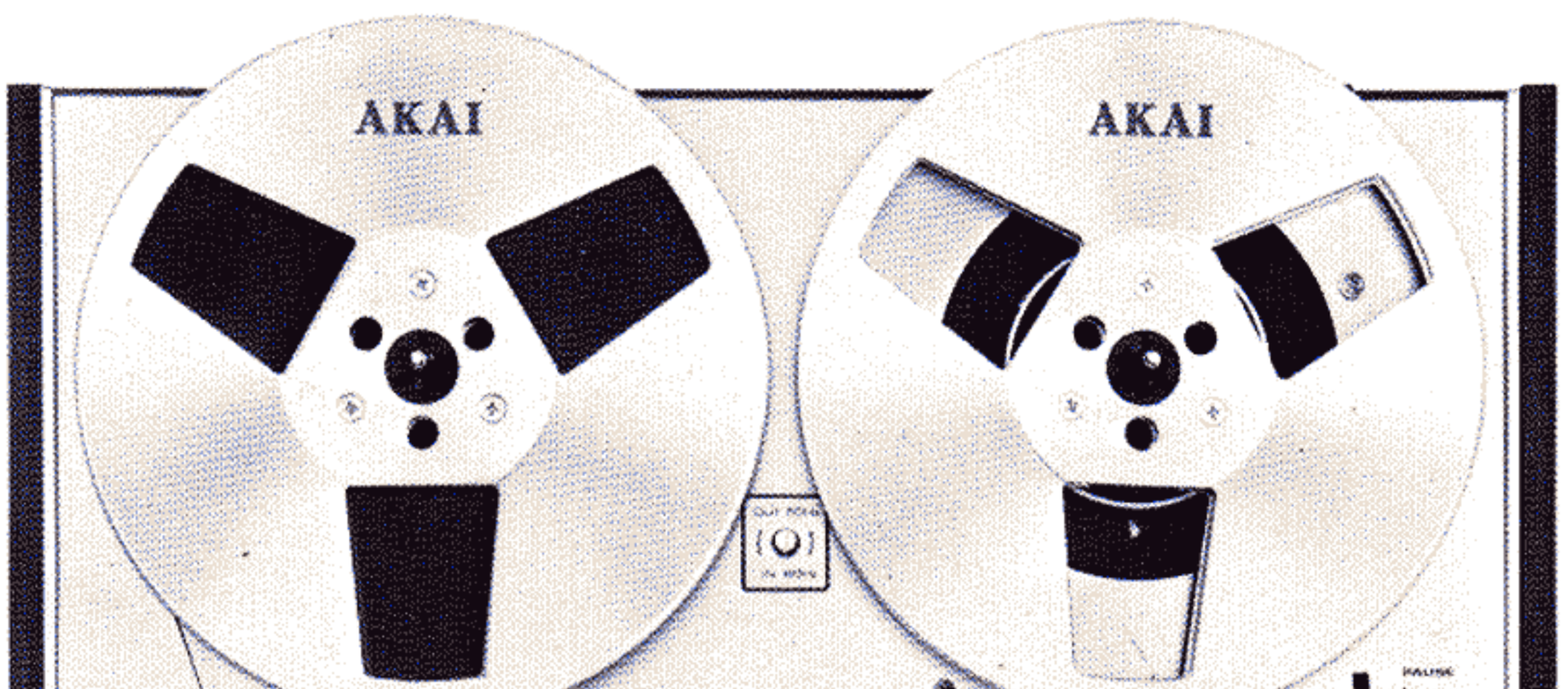
4000DB

STEREO TAPE DECK

OPERATOR'S MANUAL



WARNING

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

AKAI®

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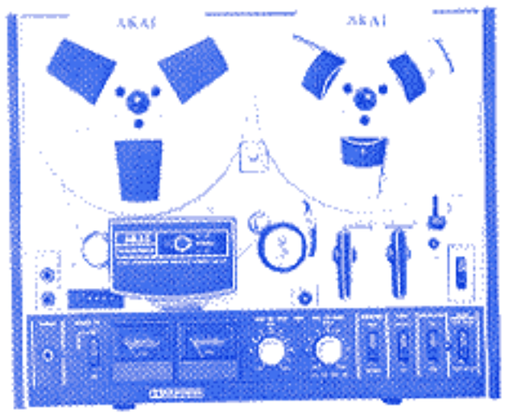
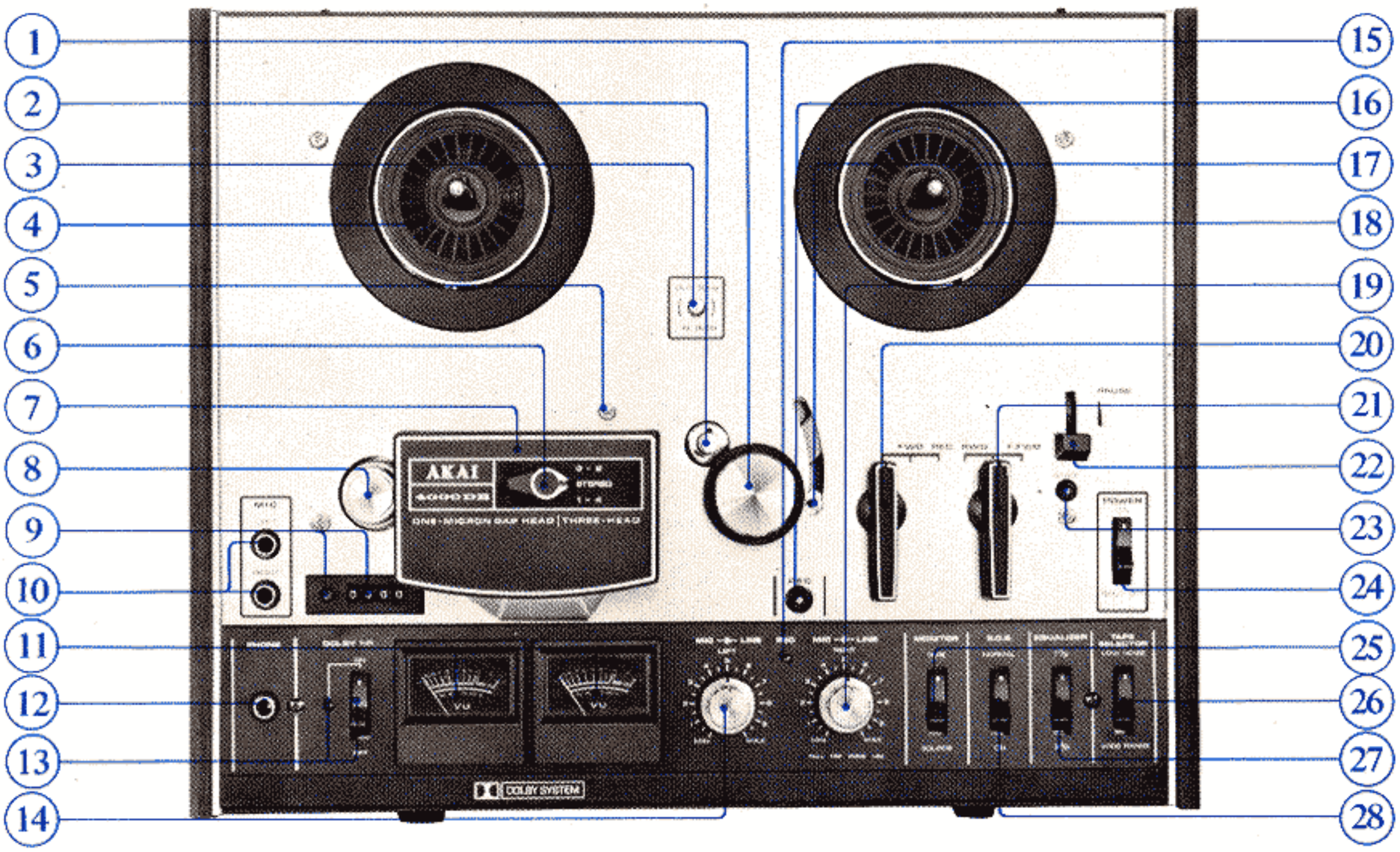


CEE, CSA, UL and LA Standard models are not equipped with a Voltage Selector or Cycle Change Apparatus. Therefore, voltage and cycle conversion is not necessary. If your machine corresponds to any of these standards, please disregard all references to voltage and cycle adjustment throughout this manual.

