) Confirm that there are no connections to the LINE INPUT JACKS 51, 52.
- (C) Set the TRACK SELECTOR KNOB 4 to "1-4" for recording on track 1.
- (D) Set the FUNCTION SWITCH 30 to "STEREO".
- (E) Insert the microphone plug in the LEFT MICROPHONE JACK 17.
- (F) Adjust the LEFT MICROPHONE VOLUME CONTROL 21 to the proper level on the VU meter.
- (G) Push the PLAY BUTTON 13 and the RECORD SAFETY BUTTON 16 and make the first recording, i.e. Do-Re-Mi.
- (H) When the first recording is complete, rewind the tape to the starting position.

Second Recording

- (I) Confirm that the RECORD OUTPUT BUTTON 25 and the PLAYBACK OUTPUT BUTTON 27 are both in the OUT position.
- (J) Set the TRACK SELECTOR KNOB 4 to "3-2" for recording on track 3 while listening to track 1.
- (K) Increase the LEFT LINE VOLUME CONTROL 20 to approximately maximum.
- (L) Connect the stereo headphones to monitor the first recording on the left channel (track 1).
- (M) Push the PLAY BUTTON 13 and the RECORD SAFETY BUTTON 16.
- (N) Reset the LEFT LINE VOLUME CONTROL 20 to the proper level by watching the left channel VU meter.
- (O) After the reset, rewind the tape again to the starting point.
- (P) Push the PLAY BUTTON 13 and the RECORD SAFETY BUTTON 16.
- (Q) The third and subsequent recordings are made the same as the second by switching the TRACK SELECTOR KNOB 4 to "1-4", "3-2" etc.

To record sound with sound, substitute the following step for step (K) of the sound on sound procedure and eliminate step (N).
(K) Decrease the LEFT LINE VOLUME CONTROL ⑳ to minimum.

19. FAST-FORWARD AND REWIND

To use fast-forward or rewind, push the FAST-FORWARD BUTTON ⑭ or the REWIND BUTTON ⑫.

Pull the LOWER HEAD COVER ⑧ down to keep the tape off the heads during the high speed operation. Only the STOP BUTTON ⑪ should be used to stop fast-forward or rewind. Push the LOWER HEAD COVER ⑧ back up before beginning playback or recording.

20. TAPE SPEED CHANGE

To select the desired tape speed, use the SPEED CHANGE SWITCH ③ in the center of the panel. For high speed tape duplication, 15 ips can be selected by attaching the extra capstan and pinch wheel contained in the standard accessories.

21. HEAD CLEANING

After every few hours of operation, the heads will accumulate small quantities of the brownish-red oxide with which the tape is coated. If the heads are not cleaned regularly, high frequency response and fidelity, in general, will suffer. Clean the heads with a soft cotton swab soaked in rubbing alcohol or carbon tetrachloride.

