

AM/FM
STEREO RECEIVER

KR-6400

INSTRUCTION MANUAL



INTRODUCTION

Because Kenwood Electronics, Inc., takes great pride in the long tradition of quality components the name Kenwood represents, your purchase of a Kenwood receiver places you in a distinguished family of connoisseurs of superb high-fidelity sound reproduction.

The purpose of this manual is to acquaint you with the operating features of your new receiver. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read this manual carefully. Knowing how to set up your receiver, to the best advantage, will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your receiver to meet your special requirements.

Turn the pages and become acquainted with the exciting features of your new receiver features that will remain new for endless hours of listening pleasure.

CONTENTS

KR-6400 FEATURES	3	OPERATING INSTRUCTIONS	10
INTERCONNECTING DIAGRAM	4	MAINTENANCE	12
CONNECTING YOUR KR-6400	5	KR-6400 SPECIFICATIONS	13
CONTROLS AND THEIR FUNCTIONS	8	TROUBLE SHOOTING	14

NOTES

* Units shipped to the U.S.A. and CANADA are designed to be operated with 120 volts AC only. Units shipped to the Scandinavian countries are designed to be operated with 220 volts AC only. Therefore the above units are not equipped with an AC Voltage Selector Switch so all reference to such a switch throughout this manual should be disregarded.

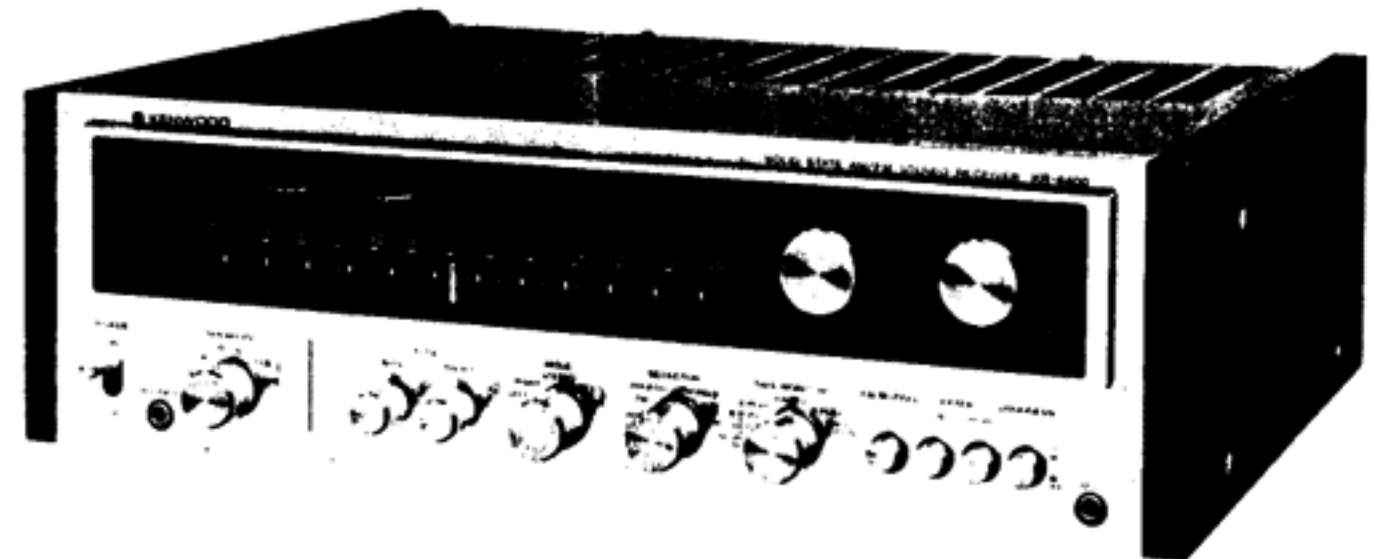
* Units shipped to all other countries are equipped with an AC Voltage Selector Switch on the rear panel that is preset at

the factory to the voltage generally available in the destination area.

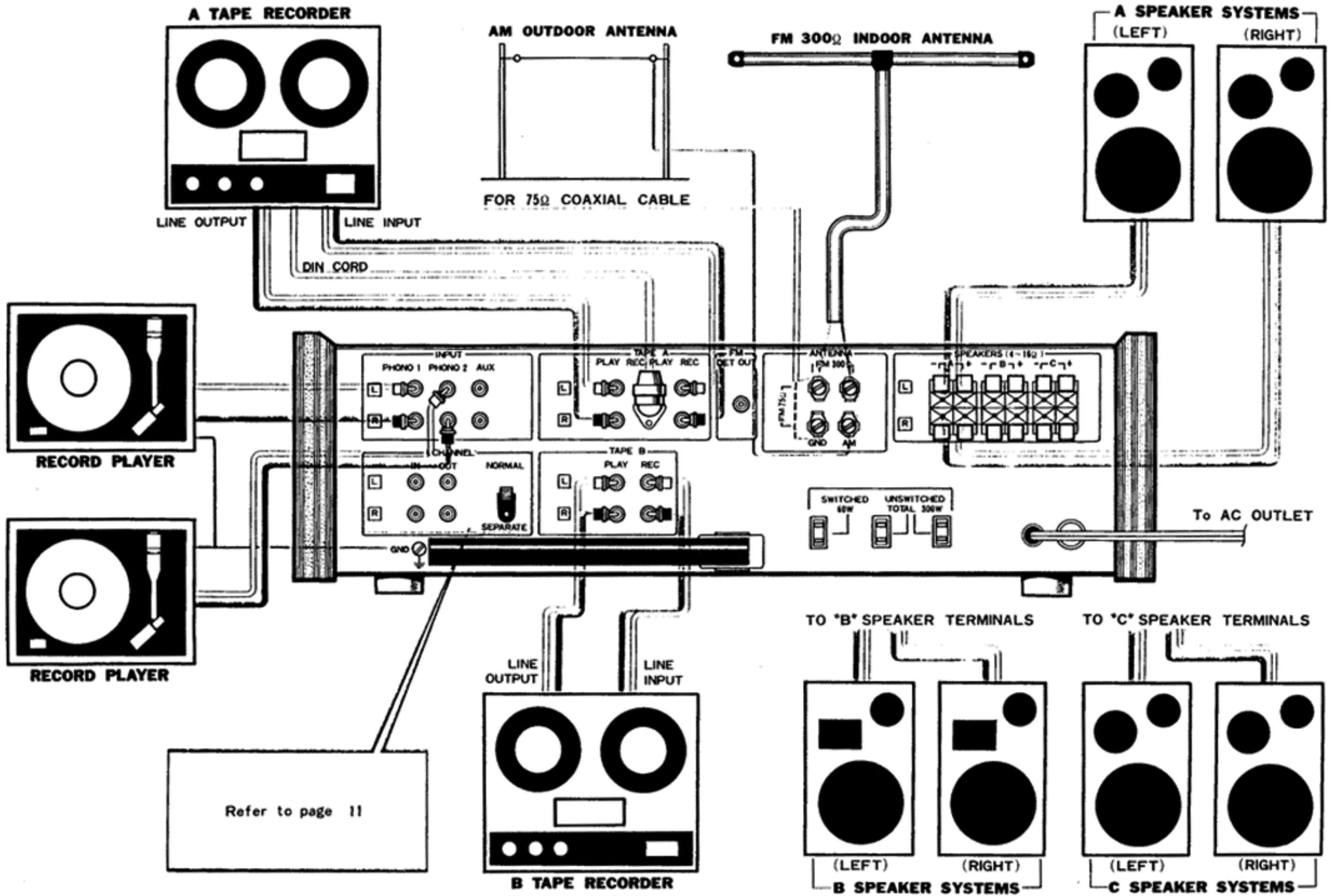
CAUTION: It is very important however, to check the Voltage Selector Switch setting and make sure that it corresponds to your line voltage before connection the power cord into an AC outlet. If the Voltage Selector requires re-setting, follow the directions outlined on page 12.