CEE: Models: 220V, 50Hz
CSA: Models: 120V, 60Hz
UL, LA: Models: 120V, 60Hz

INDEX

CONTROLS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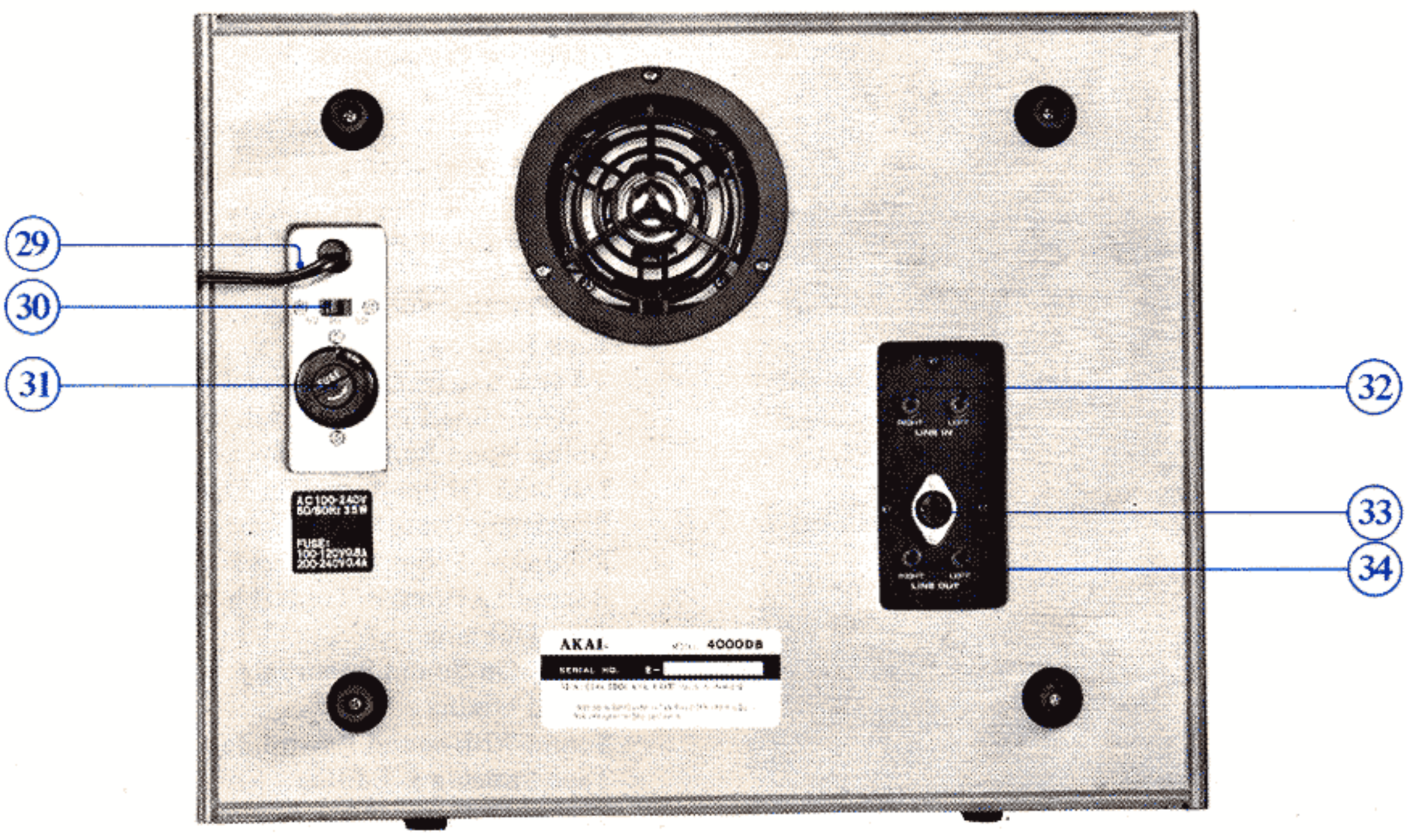
AKAI
ONE-MICRON GAP HEAD | THREE-HEAD
DOLBY SYSTEM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30
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AC 100-240V
50/60Hz 35W
FUSE:
100-120V 0.8A
200-240V 0.4A
LINE IN
LINE OUT
AKAI
4000DB
SERIAL NO.

1. **PINCH WHEEL**
Presses against capstan to transport tape.

2. **CAPSTAN**
Transports tape and controls tape speed. See Tape Speed Selection procedure.

3. **CYCLE CONVERSION SWITCH (A)**
OUT position 50 Hz, IN position 60 Hz.

4. **SUPPLY REEL TABLE**

5. **CAPSTAN STORAGE POST**

6. **TRACK SELECTOR SWITCH**

7. **HEAD COVER**
Houses Erase, Recording, and Playback Heads.

8. **TAPE GUIDE**

9. **INDEX COUNTER & RESET BUTTON**

10. **MICROPHONE JACKS (Left & Right)**

11. **VU METERS (Left & Right)**
Indicates recording and playback levels.

12. **HEADPHONE JACK**
For monitoring sound or private headphone listening. Use headphones of 8 Ω impedance.

13. **DOLBY NOISE REDUCTION SWITCH & INDICATOR LAMP**
Set the Dolby NR Switch to ON position for Dolby process recording or when playing back a Dolby process recorded tape. When set to ON position, the Dolby Indicator Lamp will light.
* Keep this switch at OFF position at all other times..

14. **RECORDING LEVEL CONTROL (left)**
Outer Control: Line; Inner Control: Microphone.

15. **RECORDING INDICATOR LAMP**
Lights when recorder is set to recording mode.

16. **RECORDING SAFETY BUTTON**

17. **SHUT-OFF LEVER**
See Automatic Shut-Off procedure.

18. **TAKE-UP REEL TABLE**

19. **RECORDING LEVEL CONTROL (right)**
Outer Control: Line; Inner Control: Microphone.

20. **RECORD/PLAYBACK LEVER**
For playback set to FWD position, and for recording set to REC position.

21. **FAST FORWARD/REWIND LEVER**
See Fast Forward & Rewind procedure.

22. **PAUSE LEVER**
See Pause Control procedure.

23. **START BUTTON**
Releases Pause Lever.

24. **POWER/AUTOMATIC SHUT-OFF SWITCH**
For turning on power, set to ON position. For automatic Shut-Off, see Automatic Shut-Off procedure.

25. **MONITOR SELECTOR SWITCH (Tape & Source)**
During recording mode when the Monitor Selector Switch is set to TAPE position, signals can be monitored as the tape passes the playback head. When set to SOURCE position, the program source will be monitored. For erasing or private listening during playback mode, the Monitor Selector Switch should be at TAPE position.

26. **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
* Scotch #211 Low Noise Tape is considered standard for this machine. The use of regular tape is not recommended.
* Set to Wide Range position only when using special wide range tape of a grade higher than low noise tape.

27. **EQUALIZER SWITCH**
Must be set to correspond with tape speed. See Tape Speed Selection procedure.

28. **S.O.S (Sound-On-Sound) BUTTON**
See Sound-On-Sound Recording procedure.

29. **AC CORD**

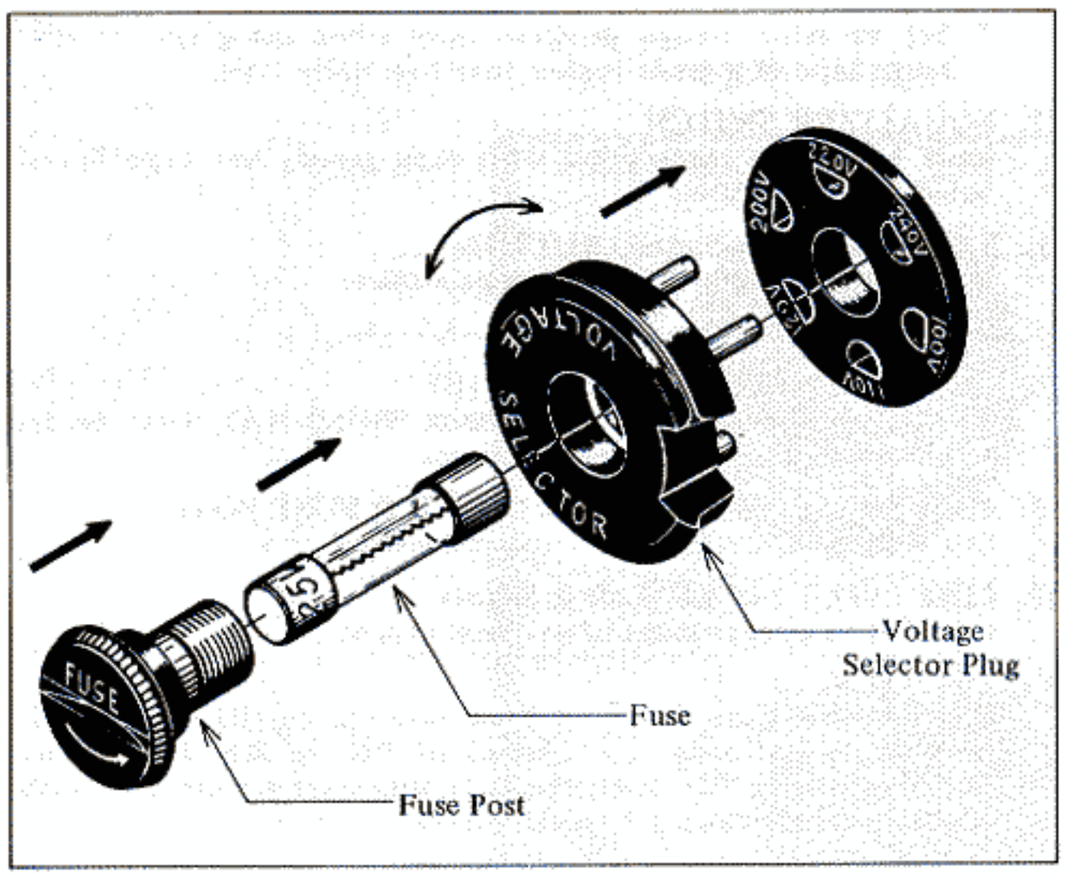
30. **CYCLE CONVERSION SWITCH (B)**
This Switch and Cycle Conversion Switch (A) must be set to correspond with area power source.

