For the best performance.....

AKAI X-200D

OPERATOR'S MANUAL

THREE MOTORS
AUTO. REVERSE
CUSTOM DECK

TABLE OF CONTENTS

1. SPECIFICATIONS

Tape Speed	: 1-7/8, 3-3/4 and 7-1/2 ips
Wow and Flutter	: Less than 0.08% RMS at 7-1/2 ips Less than 0.12% RMS at 3-3/4 ips Less than 0.20% RMS at 1-7/8 ips
Frequency Response	: 30 to 26,000 Hz ±3 db at 7-1/2 ips 30 to 19,000 Hz ±3 db at 3-3/4 ips 30 to 9,000 Hz ±3 db at 1-7/8 ips
Signal to Noise Ratio	: Better than 50 db
Input Level	: Mic ..... more than 0.5 mV Line ..... more than 50 mV DIN ..... more than 5 mV (LOW) more than 50 mV (HIGH)
Output Level	: Line ..... 0 VU (1.23 V) DIN ..... 0.4 V
Equalization	: Correct equalization for playback of tapes recorded to the NAB curve.
Recording Bias Frequency	: 100 KHz
Recording Level Indicator	: Twin type VU meter
Recording System	: 4-track stereo/monaural, CROSS-FIELD bias system
Fast Forward and Rewind Time	: 75 seconds using 1,200 foot tape at 50 Hz. 60 seconds at 60 Hz.
Recording Capacity	: 8 hours monaural recording at 1-7/8 ips (1,200 foot tape). 4 hours stereo recording at 1-7/8 ips
Maximum Reel Size	: 7" reel
Head	: 3 heads....Erase, record/playback and bias heads
Motor	: 3 motors....Hysteresis synchronous 3-speed motor for capstan drive. Two out-rotor motors for supply and take-up reel drive
Transistor	: 14 transistors
IC	: 2 IC
Power Supply	: AC 220 V, 50 Hz
Power Consumption	: 100 W
Dimensions	: 14" × 14" × 8-7/8" (358 × 358 × 227 mm)
Weight	: 37.4 lbs (17 kg)

