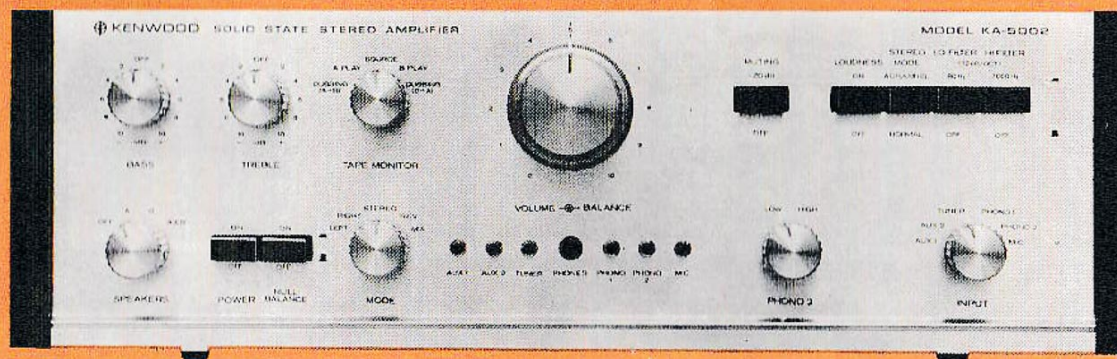




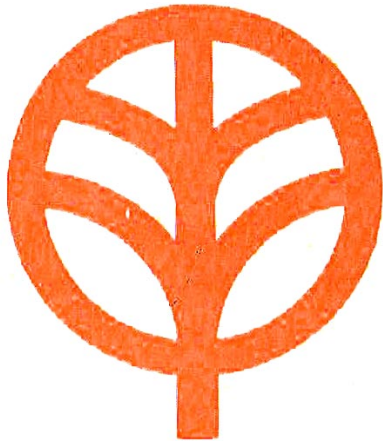
# KA-5002

## SOLID STATE STEREO AMPLIFIER



INSTRUCTION MANUAL





### **To the New KA-5002 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.

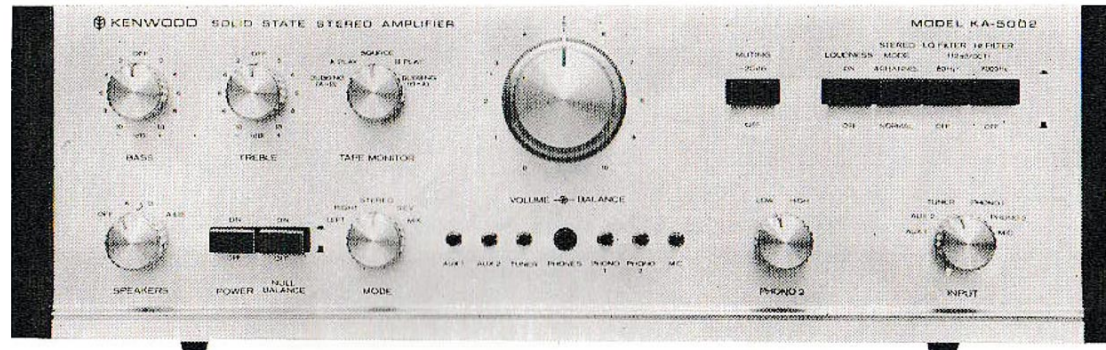
We suggest that you read this manual carefully. Knowing how to set up your amplifier to best advantage will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your amplifier to meet your special requirements.

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.

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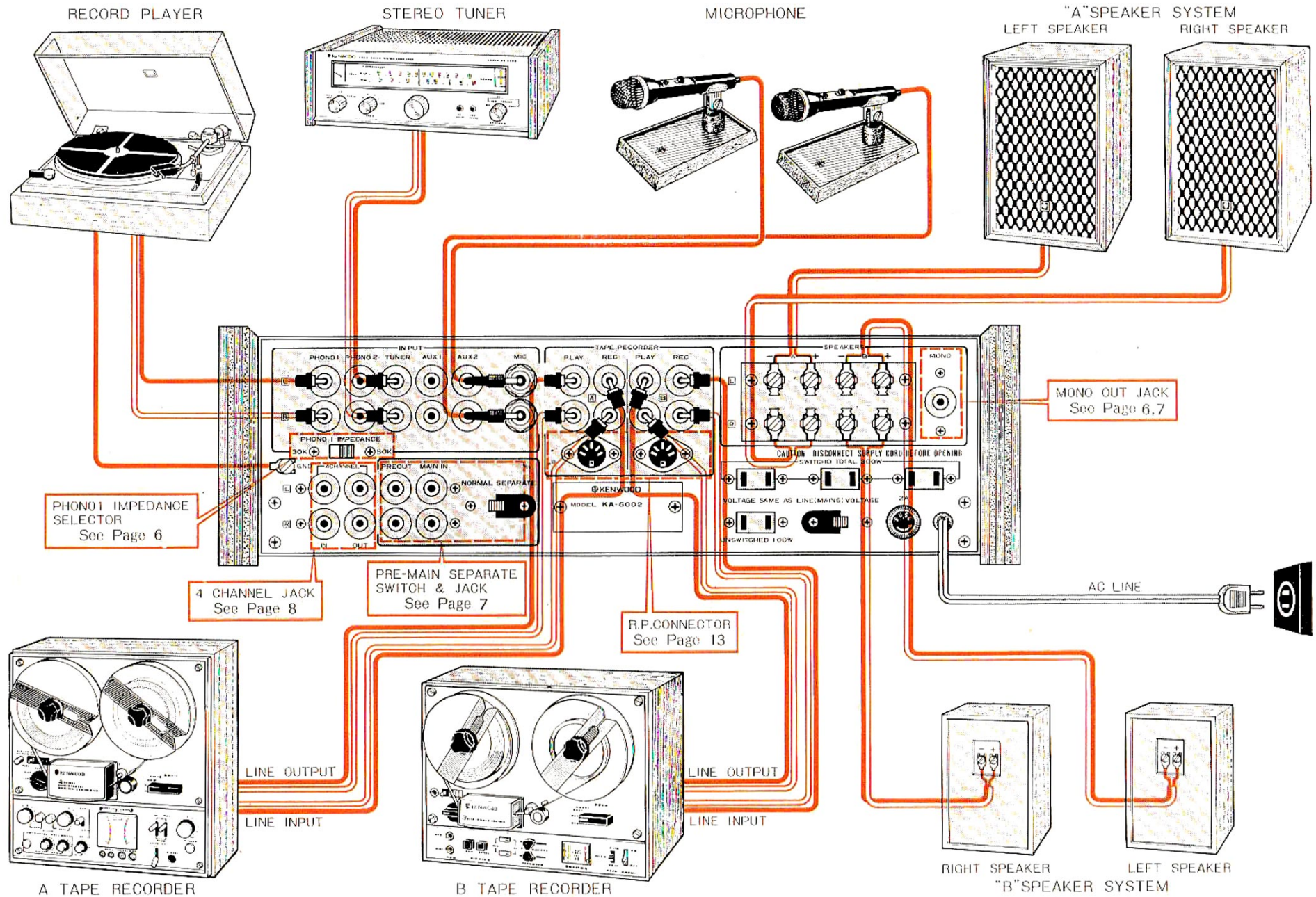
# SPECIAL KA-5002 FEATURES