Fig. 20

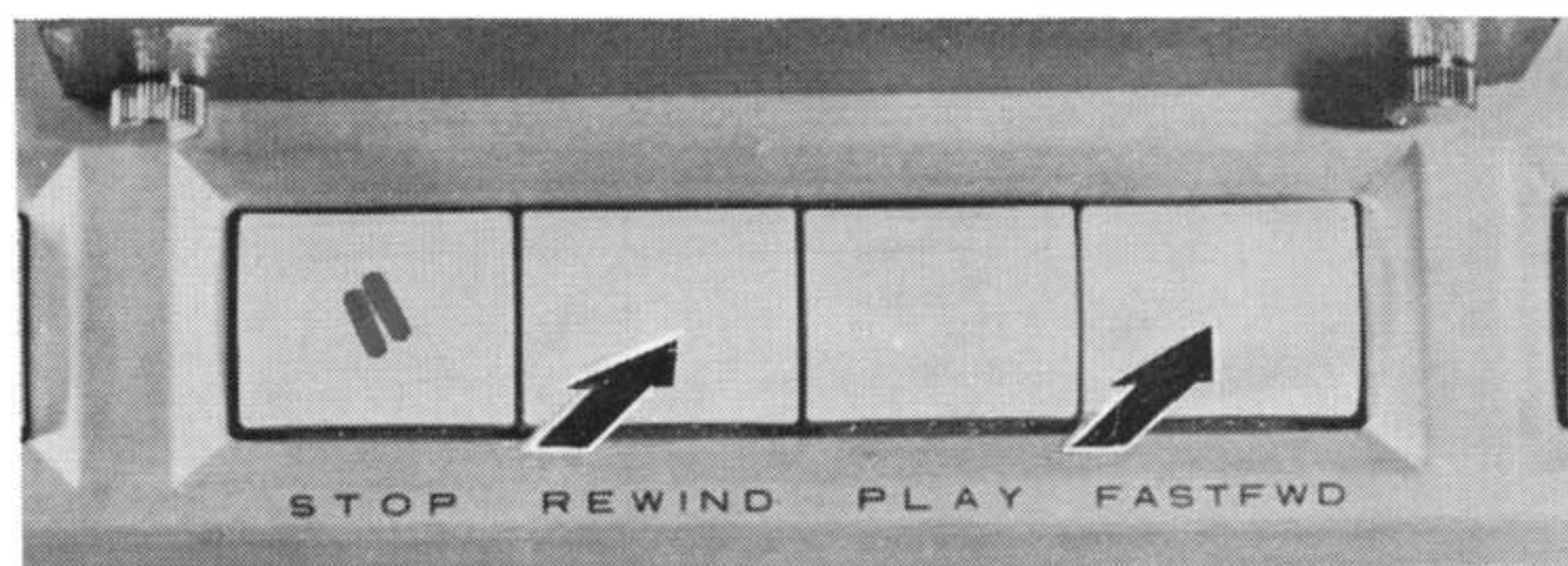


Fig. 21