2. CONTROLS

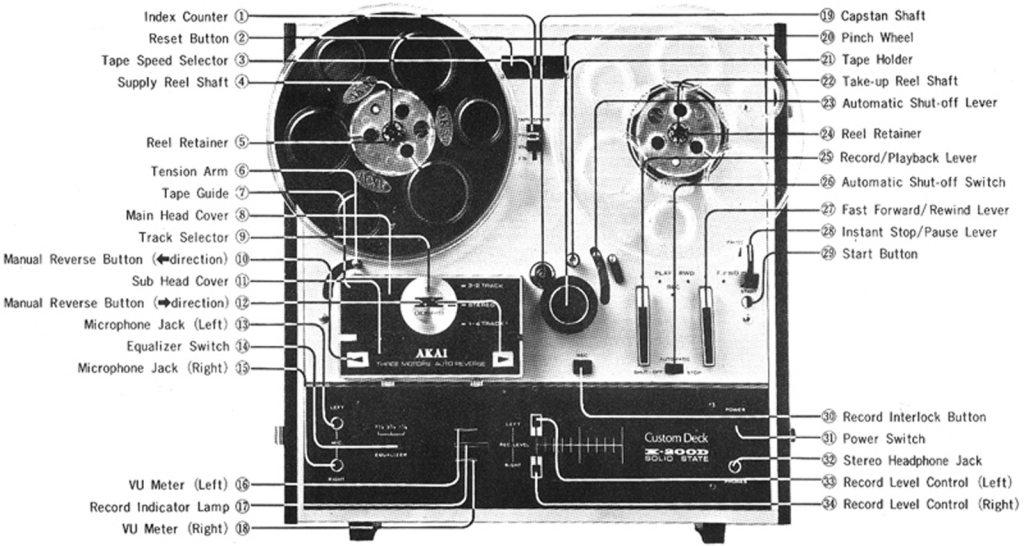


Fig. 1

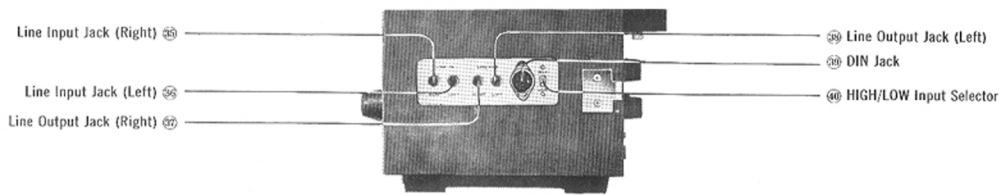

Line Input Jack (Right) ㉟
Line Input Jack (Left) ㊱
Line Output Jack (Right) ㊲
㊴ Line Output Jack (Left)
㊵ DIN Jack
㊵ HIGH/LOW Input Selector

Fig. 2

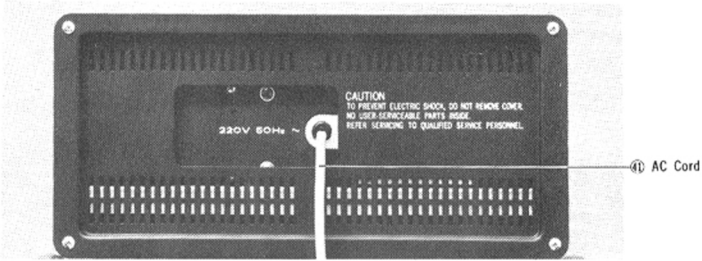

CAUTION
TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER.
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
220V 60Hz ~
㊶ AC Cord

Fig. 3

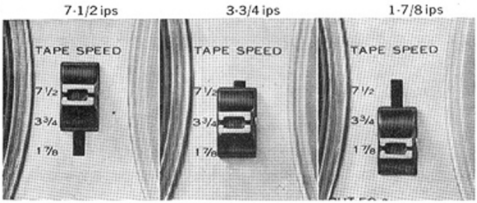


Fig. 4

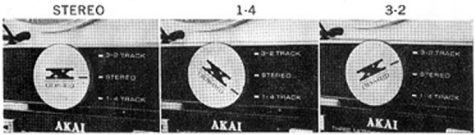
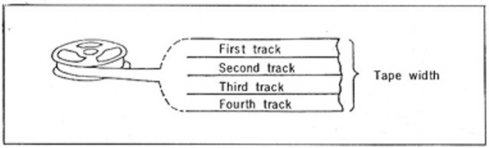


Fig. 5



3. TAPE SPEED SELECTION

The X-200D operates on 3 tape speeds, 7-1/2, 3-3/4 and 1-7/8 ips.
Refer to the chart for selection of an adequate tape speed.

* 1-7/8 ips ·····The 1-7/8 ips tape speed is obtained by setting the TAPE SPEED SELECTOR to "1-7/8".
* 3-3/4 ips ·····The 3-3/4 ips tape speed is obtained by setting the TAPE SPEED SELECTOR to "3-3/4".
* 7-1/2 ips ·····The 7-1/2 ips tape speed is obtained by setting the TAPE SPEED SELECTOR to "7-1/2".

Important: In each case, set Equalizer Switch to consistent speed.

RECORDING TIME

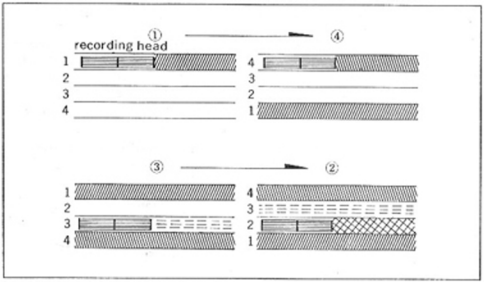
4-TRACK STEREO			
TAPE LENGTH	TAPE SPEED		
	1-7/8 ips	3-3/4	7-1/2
1200 ft	4 hrs	2	1
1800	6	3	1.5
2400	8	4	2
4-TRACK MONO			
1200	8	4	2
1800	12	6	3
2400	16	8	4

4. 4-TRACK RECORDING/PLAYBACK SYSTEM

The AKAI X-200D employs a four track system which can be used for either stereo or monaural recording/playback. The desired track or tracks are selected by the TRACK SELECTOR.