KR-6400 FEATURES

1. **MAIN AMP** - The OCL type main amplifier consists of a differential amplifier in the first stage and direct-coupled, complementary symmetry amplifier circuits in every following stage. It is designed for heavy duty use and features an oversize heat sink and rugged power transistors. It is also equipped with a "sure-action" protection circuit which includes a sensitive DC current detector that protects speakers, and an ASO limiter type detector that protects power transistors by circuit breaking relay action.
2. **PREAMP SECTION** - The equalizer amplifier is a dual cantype, low noise operational IC amplifier which has very high stability and low distortion ratio. Every audio stage from input to output is supplied by a positive, negative dual power supply. The speakers can easily be phase shifted to correspond with AUX, TAPE PLAY and 4CH inputs, making this receiver easily adaptable for 4-channel reproduction.
3. **TUNER SECTION** - The FM front end consists of one FET and two other transistors used in one RF stages. It also includes a frequency linear 4-gang tuning condenser.
 - * PLL is employed in the MPX section and assures excellent channel separation and improved stability.
 - * FM DET OUT connectors are available, permitting this receiver to be ready for FM 4-channel broadcasts whenever they become available.
 - * Linear scaled front dial assures fast, accurate tuning.
4. **EASY TO USE** - All controls are very rationally designed and laid out for easy operation.
5. **UNIT CONSTRUCTION** - The main and complex parts of the receiver have been divided into sectional units to minimize wiring and improve serviceability. This assures uniform, long life performance.
6. **TAPE DUBBING VERSATILITY** - One of the special features of the KR-6400 is the availability of two independent tape monitor circuits which permit tape dubbing from one tape recorder to another while listening to a completely different source such as a FM broadcast.
7. **4CH IN-OUT** - Those who wish to enjoy 4-channel reproduction can do so through this receiver by connecting a SQ, RM or CD-4 type adaptor to these jacks. For further details follow the instructions that come with the adaptor.
8. **Three pairs of stereo speaker systems** can be connected to this receiver.



INTERCONNECTING DIAGRAM

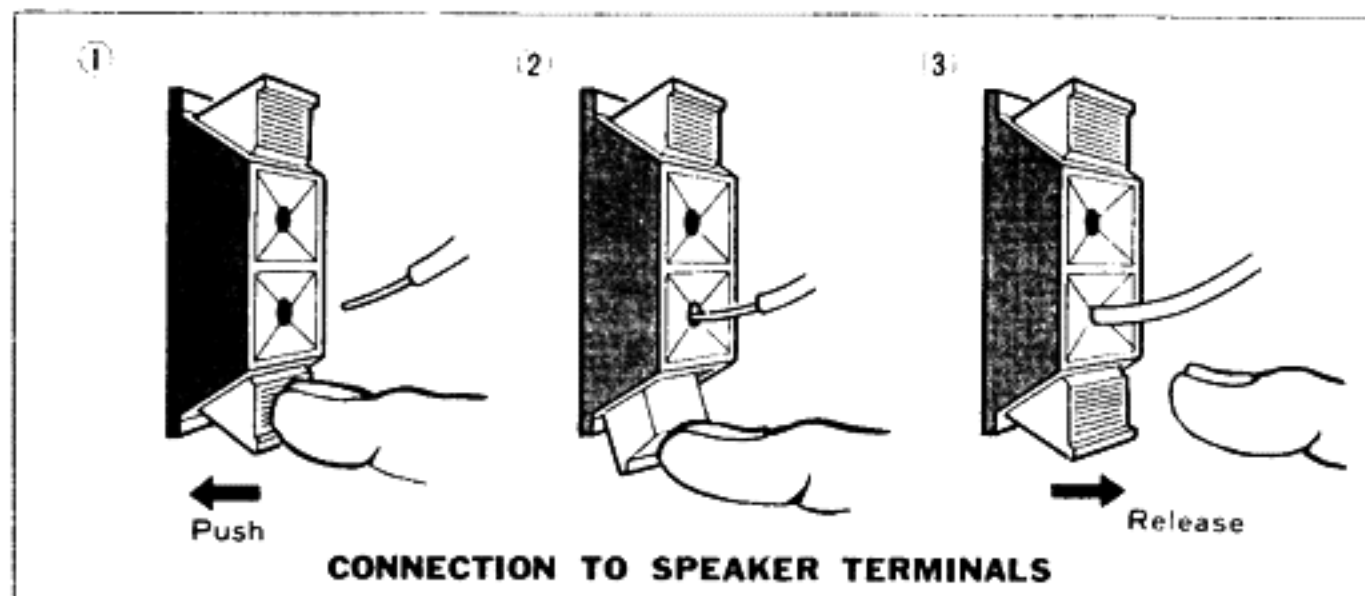


CONNECTING YOUR KR-6400

SPEAKER CONNECTING AND SPEAKER SWITCH

In connecting only one set of speakers, connect the right speaker to right terminals and left speaker to left speaker terminals of "A" terminals. Should plus or minus of either right or left channel be reversely connected, sounds at the center section will be adversely affected by lack of separation. To connect a second set of speakers, connect right speaker to right speaker terminals and left speaker to left speaker terminals of "B" terminals. In the same manner, a third set of speakers can be connected to "C" terminals.

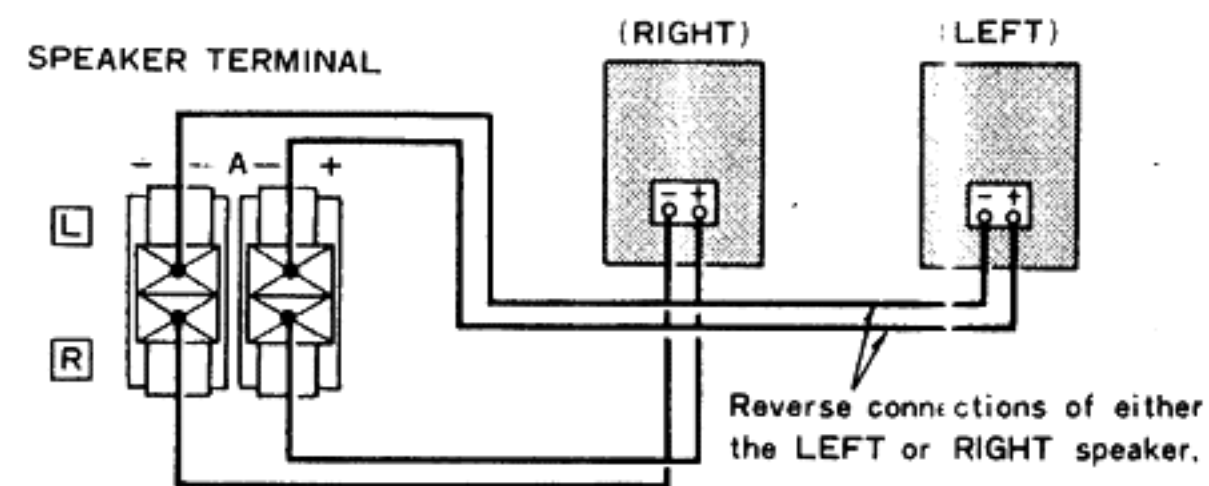
Sound cannot be heard when the SPEAKERS switch on the front panel is set to the A + B or A + C position, when only one pair of speaker system is used with connections made either to "A" SPEAKERS terminals or "B", "C" terminals. When connecting the speaker leads to the SPEAKERS terminals, make sure that the bare wire strands at the ends of the speaker leads don't touch each other or adjacent terminal.