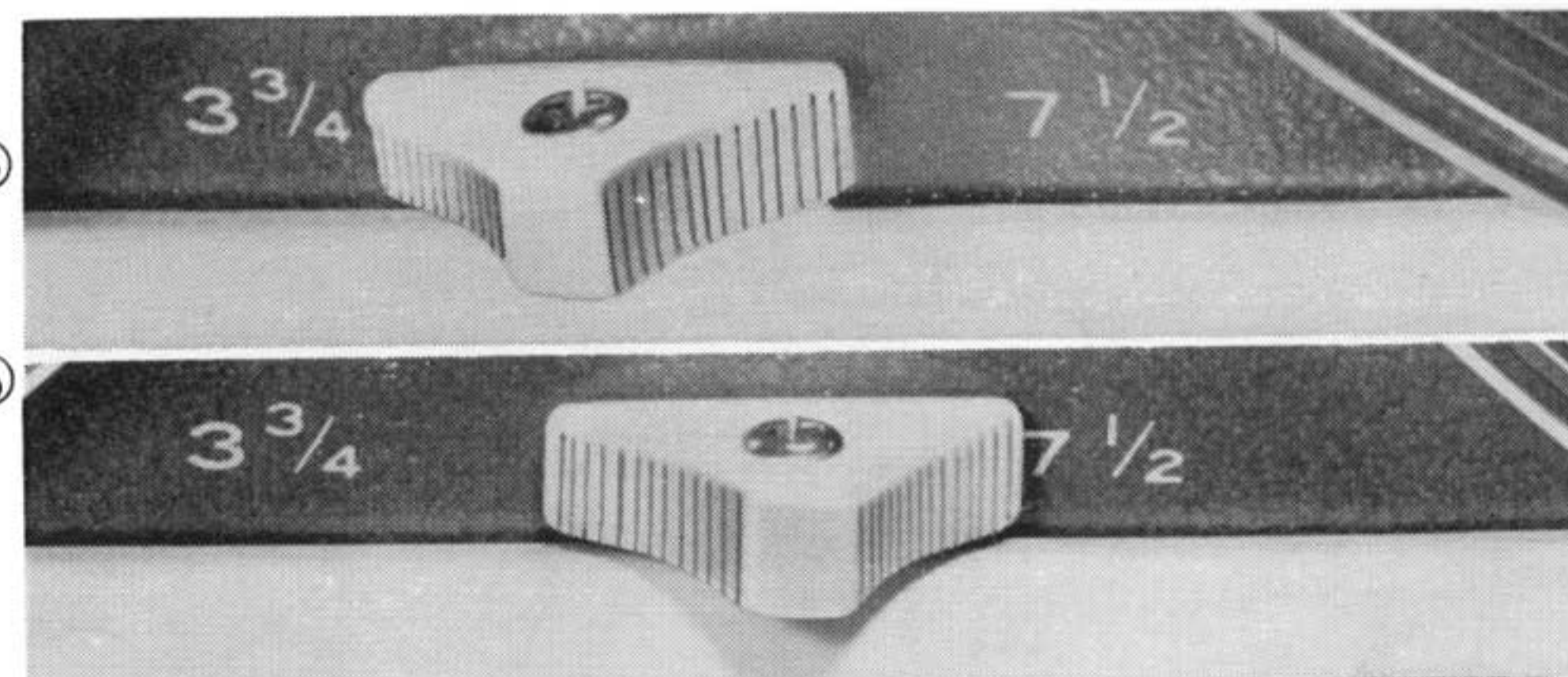
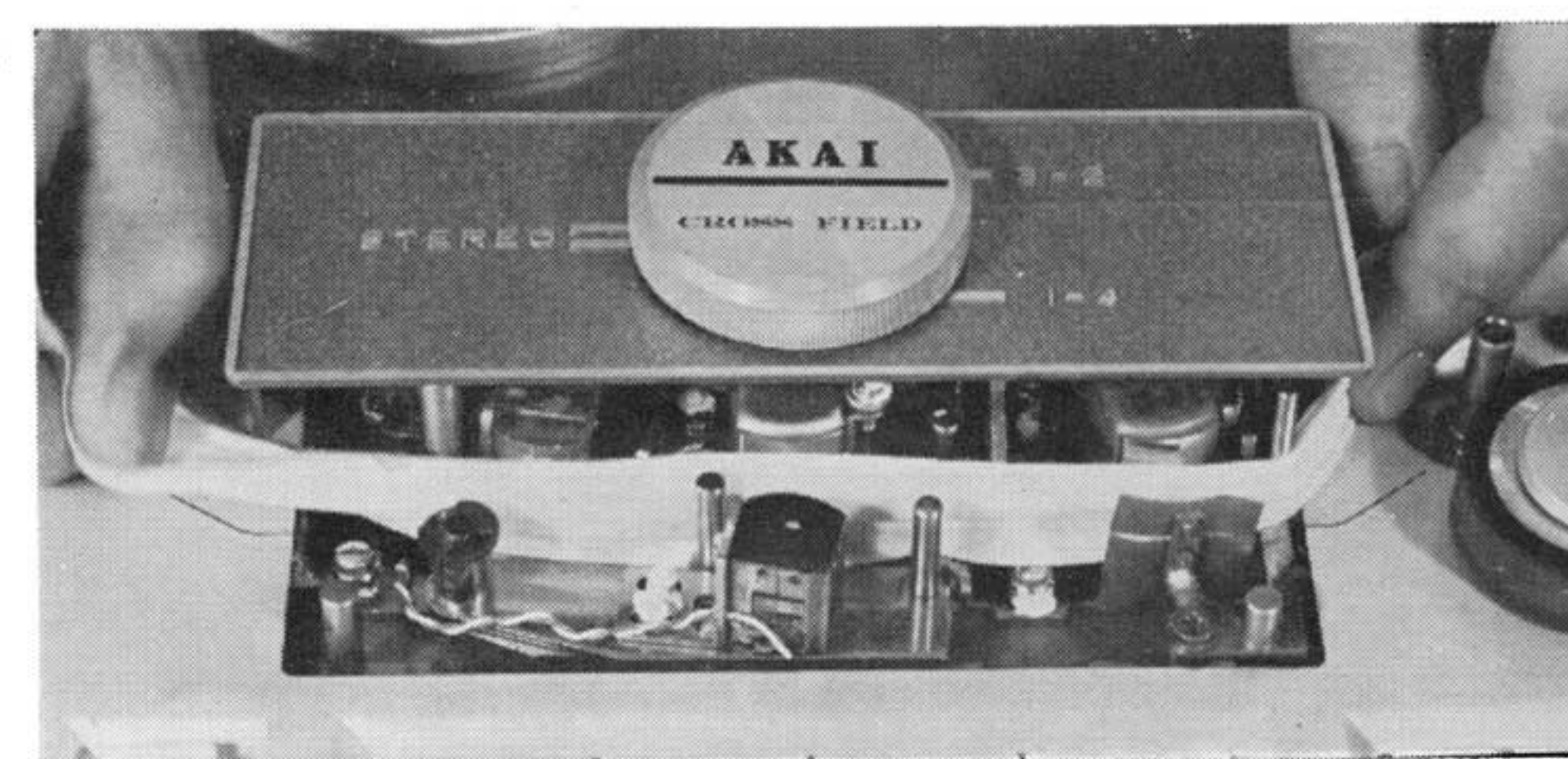