4-TRACK STEREO RECORDING/PLAYBACK

Stereo recording/playback requires the simultaneous use of two tracks.
Set the TRACK SELECTOR to "STEREO".
The first stereo recording/playback occurs on tracks 1 and 3, and the second on tracks 2 and 4 after the reels have been inverted.



4-TRACK MONAURAL RECORDING/PLAYBACK

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

(A) Set the TRACK SELECTOR to "1-4". The first monaural recording/playback occurs on track 1, and the second on track 4 after the reels have been inverted.

(B) Invert the reels.

(C) Set the TRACK SELECTOR to "3-2".
The third monaural recording/playback occurs on track 3, and the fourth on track 2 after the reels have been inverted.

The X-200D does not record in the reverse direction. Using reverse playback, it is not necessary to turn the tape reels over. When the X-200D begins reverse playback, the record/playback head is automatically shifted to the remaining tracks.

Diagram 1. Ordinary recording system

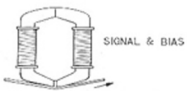
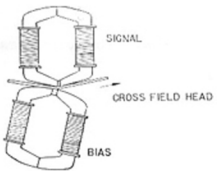


Diagram 2. Cross-field recording system



5. CROSS-FIELD HEAD

AKAI's exclusive cross-field head has created a sensation in the tape recorder world by offering a wide recording range which has never been duplicated.
Using this cross-field head, Model X-200D provides a surprising recording performance (30-26,000 Hz±3 db at a tape speed of 7-1/2 ips.)
Why is cross-field recording superior? How does it differ from conventional recording methods?
In the typical recording system, the signal current and the bias current are combined and applied to the recording head. (Diagram 1.)
It is well known that the bias current is to minimize distortion while maintaining a proper sensitivity ratio.
However, the bias current providing such an advantage also has an undesirable effect. That is, the wide magnetic field of the bias current affects the recorded signal, resulting in the weakening or even erasing of the signal.
This 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 positioned inter-relatively, so that the magnetic field of the bias will not affect the signal recorded on the tape, even when maximum bias is applied. This permits recording with high fidelity even at low speeds.

Fig. 6

Fig. 7

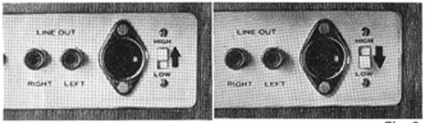


Fig. 8

Fig. 9

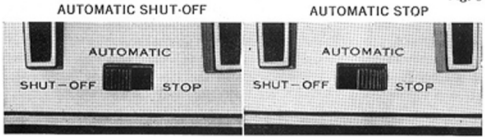
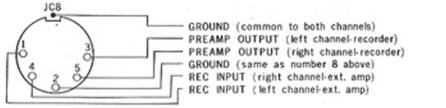


Fig. 10

6. DIN (ONE MULTIPLE-CONNECTION) JACK

A DIN JACK is provided at the left side of Model X-200D, and is used for interconnecting Model X-200D with an external stereo amplifier, with the same connection jack. This system permits easy recording and playback of stereo programs through an external stereo amplifier, as the complex connection or disconnection of 4 separate plugs from Model X-200's side panel is avoided.

If your amplifier is not equipped with the DIN Jack and the use of this one connection system is required, AKAI DR-110 can be used.



Front View of DIN JACK

NOTE :

When the output level of an external amplifier is more than 50 mV, set the HIGH/LOW INPUT SELECTOR to "HIGH".

But, when output level is more than 5 mV, set it to "LOW".

7. AUTOMATIC STOP/SHUT-OFF

For Automatic Stop, set switch to "STOP" position. When the tape comes to the end or is accidentally broken, the AUTOMATIC SHUT-OFF LEVER drops and reel movement is stopped.

For Automatic Shut-Off, set switch to "SHUT-OFF" position. When the tape comes to the end or is accidentally broken, the AUTOMATIC SHUT-OFF LEVER drops and the power is cut off

8. OPERATING PRECAUTIONS

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

① THE USE OF NEW TAPE WILL RESULT IN THE BEST RECORDINGS.

② THE SYMPTOMS LISTED BELOW DO NOT NECESSARILY INDICATE MECHANICAL FAILURE OF YOUR TAPE DECK. 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 erase head. This will prevent prerecorded material from being completely erased.

