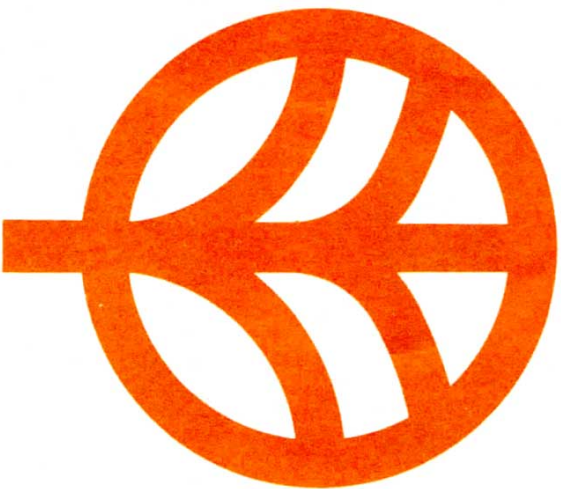


KA-2002

SOLID STATE STEREO AMPLIFIER



INSTRUCTION MANUAL



To the New KA-2002 Amplifier Owner:

Because Kenwood Electronics, Inc., takes great pride in the long tradition of quality components the name Kenwood represents, your purchase of a Kenwood amplifier 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 amplifier. 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 amplifier to 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 amplifier to meet your special requirements.

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

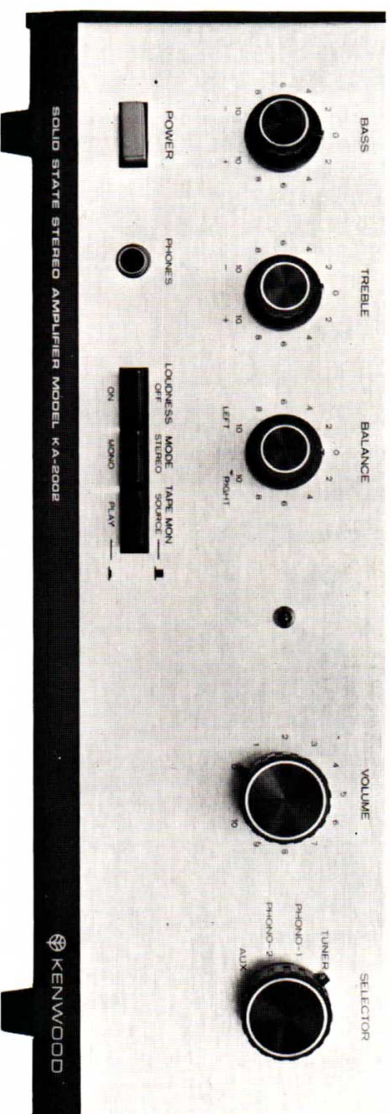
WARRANTY REGISTRATION

IMPORTANT: Fill out your warranty registration and mail it at once.

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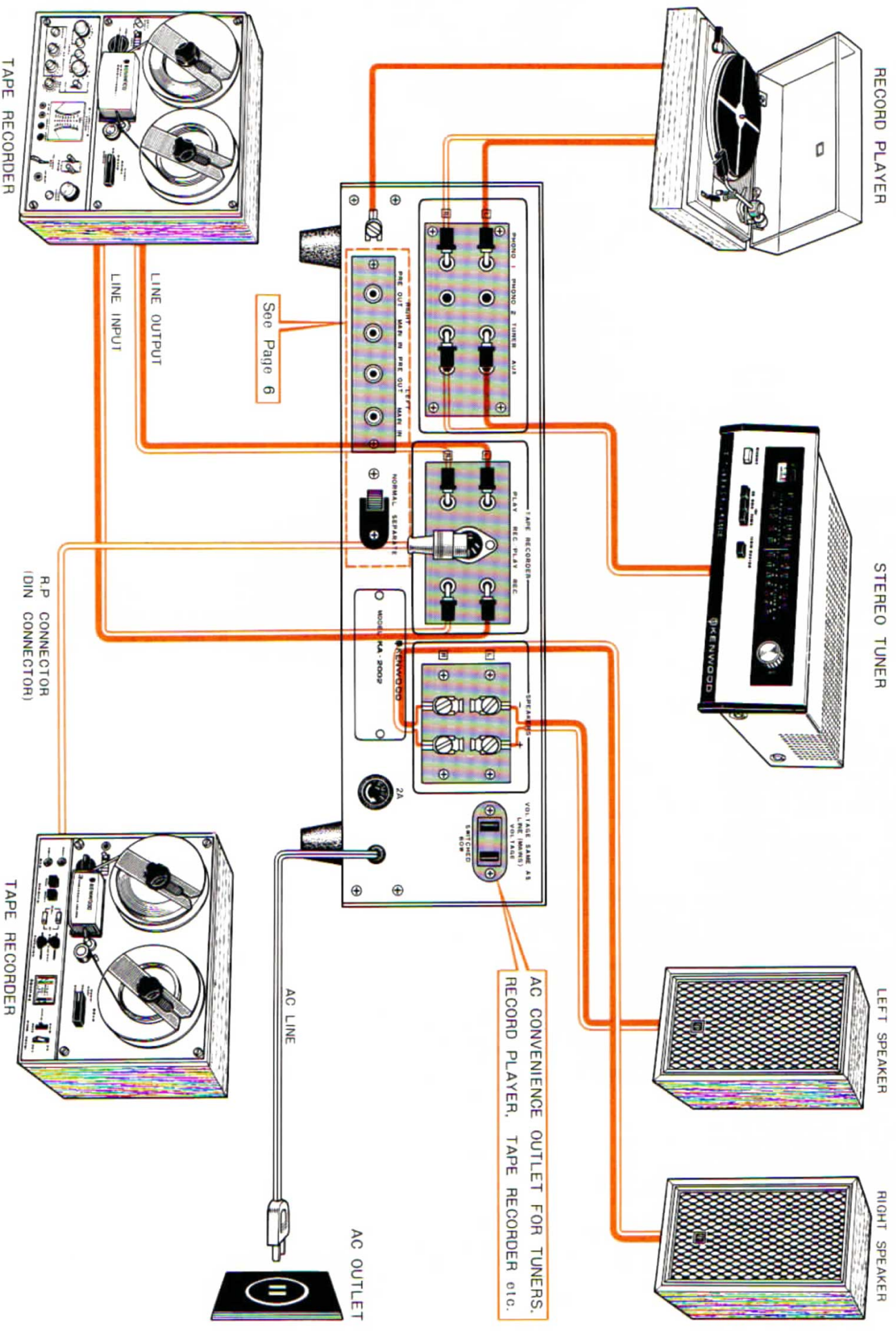
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SPECIAL KA-2002 FEATURES