PHASING of THE SPEAKERS

Speaker phasing can be determined in the following manner:

1. Set the SELECTOR switch to FM.
2. Set the MODE switch to MIX.
3. Tune in the desired station with the TUNING knob.
4. If the sound is coming directly from the front, the speakers are in phase. If the sound comes from both sides and there is a noticeable loss in low frequencies, the speakers are out of phase. In this case reverse the leads on one speaker.



CONNECTING YOUR KR-6400

ANTENNA CONNECTIONS

FM ANTENNA

Since FM broadcast signals travel along a straight, direct-line path, they become rather weak behind hills and buildings even in the vicinity of a broadcasting station. FM signals also become weak in areas distant from a station even through there may not be any obstruction to the direct line path of the signal. Therefore, a good FM antenna should be installed in the most effective manner for best possible FM reception.

In areas near the FM station where signals are strong, stretch the T-type indoor antenna that is supplied to its maximum, and connect it to the FM 300 Ω terminals on the rear panel. This antenna should be carefully hung in the direction that provides best reception with minimal undesirable reflection.

An outdoor FM antenna will become necessary if interference is encountered as a result of weak FM signals with an indoor antenna. If a 300 Ω feeder line is employed, it should be connected to the FM 300 Ω terminals.

For a 75 ohm coaxial cable, connection should be made to the FM 75 Ω terminals.

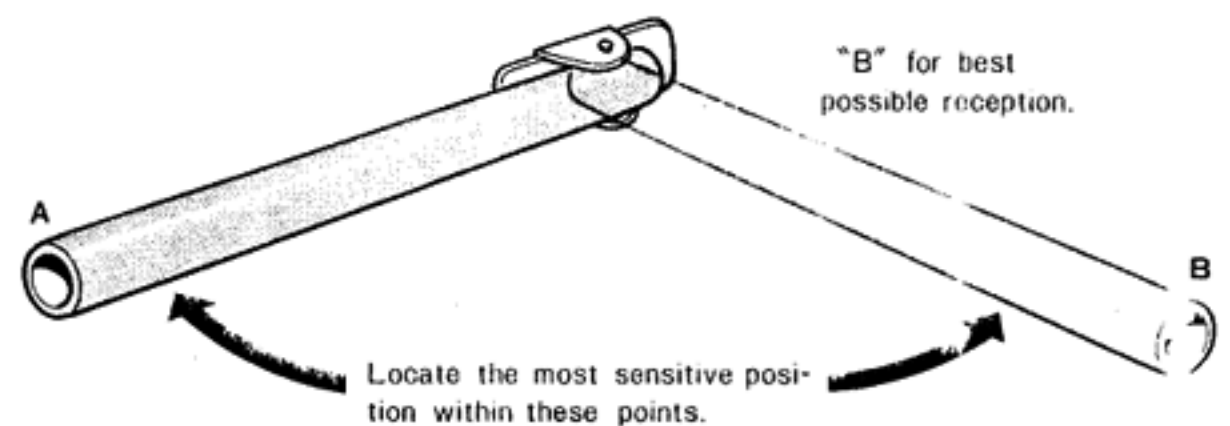
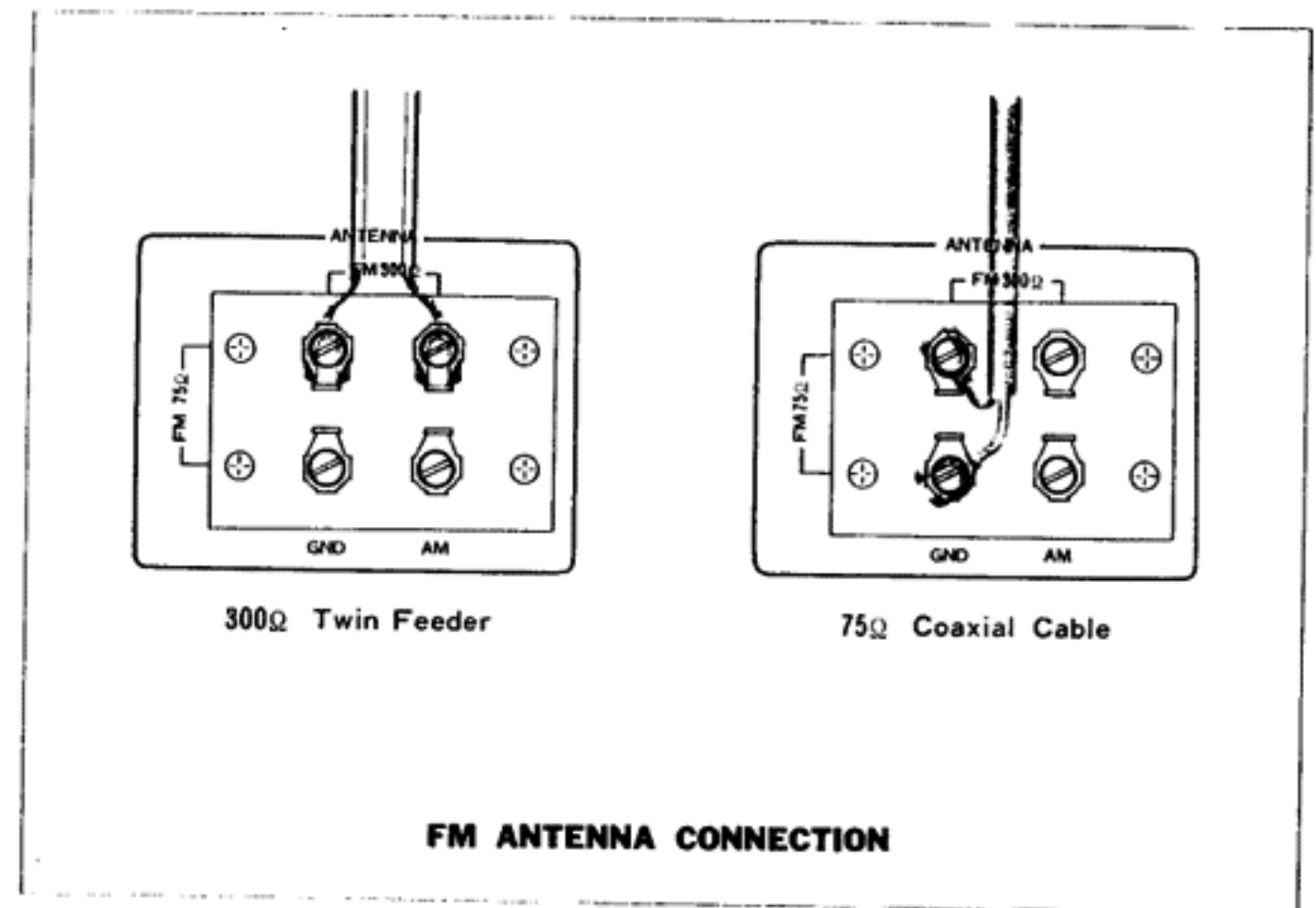
AM ANTENNA

The ferrite stick antenna incorporated in your KR-6400 assures satisfactory reception from all local AM stations. Since the ferrite stick antenna has directional properties, you should adjust the antenna to the position at which the strongest signal is received.

In fringe areas or in locations surrounded by steel frame buildings where satisfactory reception cannot be obtained with the ferrite loopstick antenna, an AM outdoor antenna should be connected to the AM terminal.

