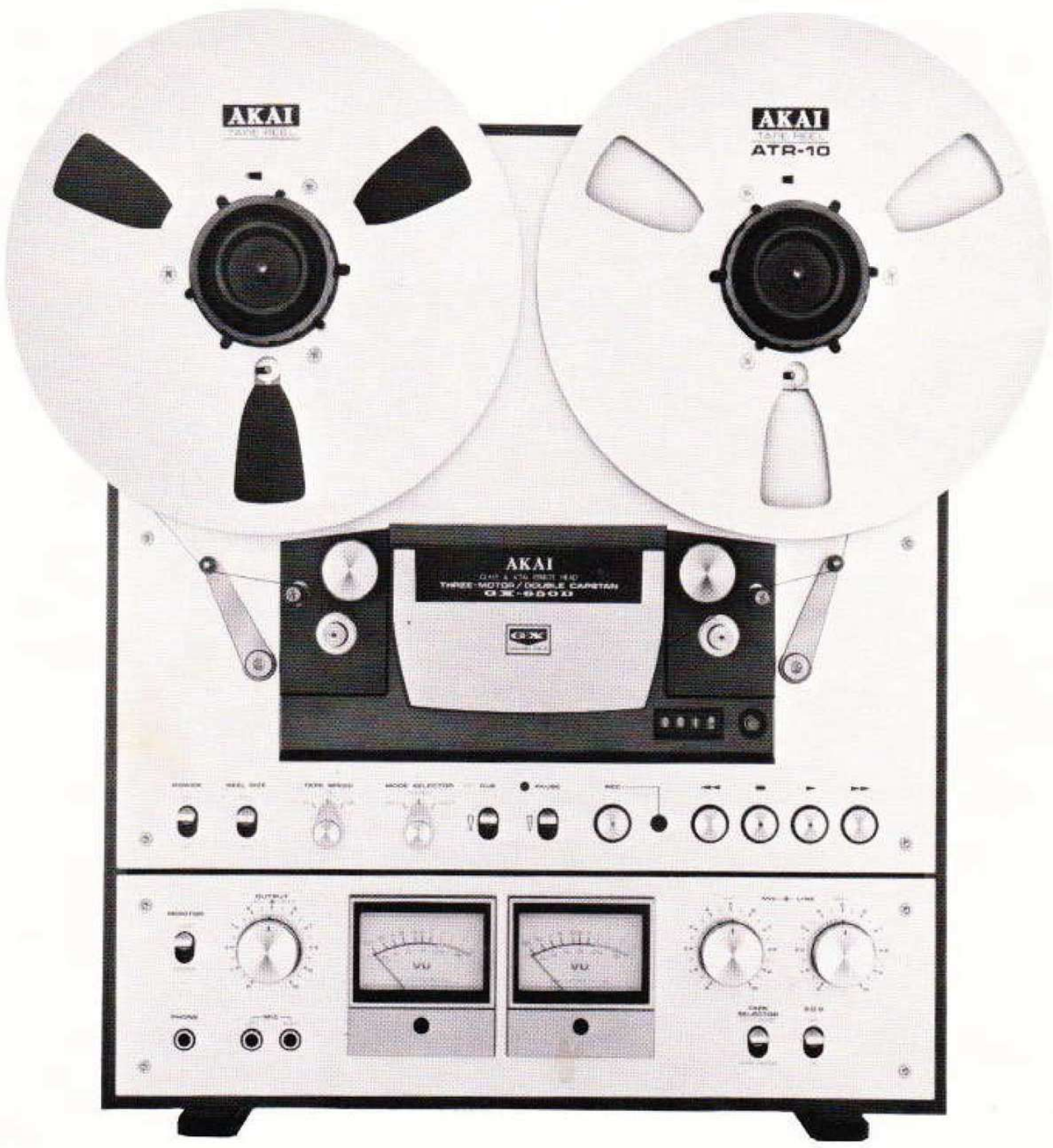
GX-650D

STEREO TAPE DECK

OPERATOR'S MANUAL

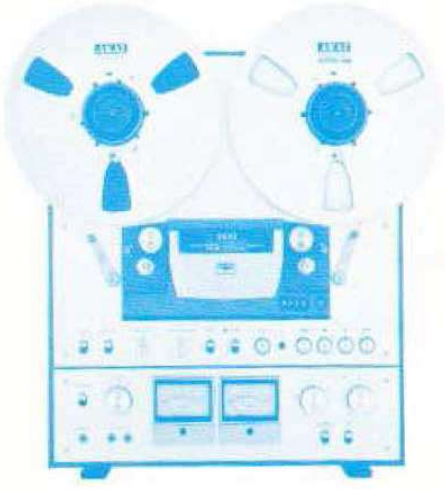


WARNING:
To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

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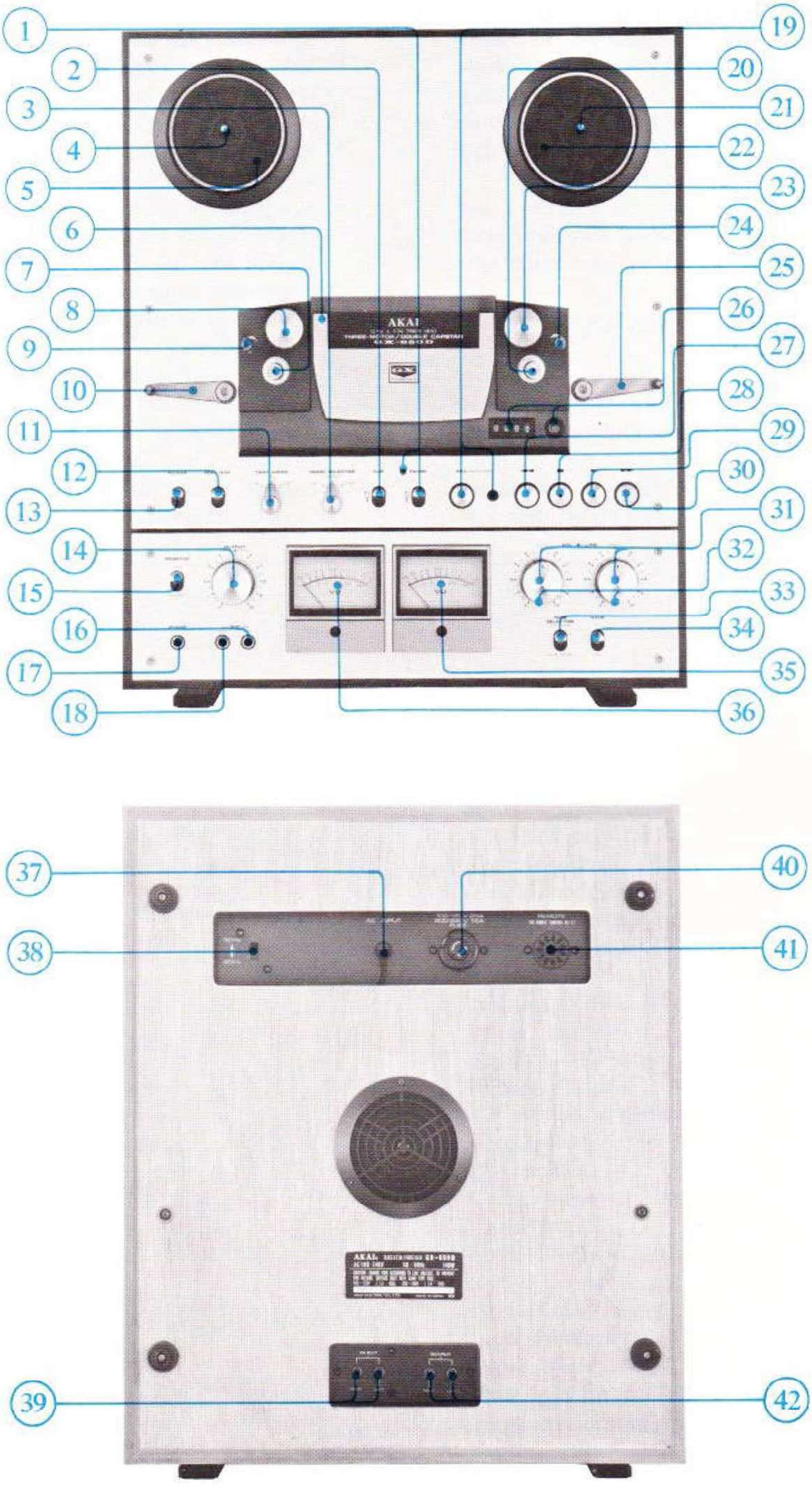
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OPERATING PRECAUTIONS AND NOTES

* Your new GX Head Tape Deck is made of the finest materials and incorporates the latest engineering techniques. With proper care this machine will bring you long lasting high quality performance. We therefore, urge you to READ YOUR MANUAL CAREFULLY PRIOR TO OPERATION.
* As dirty or magnetized heads become the source of loss of sound, sound drop-out, and other recording and playback failures, the heads should be kept clean and demagnetized at all times.
* Place your machine on a flat, level surface. Operate in either a vertical or horizontal position.
* Do not block the ventilator.
* Akai LN-150-7 or Scotch #211 Low Noise Tape is considered standard for this machine. The use of regular tape is not recommended.
* Set Tape Selector Switch to WIDE RANGE only when using special wide range tape of a grade higher than low noise tape.
* New tape gives best results.
* Avoid using extremely thin tape whenever possible. When the use of such tape is unavoidable, be sure to depress the Stop Button before changing modes.
* As tapes which have not been used for a period of time may have become sticky, run tape once before using.
* Always store tapes in a cool, dry place.
* If the sound sources are so far away from the microphones that the input level controls must be turned to maximum, some hum or noise will inevitably be recorded. A test recording is recommended before making a final recording.
* Should there be a problem with your machine, write down the model and serial numbers and all pertinent data regarding warranty coverage as well as a clear description of the existing trouble and contact your nearest authorized Akai Service Station or the Service Dept of Akai Co., Tokyo, Japan.

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CONTROLS



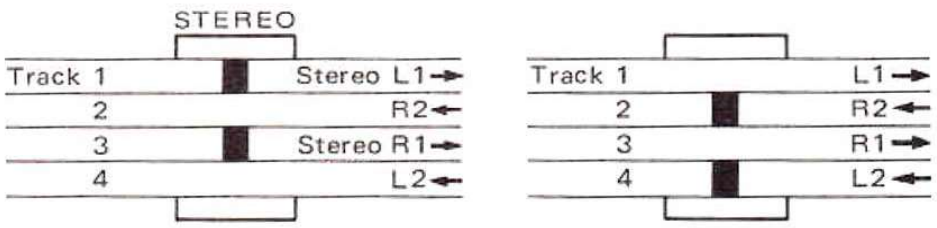
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1. PAUSE SWITCH AND INDICATOR LAMP
   Convenient for temporarily suspending tape travel during recording or playback. Pause Indicator Lamp lights to confirm pause mode.
2. CUE SWITCH
   For precision cueing and editing. Refer to "CUE SWITCH", page 5.
3. MODE SELECTOR
   For selection of stereo or monaural mode.
   LEFT: Tracks 1, 4
   RIGHT: Tracks 3, 2
   STEREO: Left and Right Tracks 1 and 3, 2 and 4.
4. BUILT-IN REEL RETAINER (Left)
   To lock reel firmly into place, pull tip of retainer outward and turn to left or right.
5. SUPPLY REEL TABLE
6. HEAD COVER
   Houses GX Recording, GX Playback, and Erase Heads.
7. CAPSTAN (Left)
   The dual capstan system employed in this model provides perfect tape stability.
8. PINCH WHEEL (Left)
   Presses against left capstan to transport tape.
9. TAPE GUIDE
10. AUTOMATIC STOP/TENSION LEVER (Left)
    When this lever drops at the end of the tape, the automatic stop mechanism of the unit is activated and reel movement is stopped. Also functions as a tension lever to provide proper tape tension.
11. TAPE SPEED SELECTOR