1. Direct coupling power amplifier.
2. Kenwood's exclusive low level phono input (0.06 mV) for moving coil type or low level output cartridges.
3. 2 Set's of stereo speaker terminals and front panel speaker selector switch. (OFF, A, B, A & B).
4. 2 pairs of magnetic phono input jacks for 2 sets of record player.
5. Tape monitor and Dubbing switch for 2 taperecorder.
6. 4 channel input, output terminals, and volume control.
7. Phono 1 input impedance selector.
8. 2 dB step type tone control switch.
9. Null balance switch.
10. Power transistor protection circuit.
11. Push-button — 20 dB muting switch of quick response for momentary quietness during telephone call, etc.
12. Pre-amplifier outputs for the use with other power amplifier or multi-channel system.
13. Main amplifier inputs for the use with other components such as a pre-amplifier, tuner or taperecorder with pre-amplifier. Also these inputs enable you to drive the main amplifier directly.
14. Blue light indicators for input selector switch.
15. Front panel stereo headphone jack.
16. 12 dB/oct cut off low and high filter.



# INTERCONNECTING DIAGRAM





# CONNECTIONS TO COMPONENT PARTS

## SPEAKER CONNECTIONS

Special circuitry in the KA-5002 amplifier makes it possible to hook up two stereo sets of speakers (e.g., in different rooms). Any speaker with an impedance between 4 and 16 ohms can be used.

In connecting only one set of speakers, connect the right speaker to right speaker 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.

"A & B SPEAKERS" position of the SPEAKER selector switch will not work unless both A speakers system and B speakers system are connected.

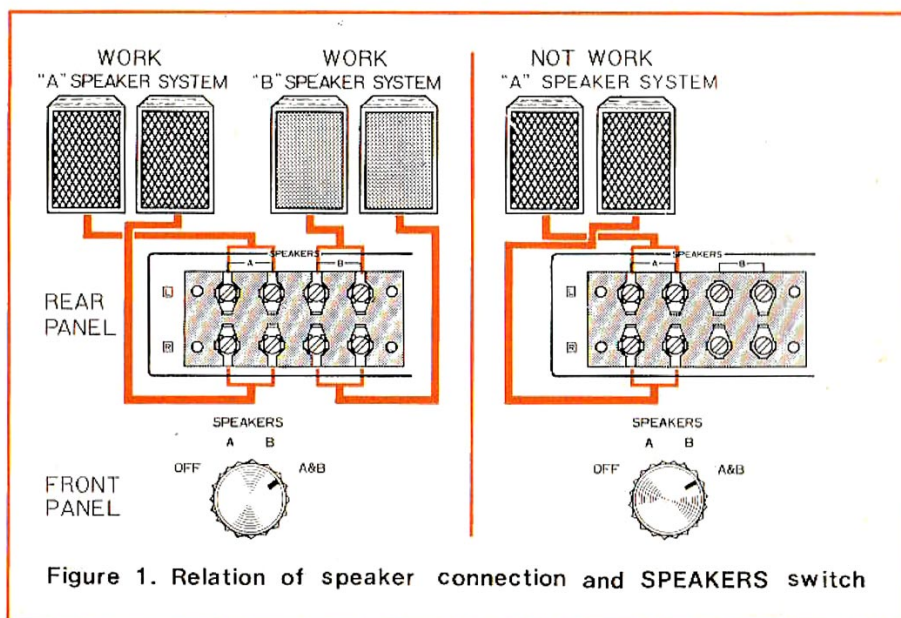


Figure 1. Relation of speaker connection and SPEAKERS switch

## PHASING OF THE SPEAKERS

Correct phasing is important in a stereophonic system. If the speakers are out of phase, they will work in opposition to each other, causing a noticeable deterioration in bass quality. Check correct phasing of the speakers as follows.

1. Set the INPUT selector switch to PHONO 1 (PHONO 2), MODE switch to MIX and set VOLUME to desired listening level.
2. Play a monophonic record containing heavy bass passages.
3. Listen to the intensity of the bass tone. Then reverse the leads to either the left or right speaker and listen again. (See Figure 2). The speaker connection which results in the deepest bass reproduction is the correct one, and indicates that the speakers are then in phase.

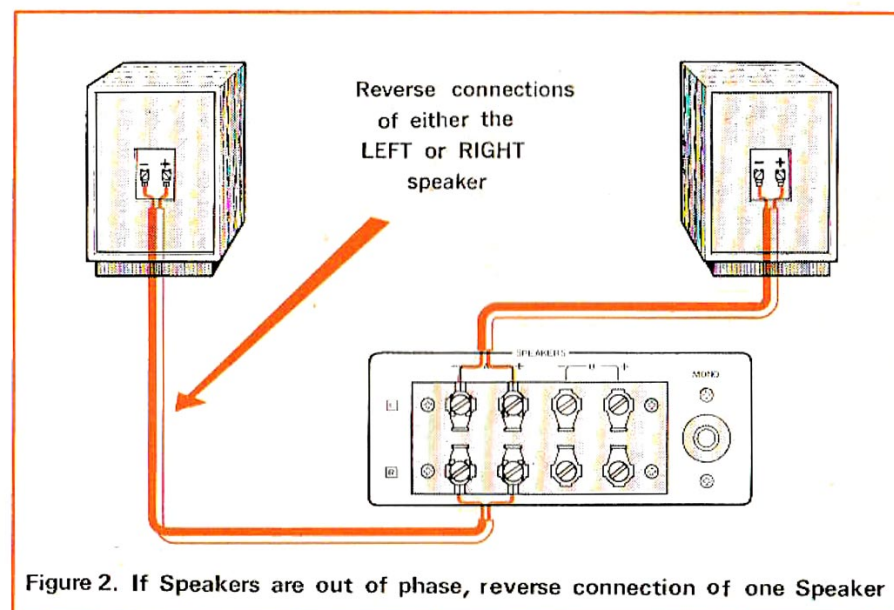


Figure 2. If Speakers are out of phase, reverse connection of one Speaker



# CONNECTIONS TO COMPONENT PARTS

## STEREO RECORD PLAYERS

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

Two pairs of stereo phono inputs have been incorporated in this unit so that two sets of stereo record players can be hooked up. (See table 1). When operating PHONO 1 (or PHONO 2), switch the INPUT selector switch to PHONO 1 (or PHONO 2).

**PHONO 1:** Connect a high level output, magnetic cartridge to these input jacks. Then use PHONO 1 IMPEDANCE switch at the rear to match impedance with the cartridge used. (Normally 50 K ohms is recommended).

**PHONO 2:** Set PHONO 2 switch on the front panel to HIGH when a high level output magnetic cartridge is used, and to LOW for low level magnetic cartridges. (Low input impedance 200 ohms).