1. Wide power band width of 20 Hz to 30,000 Hz with very low IM distortion.
2. 2 dB step type tone controls with BASS and TREBLE.
3. All transistor amplifier provides wide 20 to 30,000 Hz frequency response and 20 to 30,000 Hz power band width.
4. High damping factor 50 (8 ohms), for excellent transient response.
5. Pre-amplifier outputs for use with other power amplifier or multi-channel system.
6. 2 pairs of magnetic phono input jacks for 2 sets of record players.
7. Push-button controls regulate LOUDNESS Control, MODE, TAPE Monitor Switch.
8. Front panel stereo headphone jack.

INTERCONNECTING DIAGRAM



CONNECTIONS TO COMPONENT PARTS

SPEAKER CONNECTIONS

4 to 16 ohm speakers are suitable. Connect right speaker to right speaker terminal; left speaker to left speaker terminal. Should plus or minus of either right or left channels be reversely connected, sound from the center section will be affected by a lack of separation. See "phasing of the speakers".

Special Protection: If you operate your KA-2002 when speakers are shorted, a newly developed protection circuit guards against damage from short circuits at the output terminal.

Note: Connecting conductor in excess of 100 feet may cause some power loss.

MULTIPLE STEREO SPEAKER SYSTEM CONNECTION

Generally high fidelity loudspeakers are rated at 8 or 16 ohms. Since the speaker and its enclosure depends on each other in their function, each set of speakers must be matched carefully. The proper connection of the multiple-speaker system is as shown in Figure 1. Follow this carefully. The main speakers and auxiliary speakers must be connected in the series method as parallel connection will impair the transistors. In connecting the leads to the terminal strip on the rear

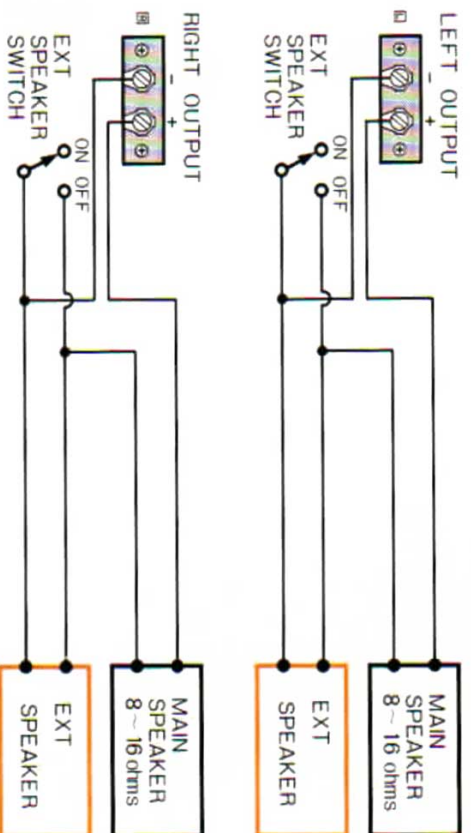


Figure 1. Connection of the multiple Speaker System.

of the amplifier, be sure they are kept apart. A wire will sometimes loop around the screw when tightening and touch the terminal holding the other wire, creating a short-circuit.

PHASING OF THE SPEAKERS

Correct phasing is important in a stereophonic system. If the speakers are out of phase, they will work in opposition of each other and there will be a noticeable loss in low frequencies. Use the following procedure to make adjustments:

1. Set the INPUT SELECTOR to PHONO 1 (PHONO 2), LOUDNESS to OFF, TAPE MONITOR to SOURCE, MODE switch to MONO and set VOLUME for desired listening level.
2. Play a monophonic record containing heavy bass passages. If a monophonic record is unavailable, substitute a stereo record.
3. After your speakers are connected, listen to the intensity of the bass tone. Then reverse the lead connections of the speakers and listen to the sound again. The position of the lead connections where the bass intensity was the greatest is the proper one and the speakers will then be permanently in phase.

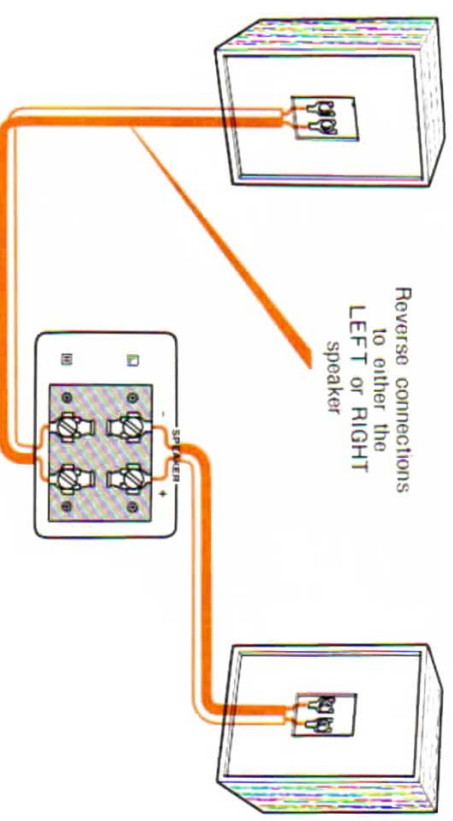


Figure 2. If speakers are out of phase, reverse connection to one.