NOTE

AC cords, speaker leads, etc. adjacent to antenna leads may interfere with reception. Keep them away as far as possible from the ferrite stick antenna.



CONNECTING YOUR KR-6400

RECORD PLAYER CONNECTIONS

Connect the left channel of the record player to the "L" PHONO input jack, and the right channel to the "R" PHONO input jack.

If the record player has a grounding terminal, connect it to this receiver's GND terminal to avoid hum.

CONNECTIONS FOR TAPE RECORDER

RECORDING

A tape recorder can be connected as follows for recording. Left channel input of the tape recorder to TAPE A "L" REC jack. Right channel input of the tape recorder to TAPE A "R" REC jack.

PLAYBACK

A tape recorder can be connected as follows for playback. Left channel output of the tape recorder to TAPE A "L" PLAY jack. Right channel output of the tape recorder to TAPE A "R" PLAY jack.

DIN CONNECTOR (REC/PLAY CONNECTOR)

If your tape recorder is equipped with a DIN connector, connect it to the REC/PLAY connector with a DIN connecting cord. A DIN connector enables recording and playback with this single cord.

NOTE:

When a DIN cord is used for connecting to the tape recorder, the PLAY and REC jacks should not be used.

For highest fidelity recording and playback sound, however, it is recommended that the tape recorder be connected to the PLAY and REC jacks instead of the DIN connector.

AUX (AUXILIARY INPUTS)

When a tuner, tape recorder or other unit is connected here, it must have an output of at least 150 mV.

FM DET OUT JACK

The FM detector circuit output is made available here so that this receiver will be ready for 4-channel broadcasting developments in the future. When FM discrete 4-channel broadcasting becomes a reality, a simple demodulator connected here will enable you to fully enjoy this coming development.

AC OUTLETS

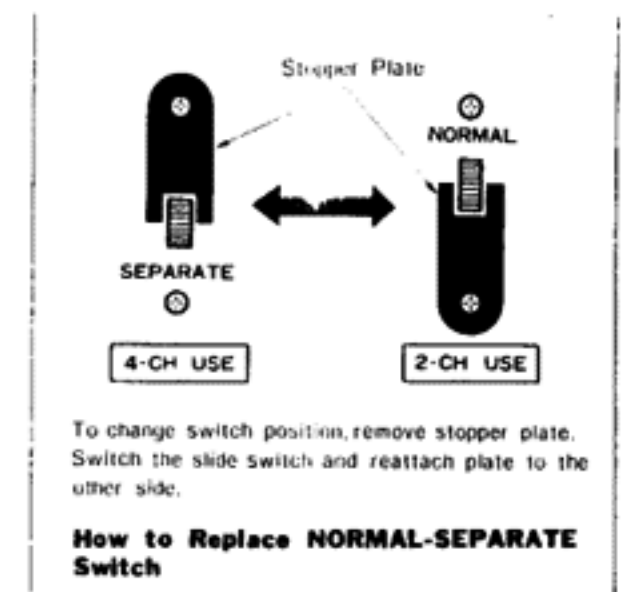
The AC outlets on the rear panel of the receiver may be used to supply power to other components such as a record player, tape recorder, etc.

1. SWITCHED outlet
This outlet is controlled by the POWER switch on the front panel. (The capacity is 60 watts maximum.)
2. UNSWITCHED outlets
These outlets are available at all times. (The total capacity is 300 watts maximum.)

NORMAL-SEPARATE SWITCH

This switch has been preset for normal and its position should not be changed.

If the receiver is to be used as 4-channel system, the switch should be reset as figure shows.



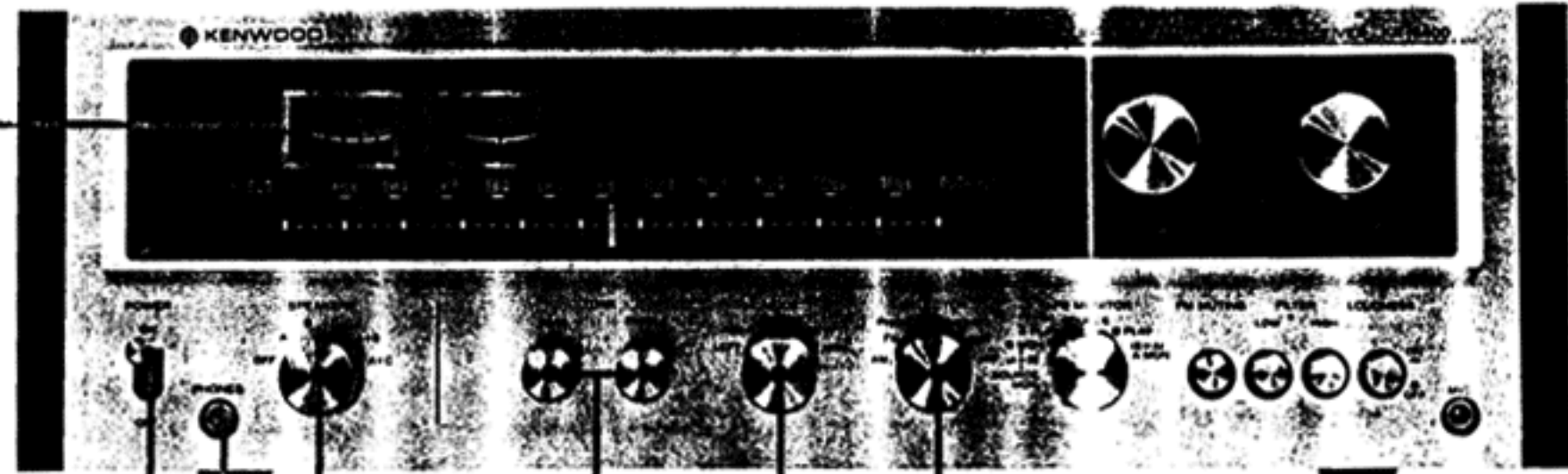
CONTROLS AND THEIR FUNCTIONS

SIGNAL meter

This meter indicates the intensity of the incoming FM or AM signal. Pinpoint tuning for any broadcast is indicated by a maximum deflection of this signal meter. Simply tune to the highest meter reading with TUNING knob.

TUNING meter

This meter is used for precise tuning to the center of an FM channel. Turn the tuning knob until the meter pointer is in the center area on the meter scale. This provides maximum separation and minimal distortion.



POWER switch

ON — This position the receiver turns on.
OFF — This position the receiver turns off.

PHONES jack

Plug a stereo headphone into this jack for private listening. The speakers are silenced when the SPEAKERS switch is set to OFF position.

SPEAKERS switch

OFF — This position silences all speakers for private headphone listening.
A — Activates speakers connected to the A SPEAKERS terminals on the rear panel.
B — Activates speakers connected to the B SPEAKERS terminals on the rear panel.
C — Activates speakers connected to the C SPEAKERS terminals on the rear panel.
A+B — Activates simultaneously two sets of speaker systems connected to the A and B SPEAKERS terminals.
A+C — Activates simultaneously two sets of speaker systems connected to the A and C SPEAKERS terminals.

BASS control

Turning it clockwise increases bass tone and counterclockwise decreases it. Tone is flat at center position.

TREBLE control

Turning it clockwise increases treble tone and counterclockwise decreases it. Tone is flat at center position.