    Set according to desired speed. For professional high fidelity recording, 15 ips speed is recommended.
12. REEL SIZE SELECTOR
    Set to "10 in" when using 10½" reels and to "7 in" when using 7" or 5" reels. (This provides proper tape tension according to reel size). When using 10½" reels, employ standard accessory reel hub adapters.
13. POWER SWITCH
14. OUTPUT LEVEL CONTROLS (Left/Right)
    Adjusts line output volume.
15. MONITOR SWITCH
    Set to SOURCE to monitor source during recording, and set to TAPE for playback or private headphone listening or for monitoring recorded signals during recording mode.
16. MICROPHONE JACK (Right)
17. HEADPHONE JACK
    Accomodates low impedance type stereo headphones for monitoring or headphone listening. (8 ohms impedance headphones recommended).
18. MICROPHONE JACK (Left)
19. RECORDING (REC) BUTTON AND INDICATOR LAMP
    Depress this button and the Forward Button simultaneously to effect recording mode. The Recording Indicator Lamp will light to confirm recording mode.
20. CAPSTAN (Right)
21. BUILT-IN REEL RETAINER (Right)
    To lock reel firmly into place, pull tip of retainer outward and turn to left or right.
22. TAKE-UP REEL TABLE
23. PINCH WHEEL (Right)
    Presses against right capstan to transport tape.
24. TAPE GUIDE
25. AUTOMATIC STOP/TENSION LEVER (Right)
    When this lever drops at the end of the tape, the automatic stop mechanism of the unit is activated and reel movement is stopped. Also functions as a tension lever to provide proper tape tension.
26. INDEX COUNTER AND RESET BUTTON
27. REWIND ◄◄ BUTTON
    Rewinds tape at high speed.
28. STOP ■ BUTTON
29. FORWARD ► BUTTON
    Advances tape for playback and recording modes.
30. FAST FORWARD ►► BUTTON
    Advances tape at high speed.
31. MICROPHONE RECORDING LEVEL CONTROLS (Left/Right)
    Adjusts microphone input level. Adjust while observing VU Meters. Normal recording level is 0 VU.
32. LINE RECORDING LEVEL CONTROLS (Left/Right)
    Adjusts line input level. Adjust while observing VU Meters. Normal recording level is 0 VU.
33. TAPE SELECTOR SWITCH
    LOW NOISE: Set to this position when using Low Noise Tape.
    WIDE RANGE: Set to this position when using Wide Range Tape.
    * Akai LN-150-7 or Scotch #211 tape is considered standard for this machine. The use of regular tape is not recommended.
34. S.O.S (SOUND-ON-SOUND) SWITCH
    For SOUND-ON-SOUND Recording, refer to page 10.
    * Keep this switch at OFF position except during sound-on-sound recording.
35. VU METER (Right)
    Indicates right channel recording and playback levels.
36. VU METER (Left)
    Indicates left channel recording and playback levels.
37. AC CORD
38. CYCLE CHANGE SWITCH (CEE, CSA, UL and LA Models are not equipped with this facility)
    Set to 50 Hz or 60 Hz position according to area power source.
39. LINE INPUT JACKS (Left/Right)
    Connects to output jacks of external source.
40. UNIVERSAL VOLTAGE SELECTOR (CEE, CSA, UL, and LA Models are not equipped with this facility)
41. REMOTE CONTROL JACK
    Remote Control of all operating functions can be accomplished with AKAI Remote Control Unit RC-17 or RC-18.
    * Absentee recording can also be accomplished by using Remote Control Unit RC-17 or RC-18 together with a timer. (Refer to ABSENTEE RECORDING procedure.)
42. LINE OUTPUT JACKS (Left/Right)
    Connects to tape inputs of external amplifier or recorder.