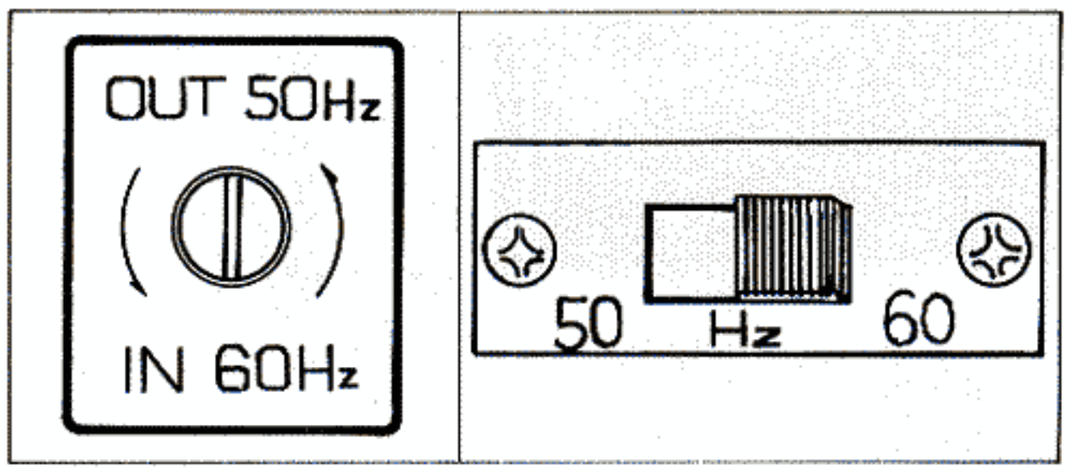
31. **UNIVERSAL VOLTAGE SELECTOR & FUSE POST**
See Voltage & Cycle Conversion procedure.

32. **LINE INPUT JACKS (Left & Right)**
Connect to output jacks of external source.

33. **DIN JACK**
Enables inter-connection with an external amplifier by means of a single Din cord. Use instead of Rec. or P.B. Jacks. Note that when using Din cord, the recording level is controlled with Microphone Recording Level Controls.

34. **LINE OUTPUT JACKS (Left & Right)**
Connect to tape in or aux jacks of external amplifier for playback.





VOLTAGE & CYCLE CONVERSION

VOLTAGE

Your machine is equipped with a universal voltage selector offering six selections of voltage from 100 V to 240 V AC for worldwide operation. Voltage is preset at the factory according to destination. Please confirm setting prior to operation and if readjustment is necessary, proceed as follows : (A) Disconnect power cord and remove the Fuse Post by screwing in direction of arrow. (B) Remove the Voltage Selector Plug and reinsert so that proper area voltage is shown through the Plug cut-out. (C) Change fuse to correspond with voltage and tighten the Fuse Post.

100 V to 120 V : 0.8 A, 250 V fuse ;
200 V to 240 V : 0.4 A, 250 V fuse.

* Be sure to disconnect power cord before attempting to readjust voltage.
* To maintain optimum performance and prolong the life of your machine, it is important that the line voltage be held within a 10% deviation of standard area voltage.

CYCLE

Correct tape speed cannot be obtained if the Cycle Conversion Switches are not properly positioned. (A) With a screw driver, turn Switch (A) on face panel counter-clock-wise about 1/8 of a turn and move to IN or OUT for 60 Hz or 50 Hz operation according to area power source. The Switch must be rotated back to its original position after being reset. (B) Cycle Conversion Switch (B) at rear of recorder must also be set accordingly.

* Do not attempt to rotate the Cycle conversion Switches when the motor is not running.

TAPE SPEED SELECTION

This model operates on two tape speeds; i.e., 3-3/4 and 7-1/2 ips. Tape speed is determined by the capstan. The Equalizer must be set accordingly for proper equalization. For 3-3/4 ips remove outer capstan and place on storage post. For 7-1/2 ips use the outer capstan.

Recording Time :

(Stereo 1800ft tape) 3-3/4 ips : 3hrs., 7-1/2 ips : 1.5hrs.
(Monaural 1800ft tape) 3-3/4 ips : 6 hrs., 7-1/2 ips : 3 hrs.

AUTOMATIC SHUT-OFF

One of the exclusive features of this model is the automatic shut-off function of the unit. For automatic shut-off, thread tape through Automatic shut-Off Lever and set Power/Automatic Shut-Off Switch to SHUT-OFF position after setting machine to playback or recording mode. When the tape comes to the end the Shut-Off Lever will drop cutting the power of the entire unit.

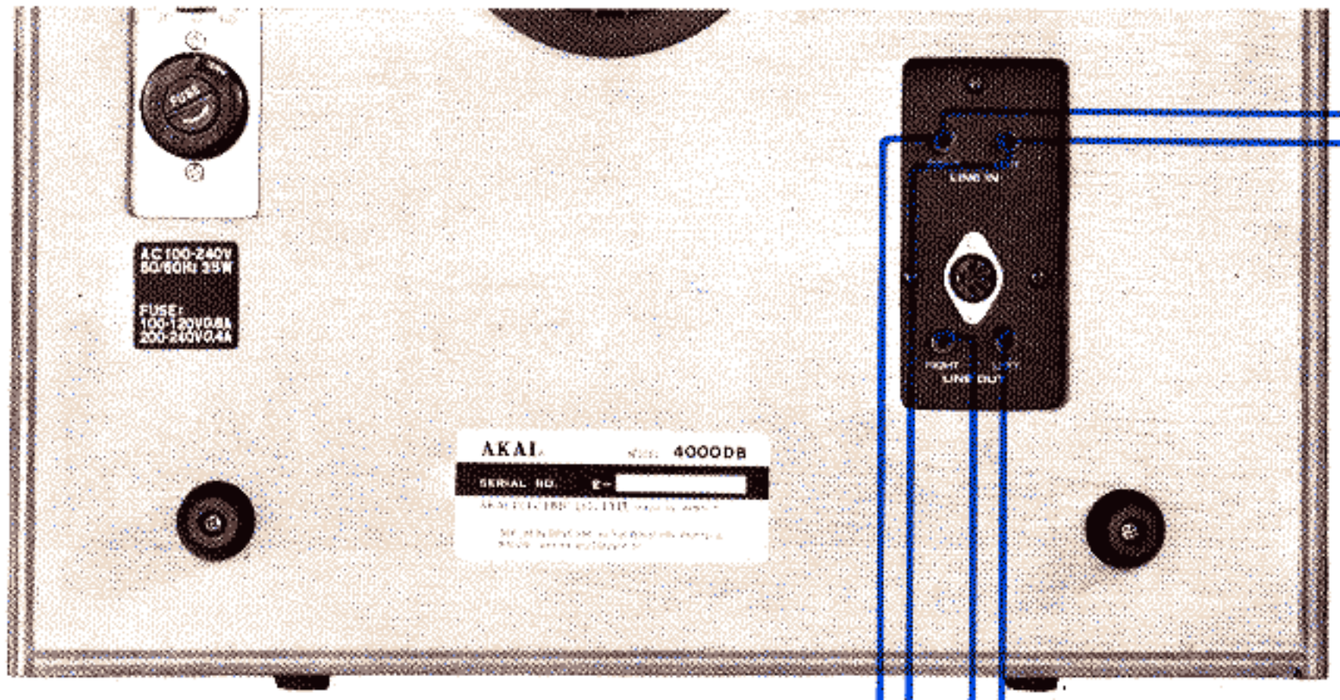
PAUSE CONTROL

To momentarily stop the tape during recording or playback, lift Pause Lever upward. Pause Control is especially useful for editing tape during recording. To release Pause lever depress Start button.

