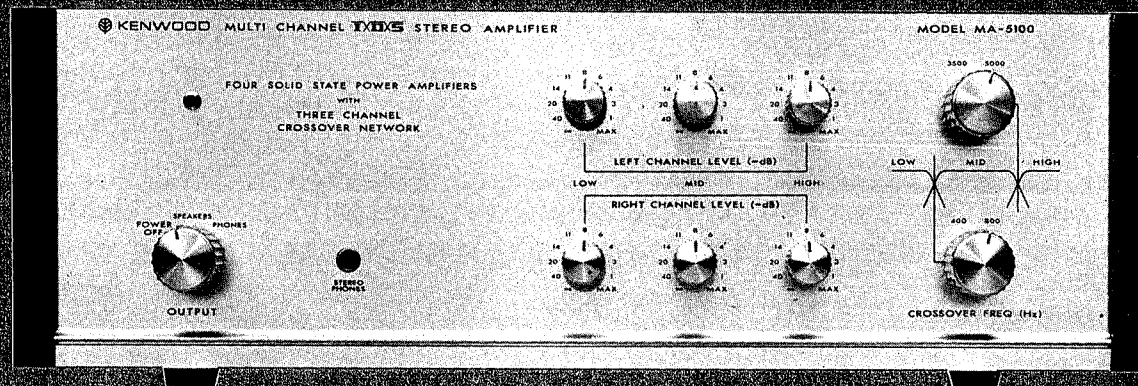




# MA-5100

## MULTI CHANNEL **IXDS** STEREO AMPLIFIER



INSTRUCTION MANUAL

**To the New MA-5100 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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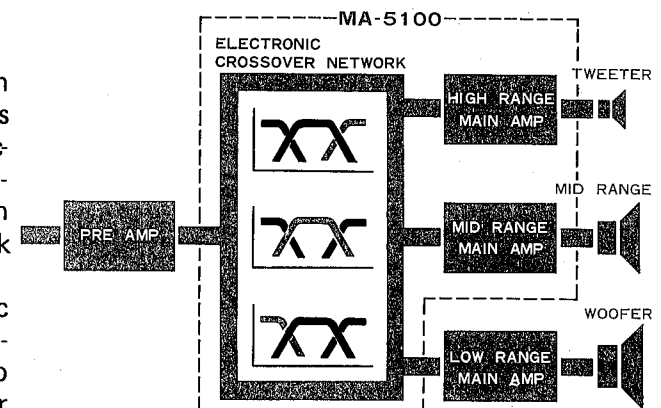
# SPECIAL MA-5100 FEATURES

- 1. 4 sets of built-in power amplifier**  
Model MA-5100 self-contains 4 sets of built-in power amplifiers, 2 sets each for the L and R channels as the high and mid range amplifiers. The high range amplifiers provide a total music power output of 22 watts (IHF 4 ohms) and the mid range amplifiers of 46 watts (IHF 4 ohms) in total.  
Thus, model MA-5100 enables you to easily turn your stereo system on hand into a multi-channel amplifier system of 3 channels or to drive a fullfledged multi-channel system with a sufficient operational margin.
- 2. Electronic crossover network incorporated**  
An electronic crossover network, incorporated in model MA-5100, provides an electronic crossover response of 12 dB/oct to allow you to select either of two crossover frequency ranges. This makes model MA-5100 adaptable for all types of amplifier and stereo receiver.
- 3. Channel selector switch**  
The channel selector switch enables you to operate model MA-5100 either on a multi-channel or full-range sound reproduction basis as desired.
- 4. DIRECT output jack**  
The DIRECT output terminal provides means to directly derive the signal applied to the INPUT terminal. This is very useful when you want to operate a measuring set such as our model KC-6060 for some purpose.
- 5. HEADPHONE jack**  
The headphone jack, provided for connection of a headphone, enables you to use the headphone even during the time when model MA-5100 is being driven as the component of a multi-channel amplifier system.

## MULTI CHANNEL **IDS** STEREO SYSTEM

The multi-channel amplifier system is an epoch-making music sound reproduction system featuring two systems of the high, mid and low range main amplifiers. These amplifiers electrically divide the inputted stereo program into high, mid and low range signals respectively to supply the stereo outputs to two speaker systems, each comprising a tweeter, mid-range and woofer speakers. This has made it possible for the multi-channel amplifier system to have sound output completely shut out any gruff sound, which was the greatest setback of conventional full range amplifier system to the enthusiasts for music.