CONNECTIONS TO COMPONENT PARTS

STEREO RECORD PLAYER

The two lines of shielded cord from your stereo record player should be terminated with phono plugs. Cord should not exceed ten feet in length. (An excess will create a loss in high frequency range.)

For Low Level Phono Inputs: Inputs from a magnetic cartridge connect to the PHONO 1 (PHONO 2) jacks.

TUNER

Use the TUNER terminals for connection to an FM Stereo or an AM-FM Stereo Tuner. For Monophonic operation, connections may be made to either the Right or Left terminals. Always use shielded cable for making these connections.

AUX

Auxiliary inputs can be used for a second tuner, tape recopying, etc. (See Figure 6, page 10).

PRE-AMPLIFIER OUTPUTS AND MAIN AMPLIFIER INPUTS

Stereo pre-amplifier outputs and stereo main amplifier inputs are incorporated in this unit. A simple setting of the slide switch will change the amplifier's function from "NORMAL" to "SEPARATE" as required.

This switch has been preset for normal amplifier use and its position should not change. In this position the input jacks and output jacks can also be used to connect a second tape deck or as a pre-amplifier output for another basic amplifier.

If the amplifier is to be used as a pre-amplifier or main amplifier only, or as a multi-channel system, the switch should be reset as follows:

1. Remove the black plate which holds the slide switch in place in its preset position "NORMAL".
2. Reset switch to the "SEPARATE" position for pre-amplifier or main amplifier only function.
3. Affix plate to hold switch in new position.

Figure 3 shows the PRE-MAIN SEPARATE switch set for "SEPARATE". Figure 4 shows how to make connections for multi-channel system.

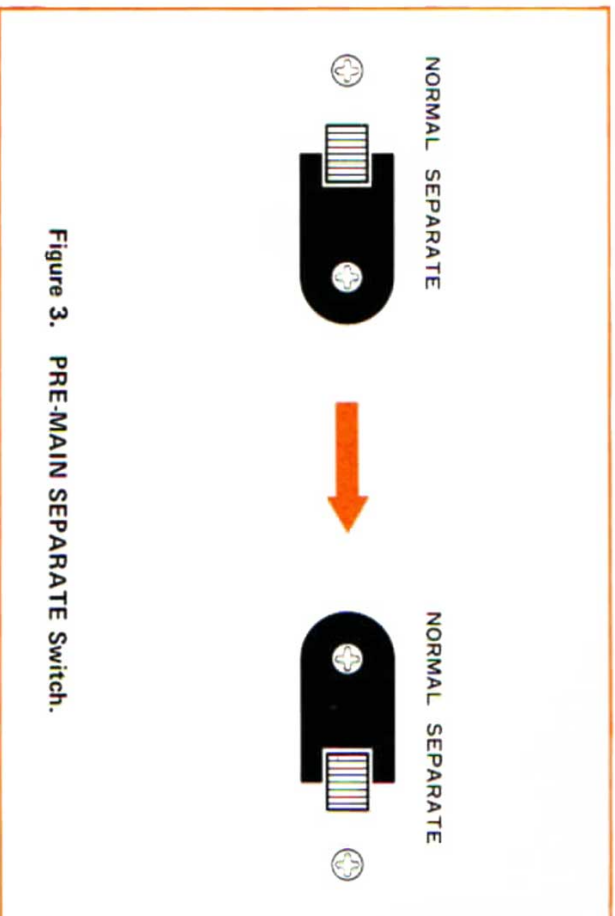


Figure 3. PRE-MAIN SEPARATE Switch.

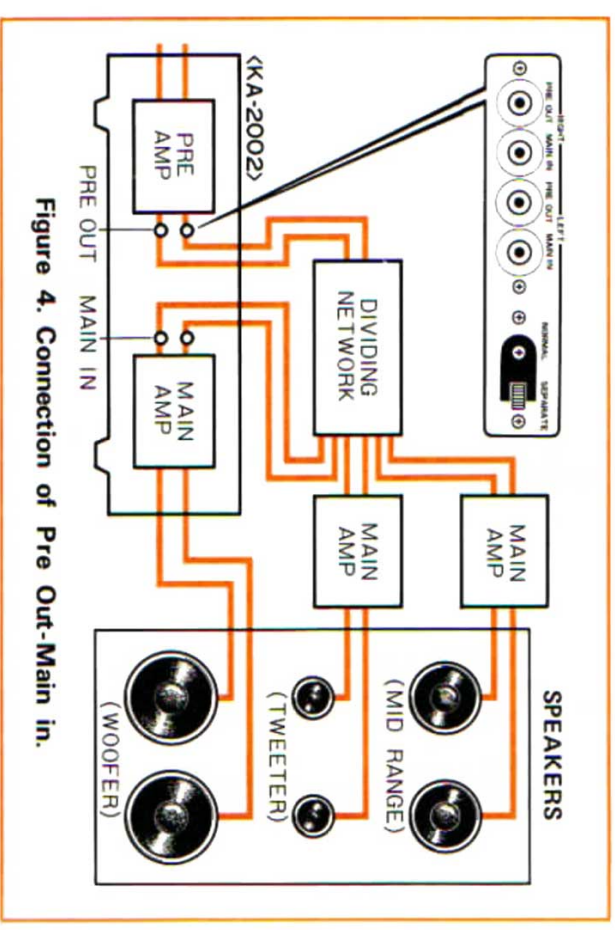


Figure 4. Connection of Pre Out-Main in.