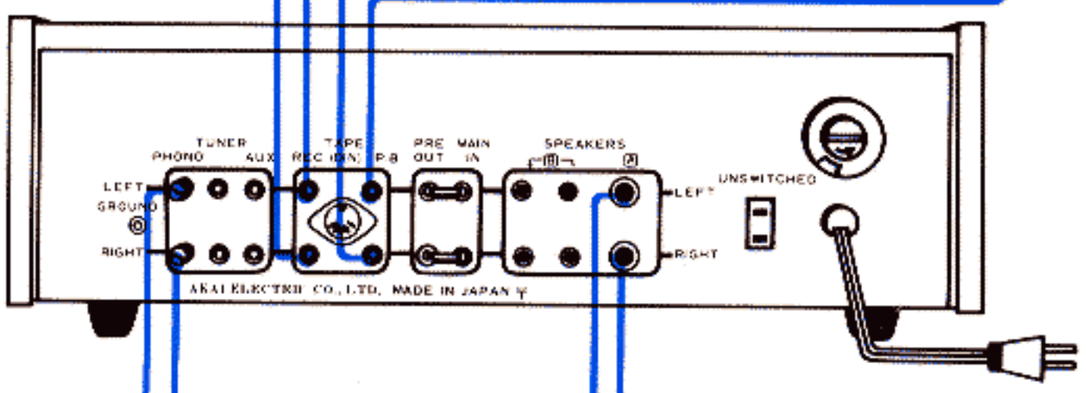
FAST FORWARD & REWIND

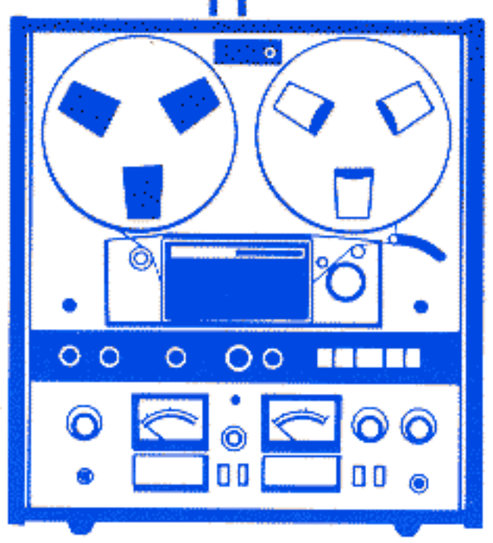
For fast forward or rewind, operate Fast Forward or Rewind Lever. This feature permits rapid selection of recordings on the tape. This lever locks into position and cannot be operated while the Record/Playback Lever is in operation and vice-versa.

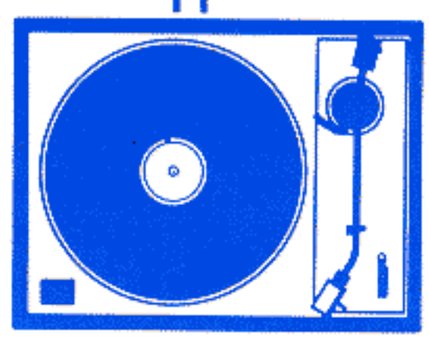
CONNECTIONS



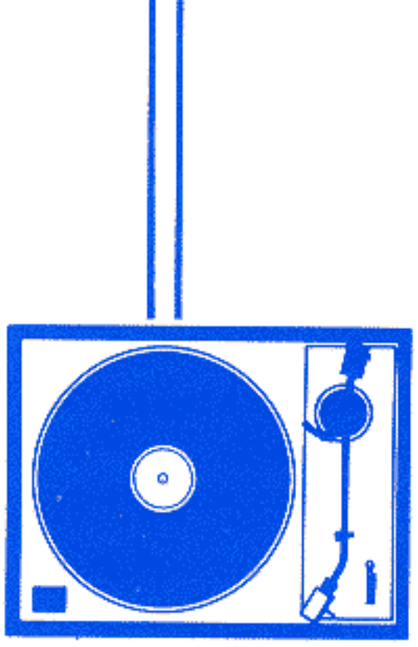
The Din Jack can be used instead of Line Input and Output Jacks for connection with an external amplifier. When using this single Din Cord connection, input level is adjusted with Microphone Level Controls.



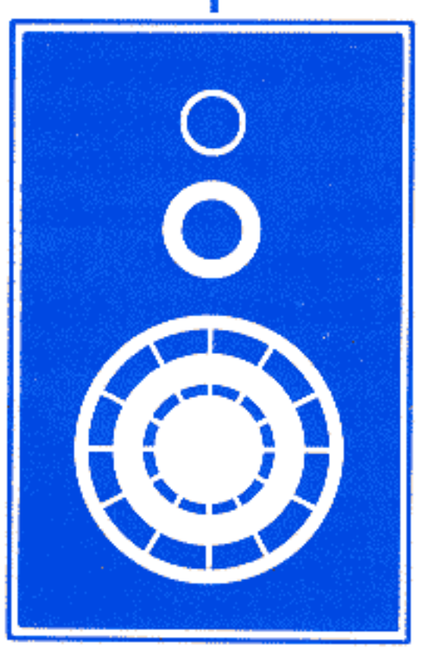


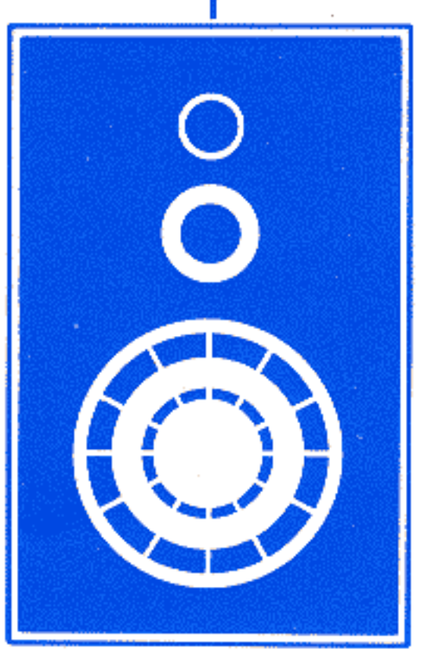


Crystal or ceramic cartridge turntable



Magnetic cartridge turntable





OPERATING PRECAUTIONS

The conditions listed below do not indicate mechanical failure of the unit. If your machine exhibits any of the following, please check for trouble as indicated.

Loss of sensitivity or tone quality may be due to :

* Wrong side of tape facing the heads.
* AC power voltage lower than the voltage to which your machine is adjusted.
* Dust or magnetic particles adhering to the heads. See head cleaning procedure.
* Magnetized heads. See head demagnetizing procedure.
* Defective or worn tape.

Irregularity of tape transport may be due to :

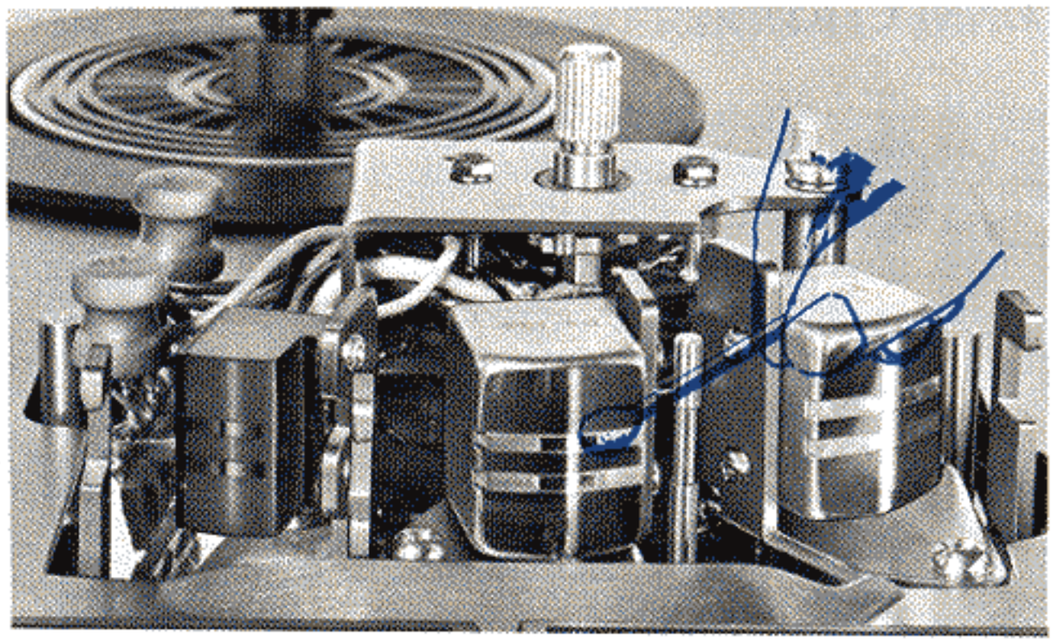
* Dust or magnetic particles adhering to the heads and other parts which the tape contacts. See head cleaning procedure.
* Dirty tape surface or oil adhering to capstan or pinch wheel.
* Bent Take-Up Reel.
* Tape loaded improperly.

If your machine will not record or playback, check to see that connections are correct and controls are properly positioned.

The following notes are provided for your convenience.