KNEWOOD's multi-channel stereo amplifier MA-5100, named IDS (Inner Electronic Dividing System), is designed exclusively to allow you to realize the above wonderful multi-channel amplifier system only by making use of your favorite pre-main amplifier or stereo receiver. Get our model MA-5100 to turn your favorite set into the multi-channel amplifier system and you can be entertained with a music sound of clear and deep tone, which is free from any gruff sound.



# CONTROLS AND THEIR FUNCTIONS

## 1. STEREO PHONES jack

When you want to amuse yourself with a stereo output using headphones, plug the headphone in this jack with 4 OUTPUT switch set to position PHONES, and you can enjoy the music sound delivered on the full range reproduction basis through the headphones.

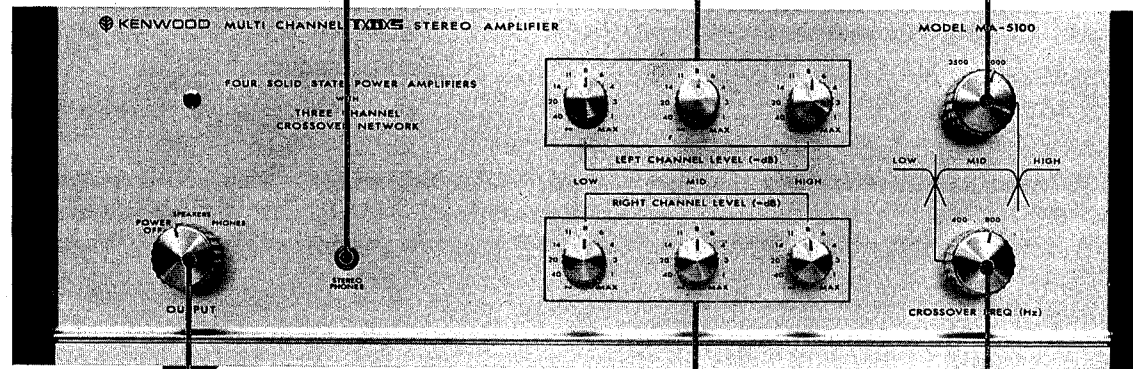
## 2. LEFT CHANNEL LEVEL Control

- LOW — Low range
- MID — Mid range
- HIGH — High range

This control may also be used as a quality control of tone.

## 3. MID/HIGH crossover selector switch

Generally set this switch to position 5000 Hz as a standard. In practice, however, set the switch to either of positions 5000 Hz and 3500 Hz for which your ears actually identify a better sound output.



## 4. OUTPUT selector switch

■ POWER OFF — Shuts off the power of the amplifier unit. Also, connects the INPUT jack directly to the LOW OUTPUT jack.

■ SPEAKERS — Turns on the amplifier unit with the sound output delivered through the speakers.

■ PHONES — Switch position for listening the stereo output through the headphones. For this position, speakers are silenced and the full-range stereo output is delivered through the headphones from the STEREO PHONES jack.

## 5. RIGHT CHANNEL LEVEL control

- LOW — Low range
- MID — Mid range
- HIGH — High range

This control may also be used as a quality control of tone.

## 6. LOW/MID crossover selector switch

Generally set this switch to position 800 Hz as a standard. In practice, however, set the switch to either of positions 800 Hz and 400 Hz for which your ears actually identify a better sound output.

# CONTROLS AND THEIR FUNCTIONS

## 7. INPUT jack

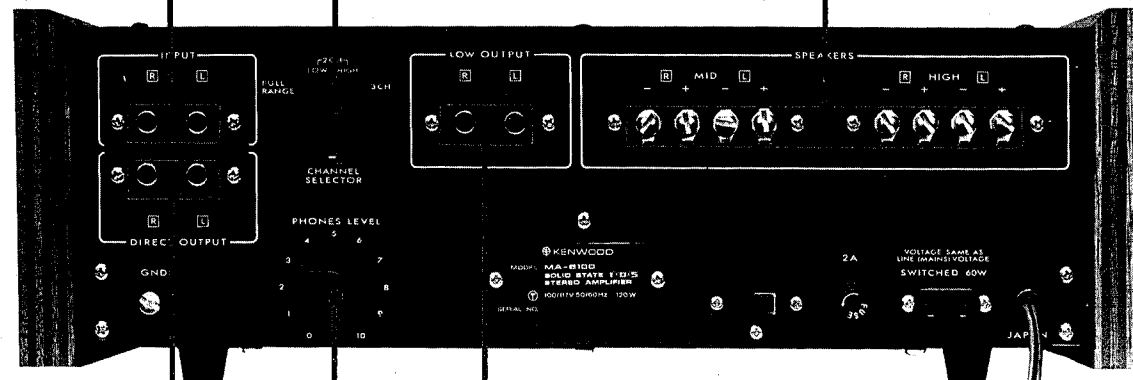
Connect the left and right channel outputs of pre-amplifier correctly to their associated terminals.