Fig. 22



19

22. HEAD DEMAGNETIZATION

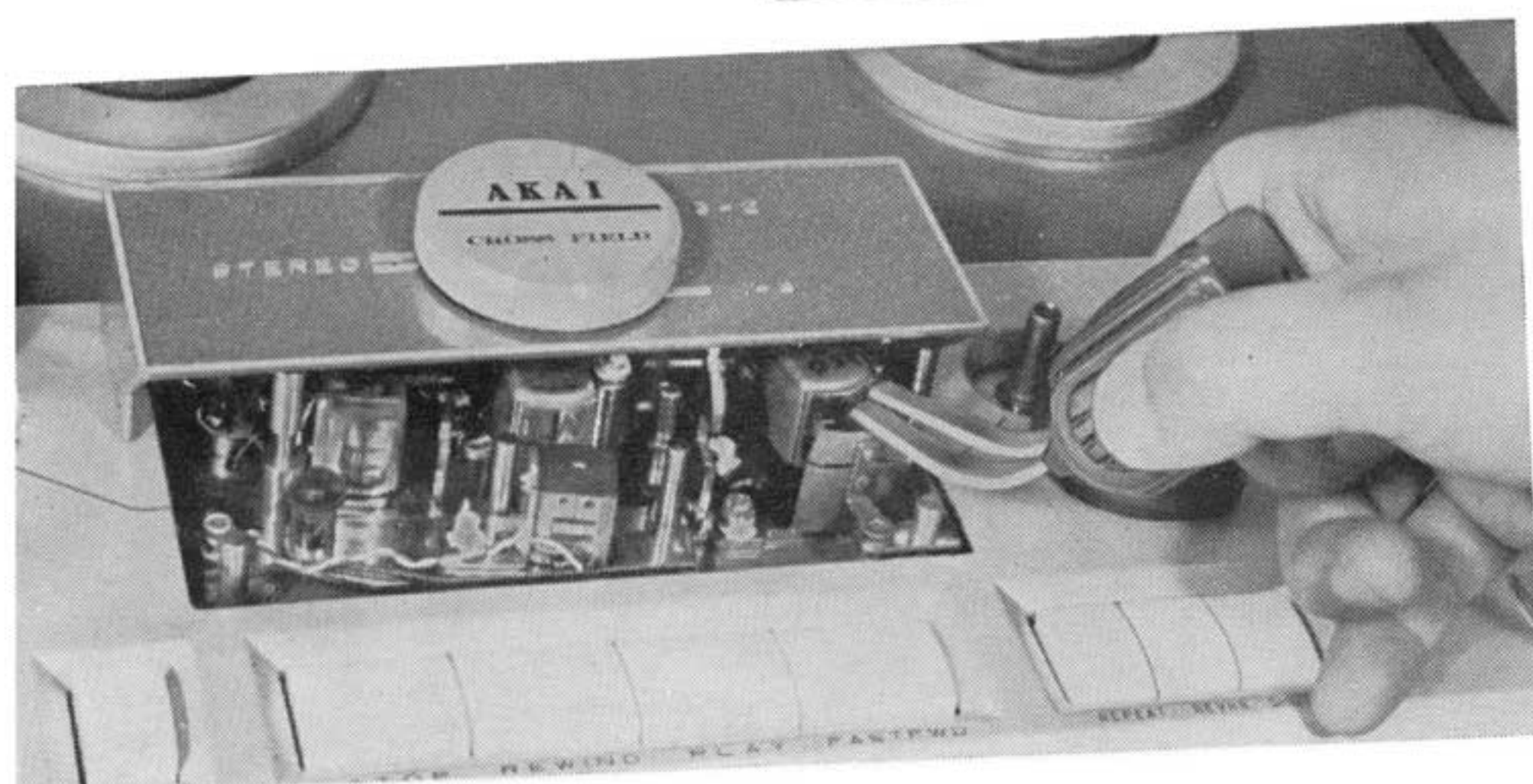


Fig. 23

Normally, in all tape recorders, the heads will become slightly magnetized. A slightly magnetized head will partially erase a recorded tape with high frequencies suffering the greatest losses. Severe magnetization will result if magnetized tools are used in the vicinity of the heads. The X-355 has a built in head demagnetizing circuit; however, periodic demagnetization with a demagnetizer is still recommended. After removing the LOWER HEAD COVER ⑧, the heads can be demagnetized by touching the heads lightly with the demagnetizer and making small circular motions over the entire head surface and head housing.

OPERATING INSTRUCTIONS

23. TRANSISTOR PROTECTION

The S. E. P. P. O. T. L. system is used to protect the output circuitry of the X-355 main amplifiers. The minimum output impedance should be 8 ohms. If a speaker of less than 8 ohms impedance is used or if the speaker terminals are accidentally shorted, the protector fuse will blow to protect the transistors. Transistors are easily damaged by excessive load or high ambient temperatures. If the protector fuse has blown, the sound may be distorted or there may be no sound at all. The protector fuse may be replaced with any suitable commercial 1A fuse.

24. VENTILATION

The ventilation system of the X-355 is designed to prevent internal accumulation of excess heat that would shorten the life of the component parts. It is recommended that the X-355 be placed so that air may circulate freely around it.

III ACCESSORIES

Extension Arms for 10-1/2" Reels No. EA-10

Long hours of recording and playback can be made uninterruptedly by using the Accessory No. EA-10 extension arms with 10-1/2" reels. The foregoing recording or playing time may be extended twice as much as using 7-1/2" tape. 10-1/2" empty reels and recording tape will be available by optional accessories.

Remote Control Unit No. RC-11

All operating functions of the Model X-355 recorder can be controlled remotely by using the Accessory No. RC-11 remote control unit with 10 feet long cable. (If long cable is requested may obtain through our authorized distributor.)

Condenser Microphones, No. CM-15

Akai's very latest high fidelity microphone is designed for the professional and Hi-Fi enthusiast. This unit consists of a microphone and pre-amplifier, and permits simultaneous use of two microphones for stereo purpose.