* Your machine requires constant voltage for optimum performance.
* If the sound sources are so far away from the microphones that the recording level controls must be turned up to maximum, some hum or noise will inevitably be recorded. A test recording is recommended before attempting 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 exising trouble and contact your nearest authorized Akai Service Station or the Service Department of Akai Company, Tokyo, Japan.



HEAD CLEANING

For quality performance, it is imperative that the heads be kept clean at all times. Accumulation of dust and magnetic particles on the heads results in poor head-to-tape contact and deteriorates sound quality and sensitivity. It is, therefore, recommended that the heads be cleaned every time you use your machine. With a stiff cotton swab dipped in Akai Cleaning fluid (Akai Head Cleaning Kit HC-500), rub the entire head surface (do not scratch) until all tape oxide and dust is removed. The capstan shaft, tape lifter, pinch wheel and other parts which the tape contacts should also be cleaned.

* Alcohol can also be used for head cleaning. do not use chlorothane, etc. as such chemicals will damage the rubber parts.

PINCH WHEEL & CAPSTAN CLEANING

If foreign matter is allowed to accumulate on the pinch wheel and capstan, these particles will come off on the tape, causing deterioration of sound quality. Oil adhering to the capstan also causes irregularity in tape transport. It is, therefore, recommended that these parts be wiped clean periodically.

HEAD DEMAGNETIZING

Normally, the steel pole pieces which form part of the recording and playback heads become slightly magnetized. The effect of magnetization is that it causes considerable drop out or introduces noise into your recordings. It is, therefore, recommended that head demagnetizing be performed periodically. This can be accomplished with a bulk head demagnetizer (Akai Head Demagnetizer AH-8 is highly recommended) by bringing it very close to the heads and making several small circular motions over the head surface areas as well as the parts which the tape contacts.

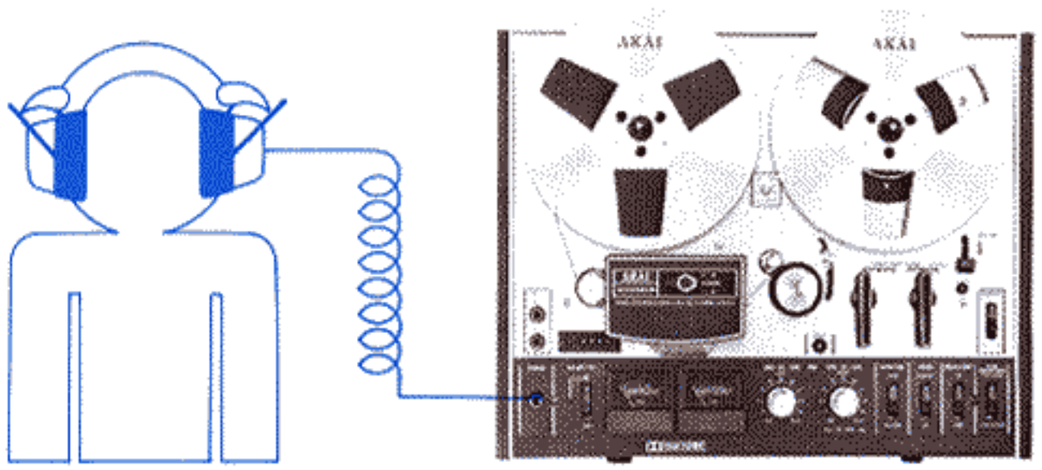
* Be sure to cut off the power of the unit prior to demagnetizing the heads.
* Both prongs of the demagnetizer should be covered with a kind of masking tape to prevent heads from being scratched.
* Do not use magnetized tools in the vicinity of the heads.
* Read the instructions of the demagnetizer carefully before operation.

TAPE ERASING

Any signals previously recorded on the tape will be automatically erased as a new recording is made. For erasing only, set machine to recording mode. No plugs should be connected to the Input Jacks and Volume Controls should be kept at minimum. For quick and complete erasure, the use of a bulk tape eraser is recommended. Akai Tape Eraser ATE-7 is highly recommended.

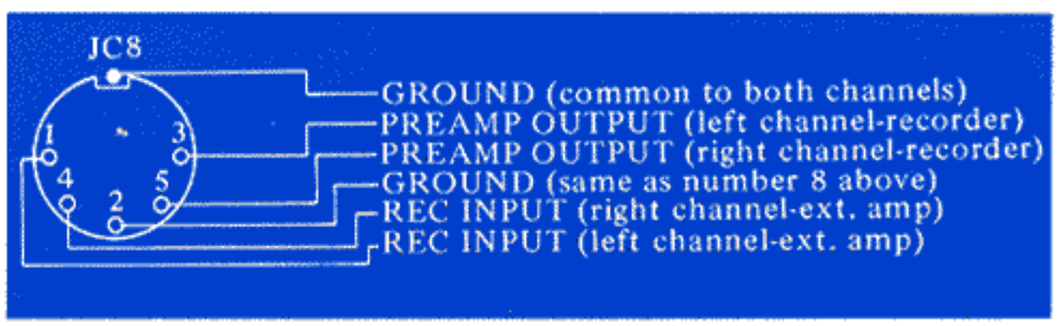
ADJUSTMENT OF RECORDING LEVEL

When the machine is set to recording mode, the recording input levels are registered on the VU Meters, but the recording level can be more precisely set while monitoring through headphones. Adjust so that the VU Meters register normally. For recording with the least possible distortion, keep the recording level as high as possible within the yellow part of the meter scale.



SOUND MONITORING

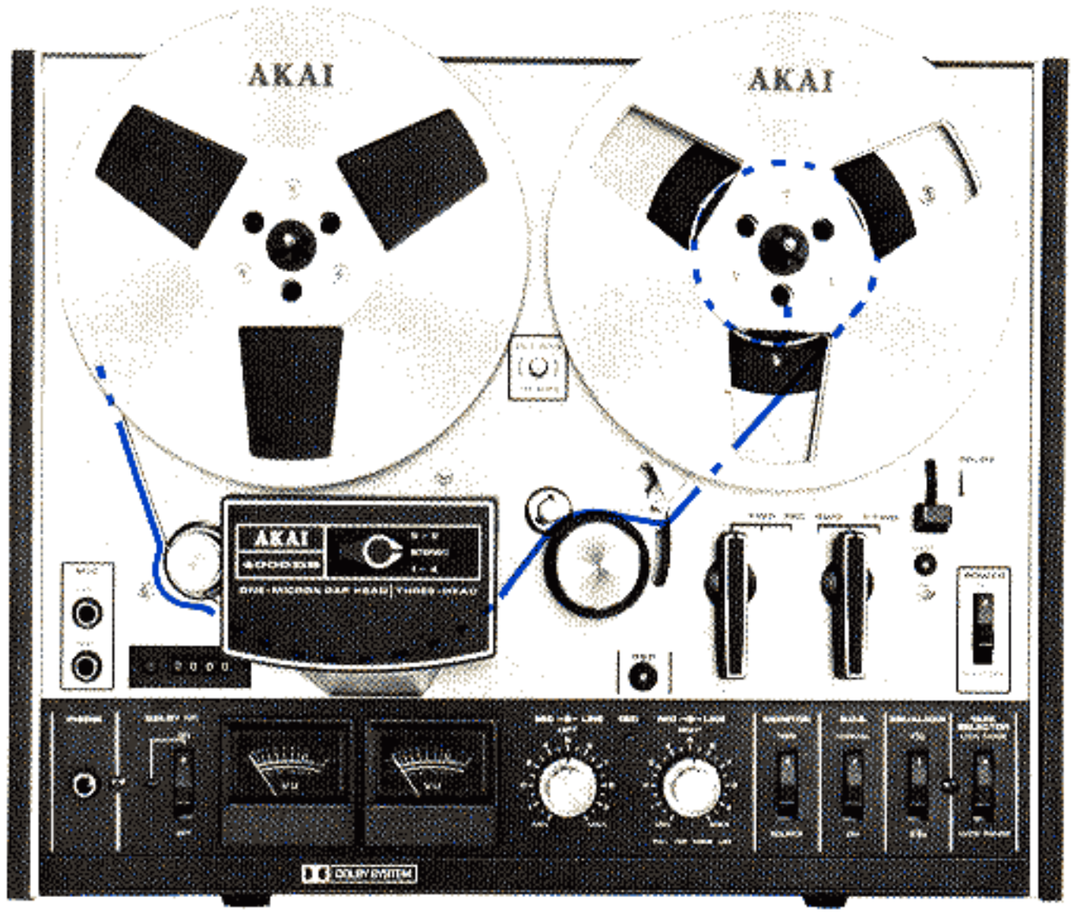
For sound monitoring or private listening, connect stereo headphones of low impedance type (8 Ω) to Headphone Jack. Akai models ASE-22 and ASE-20 are highly recommended. For monitoring source, set Monitor Switch to SOURCE position, and for monitoring signals being recorded or for private headphone listening, set to TAPE position.