ELECTRICAL CONNECTIONS

POWER

Plug the AC line cord into an outlet furnishing 110 to 120 volts AC, 50 / 60 Hz.

AC OUTLETS

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

Switched outlet (60 watts)

This is switched with the power switch on the amplifier. **IMPORTANT!**

Do not connect any electrical equipment with a power consumption of more than 60 watts.

FUSE

Shield 2 Amp. fuse is used. Rotate the fuse holder counter-clockwise for replacing. When the fuse has blown out, check carefully the reason for the blow-out and then replace the fuse. When something is wrong with the supply circuit, the fuse will blow again.

Do not, in any case, use copper wire in place of the specified shield fuse.

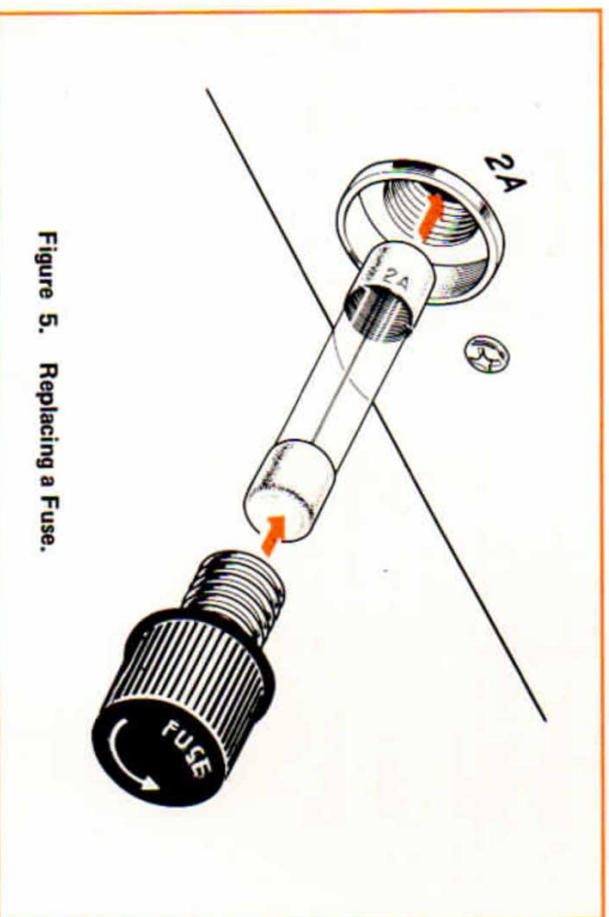


Figure 5. Replacing a Fuse.

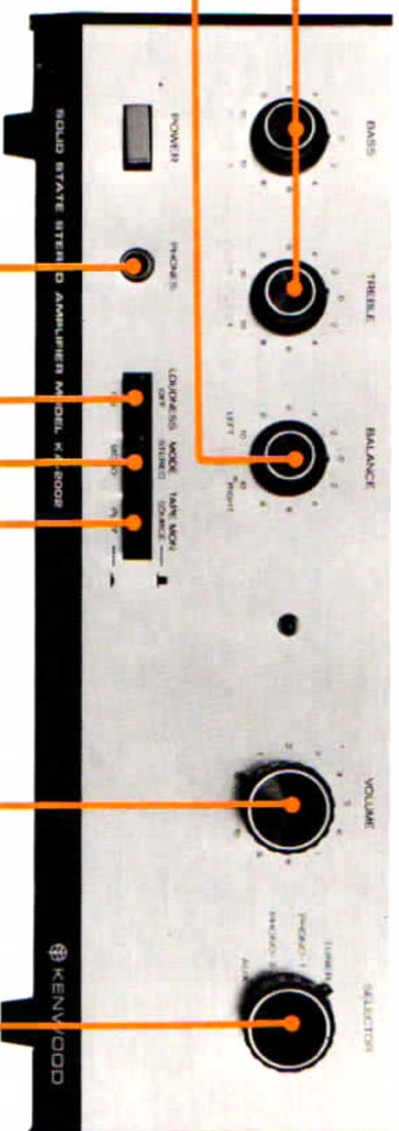
CONTROLS AND THEIR FUNCTIONS

1. BASS & TREBLE CONTROL

Turning clockwise increases bass (treble) tone and counterclockwise decreases it while center setting is at flat.

2. BALANCE

This control provides a simple means of adjusting the levels of both channels for proper balance during stereo-
phonic reproduction.



3. STEREO PHONES

This is a jack for stereo
headphone.

4. LOUDNESS

This switch provides the
frequency response change
(bass and treble boost) if
required by individual at
low listening levels and per-
mits the VOLUME control
to function as a compensa-
ted loudness control.
ON: Press button in.
OFF: Press button to
release.

5. MODE

This switch determines
the manner in which pro-
gram sources (previously
selected by the SELECTOR
switch) will go through the
amplifier section.
■ STEREO—This provides
stereophonic reproduction
of any stereo program
source. This position will
also provide monophonic
reproduction through both
channels when the LEFT
and RIGHT input are mono.
■ MONO — Mixes left and
right channels.

MONO: Press button in.
STEREO: Press button to
release.

6. TAPE MONITOR

For playback of tapes
or for monitoring of the
recording. (See page 10)

TAPE PLAY:
Press button in.
SOURCE:
Press button to
release.

7. VOLUME

The single control desig-
nated VOLUME adjusts the
relative level of both chan-
nels simultaneously.