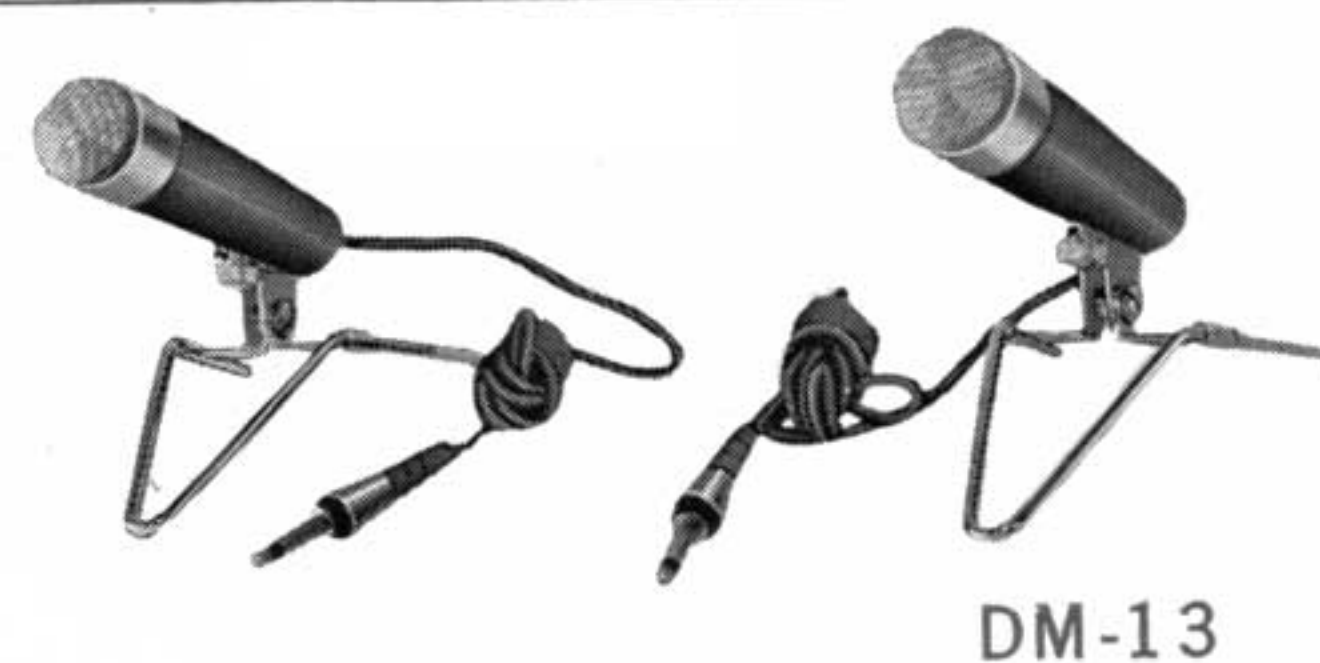
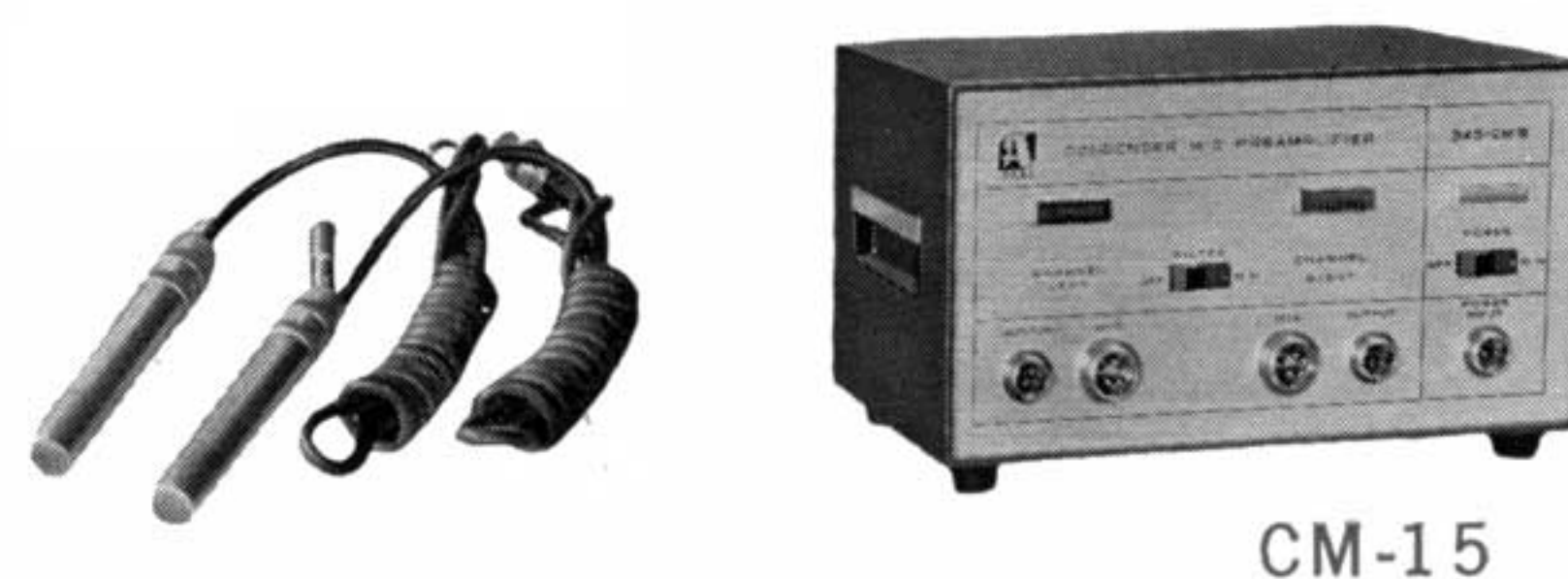
Frequency response; 50 to 15,000

Dynamic Microphones, No. DM-13

Although compact, extremely high quality dynamic microphones. They are guaranteed to give complete satisfaction to the most critical audio enthusiast and professional users.