HOW TO USE THE DIN JACK

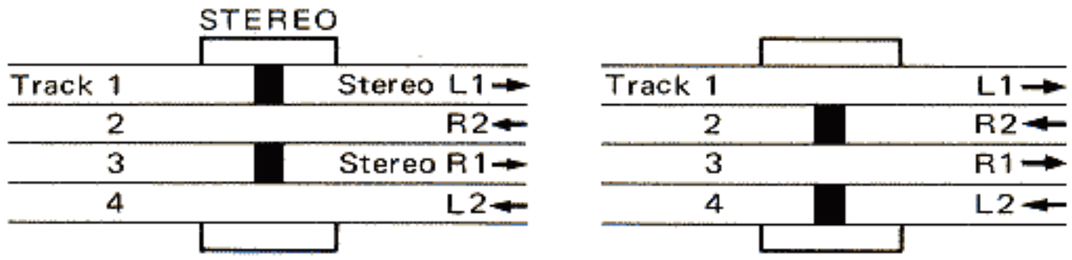
The Din Jack can be used instead of Rec and P.B. Jacks if your amplifier has a corresponding connection. This one cord system eliminates the necessity of four separate connections and disconnections.

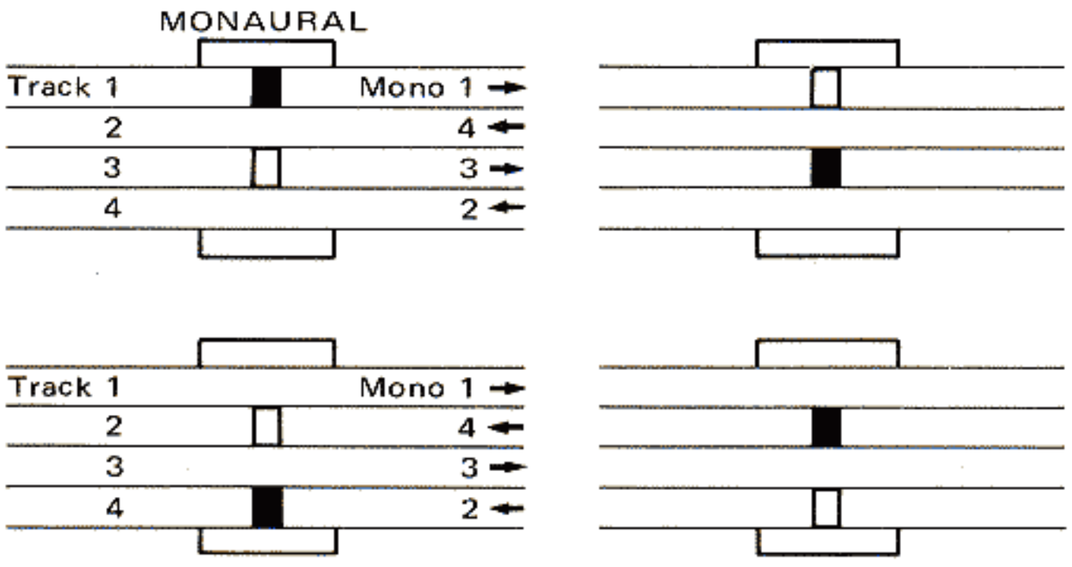
* When using Din Jack, the recording level is adjusted with the Microphone Recording Level Controls.



TAPE LOADING

Place a full reel of tape on the Supply Reel Table and an empty reel on the Take-Up Reel Table, and lock reels into place with built-in reel retainers by pulling retainers outward and turning to left or right. Thread the tape as illustrated by the dotted lines in the figure at left. If automatic shut-off is desired, thread tape through Automatic Shut-Off Lever.





4-TRACK STEREO AND MONAURAL RECORDING/PLAYBACK SYSTEM

Stereo

4-Track stereo recording and playback requires the simultaneous use of two tracks. For stereo operation, set Track Selector to STEREO position. 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.

Monaural

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

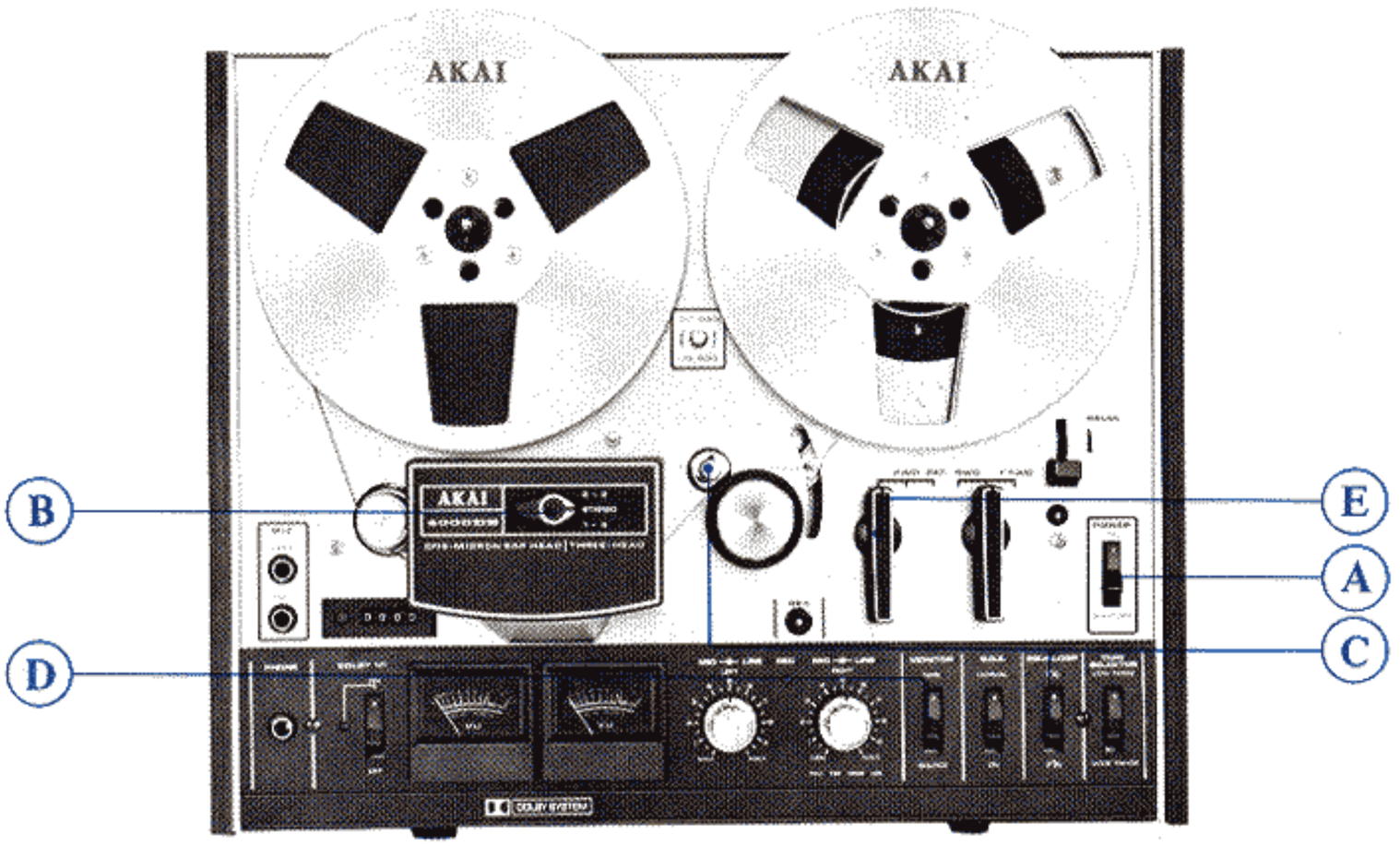
DOLBY NOISE REDUCTION SYSTEM

Setting the Dolby NR Switch to ON position activates the Dolby circuit to expand low level signals before they are recorded and lowers them by precisely that same degree at playback time, thus reducing the extraneous and super-imposed noise by as much as 10dB. This revolutionary process reduces tape hiss to a completely inaudible level.

* When playing back a Dolby recorded tape, the Dolby NR Switch must also be set to ON position.

PLAYBACK OF PRE-RECORDED TAPE

Please read the operating precautions carefully before attempting operation. Connect the Line Outputs of the 4000DB to the tape inputs of the external amplifier and connect two speakers to the amplifier. Connect AC cord and load a pre-recorded tape.



STEREO PLAYBACK

A. Turn on Power Switch.
B. Set Track Selector to STEREO position.
C. Select tape speed and set Equalizer Switch to consistent speed.
D. Set Tape Monitor Switch to TAPE position.
E. Set Record/Playback Lever to FWD position to begin playback.
F. Adjust external amplifier controls.
G. To stop playback, return Record/Playback Lever to vertical position.

MONAURAL PLAYBACK

Only the left channel is used for monaural playback. Substitute the following step for step B of stereo playback procedure and add step H.