## 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.

Table 1

Operation Control	HIGH LEVEL OUTPUT		LOW LEVEL OUTPUT
INPUT jacks	PHONO 1	PHONO 2	PHONO 2
PHONO 1 IMPEDANCE Selector(rear)	30K or 50K		
PHONO 2 Sensitivity Selector		HIGH	LOW
INPUT Selector	PHONO 1	PHONO 2	PHONO 2

## MIC

When connecting microphones be sure to use low impedance microphones only, such as a Dynamic Microphone. Connect one microphone each to left and right channel MIC inputs for stereophonic operation. A microphone can be connected to either channel for monophonic operation.

## AUX

Auxiliary inputs can be used for a second tuner, tape deck, TV set, etc.

## STEREO HEADPHONE JACK

Enjoy the wonderful sounds of stereo without disturbing others or monitor the playback of tapes as you record them with your stereo headphone. Plug the headphone into the STEREO PHONES JACK and turn the SPEAKER selector switch to OFF position.

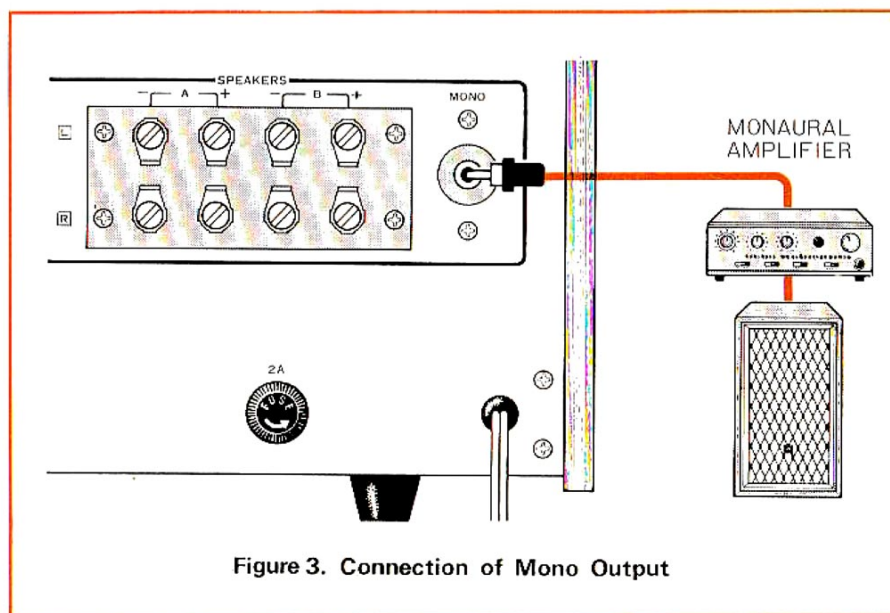


Figure 3. Connection of Mono Output



# CONNECTIONS TO COMPONENT PARTS

## MONO OUTPUT

This MONO OUTPUT jack may be used to connect to a monaural amplifier to drive such a mono speaker make connections from it to the AUX input jack of the monaural amplifier. (See Figure 4).

The output voltage of this MONO OUTPUT jack contains a mixed monaural signal of the left and right channels. It is about 1V (at rated output and 56 ohms output impedance).

## 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.

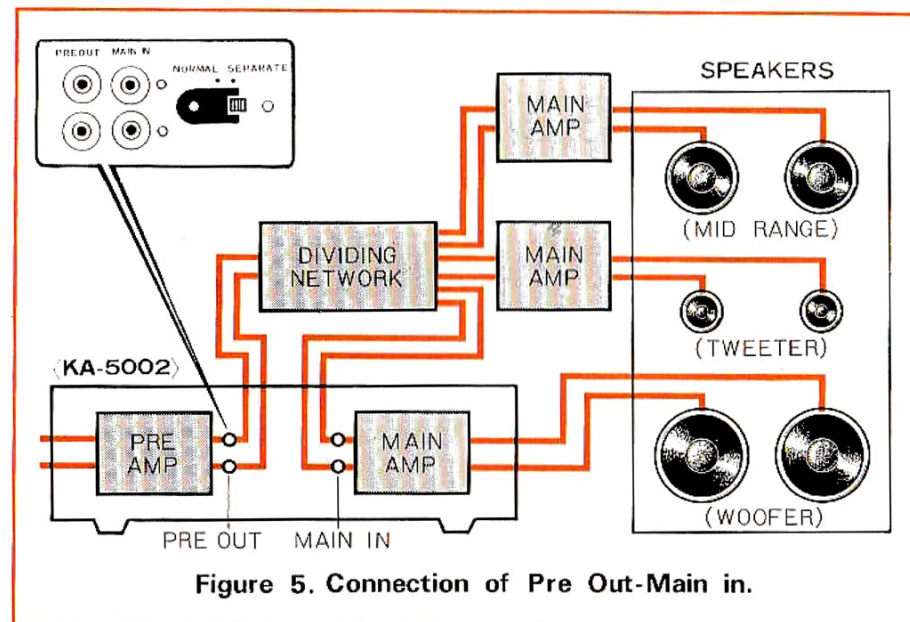
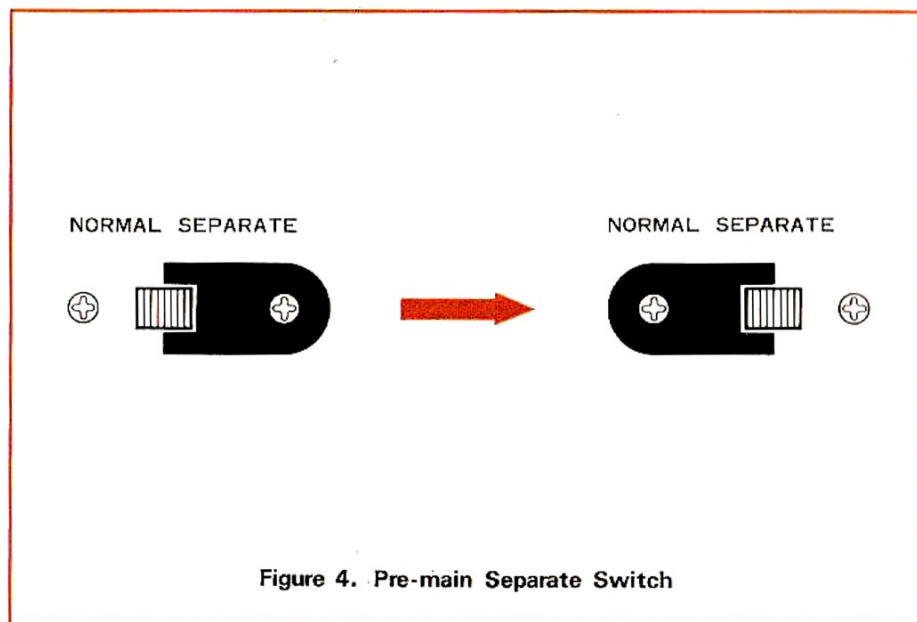
This switch has been preset for normal amplifier use and its position should not change. In this position PRE-OUT jacks can also be used to connect a second tape deck or as a pre-amplifier output for another basic amplifier.

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 4 shows the PRE-MAIN SEPARATE switch set for "SEPARATE."

Figure 5 shows how to make connections for multi-channel system.