8. SELECTOR

This switch selects the
program source. The fol-
lowing describes each func-
tion:

- TUNER — Selects
sources connected to the
TUNER input jacks.
- PHONO 1 — Selects
sources connected to the
PHONO 1 input jacks.
- PHONO 2 — Selects
sources connected to the
PHONO 2 input jacks.
- AUX — Selects sources
connected to the AUX in-
put jacks.

OPERATIONS

CONTROL OPERATION	INPUT terminals (rear panel)	OUTPUT terminals and jack	SELECTOR switch	MODE switch	TAPE MONITOR switch	BASS & TREBLE controls	BALANCE control
TUNER	TUNER	SPEAKERS or PHONES	TUNER	STEREO or MONO	SOURCE	"0" POSITION	TO BE BALANCED
	PHONO 1	SPEAKERS or PHONES	PHONO 1	STEREO or MONO	SOURCE	"0" POSITION	TO BE BALANCED
RECORD PLAYER	PHONO 2		PHONO 2				
TAPE RECORDER (For play back)	TAPE PLAY	SPEAKERS or PHONES	ANY POSITION	STEREO or MONO	PLAY	"0" POSITION	TO BE BALANCED
	AUX	SPEAKERS or PHONES	AUX	STEREO or MONO	SOURCE	"0" POSITION	TO BE BALANCED
	REC/PLAY	SPEAKERS or PHONES	ANY POSITION	STEREO or MONO	PLAY	"0" POSITION	TO BE BALANCED

NOTE : This chart shows the most usual operations, Bass control, Treble control and loudness switches can be set according to your listening desire.

TAPE RECORDER CONNECTIONS & OPERATIONS

PIN JACK

You may record FM (monaural or stereo), AM broadcasts and LP records by connecting the output jack of TAPE REC to the input jack of your tape recorder. Play back your tape recordings by simply connecting the line output of your tape recorder to the TAPE PLAY jack of your KA-2002.

R.P. CONNECTOR (IDIN CONNECTOR)

Normally for most recording and playback, separate cables must be connected to their respective input jacks on the amplifier; however, if your tape recorder is equipped with R & P (Record and Playback) 5-Pins connector type patch cord, a special jack (connector) is provided on the KA-2002 enabling both recording and playback with this single cable.

PLAYBACK

1. Push the POWER switch for power on.
2. The SELECTOR switch can be at any position.
3. Push the TAPE MONITOR switch to PLAY.
4. Start the tape recorder.
5. Adjust the volume. Use the BASS, TREBLE and LOUDNESS to suit your listening pleasure as explained previously.

TAPE MONITOR

The KA-2002 incorporates a Tape Monitoring circuitry enabling you to monitor while you record. Connections to the tape recorder are made as explained in the section dealing with "Interconnecting Diagram".

For Two-head Tape Recorders

Ordinary two-head type tape recorders are not equipped with a separate playback monitor amplifier to enable tape recording and simultaneous monitoring. Therefore, when recording, set the Tape Monitor Switch to "SOURCE" position, and feed the signal to be recorded through the KA-2002. And, for playback of the recorded tape through the KA-2002 speaker system, set TAPE MONITOR switch to PLAY position.

For Three-head Tape Recorders

Three-head type tape recorders have separate recording and playback heads, and their respective separate amplifiers. This enables simultaneous playback monitoring of the recording. For operating the KA-2002 in conjunction with three-head type recorders, set the Tape Monitor switch to "PLAY" position. This enables monitoring the recording and fully controlling level, acoustic balance, microphone position, etc.

For playback of the recorded tape, set TAPE MONITOR switch to PLAY position.

TAPE RECOPYING

To make a copy of a recorded tape on to another tape, follow the connecting instruction as shown in Figure 6.

1. Push the POWER switch for power on.
2. Set the SELECTOR switch to AUX position.
3. Push the TAPE MONITOR switch to PLAY.
4. Operate your equipments simultaneously.

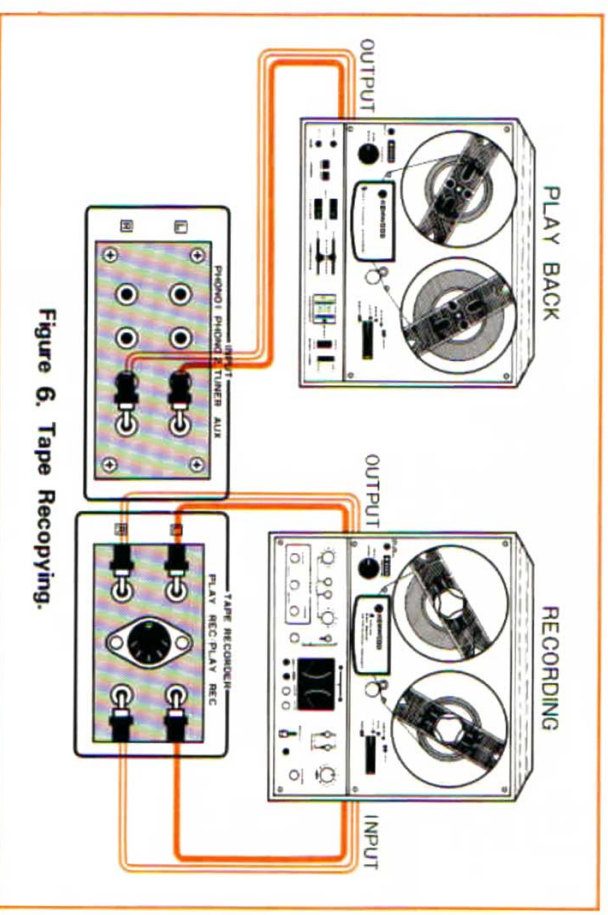


Figure 6. Tape Recopying.