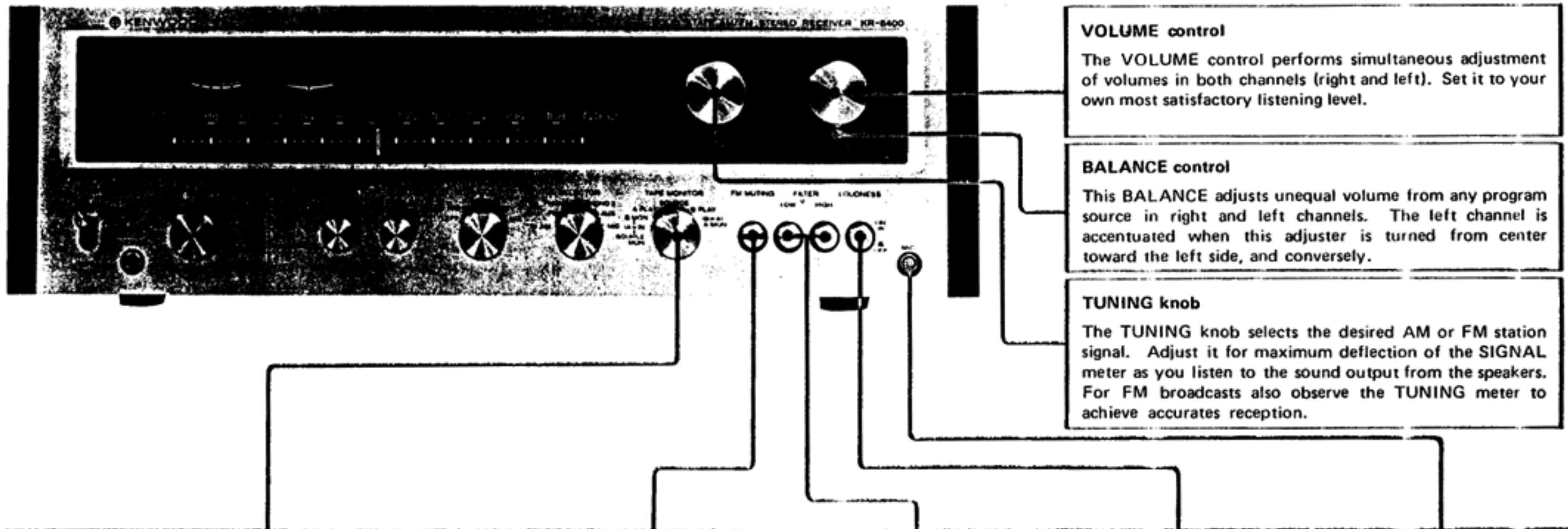
MODE switch

Switch positions and functions are as follows:
LEFT — The left channel is heard from both speakers.
RIGHT — The right channel is heard from both speakers.
STEREO — This provides stereophonic reproduction of any stereo program source. The left channel is heard from the left speaker, and the right channel is heard from the right speaker.
REV — This reverses positions of two speakers. The left channel is now heard from the right speaker, and the right channel from the left speaker.
MIX — The left and right channels are mixed together and are heard from both speakers.

SELECTOR switch

Switch positions and functions are as follows:
AM — For AM reception.
FM — For the reception of both FM monaural and stereo signals. Automatic switching operates between FM monaural and stereo sources. When an FM stereo broadcast is tuned in, the STEREO indicator lights up.
PHONO 1 — In this position the record player is available if connected to the PHONO 1 input jacks on the rear panel.
PHONO 2 — In this position the record player is available if connected to the PHONO 2 input jacks on the rear panel.
AUX — Selects source connected to the AUX jacks.
MIC — In this position the microphone is available.

CONTROLS AND THEIR FUNCTIONS



VOLUME control

The VOLUME control performs simultaneous adjustment of volumes in both channels (right and left). Set it to your own most satisfactory listening level.

BALANCE control

This BALANCE adjusts unequal volume from any program source in right and left channels. The left channel is accentuated when this adjuster is turned from center toward the left side, and conversely.

TUNING knob

The TUNING knob selects the desired AM or FM station signal. Adjust it for maximum deflection of the SIGNAL meter as you listen to the sound output from the speakers. For FM broadcasts also observe the TUNING meter to achieve accurate reception.

TAPE MONITOR switch

Switch positions and functions are as follows:

SOURCE — The source signal is heard.

A PLAY — For monitoring a recording or for playback on a tape recorder connected to the A TAPE jacks. Sound recorded on the tape is heard.

B PLAY — For monitoring a recording or for playback on a tape recorder connected to the B TAPE jacks. Sound recorded on the tape is heard.

B MON (A ► B) — For dubbing from a tape recorder connected to the A TAPE jacks into a tape recorder connected to the B TAPE jacks. The recording condition of the B tape recorder can be monitored.

SOURCE MON — Parallel with the tape dubbing operation (A ► B), this position makes it possible to reproduce simultaneously from the loudspeakers other program sources selected by the SELECTOR switch such as an FM broadcast or phono disc reproduction.

A MON (B ► A) — For dubbing from a B tape recorder to A. The recording condition of the A tape recorder can be monitored. The TAPE switch should be kept switched to SOURCE unless monitoring or tape reproduction is performed.

FM MUTING switch

This switch silences interstation noise on the FM band, but it may also eliminate the signal of a weak and distant station along with the interstation noise. Therefore, set this switch to OFF (by pressing button release) in the reception of a weak and distant station.

LOW and HIGH FILTER switches

LOW FILTER — Pressing this button switch reduces low frequency noise such as turntable rumble, hum, etc., on program materials. Generally, this filter should be used only when necessary.

HIGH FILTER — Pressing this button switch reduces high frequency noise such as tape hiss, record scratch, etc. Generally, this switch should be used only when necessary.

LOUDNESS control

The LOUDNESS control boosts bass and treble tones at low listening levels. Our ears have less sensitivity to low and high frequencies at low listening levels and the LOUDNESS control compensates for this deficiency. This control should be switched off when listening at normal and high levels.

MIC jack

This is a microphone jack for monophonic sound only.

OPERATING INSTRUCTIONS

AM-FM RECEPTION

1. Set the SELECTOR switch to AM or FM.
2. Set the SPEAKERS switch in accordance with your system arrangement.
3. Set the MODE switch to STEREO and the TAPE MONITOR switch to SOURCE.
4. Adjust the VOLUME control to the desired listening level.
5. Use the BASS, TREBLE and BALANCE controls to adjust the sound as desired and to match the acoustic conditions of your room.