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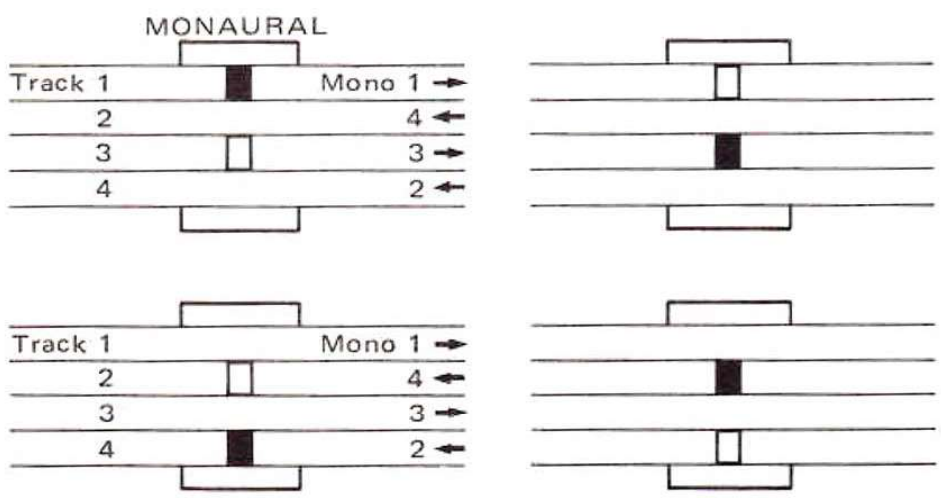
4-TRACK STEREO RECORDING AND PLAY-BACK SYSTEM

4-track stereo recording and playback requires the simultaneous use of two tracks. For stereo operation, set the Mode Selector to STEREO. The first recording or playback takes place on tracks 1 and 3 and the second on tracks 2 and 4 after the reels have been inverted.



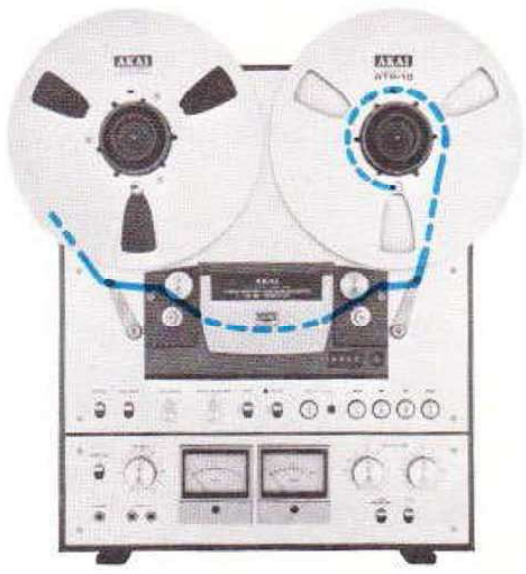
4-TRACK MONAURAL RECORDING AND PLAYBACK SYSTEM

4-track monaural recording and playback sequence is 1-4-3-2. For monaural operation, set the Mode Selector to LEFT track. The first recording or playback takes place on track 1 and the second on track 4 after the reels have been inverted. For recording or playback on tracks 3 and 2, set the Mode Selector to RIGHT track. The third recording or playback takes place on track 3, and the fourth on track 2 after the reels have been inverted.