B. Dust on the recording head. Clean the head gently with a soft cotton swab soaked in rubbing alcohol or carbon tetrachloride.

C. A.C. power voltage lower than the standard voltage to which your machine is adjusted.

(2) Irregularity in the tape transport may be due to :

A. Grime adhering to the heads.

B. Oil on the capstan.

C. Sticky or dirty tape surface.

D. Bent take-up reel.

(3) If your machine will not record, check the following for correct position.

A. Record/Playback lever.

B. Input plugs.

NOTE :

(1) Before operating your machine, be sure to clean the surface of the head.

(2) Unused tape may become soft and sticky. It is advisable to run the tape once from the supply reel to the take-up reel before threading it for recording.

③ THE FOLLOWING NOTES ARE PROVIDED FOR YOUR CONVENIENCE.

(1) If any trouble develops, please take your machine to the nearest authorized agent in your area or inquire at the Service Dept. of the Akai Company in Tokyo, Japan.

(2) Your Akai Model X-200D requires constant voltage for optimum performance.

(3) The standard 1,200 foot length of tape on a 7" reel plays up to 32 minutes at 7-1/2 ips speed in one direction.

(4) If the sound sources are so far away from the microphones that the volume control must be turned up to a maximum, some hum or noise will inevitably be recorded. In such instance, a test recording is recommended before attempting a final recording.

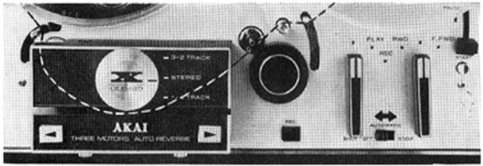


Fig. 11

Fig. 12

Fig. 13

Fig. 14

1. TAPE LOADING

Place the full reel of tape on the SUPPLY REEL SHAFT and the empty reel on the TAKE-UP REEL SHAFT.
Thread the tape as illustrated by the dotted line.
To keep the reels from failing, lock the reels with the retainers provided on the the REEL SHAFTS.
IMPORTANT:
If the automatic shut-off and automatic stop are required, thread the tape below the AUTOMATIC SHUT OFF LEVER. If not, pass the tape directly onto the take-up reel.

2. INSTANT STOP/PAUSE CONTROL

To momentarily stop the tape during record/playback, set the INSTANT STOP/PAUSE LEVER to "PAUSE" Position as shown Fig. 13.
The lever will be locked in the stop position and can be released by pushing the START BUTTON. The INSTANT STOP/PAUSE LEVER will not function during fast forward or rewind operation.
Use of the INSTANT STOP/PAUSE LEVER permits adjustment and balance of the recording level when the recorder is set to normal recording mode. Adjust to optimum recording level while watching the VU meters.
This control may also be used during recording to edit the tape (e.g. lift the level to stop the recorder when certain portions of the program are not desired).

Note that when the lever is released, no annoying 'click" is impressed on the tape.

3. FAST FORWARD AND REWIND

Fast forward or rewind is performed by turning the FAST FORWARD/REWIND LEVER to the proper position. Fast forward or rewind permits rapid selection of recordings on the tape. The FAST FORWARD/REWIND LEVER cannot be turned out of the stop position unless the RECORD/PLAYBACK LEVER is in its stop position, and vice-versa.

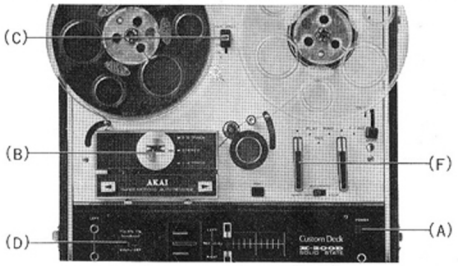
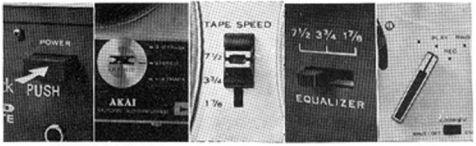
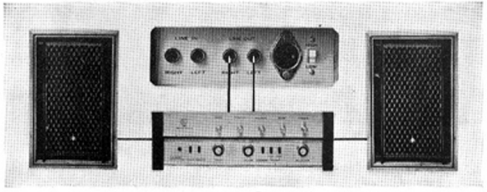


Fig. 15





4. PLAYBACK

STEREO

Connect the recorder to AC power source with the attached AC CORD and load the tape.