PHONO OPERATION

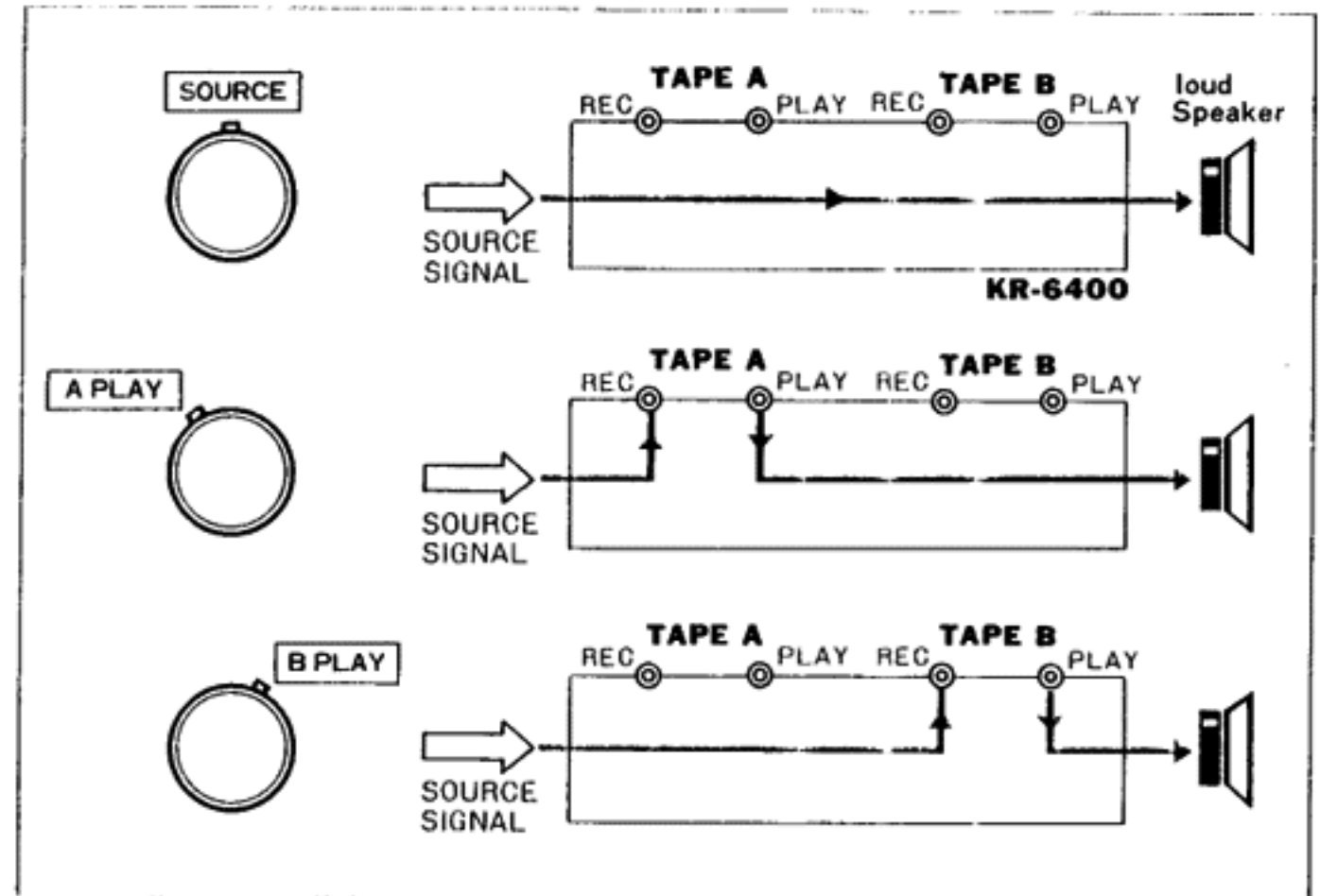
1. Two pairs of phono input jacks, PHONO 1 and PHONO 2, are provided to enable connections to two record players. To reproduce the output of the record player that is connected to PHONO 1 jacks, set the SELECTOR switch to PHONO 1. To reproduce the output of the record player that is connected to PHONO 2 jacks, set the SELECTOR switch to PHONO 2.
2. Set the MODE switch to STEREO and the TAPE MONITOR switch to SOURCE.
3. Adjust the VOLUME to the desired listening level.
4. Use the BASS, TREBLE, FILTER and LOUDNESS controls to adjust the sound to your preference and to the acoustic conditions of your room.

TAPE RECORDER OPERATION

Tape Monitoring

If you use the KR-6400 with 3-head type tape recorders, you can check the sound quality of the recording that is being made by momentarily comparing source with recorded signals as follows. Set the TAPE switch to A PLAY (or B PLAY) to monitor the recorded signal. Set the TAPE switch to SOURCE to reproduce the source signal before

it is recorded.



The Diagram of the TAPE MON Switch and the SIGNAL

When Recording With One Tape Recorder

Connect the tape recorder to either the TAPE A jacks or TAPE B jacks on the rear panel.

1. Set the SELECTOR switch to the desired program source. To monitor the recording, set the TAPE MONITOR switch to A PLAY or B PLAY, whichever side the tape recorder is connected.
2. Recording level should be adjusted with the volume control of your tape recorder.
3. Recording is not affected by the VOLUME, BASS, TREBLE, FILTERS, LOUDNESS, etc., controls of the receiver.

OPERATING INSTRUCTIONS

- Operate both tape recorders simultaneously.

Simultaneous Recording With Two Recorders

Connect one tape recorder to TAPE A jacks and the other to TAPE B jacks on the rear panel.

- Set the SELECTOR switch to the desired program source.
- Recordings can now be made into both tape recorders simultaneously. To monitor these recordings, use the TAPE MONITOR switch as follows. Set it to A PLAY to monitor the recording being made with the tape recorder connected to TAPE A jacks. Set it to B PLAY to monitor the recording being made in the tape recorder connected to B TAPE jacks.
- Recording levels should be adjusted exactly as described previously for single tape recorder operation.