Tracks 1-4

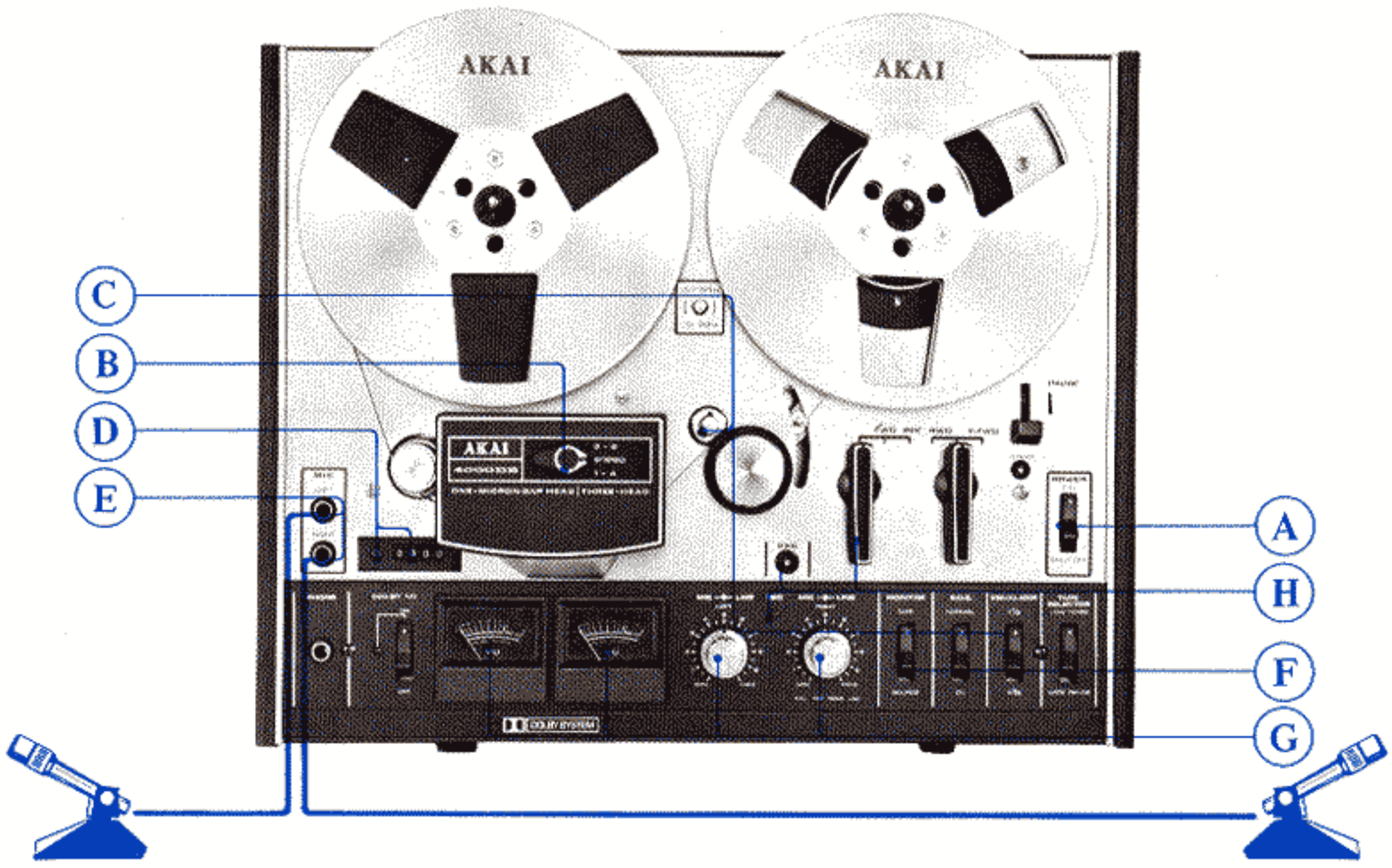
B. Set Track Selector to 1-4 position.
H. Invert reels for playback on track 4.

Tracks 3-2

B. Set Track Selector to 3-2 position.
H. Invert rells for playback on track 2.

* If recordings have been made on both left and right channels of the tape, at playback time both VU Meters will register. However, speaker output depends upon position of Track Selector.
* If recordings have been made on both left and right channels of the tape, monaural headphone listening cannot be accomplished. Output from both channels will be heard through headphones.

RECORDING USING MICROPHONES



Please read the operating precautions carefully before attempting operation. Connect AC cord and load a blank tape.

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.

* Scotch #211 Low Noise Tape is considered standard for this machine. The use of regular tape is not recommended.
* Set to Wide Range position only when using special wide range tape of a grade higher than low noise tape.

STEREO RECORDING

A. Turn on Power Switch.
B. Set Track Selector to STEREO position.
C. Select Tape Speed and set Equalizer switch to consistent speed.
D. With Reset Button, set Index Counter to "0000" position. This Index Counter provides an easy reference for locating positions on the tape.
E. Plug in microphone to Microphone Jacks. Maintain a distance of at least 2 meters (7ft.) between microphones.
F. Set Monitor Switch to SOURCE position.
G. Adjust and balance microphone input level with Microphone Recording Level Controls while observing VU Meters. Normal recording should not exceed "0" VU on either VU Meter.
H. When an optimum recording level has been determined, while holding Record Safety Button at depressed position, set Record/Playback Lever to REC position to begin recording. Note that at this time the Recording Indicator Lamp will light.
I. To stop recording, return Record/Playback Lever to vertical position.

MONAURAL RECORDING

Only the left channel is used for monaural recording. Substitute the following steps for steps B, E and G of stereo recording procedure and add step J.

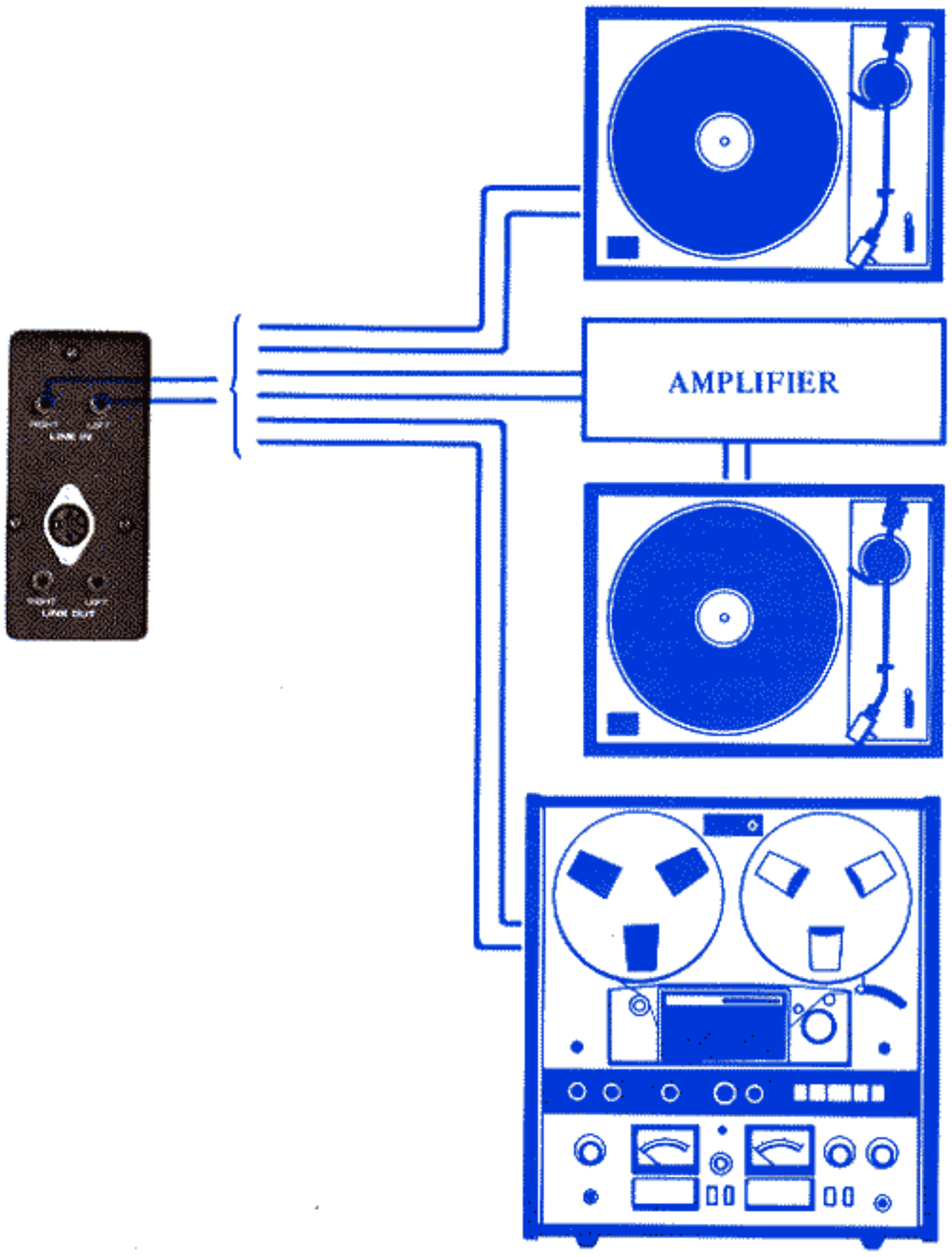
Tracks 1-4

B. Set Track Selector to 1-4 position.
E. Plug in microphone to left Microphone Jack.
G. Adjust and balance microphone input level with left Microphone Recording Level Control while observing left VU Meter.
J. Invert reels to record on track 4.