(A) Push POWER SWITCH.
(B) Set TRACK SELECTOR to "STEREO".
(C) Select the desired tape speed by TAPE SPEED SELECTOR.
(D) Set EQUALIZER SWITCH to 7·1/2, 3·3/4 or 1·7/8 ips, whichever is consistent with tape speed.

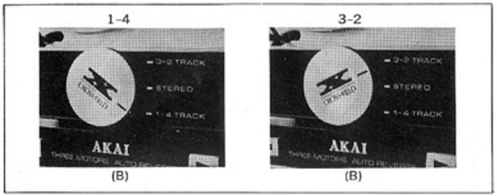
The Model X-200D does not include a power amplifier or loudspeakers. It, therefore, is necessary to provide an external stereo amplifier and speakers for stereophonic playback.

(E) Connect both LINE OUTPUT JACKS (LEFT and RIGHT) to TAPE INPUT JACKS or AUX INPUT JACKS of the external amplifier. Connect two loudspeakers to the power amplifier.

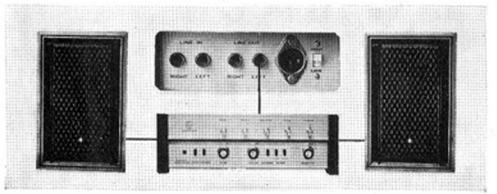
IMPORTANT

The output level at the X-200D's output jack is 1.23 V maximum. Check your amplifier before operation with input terminals.

(F) Set RECORD/PLAYBACK LEVER to "PLAY".
(G) Adjust the volume of sound by using the volume control knob of the external amplifier.



(B) (B)



(E)

MONAURAL

For monaural playback, substitute the following steps (B) and (E) of the stereo procedure, and add step (H). Follow the rest of the stereo procedure.

Playback on tracks 1 and 4

Only the left channel amplifier is used for monaural playback on tracks 1 and 4.

(B) Set TRACK SELECTOR to "1-4".
(E) Connect LINE OUTPUT JACK (LEFT) to TAPE INPUT JACK (LEFT) or AUX INPUT JACK (LEFT) of the external amplifier.
(H) Invert the reel to playback on track 4.

Playback on tracks 3 and 2

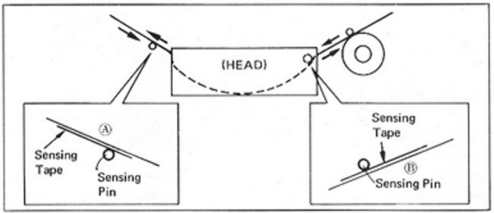
Only the left channel amplifier is used for monaural playback on tracks 3 and 2.

(B) Set TRACK SELECTOR to "3-2".
(E) Connect LINE OUTPUT JACK (LEFT) to TAPE INPUT JACK (LEFT) or AUX INPUT JACK (LEFT) of the external amplifier.
(H) Invert the reel to playback on track 2

5. AUTOMATIC REVERSE (METALLIC SENSING TAPE)

Automatic reverse with metallic sensing tape is used for playback only.

(A) Cut sensing tape approximately 1/2 inches.
(B) Put this sensing tape at the desired reverse point of the tape in use. Reversal will occur when the metallic sensing tape makes contact with SENSING PIN.



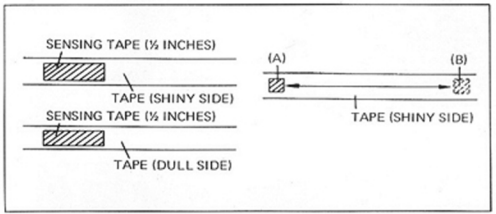


Fig. 16

(C) If you put sensing tape at the desired reverse point A on shiny side of the tape in use, the tape direction (➡) will automatically reverse and play in the opposite direction (⬅).