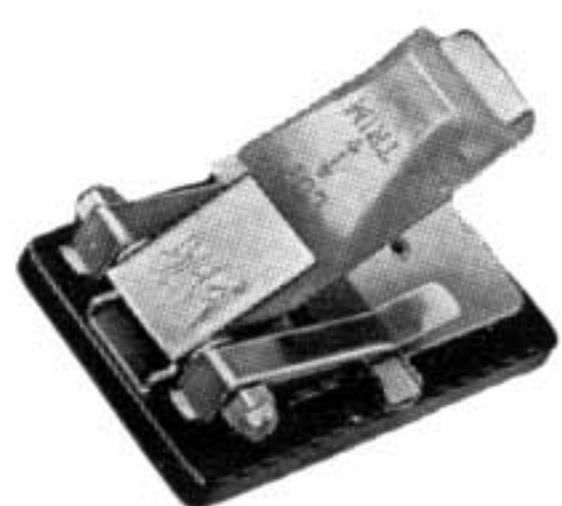
Frequency response; 50 to 12,000

I. ACCESSORIES OPTIONAL

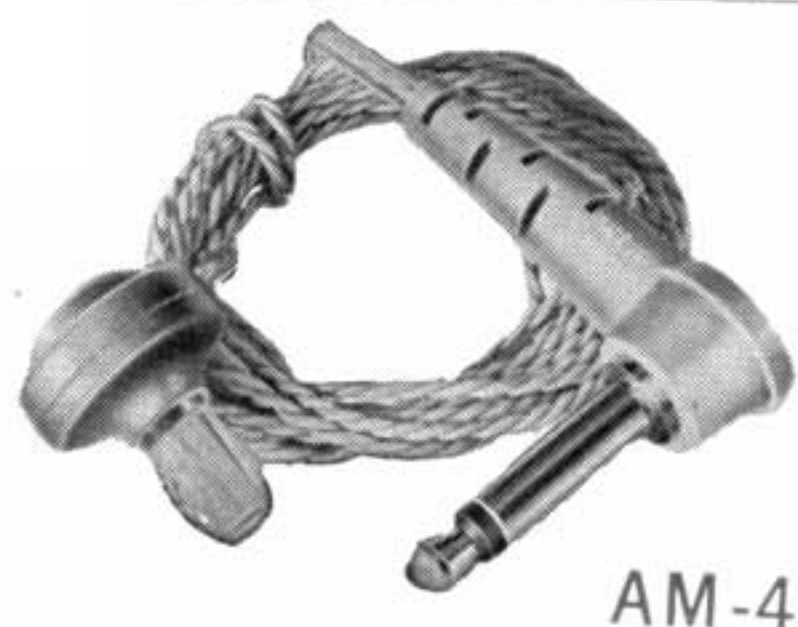


21

ACCESSORIES OPTIONAL



AS-3



AM-4



AM-4P



AH-6



AP-2

Tape Splicer No. AS-3

This Tape Splicer is a small pocketable device and not only provides easy splicing but also preserves the original quality of recording.

Monitor Earphone Nos. AM-4 & AM-4P

The Monitor Earphone is used both for recording and playback. It is quite useful 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 the others. A high impedance crystal type in two different models is available, as shown in Pictures.

Head Demagnetizer No. AH-6

Normally 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 keep the original quality of the tapes. The AH-6 has a built-in on-off switch and a neon bulb.

Telephone Pick-up No. AP-2

This is designed to record telephone conversations with maximum clarity and sensitivity. Adjust press on to the back of the telephone, rubber suction cup holds the Pick-Up in positions.

ACCESSORIES

ACCESSORIES

Tape Eraser No. ATE-7

This unit erases any previously recorded materials completely in a few seconds and accomodates tape reels from 3" to 7-1/2" in diameter. It is designed to provide maximum erasing efficiency. Has a pop-up shaft to hold the tape reel in position and also serves as a power switch and on-off bulb indicator of the unit.

Stereo Headphone No. ASE-9S

In order to enjoy true stereophonic effects with the Akai tape recorder, the Stereo Headphones ASE-9S is recommendable.

Head Cleaning Kit, No. HC-500

HEAD CLEANER proves its value when used to wipe off the brownish-red oxide powders that accumulate on both the head assembly and pinch wheel. Since these powders prevent high frequency response, we are recommendable to use adequate head cleaner.