Tracks 3-2

B. Set Track Selector to 3-2 position.
E. Plug in microphone to left Microphone Jack.
G. Adjust and balance microphone input level with left Microphone Recording Level Control while observing left VU Meter.
J. Invert reels to record on track 2.

* Disregard right VU Meter indication when making a monaural recording.
* If recordings have been made on both left and right channels, monaural monitoring through headphones cannot be accomplished. Output from both channels will be heard through headphones.



RECORDING FROM AN EXTERNAL AMPLIFIER

If an external amplifier or tuner amplifier is used, connect the tape outputs of the external amplifier to the Line Inputs of the 4000DB in step E of stereo recording procedure. VU level is controlled with the Line Recording Level Controls.

* If the Din Jack is used for this connection, VU level is controlled with the Microphone Recording Level Controls.

RECORDING FROM A TURNTABLE

To record from a stereo or monaural disc, a crystal or ceramic pick-up can be connected directly to the Line Inputs instead of step E of recording procedure. However, if magnetic or similar cartridges are used, connect to the Line Inputs of the 4000DB through an external amplifier.

TAPE DUBBING

When tape duplication is desired, connect the Line Outputs of your 4000DB to the line inputs of the recording machine instead of step E of recording procedure.

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.

First Recording

A. Turn on Power Switch.
B. Confirm that there are no connections to the Line Input Jacks.
C. Set Index Counter to "0000" position.
D. Set Track Selector Switch to 1-4 position.
E. Plug in microphone to left Microphone Jack.
F. Set Monitor Selector Switch to SOURCE position.
G. Adjust left Microphone Recording Level Control while observing left VU Meter.
H. While holding Recording Safety Button at depressed position, set Record/Playback Lever to REC position to begin first recording.
I. When the first recording is complete, rewind tape to starting point.

Second Recording

J. Set S.O.S. Switch to ON position.
K. Set Track Selector Switch to 3-2 position.
L. Increase left Line Recording Level Control to maximum.
M. Connect stereo headphones to monitor first recording on track 2.
N. While holding Recording Safety Button at depressed position, set Record/Playback Lever to REC position to begin second recording. The first recording is heard through headphones.
O. Reset left Line Recording Level Control until proper level is obtained while observing VU Meter.

* The second recording is made on track 3 as the first recording is monitored through headphones. The two recordings will be completely merged on track 3.

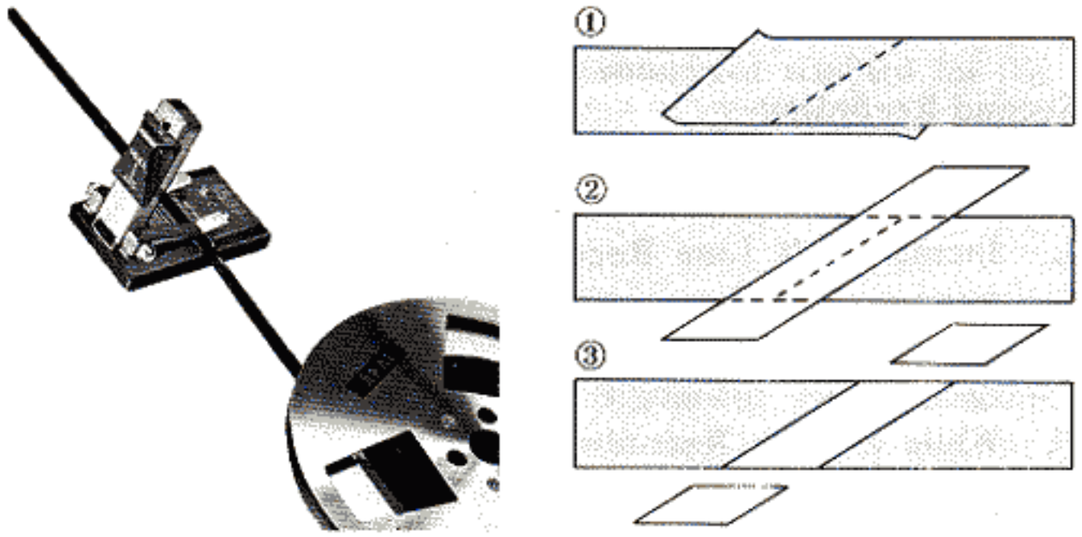
* The third and subsequent recordings are made in the same manner as the second by switching Track Selector Switch to and from 1-4, 3-2. For playback, set Track Selector Switch to track on which the last recording was made and set Monitor Selector Switch to TAPE position.

SOUND MIXING

For mixing microphone and line input signals, proceed as follows :

A. Plug in microphone to Microphone Jacks and connect line outputs of external source to the Line Input Jacks of the 4000DB.
B. Adjust microphone volume level with Microphone Recording Level Controls and line input level with Line Recording Level Controls.
C. For playback, operate Track Selector Switch according to tracks used in making recording.

* Mixing can also be accomplished by using the Din Jack and Line Input Jacks simultaneously. In this case, the Din Jack input is controlled with Microphone Recording Level Controls.



SOUND-WITH-SOUND RECORDING

This feature is especially convenient for teacher/student repetition and comparison (teacher's voice on track 1, student's voice on track 3).

A. Turn on Power Switch.
B. Confirm that there are no connections to the Line Input Jacks.
C. Set Index Counter to "0000"position.
D. Set Track Selector Switch to 1-4 position.
E. Plug in microphone to left Microphone Jack.
F. Set Monitor Selector Switch to SOURCE position.
G. Adjust left Microphone Recording Level Control while observing left VU Meter.
H. While holding Recording Safety Button at depressed position, set Record/Playback Lever to REC position to begin first recording.
I. When the first recording is complete, rewind tape to starting point.
J. Set Track Selector Switch to 3-2 position.
K. Set Monitor Selector Switch to TAPE position.
L. Connect stereo headphones to monitor the first recording.
M. While holding the Recording Safety Button at depressed position, set Record/Playback Lever to REC position to begin second recording. (Monitor first recording through headphones).
N. After completing recording, rewind tape to starting point.
O. Set Track Selector Switch to STEREO position.
P. Set Record/Playback Lever to FWD position for playback.

TAPE SPLICING & 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. Press firmly exerting pressure to secure ends evenly. Trim off excess splicing tape cutting into magnetic tape very slightly. This eliminates the possibility of a sticky splice. Splicing tape using scissors requires skillful work. With Akai's specially designed portable Tape Splicer Model AS-3, splicing can be done very smoothly.

TECHNICAL DATA

Track System	4 track 2-channel Stereo/ Monaural system
Reel Capacity	Up to 7" reel
Tape Speed	7-1/2 and 3-3/4 ips (±2%)
Wow & Flutter	Less than 0.15% at 7-1/2 ips Less than 0.2% at 3-3/4 ips
Frequency Reponse	30 Hz to 23,000 Hz (±3 dB) 30 Hz to 16,000 Hz (±3 dB)
Distortion	Less than 1.0% (1,000 Hz "0" VU)
Signal to Noise Ratio	Better than 55 dB (with Dolby Process: 60 dB at 5 kHz)
Erase Ratio	Better 70 dB
Cross-Talk	Better than 65 dB (monaural) Better than 40 dB (stereo)
Bias Frequency	105 kHz
Heads	(3) One-micron gap Recording Head, One-micron gap Playback Head, Erase Head,
Motors	(1) 4-pole induction motor
Fast Forward & Rewind Time	120/150 sec. using a 1,200 ft. Tape at 60/50 Hz
Output Jacks	Line (2): 0.775 V ("0" VU) (Required load impedance: more than 20 kΩ) Phone (1): 30 mV/8 Ω
Input Jack	Microphone (2): 0.4 mV/4.7 kΩ Line (2): 70 mV
Din Jack	7 mV
Semi-Conductors	Transistors: 27, FET: 2, IC: 4 Diodes: 17
Power Requirements	100 V to 240 V A.C., 50/60 Hz
Power Consumption	35 W
Dimensions	406(W) x 325(H) x 196(D) mm (16.0 x 12.8 x 7.7 ")
Weight	12.0 kg (26.4 lbs)

* Specifications were determined with Scotch #211 (low noise) tape.
* For improvement purposes, specifications and design are subject to change without notice.
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STANDARD ACCESSORIES

Pin Plug Cord	1
Spare Fuse	1 set
Operator's Manual	1

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13
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