(D) If you put metallic sensing tape at the desired reverse point B on dull side of the tape in use, the tape direction (⬅) will automatically reverse and play in the opposite direction (➡).

(E) So, it you put two pieces of metallic sensing tape at the desired points A and B simultaneously, the X-200D will give continuous playback in both direction between A and B.

NOTE : If the sensing tape is dirty, the proper reverse operation of the tape will not be made.

6. MANUAL REVERSE

Pushing MANUAL REVERSE BUTTONS will put the X-200D into the reverse (playback) function.

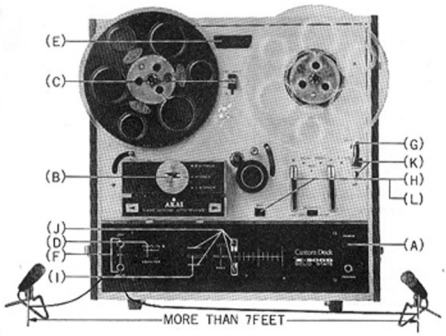
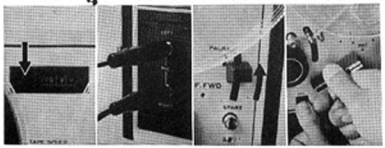


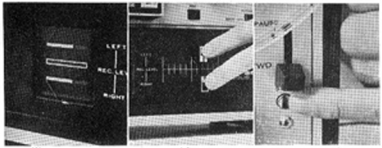
Fig. 17



7. RECORDING

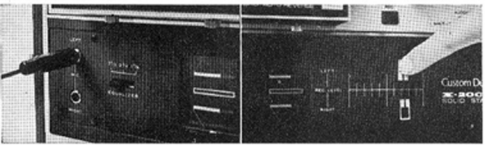
STEREO

(A) Push POWER SWITCH.
(B) Set TRACK SELECTOR to "STEREO".
(C) Select the desired tape speed by TAPE SPEED SELECTOR.
(D) Set EQUALIZER SWITCH to 7-1/2, 3-3/4 or 1-7/8 ips, whichever is consistent with tape speed.
(E) Set RESET BUTTON and set INDEX COUNTER to "0000".
This INDEX COUNTER provides a reference for locating any position on the tape.
(F) Insert microphone plugs into MICROPHONE JACKS (LEFT and RIGHT).
Maintain a distance of at least seven feet between the microphones.
(G) Push INSTANT STOP/PAUSE LEVER upward until it locks.
(H) Turn RECORD/PLAYBACK LEVER to "REC" position while depressing RECORD INTERLOCK BUTTON.



(I) (J) (K)

(B) (B)



(F) (J)

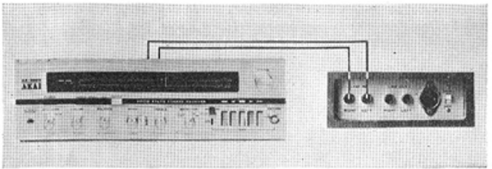


Fig. 18

(I) Check RECORD INDICATOR LAMP is on.
If the lamp is not on, the X-200D will not record.

(J) Microphone volume level may be adjusted and balanced by RECORD LEVEL CONTROLS (LEFT and RIGHT). Normal recording should not exceed the white zone on VU METERS (LEFT and RIGHT).

(K) After optimum recording level is determined, push START BUTTON and release INSTANT STOP/PAUSE LEVER to start stereo recording.

(L) To stop recording, return RECORD/PLAYBACK LEVER while depressing RECORD SAFETY BUTTON.

MONAURAL

For monaural recording, substitute the following steps (B), (F) and (J) of the stereo procedure, and add step (M). Follow the rest of the stereo procedure.

Recording on tracks 1 and 4

Only the left channel amplifier is used for monaural recording on tracks 1 and 4.

(B) Set TRACK SELECTOR to "1-4".

(F) Insert microphone plug into MICROPHONE JACK (LEFT).

(J) Microphone volume level may be adjusted and balanced by RECORD LEVEL CONTROL (LEFT), while observing VU METER (LEFT).

(M) Invert the reel to record on track 4.

Recording on tracks 3 and 2

Only the left channel amplifier is used for monaural recording on tracks 3 and 2.