SUPPLEMENTARY INFORMATIONS

PROTECTION CIRCUIT

The newly developed protection circuit is completely effective and prevents damage which may be caused by short circuits at the speaker outputs or the electrical overloading point. When a short circuit occurs this protection circuit will function automatically to protect the transistors. The program sound will be heard off and on intermittently about every one second. In this case, there is no fear of damaging the transistors. Just switch off the supply line and check the connections.

ACOUSTIC FEEDBACK

Sometimes an undesirable sound (howling) caused by acoustic feedback may be encountered. This is generally caused by poor placement of the turntable and speaker enclosures which may be too close to each other. The turntable should be located a reasonable distance away from the speakers, or a soft, thick cushion such as foam rubber should be inserted underneath it. This will help to prevent vibration of the turntable, which is usually the main cause of any acoustic feedback that may be encountered. (See Figure 7).

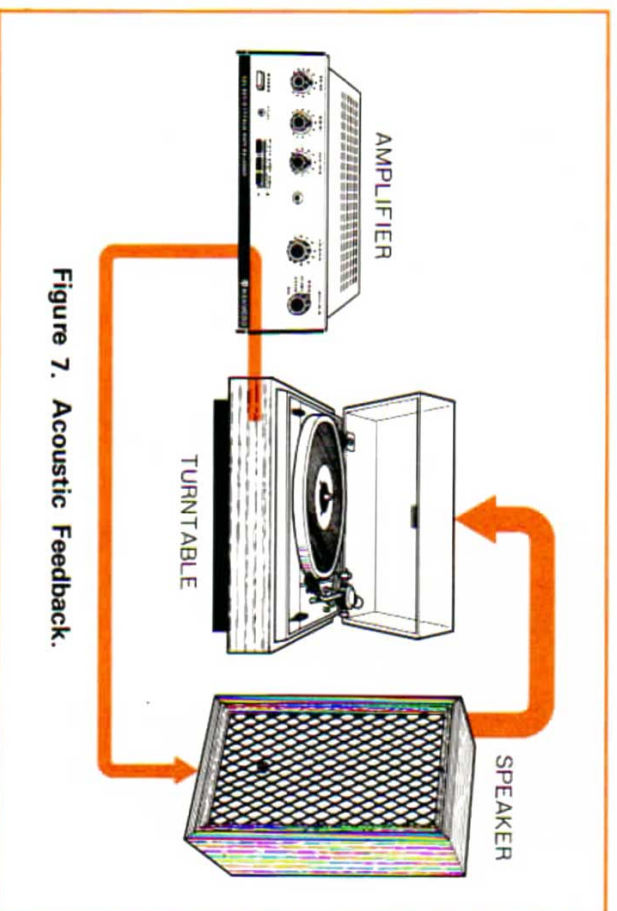


Figure 7. Acoustic Feedback.