AKAI Magnetic Tape & Tape Reel

AKAI Magnetic Tape	AKAI Tape Reel
AT-5S (600 feet)	ATR-5 (for 5")
AT-7S (1200 feet)	ATR-7 (for 7")
AT-10S (2400 feet)	
AT-5L (900 feet)	
AT-7L (1800 feet)	
AT-10L (3600 feet)	

ACCESSORIES OPTIONAL



ATE-7



ASE-9S



HC-500



MAGNETIC TAPE



TAPE REEL

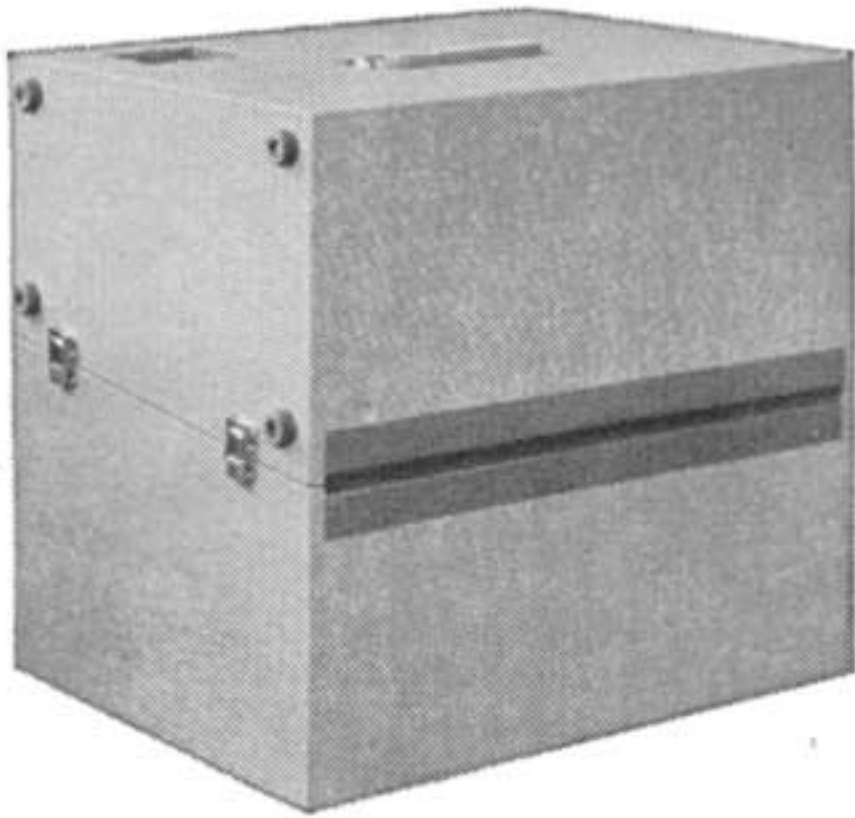
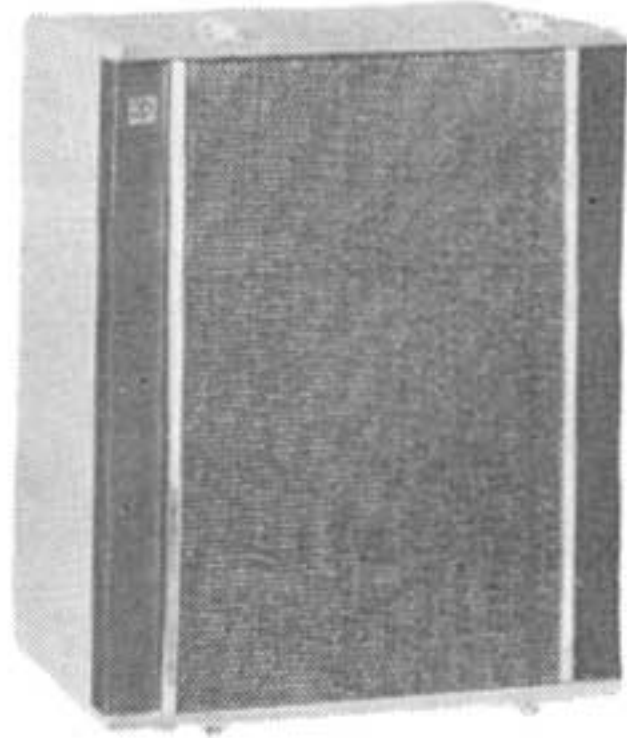
23

2. ACCESSORIES SPEAKERS

The following stereo speaker system Model SS-110 and SW-130 are specially designed to match impedance to Akai's stereo tape recorders and to obtain the best result. 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.