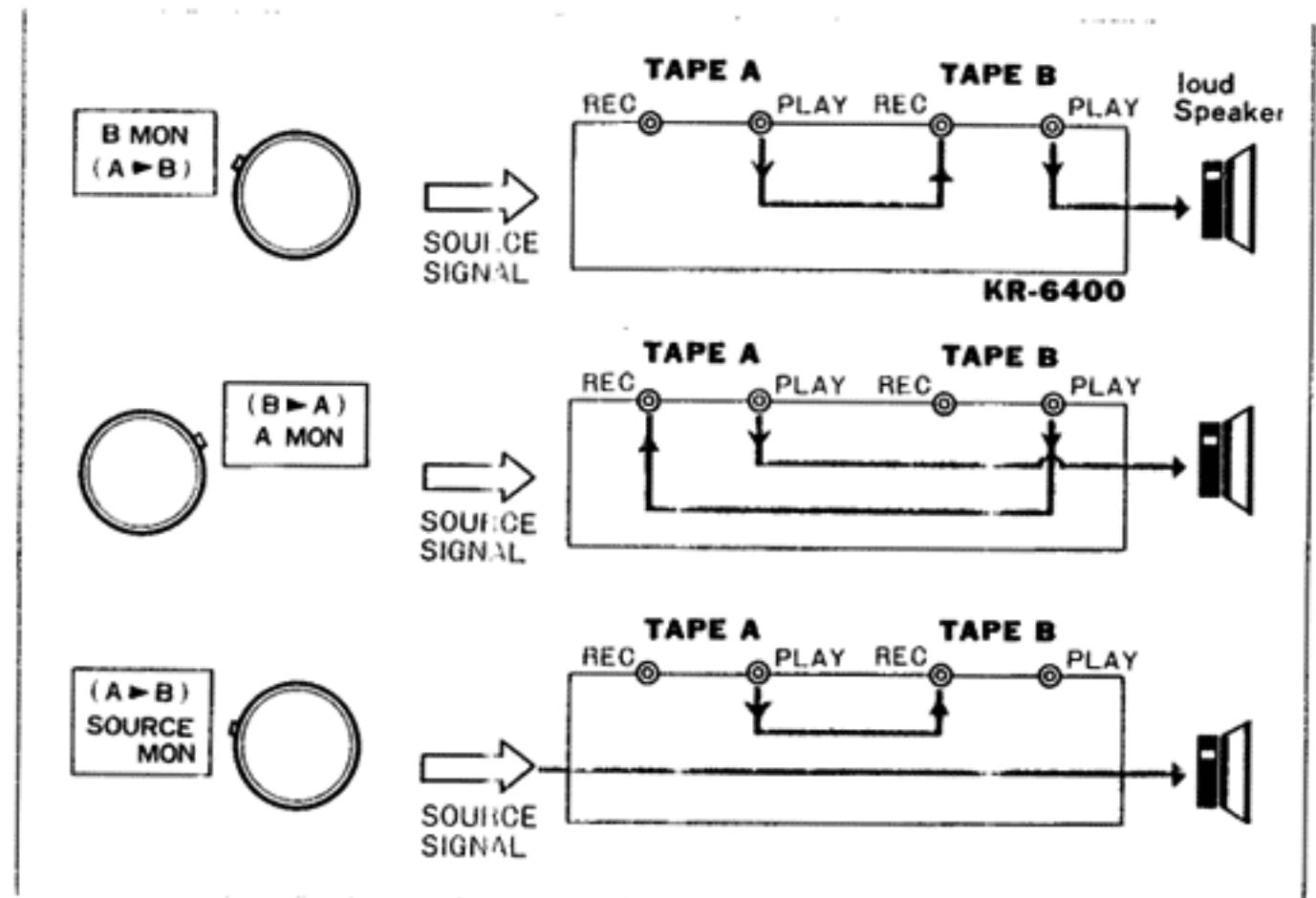
Playback

- The SELECTOR switch can be at any position.
- Set the TAPE MONITOR switch to the corresponding position (A PLAY or B PLAY) and the MODE switch to STEREO.
- Adjust volume and tone quality.

Dubbing

Tape recordings may be easily duplicated from one tape recorder to another with minimal loss of quality by setting the TAPE MONITOR switch to B MON (A ► B) or A MON (B ► A) as follows.

- The SELECTOR switch can be at any position.
- Set the TAPE MONITOR switch to B MON (A ► B) when it is desired to copy recorded material on the tape recorder A for re-recording on the tape recorder B. The recording can be monitored. Set the TAPE switch to A MON (B ► A) when it is desired to copy a recording on the tape recorder B for re-recording on the tape recorder A. The recording can be monitored. In addition, SOURCE MON position can be done at the same time that a different source signal such as an FM broadcast or phono disc is being reproduced through the loudspeakers.



The Diagram of the TAPE MON Switch and the SIGNAL

MIC

- Plug a microphone into the MIC jack on the front panel.
- Set the SELECTOR switch to MIC.
- Set the MODE switch to STEREO.
- Adjust the volume and tone quality.

4-CHANNEL IN-OUT

When it is desired to set up a 4-channel stereo system, connect another adaptor to 4-channel program source is necessary for such operation. For further details follow the instructions that come with the adaptor.

MAINTENANCE

CONCERNING TRANSISTORS

Transistors differ fundamentally from radio vacuum tubes and require special attention to ensure their full performance capabilities. Given proper care, transistors will provide years of practically trouble-free performance.

- (a) Avoid locations subject to direct sunlight.
- (b) Avoid high or low temperature extremes.
- (c) Keep the amplifier away from heat radiating sources.

PROTECTION CIRCUIT

The newly developed protection circuit is completely effective and prevents damage which may be caused by short-circuiting at the speaker terminals or the power output circuit of the receiver. When a short-circuit occurs, this protection circuit will function automatically to protect the power output transistors and the speakers. If the power output transistor fails, this protection circuit will function automatically to protect the speaker.

ACOUSTIC FEEDBACK

Occasionally a disturbing howling sound caused by acoustic feedback, may be heard. This is generally caused by the relative positions of the turntable and speaker enclosures. The sound pressure radiated from the speaker box surrounds and vibrates the turntable. This vibration is picked up by the cartridge, sent to the amplifier as an electrical signal, and returned to the speaker. This again causes the speakers to radiate vibration which induces sympathetic vibrations in the turntable and cartridge. Sympathetic vibrations are reinforced with each repeating cycle and result in an undesirable sound called oscillation or "howling". To prevent it, keep your turntable away from your speakers. Also mounting your turntable on shock-absorbing pads may help.

AC VOLTAGE SELECTION AND POWER FUSE

The KR-6400 operates on 110 - 120 volt AC or 220 - 240 volt AC. The AC Voltage Selector Switch on the rear panel is set to the voltage that prevails in the area to which the amplifiers are shipped. Before operating this amplifier, make sure that the position of the AC Voltage Selector Switch matches your line voltage. If not, it must be changed to the proper setting.

To change, first turn the amplifier off. Then remove the stopper plate and slide the AC Voltage Switch to the opposite side. Then re-attach the stopper plate to the other side.

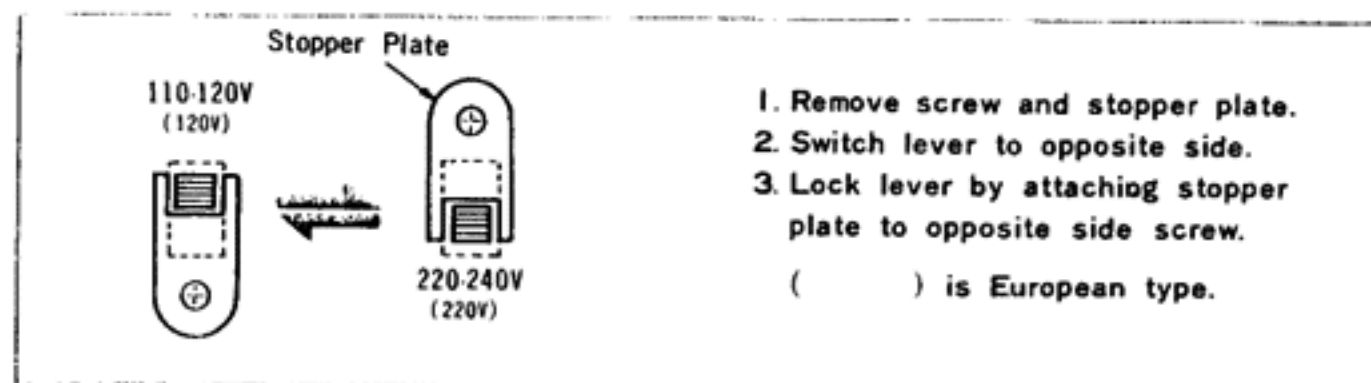
When the position of the AC Voltage Selector Switch is changed, it is also necessary to change the power fuse. For 110 - 120 volt operation a 3 ampere fuse should be used. For 220 - 240 volt operation a 1.6 or 1.5 ampere fuse should be used.

If the power fuse fails, remove blown fuse and replace with the same type fuse of the same capacity. Any trouble in the power supply circuit will cause the fuse to blow again. In such a case, consult a qualified serviceman.

When you replace the fuse, turn the fuse holder in the direction of the arrow using a Phillips screw driver.

NOTES:

1. Always disconnect power supply before replacing a fuse.
2. Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector Switch.