(B) Set TRACK SELECTOR to "3-2".

(F) Insert microphone plug into MICROPHONE JACK (LEFT).

(J) Microphone volume level may be adjusted and balanced by RECORD LEVEL CONTROL (LEFT), while observing VU METER (LEFT).

(M) Invert the reel to record on track 2.

FROM AN EXTERNAL AMPLIFIER

If an external amplifier or tuner-amplifier combination is used, connect TAPE OUTPUT leads of the external amplifier to LINE INPUT JACKS (LEFT and RIGHT) in step (F) of the recording procedure.

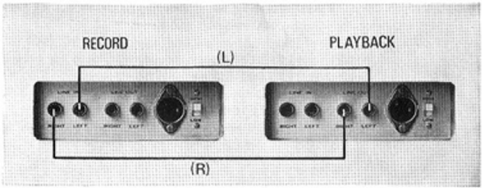


Fig. 19

FROM ANOTHER TAPE RECORDER

Connect LINE OUTPUT JACKS or EXTERNAL SPEAKER JACKS of the playback machine to LINE INPUT JACKS (LEFT and RIGHT) of the record machine in step (F) of the recording procedure.

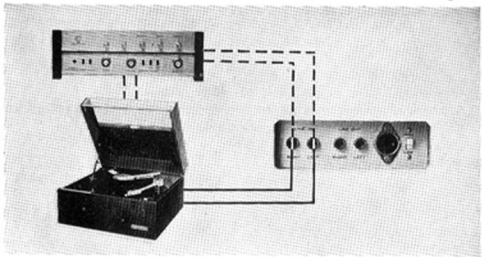


Fig. 20

FROM DISCS

To record from a stereo or monaural disc, a "CRYSTAL PICK UP" or a "CERAMIC PICK UP" can be directly connected to LINE INPUT JACKS (LEFT and RIGHT) in step (F) 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 LINE INPUT JACKS (LEFT and RIGHT).

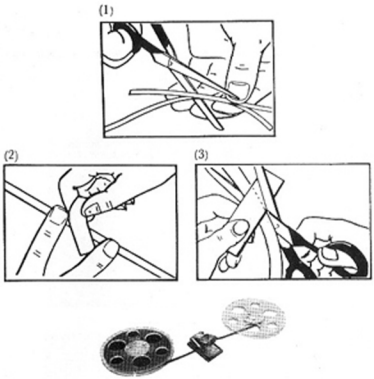
Fig. 21

8. MONITORING

Monitoring is performed by connecting stereo headphones to the STEREO HEADPHONE JACK.

On monaural as well as stereo recording, please use stereo headphones.

CAUTION: The stereo headphones should be of low impedance type (8 ohms).



9. TAPE SPLICING AND EDITING

Superimpose the tapes and cut them diagonally as illustrated in Figures. Cutting on the diagonal eliminates the "click" or "pop" sound in recording/playback.

Match the aligned ends and apply splicing tape to the glossy side.

Firmly press the splice with fingers to secure the ends evenly. Trim off excess splicing tape (cut into the recording tape very slightly as illustrated by the dotted lines—this eliminates the possibility of a sticky splice.) Because tape splicing with scissors is difficult and requires much skill, it is recommended that our specially designed portable splicer be used to ensure professional results.

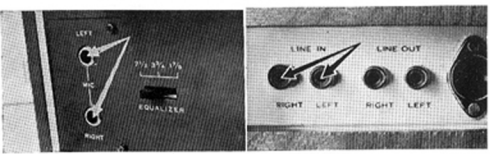


Fig. 22

10. TAPE ERASING

Any signals previously recorded on a tape will be automatically erased as a new recording is made. For erasing only, load the tape and set the recorder to the normal record position. No plugs should be connected to the LINE INPUT JACKS (LEFT and RIGHT) or the MICROPHONE JACKS (LEFT and RIGHT). A Bulk Tape Eraser should be used for quick and complete erasing.

11. HEAD CLEANING

Tape Oxide/Dust Deposits Cause 90% of Your Tape Recording Failure

For quality performance it is imperative that tape recorder heads be kept clean at all times.