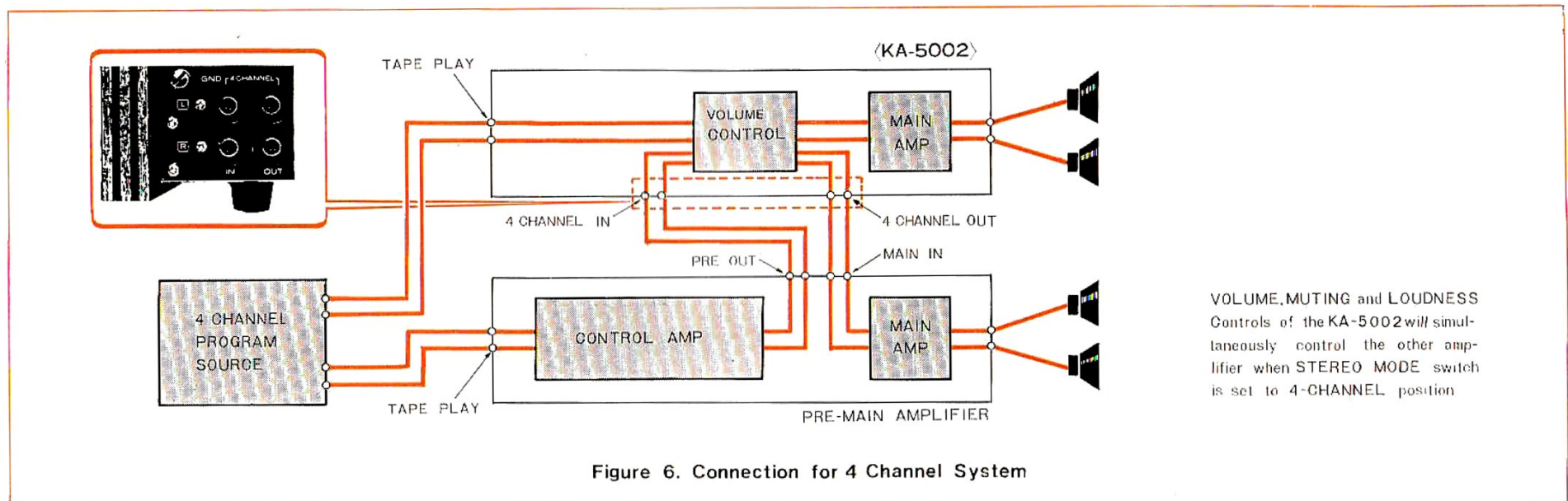


# CONNECTIONS TO COMPONENT PARTS

## 4-CHANNEL INPUTS AND OUTPUTS

When it is desired to set up a 4-channel stereo system, connect another amplifier to the 4-CHANNEL jack at the rear of this unit. It must be remembered, however, that a 4-channel program source is necessary for such operation. (See Fig 6).

With a 4-channel stereo system thus set up and the STEREO MODE switch of the KA-5002 set to 4-CHANNEL position, VOLUME, MUTING and LOUDNESS controls of this unit will simultaneously control the other amplifier.





# ELECTRICAL CONNECTIONS

## POWER

Plug the AC line cord into an outlet furnishing 220 to 240 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.

1. Switched outlets (total 300 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 300 watts in total.
2. Unswitched outlet (100 watts)  
This is not connected to the power switch on the amplifier.  
**IMPORTANT!** Do not connect any electrical equipment with a power consumption of more than 100 watts.

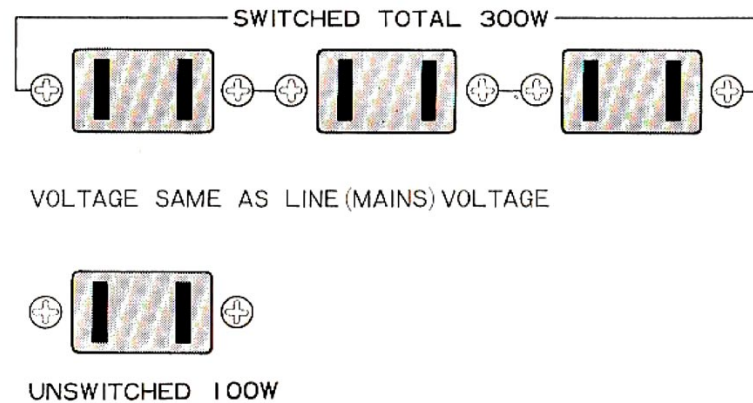


Figure 7. AC Outlets

## AC VOLTAGE SELECTION

This unit is pre-set to be used at 220 — 240 volts AC. In countries with 110 — 120 volts AC, set the AC voltage selector switch from 220 — 240 volts to 110 — 120 volts as follows:

1. Turn the power switch to "OFF."
2. Remove the black plate which is affixed to the AC voltage selector switch on the rear panel.
3. Set the slide switch to the left.
4. Attach the black plate to opposite side screw.

Figure 8 illustrates the AC voltage selector switch set for 110 — 120 volts AC.



Figure 8. AC Voltage Selector Switch.



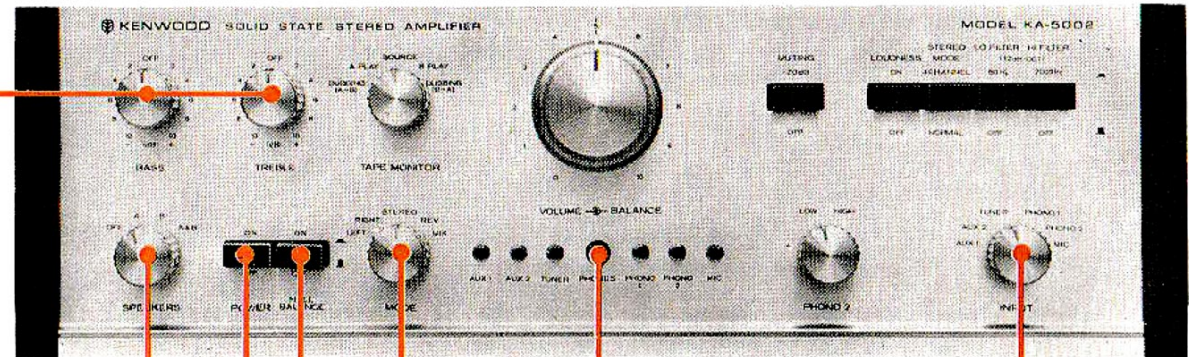
# CONTROLS AND THEIR FUNCTIONS

## 1. BASS controls

Turn knob to the right to increase bass, to the left to decrease bass. One position to the left or right makes a  $\pm 2$  dB change in bass response at 100 Hz. OFF position provides flat response with tone control circuits deactivated.

## 2. TREBLE controls

Turn knob to the right to increase treble tones; to the left to decrease them. One position to the left or right makes a  $\pm 2$  dB change in treble response at 10,000 Hz. OFF position provides a flat response with tone control circuit deactivated.



## 3. SPEAKERS

- OFF – Silences all speaker systems for private headphone listening.
- A – Selects speakers connected to rear panel A output terminals.
- B – Selects speakers connected to B outputs.
- A & B – Selects two sets of speakers connected to A and B output terminals.

## 4. POWER

Push to turn power on. Push again to turn it off.