TROUBLE SHOOTING

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

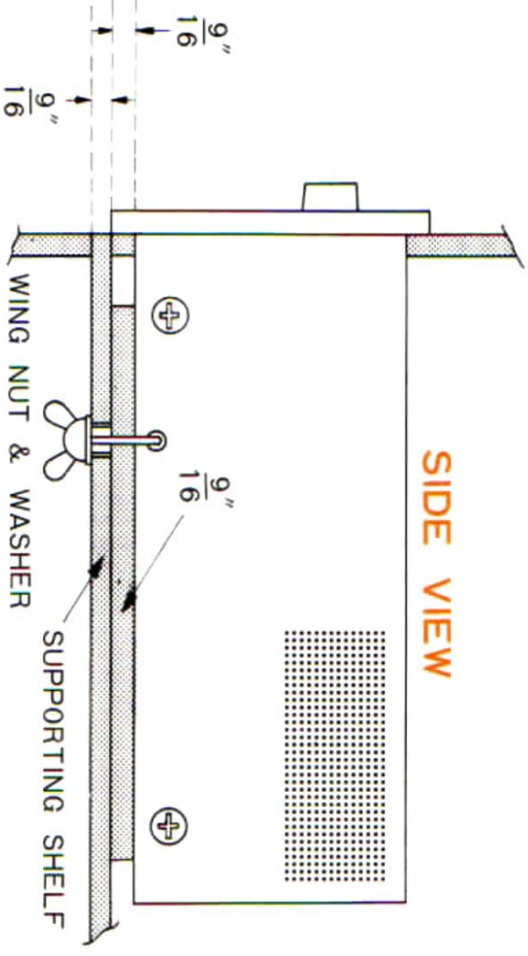
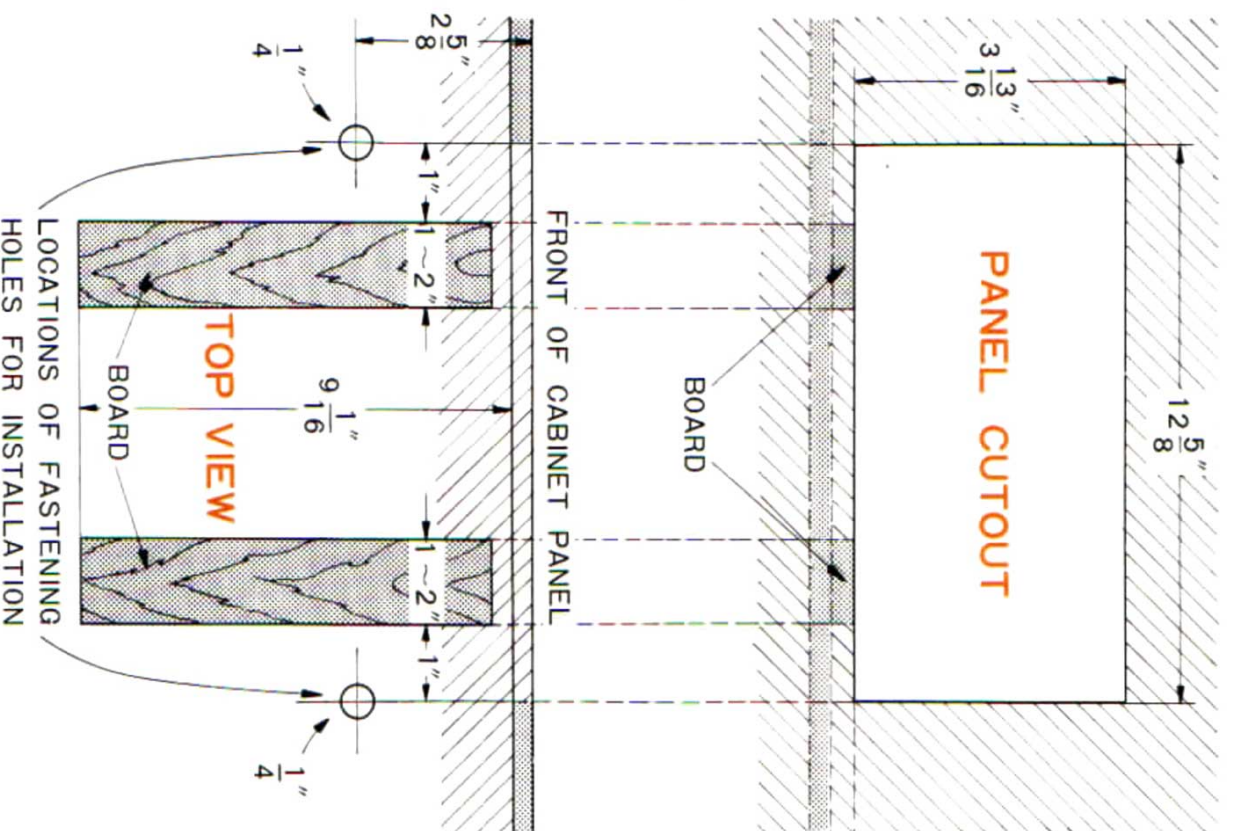
During Tuner or Phono Operation		Cause	Correction
No sound from LEFT and RIGHT.	No pilot lamp indication, no sound although AC is switched ON.	Poor AC plug connection. Blown fuse.	Check plug contact. Replace fuse. If it blows again, trouble must be corrected.
	No sound from LEFT and RIGHT.	Speaker cords disconnected. Volume Control at 0 (extreme left) TAPE MON switch at PLAY position. PRE MAIN SEPARATE SWITCH at SEPARATE Position.	Check connections from amp output to speakers. Set to appropriate volume level. Always set to SOURCE except when using tape recorders. Always NORMAL position except when using together with multi-channel or 3-D systems.
Sound only from one side.	Noise when AC is switched ON or when volume is adjusted immediately after.	Poor speaker cord connections. BALANCE control set to one extreme or other. Insufficient circuit warmup.	Check amp output and speakers connections. Adjust BALANCE control. Allow 5 - 6 second interval after switching AC ON, before manipulating volume control.
Unbalance results when volume is lowered.	Intermittent speaker response at 3 second intervals.	LEFT RIGHT resistor values unbalanced. Protection Circuit indication of short circuit in the output.	Adjust BALANCE control. Check speaker cord connections.
Difference in volume level of radio and phono.		Difference in received signal and phono output levels.	Set to appropriate volume level.
During Phono Operation Only		Cause	Correction
No sound from LEFT and RIGHT, or sound only from one side.	Loud hum drowns out sound.	Player output disconnected. Poor Player output cord prong connections.	See that player output cord is firmly plugged into amp input. 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. Player not grounded.	Keep player output cord away from AC cords. Choose cord paths which keep hum at a minimum. Twist LEFT RIGHT player output cords together. Reverse player AC plug connections. Connect player ground wire to GND terminal.
Sound audible but continuous background buzz interferes.	Howling noise occurs when volume is raised or bass response is increased.	TV signal picked up by player output cord. Frequently occurs near TV transmitting antenna. Speaker vibrations induce feedback in pickup.	Route player cord so that buzz is minimized. Increase distance between player and speakers. Choose speaker locations carefully. Remember, loose flooring induces howling.

SPECIFICATIONS

Dynamic Power: Both Channel Driven Both Channel Driven	46 watts at 4 ohms 38 watts at 8 ohms
Continuous Power: Each Channel Driven Each Channel Driven Both Channel Driven Both Channel Driven	19/19 watts at 4 ohms 17/17 watts at 8 ohms 15/15 watts at 4 ohms 13/13 watts at 8 ohms
Harmonic Distortion:	0.8 % at rated 0.2 % at -3 dB rated
Intermodulation Distortion:	0.8 % at rated 0.2 % at -3 dB rated
Frequency Response: high level (AUX) input	0.2 % at -3 dB rated
Power Bandwidth (IHF):	20-30,000 Hz $\pm$ 2 dB
Input Sensitivity: (for rated output)	20-30,000 Hz
	Phono 1 2 mV 50 Kohms
	Phono 2 2 mV 50 Kohms
	Tuner 150 mV 50 Kohms
	Aux/Tape play 150 mV 50 Kohms
	Main in 100 mV
	Pin 150 mV
	DIN 30 mV
	Phono 1 60 dB
	Phono 2 60 dB
	Tuner 70 dB
	Aux/Tape 70 dB
Recording Output: (below rated input)	50 at 8 ohms
Hum & Noise: (below rated output)	accept 4 to 16 ohms
	$\pm$ 10 dB at 100 Hz
	$\pm$ 10 dB at 10,000 Hz
Damping Factor:	$\pm$ 8 dB at 100 Hz
Speaker Impedance:	+ 4 dB at 10,000 Hz
Bass Control:	
Treble Control:	
Loudness Control (at -30dB rated):	Selector (Aux, Tuner, Phono 1, Phono 2) Mode, Tape Monitor, Loudness
Switches:	Switched 1
AC Outlets:	22 Transistor, 10 Diode, 2 Thermistor
Semiconductor	at full power 60 watts
Power Consumption:	at no signal 8 watts
Dimension:	13"(W) x 4-5/8"(H) x 9-7/16"(D)
Net Weight:	10.6 Lbs. (4.8 Kg)

Note: Any of the specifications given here may be changed or modified without notice.