TAPE LOADING

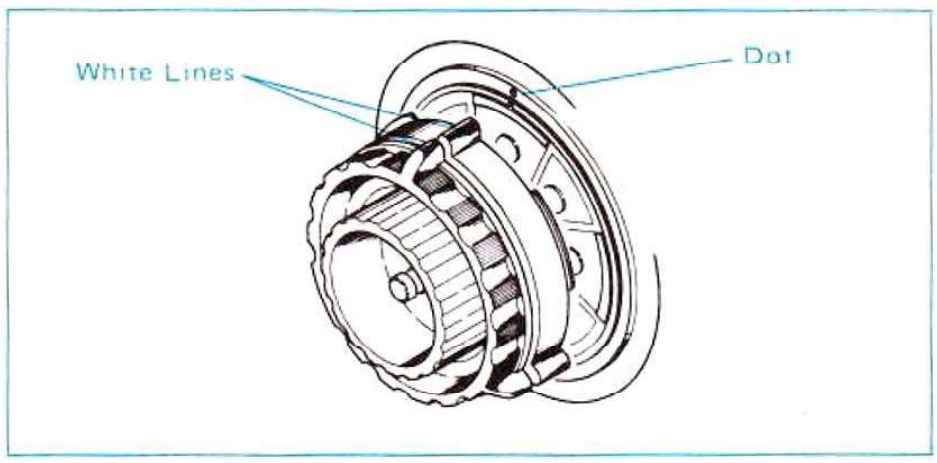
1. Place a full reel of tape on the supply reel table and an empty reel on the take-up reel table.
2. Lock both reels into place by pulling tip of reel retainers outward and turning to left or right.
3. Unwind about an 85 cm length of tape from the supply reel and thread the tape as shown by the dotted lines in the figure.
4. Insert end of tape in slot of empty reel and wind around hub two or three times.
5. Continue winding tape onto take up reel until all tape slack has been taken up.



When using 10½" reels, place the standard accessory reel hub adapters on reel tables and lock into place by pulling tip of reel retainers outward and turning to left or right.

When using 10½" plastic reels
Fit adapters on reel tables so that the white lines on the inner and outer hub adapters are aligned and match these lines with the dot on the reel table.

When using 10½" metallic reels
Fit adapters on reel tables so that the white lines on the inner and outer hub adapters are aligned, but do not match with dot on reel table. (This provides the necessary spacing for the difference in plastic and metallic reel thickness).



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TAPE SPEED SELECTION

This model operates at 15, 7½ or 3¾ ips tape speed. Simply set Tape Speed Selector to desired speed.
Stereo recording at 15 ips is 30 minutes using a 2,400 ft tape and 45 minutes using a 3,600 ft tape.

* For professional recording, 15 ips tape speed is recommended.

TAPE SELECTOR SWITCH

Operating this switch changes the recording equalization according to the tape being used for optimum utilization of tape characteristics.

Low Noise: Set to this position when using low noise tape.

Wide Range: Set to this position when using wide range tape.

* Akai LN-150-7 or Scotch #211 tape is considered standard for this machine. The use of regular tape is not recommended.

* Set Tape Selector to Wide Range position only when using special wide range tape of a grade higher than low noise.

DIRECT FUNCTION CHANGE CONTROL

This model employs a direct function change control system for speedy mode selection. The necessity of depressing the Stop Button before changing modes is eliminated. Direct function change to recording mode facilitates easy add-on recording.

* The use of extremely thin tape should be avoided. When the use of such tape is absolutely necessary, it is recommended that the Stop Button be depressed before changing operating modes.

CUE SWITCH

The Cue Switch facilitates precision cueing and editing. When the Cue Switch is depressed during Fast Forward or Rewind, a "tweeting" sound will be heard where there are recordings on the tape. Where there are no recordings, or at blank spaces between recordings, no sound will be heard. After stopping tape, move reels by hand while listening to the sound and set to exact desired position.

* When using the Cue Switch, the Tape Monitor Switch must be set to TAPE position.

AUTOMATIC STOP

At the end of the tape, the Automatic Stop/Tape Tension levers drop. This activates the automatic stop mechanism of the unit and stops reel movement. This feature is especially convenient when the machine is left unattended.

PAUSE CONTROL

The GX-650D is equipped with a Pause Switch for temporarily suspending tape travel during recording or playback. Especially convenient for editing tape. Depress when a certain portion of the program is not desired and return to normal position to resume recording mode. Pause Indicator Lamp will light to confirm pause mode.

* Pause Control does not function during Fast Forward or Rewind.

SOUND MONITORING

For private headphone listening or tape playback through a speaker system, set Monitor Switch to TAPE position, and to monitor program source, set to SOURCE positon. Dual Monitoring for more professional results can also be accomplished with this machine by switching the Monitor Switch to and from TAPE and SOURCE to compare just recorded signals with the input source during recording.
For precise recording level adjustment, set Monitor Switch to SOURCE and monitor signals through headphones while adjusting input level controls.

* Output Level Controls have no effect during headphone listening.

REMOTE CONTROL

All operating functions of this model can be remote controlled by using Akai optional accessory Remote Control Unit RC-17 or RC-18. Plugs into remote control jack on rear panel.