## 5. NULL BALANCE

This switch provides an easy way to test for perfect stereo balance of the left and right channels.

Keeping this switch pushed in to ON, merely adjust BALANCE control (10) for minimum sound from the speakers.

## 6. MODE

- LEFT – Left input program reproduction is provided through both speakers.
- RIGHT – Right input program thru both speakers
- STEREO – This provides stereophonic reproduction of stereo sources.
- REV – Reverses positions of the two speakers. Left signal is now heard from right speaker, and right from left.
- MIX – Mixes left and right channels.

## 7. STEREO PHONES

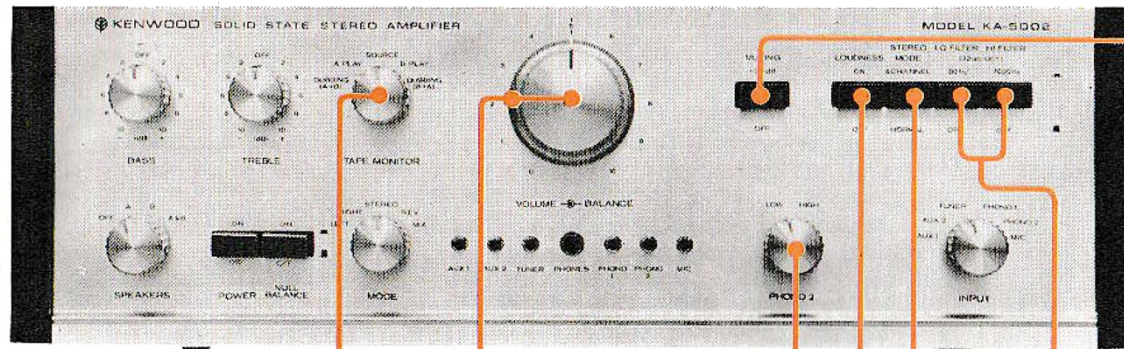
Plug headphones into this jack for private listening.

## 8. INPUT

- AUX 1 – Selects sources connected to AUX 1 input jacks.
- AUX 2 – Selects sources connected to AUX 2 input jacks.
- TUNER – Selects sources connected to TUNER input jacks.
- PHONO 1 – Selects sources connected to PHONO 1 input jacks.
- PHONO 2 – Selects sources connected to PHONO 2 input jacks.
- MIC – Selects sources connected to MIC input jacks.



# CONTROLS AND THEIR FUNCTIONS



## 17. MUTING

Push switch in to reduce volume momentarily as during a telephone call, etc.

Output power is reduced to 1/100 without touching Volume control.

Push switch again to return volume to original level.

## 9. TAPE MONITOR

Switch positions and functions are as follows.

■ **SOURCE** – For recording without monitoring, or not using tape recorder

■ **"A" PLAY** – For recording while monitoring or for playback of tape recorder connected to the "A" jacks

■ **"B" PLAY** – For recording while monitoring, or for playback of tape recorder connected to the "B" jacks

■ **DUBBING (A → B)** – For dubbing from a tape recorder connected to the A jacks into a tape recorder connected to the B jack.

■ **DUBBING (B → A)** – Dubbing from a B tape recorder to "A"

## 10. BALANCE

This control provides a simple means of adjusting the levels of both channels for perfect stereophonic balance.

Adjust it for minimum speaker response while playing a monaural record and keeping **NULL BALANCE** (5) pushed in. If a monaural record is unavailable, substitute a stereo record. Set **MODE** switch (6) to **MIX**. Adjust for balance as explained above. In this case the Main Amp section only is being balanced.

## 11. VOLUME

This single control adjusts the relative levels of both channels simultaneously. It does not control the volume level of microphones connected to **MIC** jacks.

## 12. PHONO 2

This Selector Switch enables matching input sensitivity to the output level of the cartridge connected to the **PHONO 2** jack.

■ **LOW** – Use this position when connecting a low level output magnetic cartridge to the **PHONO 2** input jacks.

■ **HIGH** – Use this position when connecting a high level output magnetic cartridge to the **PHONO 2** input jacks.

## 13. LOUDNESS

This switch provides, when desired, bass and treble boost at low listening levels.

It also permits the **VOLUME** control to function as a compensated loudness control.

## 14. STEREO MODE

This switch provides selection of normal, left-right, 2-channel stereo, or left-right, front-back, 4-channel stereo at the following positions.

■ **NORMAL** – For ordinary 2-channel stereo, use this setting. 4-channel inputs are then shorted out.

■ **4-CHANNEL** – Another amplifier connected to the 4-CHANNEL jack to make up a 4-channel system will be simultaneously controlled by the **MUTING**, **LOUDNESS** and **VOLUME** controls of this unit.

## 15. LOW FILTER

This switch activates a low frequency filter which reduces any rumble from noisy turntables or record changers to a minimum. 80Hz cutoff, 12 dB/octave.

## 16. HIGH FILTER

This switch activates a high filter which reduces any high frequency noise interference that may be encountered. 7,000Hz cutoff, 12dB/octave.

# OPERATING INSTRUCTIONS

CONTROL OPERATION		Input Terminals (Rear)	SPEAKERS Selector Switch	INPUT Selector Switch	MODE Selector Switch	TAPE MONITOR Switch	MUTING & NULL BALANCE Switch	STEREO MODE Selector Switch	BALANCE Control	PHONO 2 Sensitivity Selector
TUNER		TUNER	"A" POSITION	TUNER	STEREO or MIX	SOURCE	OFF ■	NORMAL	TO BE BALANCED	—
RECORD PLAYER	HIGH LEVEL OUTPUT P.U.	PHONO 1	"A" POSITION	PHONO 1	STEREO or MIX	SOURCE	OFF ■	NORMAL	TO BE BALANCED	—
		PHONO 2		PHONO 2						HIGH
	* LOW LEVEL OUTPUT P.U.	PHONO 2	"A" POSITION	PHONO 2	STEREO or MIX	SOURCE	OFF ■	NORMAL	TO BE BALANCED	LOW
TAPE RECORDER (From Line output)		A PLAY	"A" POSITION	ANY POSITION	STEREO or MIX	A PLAY	OFF	NORMAL	TO BE BALANCED	—
		B PLAY				B PLAY	■			
MICROPHONE		MIC	"A" POSITION	MIC	STEREO or MIX	SOURCE	OFF ■	NORMAL	TO BE BALANCED	—

NOTES : This chart shows connecting points of associated equipment and the settings of the various amplifier controls for normal operation .....

1. . . . when "A" speaker system only is used.
2. . . . when all sources are stereophonic.  
(for monaural sources with input connected to one side only, set MODE to MIX).
3. Keep MUTING at OFF except when required.
4. Set STEREO MODE to NORMAL for ordinary 2-channel stereo.
5. To rectify left-right imbalance, play monophonic record. Adjust BALANCE for minimum speaker response while pressing NULL BALANCE switch "IN"
6. Adjust VOLUME, TONE CONTROL, LOUDNESS, HI-FILTER and LOW-FILTER as required.



# TAPE RECORDER CONNECTIONS & OPERATIONS

## CONNECTIONS

Special circuitry in the KA-5002 amplifier makes it possible to make connections to two taperecorders.