Dust and magnetic particles from the tape tend to deposit on the heads after prolonged use of the recorder. This results in poor head-to-tape contact deteriorating sound quality and sensitivity. Such dust also causes drastic drops in recording/playback levels and affects high quality sound.

EXAMPLE **CLEAN HEAD**

Frequency response curve

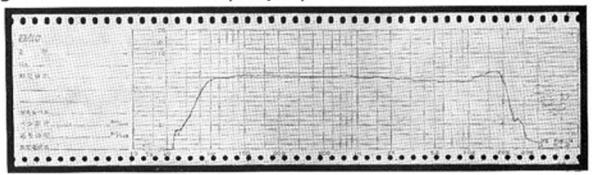


Fig. 23

DUSTY HEAD

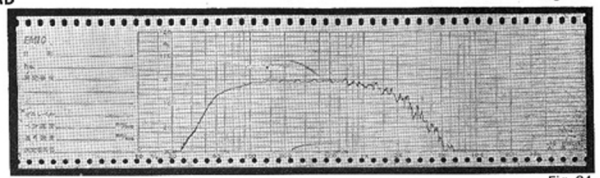


Fig. 24

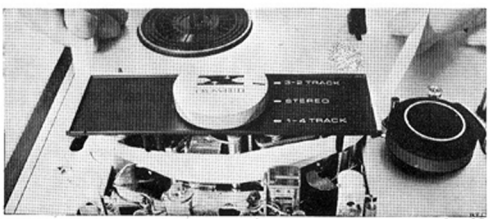


Fig. 25

Make it a rule to clean the heads every time you use your tape recorder. AKAI's Head Cleaning Kit (Accessory NO. HC-500) is recommended for removing foreign matter deposited on the heads. If this kit is not available, use alcohol.

NOTE: Clean the heads after setting the RECORD/PLAYBACK LEVER to "PLAY".

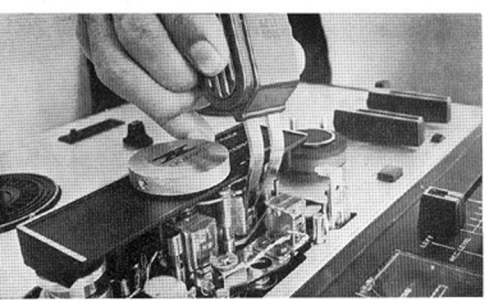


Fig. 26

12. HEAD DEMAGNETIZING

Normally the steel pole pieces which form a part of the recording and playback heads become slightly magnetized. The effect of slight head magnetization is that it partially erases the tape, especially at high frequencies. Generally, this condition can be detected by the loss of high frequency response which cannot be corrected through head alignment. Severe magnetization (which may be caused by using magnetized tools in the vicinity of the heads) will result in noise or considerable distortion in addition to the loss of high frequency response. Although Model X-200D already has a built-in Head Demagnetizing Circuit, it is recommended that head demagnetization be performed periodically. This can be accomplished by touching the head lightly with the demagnetizer and making several small circular motions over all head surface areas as well as the head housing.

Note: To avoid scratching the head surface, we suggest that you cover both prongs of the head demagnetizer with a sort of masking tape.

Ⅲ. ACCESSORIES

1. OPTIONAL ACCESSORIES

Dynamic Microphone No. DM-13

Tape Eraser No. ATE-7

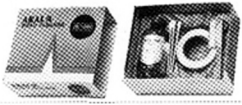
Tape Splicer No AS-3

Stereo Headphones No. ASE-9S

Condenser Microphones No. CM-15

Head Demagnetizer No. AH-6

Head Cleaning Kit No. HC-500



Akai Connecting Cords

D-100

DR-110

DM-120

RM-130

Akai Magnetic Tapes & Tape Reels

AKAI Magnetic Tape

AT-5S	(600 foot)
AT-7S	(1,200 foot)
AT-10S	(2,400 foot)
AT-5L	(900 foot)
AT-7L	(1,800 foot)
AT-10L	(3,600 foot)

AKAI Tape Reel

ATR-5	(for 5")
ATR-7	(for 7")
ATR-10	(for 10-1/2")

2. STANDARD ACCESSORIES

Connection cord	1
Sensing Tape	1
Spare Fuse	2
Operator's Manual	1