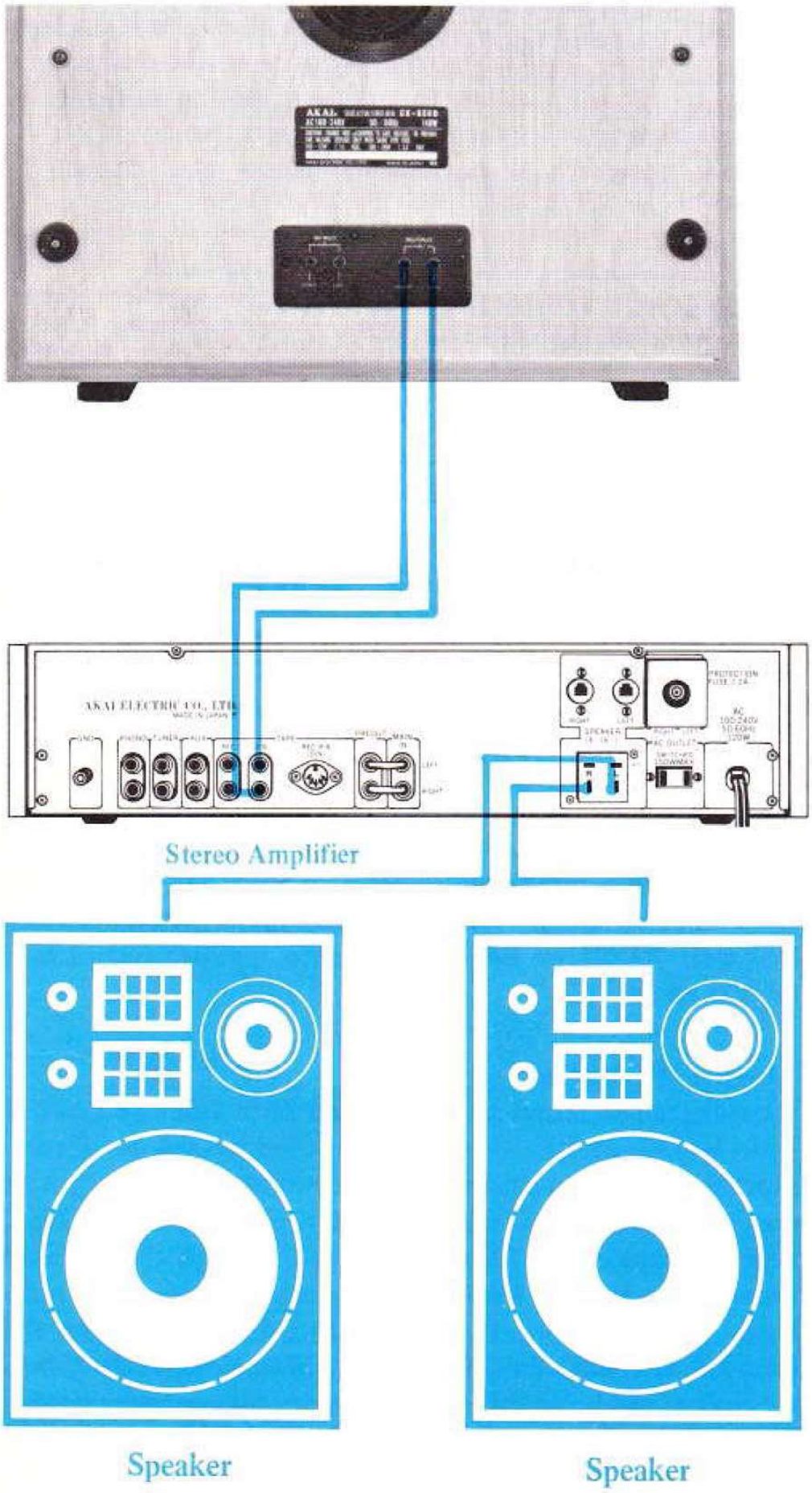
Absentee Recording

By using an external timer together with Remote Control Unit RC-17 or RC-18, absentee recording can be accomplished with this machine. Connect Remote Control Unit to rear panel Remote Control Jack and properly load a tape, avoiding tape slack. Plug in AC Cord through the external timer. Adjust input level following regular recording procedure and with the Power Switch turned ON and the Remote Control Unit REC and FWD Keys locked into recording mode positions, set timer, following manufacturers instructions. If timer is set to coincide with source timing, the GX-650D will automatically begin recording according to setting.

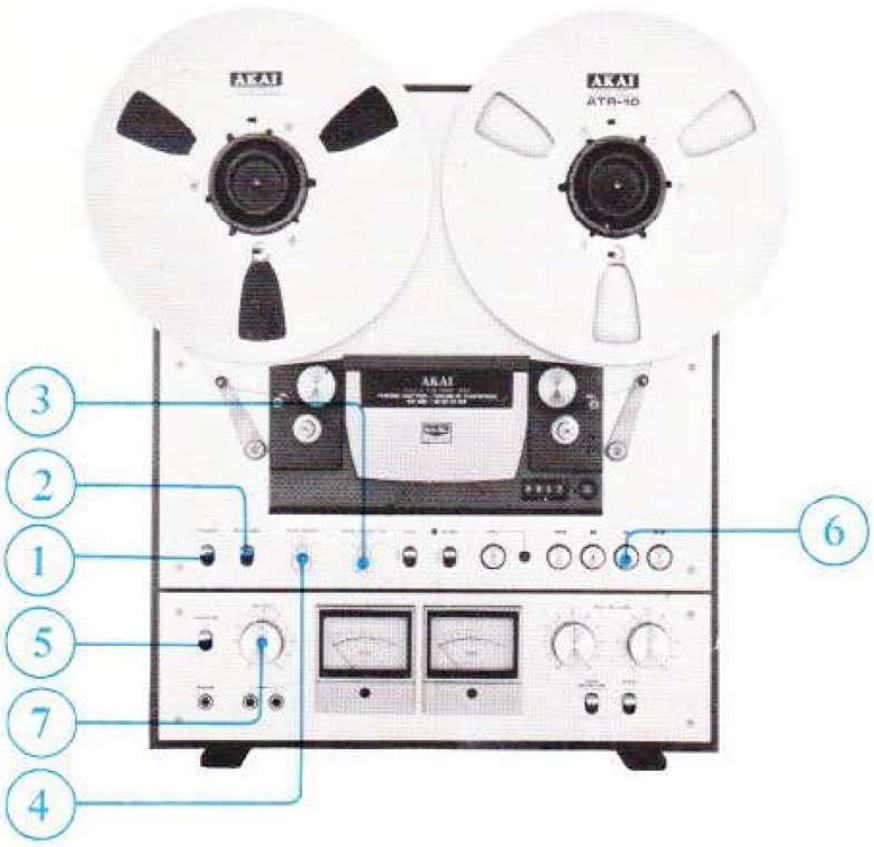
* This machine features automatic stop which is effected at the end of the tape.

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CONNECTIONS FOR PLAYBACK



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PLAYBACK

Make necessary connections as shown in CONNECTIONS FOR PLAYBACK and load a pre-recorded tape.

Stereo Playback

1. Connect power cord and turn on Power Switch.
2. Set Reel Size Selector to correspond with size of reel being used.
3. Set Mode Selector to STEREO.
4. Select tape speed.
5. Set Monitor Switch to TAPE.
6. Depress Forward ► Button to begin playback.
7. Adjust left and right Output Level Controls and external amplifier controls.
8. Invert reels for playback of track 3-2.

Monaural Playback

Follow stereo playback procedure, substituting the following steps for steps 3, 7 and 8.