### 1. PIN JACKS

When only one taperecorder is used, connect "A" REC amplifier-side jacks to the input jacks of the taperecorder. Also connect "A" PLAY amplifier jacks to the output jacks of the taperecorder.

In the same manner, another taperecorder can be connected to the respective "B" jacks of the amplifier.

### 2. R. P. CONNECTOR (DIN CONNECTOR)

Normally for most recording and playback, separate cables must be connected between the taperecorder and amplifier unit. However, if your taperecorder is equipped with a DIN cable 5-pin type connector, this single cable connection will suffice. The KA-5002 is equipped with a special connector to accept this cable plug.

## PLAYBACK

1. Push the POWER switch to turn power on.
2. The INPUT selector switch can be at any position.
3. Set TAPE MONITOR switch to A PLAY for playback of taperecorder connected to "A" jacks, and to B PLAY for "B" jack-linked taperecorder.
4. Start the taperecorder.
5. Adjust volume and tone quality as explained under "Operating Instructions."

## TAPE MONITORING

The KA-5002 incorporates a Tape Monitoring circuitry enabling you to monitor while you record.

### 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-5002. And, for playback of the recorded tape through the KA-5002 speaker system, set to A PLAY or (B PLAY) whichever the case may be.

### 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. When operating the KA-5002 in conjunction with three-head type recorders, set the TAPE MONITOR switch to A PLAY or (B PLAY). This enables monitoring the recording and fully controlling level, acoustic balance, microphone position, etc.

## DUBBING

To make a copy of a recorded tape on to another tape, follow the connecting diagram shown in Figure 9 and the steps below.

1. Push POWER switch to turn power on.
2. The INPUT selector switch can be at any position.
3. Set the TAPE MONITOR switch to DUBBING (A → B) when it is desired to copy recorded material on "A" jack-side taperecorder for re-recording on "B" jack-side taperecorder.  
Set the TAPE MONITOR switch to DUBBING (B → A) when it is desired to copy a recording on "B" jack-side taperecorder for re-recording on "A" jack-side taperecorder.
4. Operate both taperecorders simultaneously.

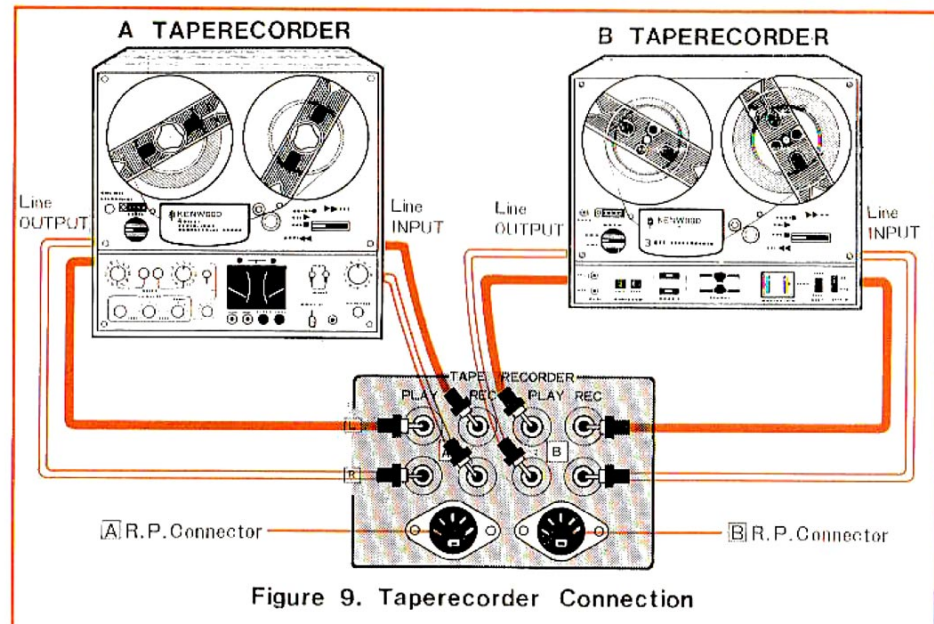


Figure 9. Taperecorder Connection

# SUPPLEMENTARY INFORMATION

## PROTECTION CIRCUITS

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 output power transistors. The program sound will be heard off and on intermittently. In this case, there is no fear of damaging the output power transistors. Just switch off the supply line and check the connections.

## FUSE

A standard 2A shield fuse is used. (Set sold in Europe 1A shield fuse is used). If fuse failure is ever encountered, check carefully all causes for the blow-out. Any trouble in the power supply circuit will cause the fuse to blow again. In such a case, consult a qualified serviceman.

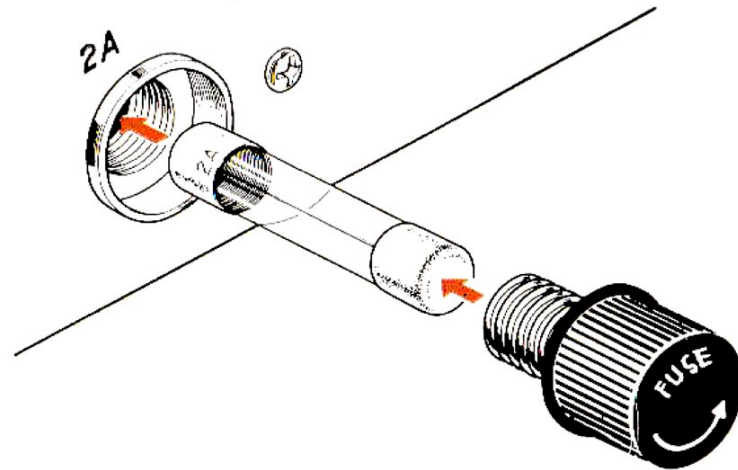


Figure 10. Replace a Fuse.

Sometimes a fuse may fail by itself. In such a case, rotate the fuse holder to the left. Remove old fuse and replace with the same type 2A fuse. See Figure 10. Never substitute a copper wire, even temporarily, for a blown fuse. Always disconnect power supply before replacing a fuse.