KR-6400 SPECIFICATIONS

FM TUNER SECTION

Frequency Range	88 MHz to 108 MHz 87.5 MHz to 108 MHz (FTZ approved)
Usable Sensitivity (IHF)	1.9 μ V
Quieting Slope	5 μ V 48 dB, 10 μ V 60 dB, 50 μ V 68 dB
Frequency Response	20 Hz – 15,000 Hz $\begin{matrix} +0.5 \\ -1.5 \end{matrix}$ dB
Harmonic Distortion	0.3% Mono (at 400 Hz 100% modulation) 0.5% Stereo (at 400 Hz 100% modulation)
Signal to Noise Ratio	68 dB at 1 mV input
Image Rejection	70 dB
Selectivity (IHF ALT channel)	65 dB
IF Rejection	90 dB
Spurious Signal Rejection	90 dB
AM Suppression	70 dB
Capture Ratio	1.5 dB
Stereo Separation	35 dB at 1,000 Hz 27 dB at 10,000 Hz
Sub Carrier Suppression	60 dB
Antenna Impedance	300 ohms balanced & 75 ohms unbalanced

AM TUNER SECTION

Usable Sensitivity (IHF)	18 μ V
Signal to Noise Ratio	45 dB at 1 mV input
Image Rejection	60 dB
Selectivity (IHF)	30 dB
IF Rejection	40 dB
Antenna	Built-in ferrite bar antenna, External antenna terminals

MAIN-AMPLIFIER SECTION

RMS Power Output	
Both Channels Driven	45 watts x 2 into 8 ohms at 20 Hz – 20,000 Hz 52 watts x 2 into 8 ohms at 1,000 Hz 65 watts x 2 into 4 ohms at 1,000 Hz
Dynamic Power Output	160 watts into 8 ohms 240 watts into 4 ohms
Total Harmonic Distortion	0.3% at rated power into 8 ohms 0.07% at 1/2 rated power into 8 ohms at 1,000 Hz
Intermodulation Distortion (60 Hz : 7 kHz = 4 : 1)	0.3% at rated power into 8 ohms 0.07% at 1/2 rated power into 8 ohms
Power Bandwidth	10 Hz – 30,000 Hz
Signal to Noise Ratio at 50 mW	55 dB
Damping Factor	50 at 8 ohms
Speaker Impedance	Accept 4 ohms to 16 ohms

PRE-AMPLIFIER SECTION

Input Sensitivity & Impedance	
Phono 1	2.5 mV, 50 K ohms
Phono 2	2.5 mV, 50 K ohms
AUX	150 mV, 80 K ohms
Tape Play A, B	150 mV, 80 K ohms
Mic	2.5 mV, 50 K ohms
Maximum Input Voltage (rms)	
Phono 1, 2	120 mV T.H.D. 0.3% at 1,000 Hz
Signal to Noise Ratio (IHF A CURVE)	
Phono 1, 2	70 dB
AUX	90 dB
Tape Play A, B	90 dB
Mic	65 dB
Output Voltage and Impedance	
Tape Rec. A, B (Pin) (Din Connector)	150 mV 100 ohms 30 mV 80 K ohms
Frequency Response	
Phono 1, 2	RIAA Standard curve \pm 1 dB
AUX, Tape Play	10 Hz – 40,000 Hz \pm 1 dB
Tone Controls	
Bass	\pm 10 dB at 100 Hz
Treble	\pm 10 dB at 10,000 Hz
Loudness Control (–30 dB)	+8 dB at 100 Hz, +5 dB at 10,000 Hz
Low Filter 100 Hz	–8 dB
High Filter 10,000 Hz	–10 dB

GENERAL

Switches	
Speaker Selector	OFF, A, B, C, A + B, A + C
Input Selector	AM–FM–PHONO 1–PHONO 2–AUX–MIC
Mode	LEFT–RIGHT–STEREO–REV–MIX
Tape Monitor	SOURCE MON–B MON–A PLAY (A \rightarrow B) –SOURCE–B PLAY–A MON (B \rightarrow A)
Others	LOW FILTER, HIGH FILTER, FM MUTING LOUDNESS, MIC JACK, PHONE JACK
AC Outlet	Switched 1, Unswitched 2
Power Consumption	340 watts at full power 40 watts at no signal
Dimensions	W 18-15/16" (480mm), H 5-15/16" (151mm) D 13-9/16" (344mm)
Weight	29.8 lbs. (13.5 kg)

TROUBLE SHOOTING

In initially installing this receiver, improper connections may result in one of the following indications of trouble. Their possible causes and corrective measures are listed below to facilitate installation.

INDICATIONS

Occurs Only During AM Reception	Cause	Correction
Continuous low frequency buzz. Most noticeable at night on weak signal stations.	Interference from electrical appliances or atmospherics.	Erecting a 10 meter outdoor antenna and securing good ground conditions should reduce interference considerably. Complete elimination is difficult.
Continuous high frequency whine which increases at night.	TV interference. 10 kHz beat interference from adjacent AM station.	Turn TV off. (Neighboring TV set may also be caused.) Impossible to eliminate from receiver side. This is one disadvantage of the AM broadcast system. Use High Filter to cut off high frequency interference.
Intermittent buzzing or sharp crackling noise.	Lightning interference. Interference from fluorescent lamps. AC Plug Connection.	Occurs when lamps are on and cannot be helped. Try reversing AC plug connections. Occurs only on certain stations due to high voltage power line and cannot be helped in many areas.
Interference from amateur stations.	Called BCI, this interference results from neighboring amateur stations. (Also occurs on FM.)	Consult interfering station operator or authorities concerned.
Occurs Only During FM Reception	Cause	Correction
Continuous hiss or buzzing interference with broadcast. Becomes louder during stereo.	Incoming signal too weak at ANT terminal.	Erect outdoor FM antenna if only indoor T-type is used. A 5 or 7 element antenna is necessary if you are located at a considerable distance from the broadcasting station.
Occasional sharp buzzing or crackling noise.	Automobile ignition noise. More noticeable on weak signals.	Erect outdoor FM antenna as far away from roads as practicable.
Weak right channel response when listening to LEFT only test FM Stereo broadcast.	Called crosstalk, a very slight response is normal.	If leakage is less than one tenth, it is not a sign of trouble. It cannot be reduced to zero.
FM Automatic Circuit fails to respond to stereo broadcast.	Incoming signal is exceptionally weak.	Erect an FM outdoor antenna.

INDICATIONS

During AM, FM or Record Playback	Cause	Correction
No pilot lamp indication, no sound although AC is switched ON.	Poor AC plug connection. Blown fuse.	Check plug contact Replace fuse. If it blows again, trouble must be corrected.
No sound from LEFT and RIGHT.	SPEAKERS switch set to A + B or A + C position. Speaker cords disconnected. SPEAKERS switched to OFF.	Both A-B or A-C groups of speakers are required in this case for response from both sides. Check connections from amp output to speakers. SPEAKERS switch should be switched to OFF only when using stereo headphones.
Sound only from one side.	Volume Control (extreme left). TAPE MON switch at PLAY position.	Set to appropriate volume level. Always set to SOURCE except when using tape recorders.
Sound only from one side.	Poor speaker cord connections. BALANCE control set to one extreme or other.	Check amp. output and speakers connections. Adjust BALANCE control.
Noise when AC is switched ON or when volume is adjusted immediately after.	Insufficient circuit warmup.	Allow 5 - 6 second interval after switching AC ON, before manipulating volume control.
Unbalance results when volume is lowered.	LEFT RIGHT resistor values unbalanced.	Adjust BALANCE control.
Difference in volume level of radio and phono.	Difference in received signal and phono output levels.	Set to appropriate volume level.
During Phono Record Playbacks Only	Cause	Correction
No sound from LEFT and RIGHT, or sound only from one side.	Player output disconnected.	See that player output cord is firmly plugged into amp. input.
Loud hum drowns out sound.	Poor player output cord prong connections.	See that player output cord is firmly plugged into amp. input.
Sound audible but background hum occurs.	Player output cord picking up hum from AC cord.	Keep player output cord away from AC cords. Choose cord paths which keep hum at a minimum. Twist LEFT RIGHT player output cords together.
Sound audible but continuous background buzz interferes.	Player not grounded.	Reverse player AC plug connections. Connect player ground wire to GND terminal.
Sound audible but continuous background buzz interferes.	TV signal picked up by Player output cord. Frequency occurs near TV transmitting antenna.	Route player cord so that hum is minimized.
Howling noise occurs when volume is raised or bass response is increased.	Speaker vibrations induce feedback in Pickup.	Increase distance between player and speakers. Choose speaker locations carefully. Remember, loose flooring induces howling.