Tracks 1-4

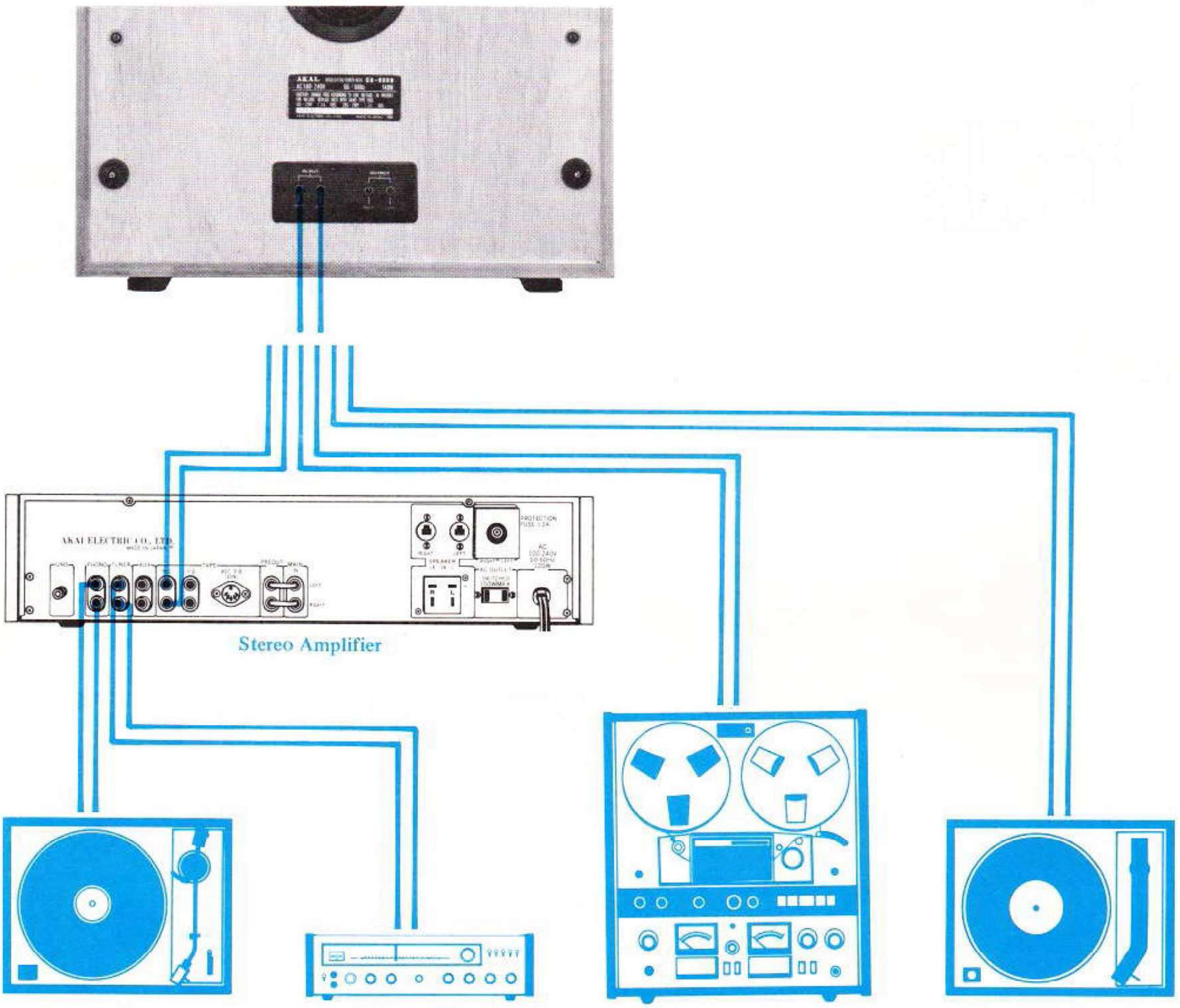
3. Set Mode Selector to LEFT.
7. Adjust left Line Output Level Control and external amplifier controls.
8. Invert reels for playback of track 4.

Tracks 3-2

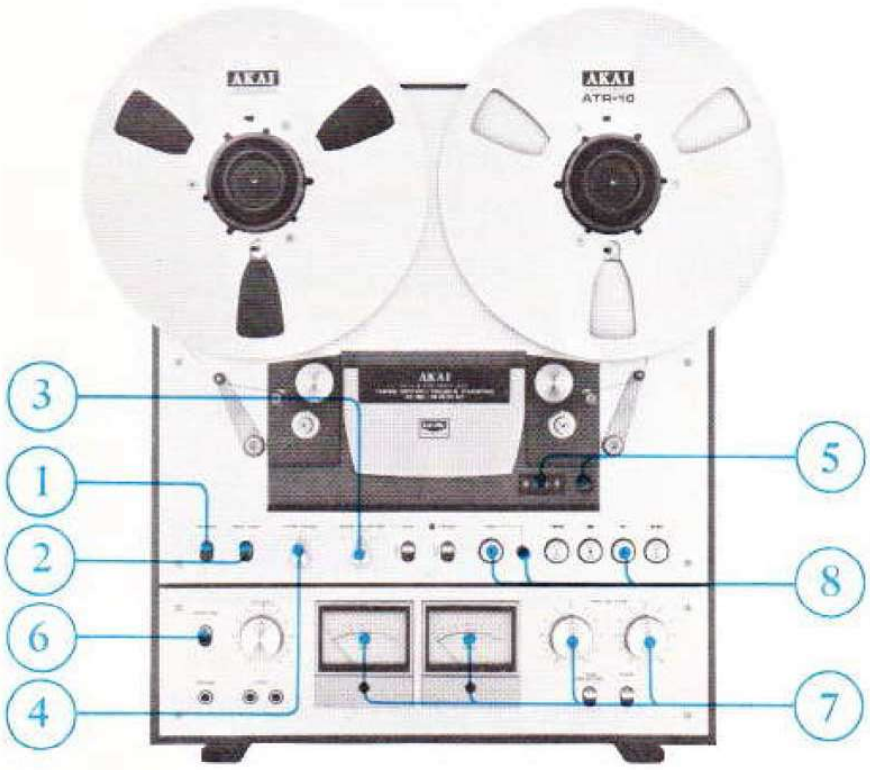
3. Set Mode Selector to RIGHT.
7. Adjust right Line Output Level Control and external amplifier controls.
8. Invert reels for playback of track 2.

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CONNECTIONS FOR RECORDING



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RECORDING

Make desired program source connections as shown in CONNECTIONS FOR RECORDING and load a tape. New blank tape gives best results.

Stereo Recording

1. Connect power cord and turn on Power Switch.
2. Set Reel Size Selector to correspond with size of reel being used.
3. Set Mode Selector to STEREO.
4. Select tape speed.
5. Set Index Counter to "000". (This provides an easy reference for locating positions on the tape).
6. Set Monitor Switch to SOURCE.
7. Adjust and balance input level with appropriate left and right Input Level Controls while observing VU Meters. Normal recording is "0" VU.
8. When an optimum recording level has been determined, depress the Forward ► and Recording (REC) Buttons simultaneously to effect recording mode.
9. Invert reels to record on track 3-2.