## 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 for any acoustic feedback that may be encountered.

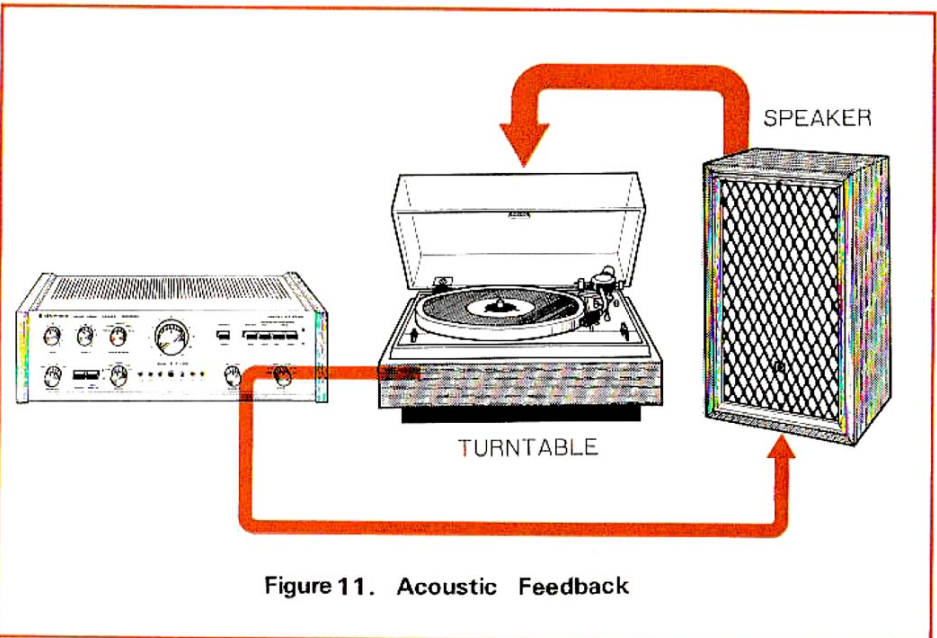


Figure 11. Acoustic Feedback



# TROUBLE SHOOTING

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

## INDICATIONS

During Tuner or Record Operation	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 switched to A & B SPEAKERS position. Speaker cords disconnected. SPEAKERS switched to OFF.  Volume Control at 0 (extreme left) TAPE MON switch at A PLAY (or B PLAY) or DUBBING position. PRE-MAIN SEPARATE switch at SEPARATE position.	Both A-B groups of speakers are required in this case for response from both sides. Check connections from amp. output to speakers. SPEAKERS should be switched to OFF only when using stereo headphones. Set to appropriate volume level. Always set to SOURCE except when using tape recorders. Always set to NORMAL except when using together with multi-channel system.
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.
Intermittent Response.	Protection Circuit indication of short circuit in the left or right output.	Check speaker cord connections.
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 Operation 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.  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 terminals.
Sound audible but continuous background buzz interferes.	TV signal picked up by player output cord. Frequently occurs near TV transmitting antenna.	Route player cord so buzz 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.

# SPECIFICATIONS

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## POWER OUTPUT:

60 watts RMS continuous power. 30 watts per channel with both channels operating simultaneously with 8 ohms load at any frequency from 20 Hz to 20,000 Hz.

48 watts per channel at 4 ohms load. (1000 Hz)

25 watts per channel at 16 ohms load. (1000 Hz)

150 watts IHF total music power at 4 ohms load.

120 watts IHF total music power at 8 ohms load.

## HARMONIC DISTORTION:

Less than 0.5% at rated output from 20 Hz to 20,000 Hz

## INTERMODULATION DISTORTION: (60 Hz & 7,000 Hz 4:1)

Less than 0.3% at rated output or at any level of less than rated output.

Less than 0.1% at -3 dB rated output.

## FREQUENCY RESPONSE:

High Level input: 20 Hz to 50,000 Hz  $\pm 1$  dB

## SENSITIVITY: (for rated output at 8 ohms load)

PHONO 1: 2.5 mV

PHONO 2: 0.06 mV 2.5 mV (Switchable)

MIC: 2.5 mV

AUX 1, 2: 200 mV

TUNER: 200 mV

TAPE PLAY A, B: 200 mV

MAIN AMP. INPUT: 1 V

## INPUT IMPEDANCE: (at 1,000 Hz)

PHONO 1 (2.5 mV): 30 K ohms, 50 K ohms (Switchable)

PHONO 2 (0.06 mV): 200 ohms

PHONO 2 (2.5 mV): 50 K ohms

MIC: 50 K ohms

AUX 1, 2: 100 K ohms

TAPE PLAY A, B: 100 K ohms

MAIN AMP. INPUT: 50 K ohms

## SIGNAL TO NOISE RATIO: (below rated output)

PHONO 1 (2.5 mV): 65 dB

PHONO 2 (0.06 mV): 45 dB

PHONO 2 (2.5 mV): 65 dB

MIC: 67 dB

AUX, TUNER, TAPE PLAY: 77 dB

Noise at minimum volume control: 0.5 mV at 8 ohms, 0.0003 milliwatts.

## MAXIMUM INPUT SIGNAL:

310 mV (P-P 1000 Hz) at PHONO 1 input.

## OUTPUT IMPEDANCE: (at Speaker Terminal)

0.25 ohms from 50 Hz to 10,000 Hz

## DAMPING FACTOR:

90 at 16 ohms load.

45 at 8 ohms load.

**LOW FILTER: (for rumble)** 80 Hz Cutoff, 12 dB per octave.

**HIGH FILTER: (for scratch)** 7,000 Hz cutoff, 12 dB per octave.

**BASS CONTROL:**  $\pm 10$  dB at 100 Hz with 2 dB step switch.

**TREBLE CONTROL:**  $\pm 10$  dB at 10,000 Hz with 2 dB step switch.

**LOUDNESS CONTROL:** (at -30 dB) at 100 Hz + 8 dB, at 10,000 Hz + 3 dB.



# SPECIFICATIONS

## INPUT:

Pair of Phono 1, Phono 2, MIC, AUX 1, 2, Tape Play A, B, 4 Channel and Main Amp. Inputs.

## OUTPUT:

2 pairs of stereo speaker outputs (4 to 16 ohms), pre-amp. outputs, Tape Recording outputs A and B, DIN standard Tape Rec/Play connector A and B, Switched and Unswitched AC outlets, and 4 channel output.

## CONTROLS:

Phono 1, Impedance Selector Switch, Phono 2 Level Switch, Input Selector Switch, Tape monitor Switch, Speaker Selector Switch, Volume Control, Balance Control, Bass Control Switch, Treble Control Switch, Muting Switch (— 20 dB), Loudness Contour Switch, Low Filter Switch, High Filter Switch. Stereo Mode Switch, NULL Balance Switch and PRE-MAIN Separate Switch.

## SPECIAL FEATURES:

- \* Direct coupling power amplifier.
- \* Tape monitor and Dubbing Switch for 2 tape recorders.
- \* Low level Phono input (0.06 mV) for Moving coil type or Low level output cartridges.

- \* 2 set of Stereo Speaker terminals and front panel Speaker selector switch.
- \* 4 channel input, output terminals, and volume control.
- \* Phono input impedance selector.
- \* 2 dB step tone controls switch.
- \* Null Balance switch.
- \* Power transistor protection circuit.
- \* — 20 dB muting switch.
- \* Light-up input indicators.
- \* Pre-amp. output.
- \* Main amp. input.
- \* Stereo phone jack on front panel.