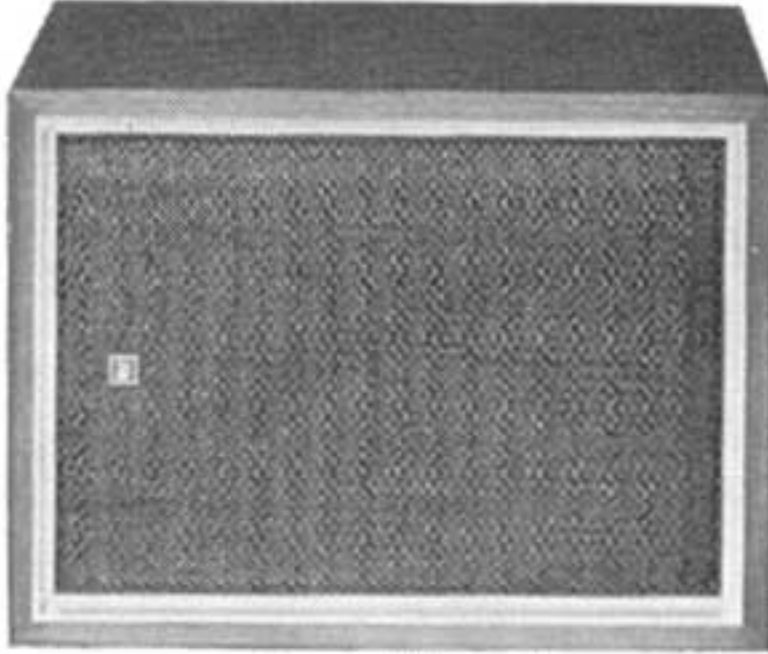
MODEL SS-110

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



MODEL SW-130

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



3. ACCESSORIES STANDARD

7" Demonstration tape	1	15 ips. Adaptor Kit	1
7" Automatic Reel	1	Spare Fuse (1A)	2
Reel Holder	2	X-355 Operator's Manual	1

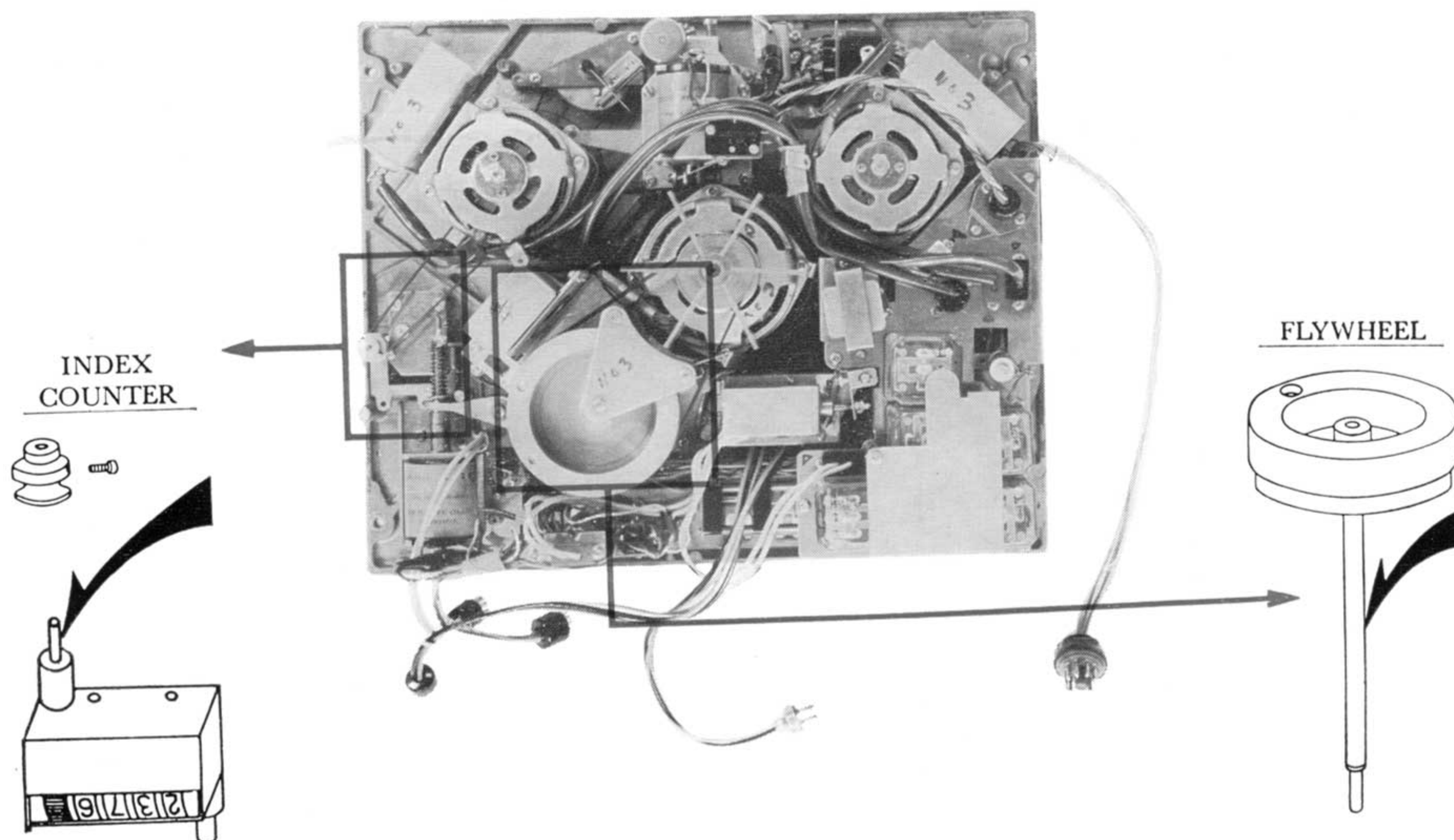
ACCESSORIES

IV LUBICATION CHART FOR X-355

LUBICATION POINTS

Main motor.....replace two bearing
 Left and right motors...replace a bearing
 Impedance Raller...replace a two beaing

Capstan shaft.....2 drops
 Pinch wheel shaft2 drops
 Selector1 drop



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