Monaural Recording

For monaural recording, follow stereo recording procedure, substituting the following steps for Steps 3, 7 and 9.

Tracks 1-4

3. Set Mode Selector to LEFT
7. Adjust and balance input level with appropriate left Input Level Control while observing the left VU Meter.
9. Invert reels to record on track 4.

Tracks 3-2

3. Set Mode Selector to RIGHT.
7. Adjust and balance input level with appropriate right Input Level Control while observing the right VU Meter.
9. Invert reels to record on track 2.

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SOUND-ON-SOUND RECORDING

For transfer of previously recorded material from one track to another, accumulating as many individual recordings on a single track as is desired. Use for language training or various interesting musical compilations, etc.

First Recording

A. Confirm that there are no connections to the line input jacks and that all line input controls are set to minimum.
B. Set Mode Selector to LEFT for recording on track 1.
C. Connect Microphone to Left Microphone Jack.
D. Set Monitor Switch to SOURCE.
E. Adjust Left Microphone Recording Level Control while observing the Left VU Meter.
F. Depress Reset Button and set Index Counter to "0000".
G. Depress Recording Button and Forward Button simultaneously to begin first recording, i.e., Do-Re-Mi.
H. When the first recording is completed, rewind tape to starting point.

Second Recording

I. Confirm that the Monitor Switch is at SOURCE position and set S.O.S Switch to ON position.
J. Set Mode Selector to RIGHT for recording on track 3 while listening to track 1 through headphones.
K. Connect Microphone to Right Microphone Jack.
L. Increase Right Line Recording Level Control to about mid-range.
M. Connect stereo headphones for monitoring first recording on track 1.
N. Depress Recording Button and Forward Button simultaneously to begin second recording., i.e., Mi-Fa-Sol.
O. Adjust Right Microphone Recording Level Control while observing the Right VU Meter.
P. Reset Right Line Recording Level Control so that the sound being transferred from track 1 is the same level as the present recording.

* The second recording (Mi-Fa-Sol) is made on track 3 as the first recording (Do-Re-Mi) is heard through headphones. The two recordings will completely merge on track 3 (Do-Mi-Re-Fa-Mi-Sol).

* Third and subsequent recordings are made in the same way as the second by switching the Mode Selector to and from LEFT and RIGHT and adjusting appropriate input level controls.

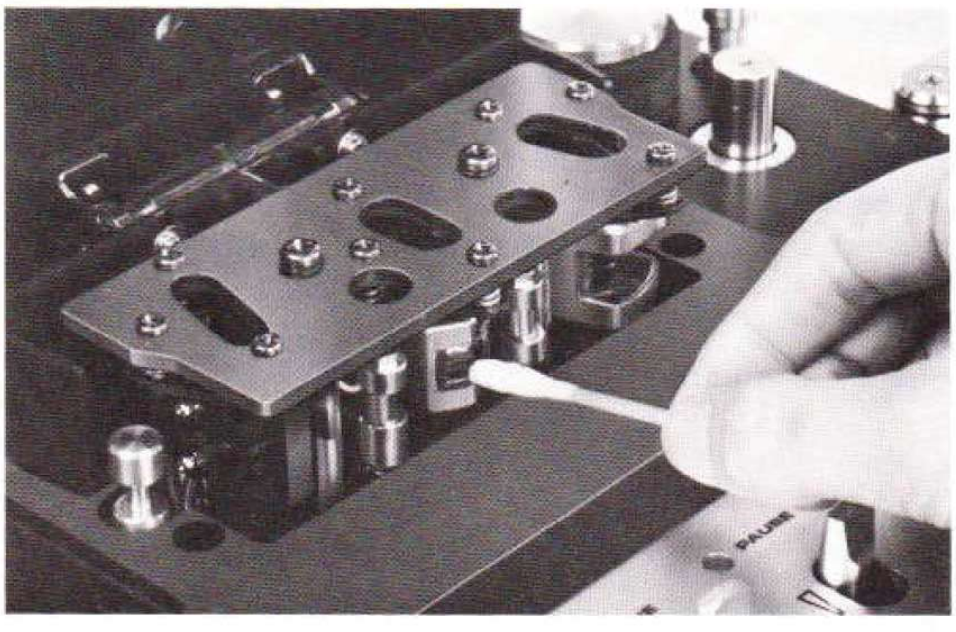
* For playback, set Mode Selector to track on which the last recording was made, set Monitor Switch to TAPE, and set the S.O.S Switch to OFF position.

SOUND MIXING

This model incorporates a built in microphone-line mixing circuit. Independent line and microphone recording level controls and input jacks enable microphone signals and signals from other sources to be blended and recorded simultaneously on the tape.

Connect microphones to Microphone Jacks and connect line outputs of external source to the Line Input Jacks. Adjust microphone volume level with Microphone Recording Level Controls and line input level with Line Recording Level Controls.

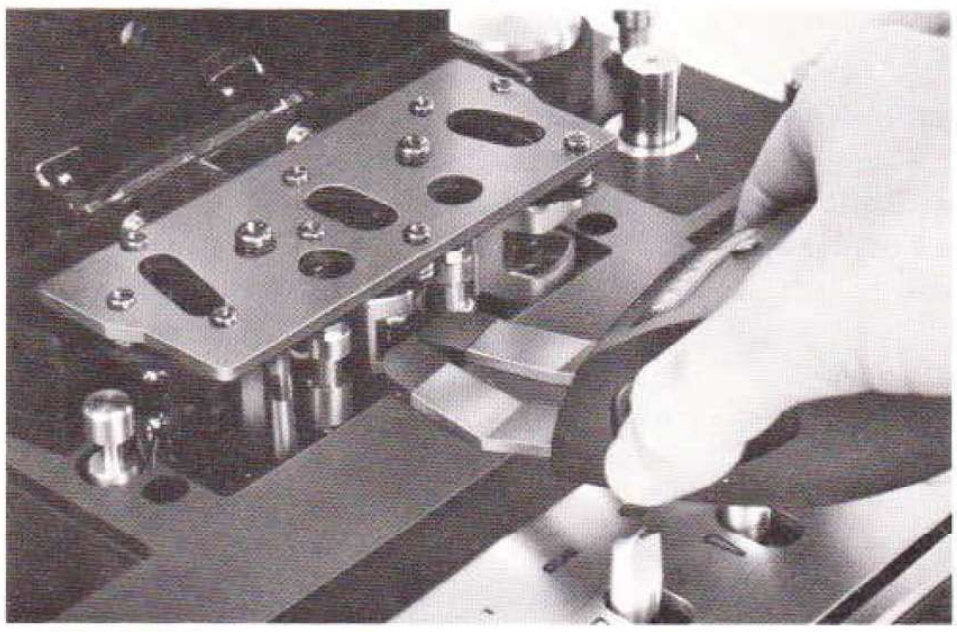
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HEAD BLOCK CLEANING

While GX Heads do not require a great deal of cleaning, occasional head cleaning is recommended, and especially when old or spliced tapes are used. Also, as magnetic particles adhering to the pinch wheel or capstan, etc. will cause irregularity in tape transport as well as deterioration of sound quality, these and other parts over which the tape travels should also be kept clean. Clean all heads and the head block area with a cotton swab stick which has been dipped in Akai Cleaning Fluid (from Akai Cleaning Kit HC-550).