MOUNTING TEMPLATE



DIRECTIONS FOR PANEL MOUNTING

1. Locate the supporting shelf at the height you wish the amplifier positioned.
2. Remove the four bottom legs.
3. An air space must be made between the bottom of the set and the supporting shelf to assure good ventilation and cool operation. This space can be made by placing two boards which measure $9/16"$ thick by $1"$ to $2"$ width between chassis and the supporting shelf.
4. Make a panel cutout in the size shown at left, $3-13/16" \times 12-5/8"$. The bottom of the cutout should be flush with the bottom plate of the amplifier, as shown in the side view. The distance between the bottom of the cutout and the top of the supporting shelf is $9/16"$.
5. The amplifier is held in place by two bolts. The holes must be made in the shelf to correspond with the holes in the amplifier. Use the "Top View" template to locate these holes on the supporting shelf. The holes should be made $1/4"$ in diameter or somewhat larger.

NOTES

KA-2002 Serial No. _____

Owner _____



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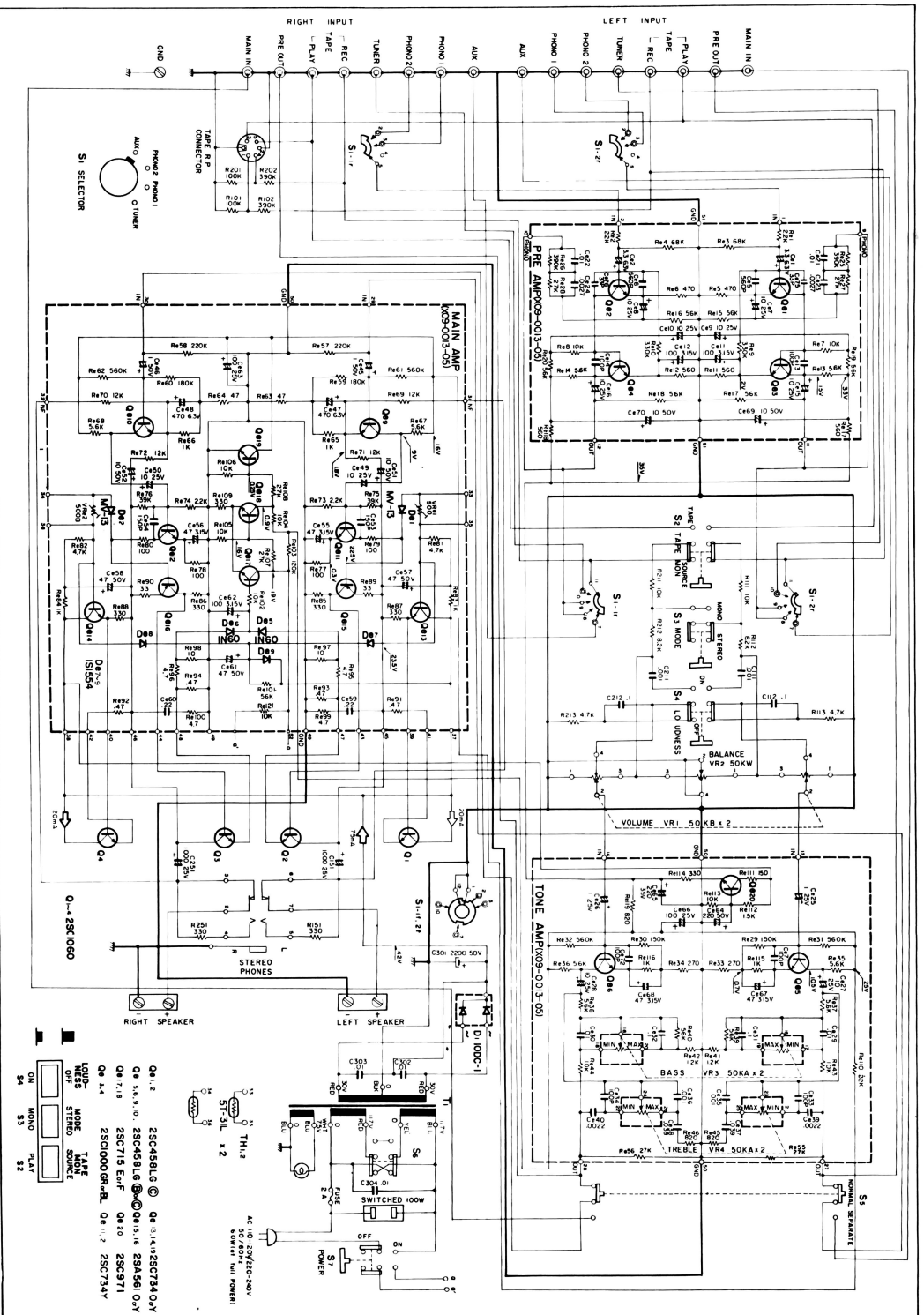
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KA-2002 SCHEMATIC DIAGRAM



POWER TRANSFORMER ARRANGEMENTS

■ For Sets sold in Europe except England
P.T