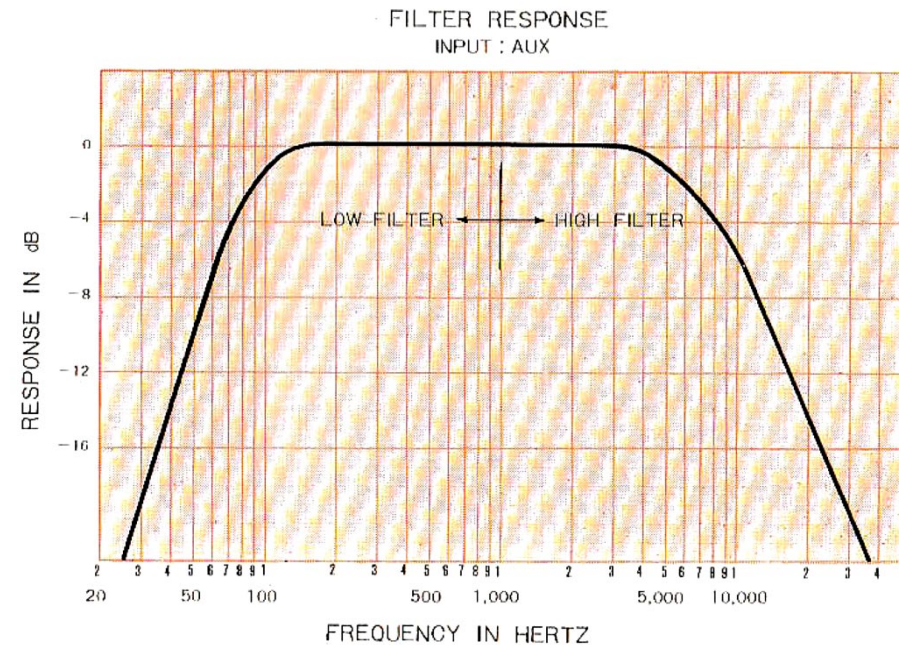
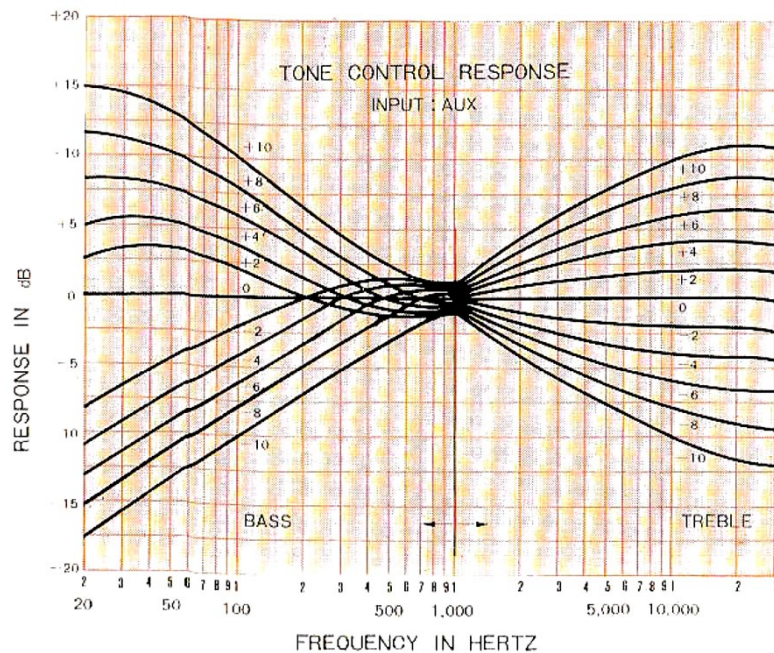
## POWER CONSUMPTION:

AC 110 - 120 / 220 - 240 volts 50/60 Hz  
15 watts quiescent, 200 watts at full power.

## DIMENSION: (not including control Knobs)

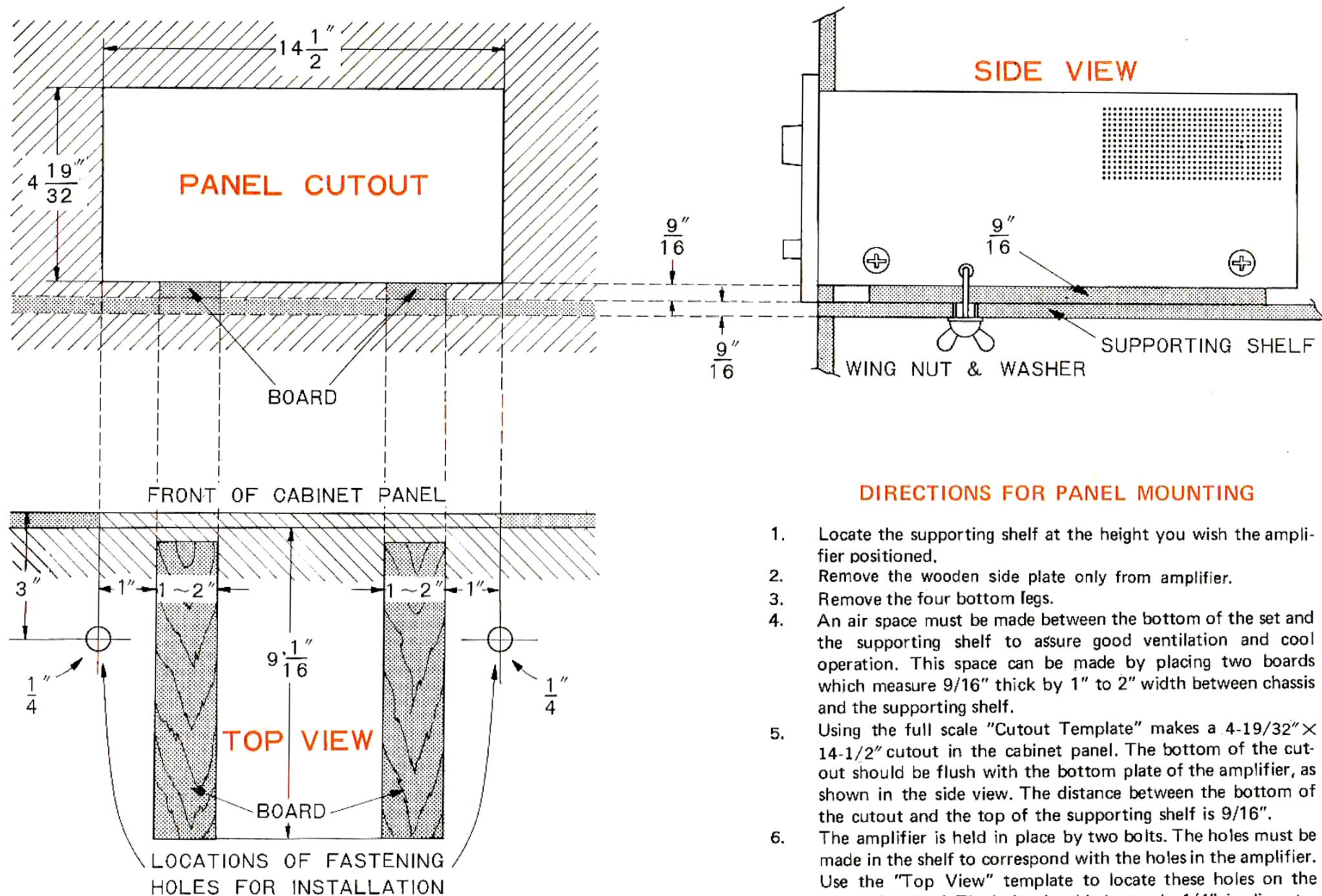
Width 16-15/16", Height 5-5/32", Depth 11-1/16"

WEIGHT: 20 Lbs.





# MOUNTING TEMPLATE





# NOTES

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*KA-5002 Serial No.* \_\_\_\_\_

*Owner* \_\_\_\_\_



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