* If Akai Cleaning fluid is not available, use alcohol. Do not use other chemicals as the rubber parts will deteriorate.
* The lift-up head cover of this model provides easy accessibility to the head block area.



HEAD DEMAGNETIZING

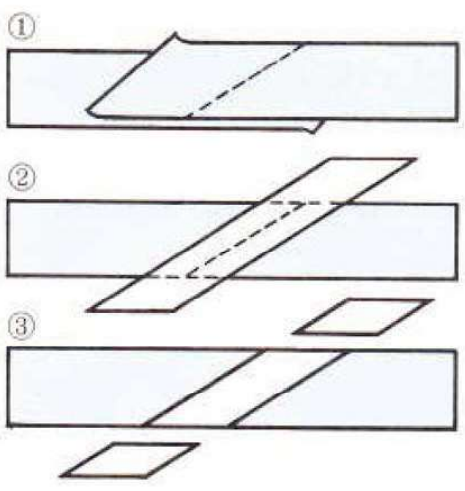
Normally, the steel pole pieces which form part of the heads become slightly magnetized. As this results in noise or distortion and loss of high frequency response, it is recommended that the heads be demagnetized periodically. This can be accomplished by bringing the prongs of a bulk demagnetizer close to the heads and making several small circular movements over all heads surface areas as well as the head housing.

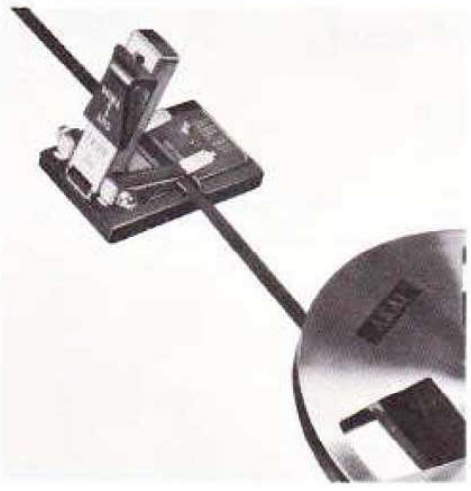
* Be sure to turn off the power of your recorder prior to demagnetizing the heads.
* Do not use magnetized tools in the vicinity of the heads.
* Avoid bringing the demagnetizer near the VU Meters and also avoid switching the demagnetizer on and off near the head block area.

TAPE ERASING

Any signals previously recorded on the tape will be automatically erased as a new recording is made. For erasing only, thread tape and set machine to recording mode. No plugs should be connected to the input jacks and the recording level controls should be kept at minimum. For quick and complete erasure, a bulk tape eraser is recommended.

* Be sure to set the Track Selector properly. If set to STEREO, both the left and right channels will be erased.





TAPE SPLICING AND EDITING

Cut tape diagonally with an overlap so that the ends are lined up. Cutting tape on the diagonal eliminates detection of the splice in recording. Cover aligned ends with splicing tape, exerting pressure to secure ends evenly. Trim off excess splicing tape. Cutting into the magnetic tape very slightly will eliminate the possibility of a sticky splice.
Splicing tape using scissors requires skillful work. For smooth and easy splicing, Akai Tape Splicing Kit Model SK-750 is recommended.

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Standard Accessories

Empty Reel (R-10M)	1
10½" reel hub adapters	1 set
Connection Cords	1 set
Operator's Manual	1

RECOMMENDED OPTIONAL ACCESSORIES

Condenser Microphones	ACM-300
	ACM-200
	ACM-100
Electret Condenser Headphone	ASE-80C
Dynamic Type Headphones	ASE-26
	ASE-24
	ASE-22
	ASE-20
Remote Control Unit	RC-18
	RC-17
Dust Cover	DC-230
Tape Splicing Kit	SK-750
Cleaning Kit	HC-550

TECHNICAL DATA

Track System	4 track, 2 channel stereo/monaural system
Reel Capacity	Up to 10½" reel
Tape Speed	15, 7½ and 3¾ ips (± 0.5%)
Wow/Flutter	Less than 0.04% RMS at 15 ips. Less than 0.055% RMS at 7½ ips. Less than 0.07% RMS at 3¾ ips.
Frequency Response	30 to 30,000 Hz ± 3 dB at 15 ips using Akai LN-150 tape 30 to 26,000 Hz ± 3 dB at 7½ ips using Akai LN-150 tape 30 to 20,000 Hz ± 3 dB at 3¾ ips using Akai LN-150 tape
Distortion	Less than 0.4% at 15 and 7½ ips (1,000 Hz "0" VU) Less than 0.9% at 3¾ ips (1,000 Hz "0" VU)
Signal-to-Noise Ratio	Better than 58 dB (measured via tape with peak recording level of + 6 VU)
Erase Ratio	Better than 70 dB
Bias Frequency	150 kHz
Heads	(3): One GX Playback Head, one GX Recording Head, and one Erase Head
Motors	(3): One AC Servo Motor for capstan drive, and two Eddy Current Motors for reel drive
Fast Forward and Rewind Time	120 sec. using a 2,400 ft tape
Output Jacks	Line (2): 0.775V (0 VU). Required load impedance: More than 20 k ohms Phone (1): 30 mV/8 ohms
Input Jacks	Microphone (2): 0.3 mV/Required microphone impedance: 600 ohms Line (2): 80 mV/100 k ohms
Semi-Conductors	Transistors 72, Diodes 61, IC 1
Power Requirements	CSA, UL, and LA Models: 120V, 60 Hz only CEE Models: 220V, 50 Hz only Other Models: 100V to 240V, 50/60 Hz (Switchable)
Dimensions	524(H) x 442(W) x 258(D) mm (20.6 x 17.4 x 10")
Weight	26.2 kg (57.6 lbs)

* **For improvement purposes, specifications and design are subject to change without notice.**

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