## 8. CHANNEL SELECTOR switch

- 3CH — Selects a 3-channel amplifier system.
  - 2CH — Selects a 2-channel amplifier system.
- HIGH** — Set the switch to this position when you select a crossover frequency of 3500 or 5000 Hz
- LOW** — Set the switch to this position when you select a crossover frequency of 400 or 800 Hz.
- FULL RANGE — Selects a full range amplifier system.

## 9. SPEAKERS connecting terminals

- MID — Terminals for mid range speakers
  - HIGH — Terminals for Tweeters
- Connect the lines of the left and right channel speakers correctly to their associated terminals with the positive polarities of the leads of each line selected properly. Speakers are adaptable for these terminals provided that they offer an input impedance of 4 to 16 ohms.



Note: Never set CHANNEL SELECTOR switch to the position other than that intended for use of this amplifier unit.

## 10. DIRECT OUTPUT jack

The signal applied to INPUT jack is repeated as it is to this jack. Make use of this jack when you want to use a measuring set for some purpose.

## 11. PHONES LEVEL control

This control provides means to set the headphones to an appropriate level compared with that of the sound output heard from the speakers.

## 12. LOW OUTPUT jack

Connect this jack to the low-range main amplifier when this amplifier unit is to be operated as the component of a 3-channel amplifier system.

Note: This jack provides an output which has not passed through a main amplifier. Never fail, therefore, to use the output after connecting it to a main amplifier.

# CONNECTIONS AND OPERATIONS

## 1. Multi-channel Amplifier System

### Combinations of component sets

Model MA-5100 may be operated with your favorite audio sets in the following combinations of the sets to realize a 3-channel amplifier system. Fig. 1 shows a connection of a 3-channel amplifier system composed under combination (a).

- (a) Model MA-5100 + Stereo receiver (with PRE-OUT and MAIN-IN terminals)
- (b) Model MA-5100 + Pre-main amplifier (with PRE-OUT and MAIN-IN terminals)
- (c) Model MA-5100 + Pre-amplifier + Main amplifier

The main amplifier of the stereo receiver or pre-main amplifier and the independent main amplifier is used as the one for the low range sound output. Therefore, if you use a main amplifier providing a music power of 45W or more (4 ohms load) for the low range, the 3 channels provide their outputs distributed in an ideal form over the entire sound output range to allow model MA-5100 to fully demonstrate its performance. Even if you employ an amplifier having a music power of less than 45W, it exerts no effect to the sound quality of the amplifier system except that the maximum output is lowered more or less.

### Speaker system

As for the speaker system, it is advisable to use such system as our speaker system model KL-7080, KL-5080 or KL-4080, which is equipped with the connecting terminals for multi-channel use.

### Interconnections of component sets

Fig. 1 illustrates an example of a 3-channel amplifier system composed by interconnecting this MA-5100 with KENWOOD Stereo Receiver KR-6160.

When a stereo receiver or pre-main amplifier other than KR-6160, proceed in the same manner as illustrated in Fig. 1 to connect the output of pre-amplifier to the INPUT of MA-5100 and the LOW OUTPUT of MA-5100 to the input terminal of main amplifier.

In making the above connections, observe the followings:

- (a) Connect between the left and right channels of the MA-5100 and a pre-amplifier or similar set using the audio cords with plug pin attached to each end, supplied with the MA-5100.
- (b) Connect the spare plug socket (SWITCHED) of the amplifier set to be connected to this MA-5100 to a power line available and both the amplifier set to be connected and MA-5100 may be turned on or off by means of the power switch on the amplifier set to be connected.
- (c) The MA-5100 is so designed that it provides a crossover slope of 12dB/oct.

Therefore, connect the lines from the speakers for mid-range sound outputs to the MID terminals of MA-5100 with the positive and negative leads of the lines crossed as shown in Fig. 1. That is, connect the negative lead from the mid-range speaker to the positive MID SPEAKER terminal of MA-5100 and the positive lead to the negative MID SPEAKER terminal to invert the phase.

- (d) Never fail to connect the high, mid and low range speaker units to the outputs of their associated channels. **If a tweeter is driven by a mid or low range amplifier by mistake, then the tweeter may be damaged.**

### Crossover frequency

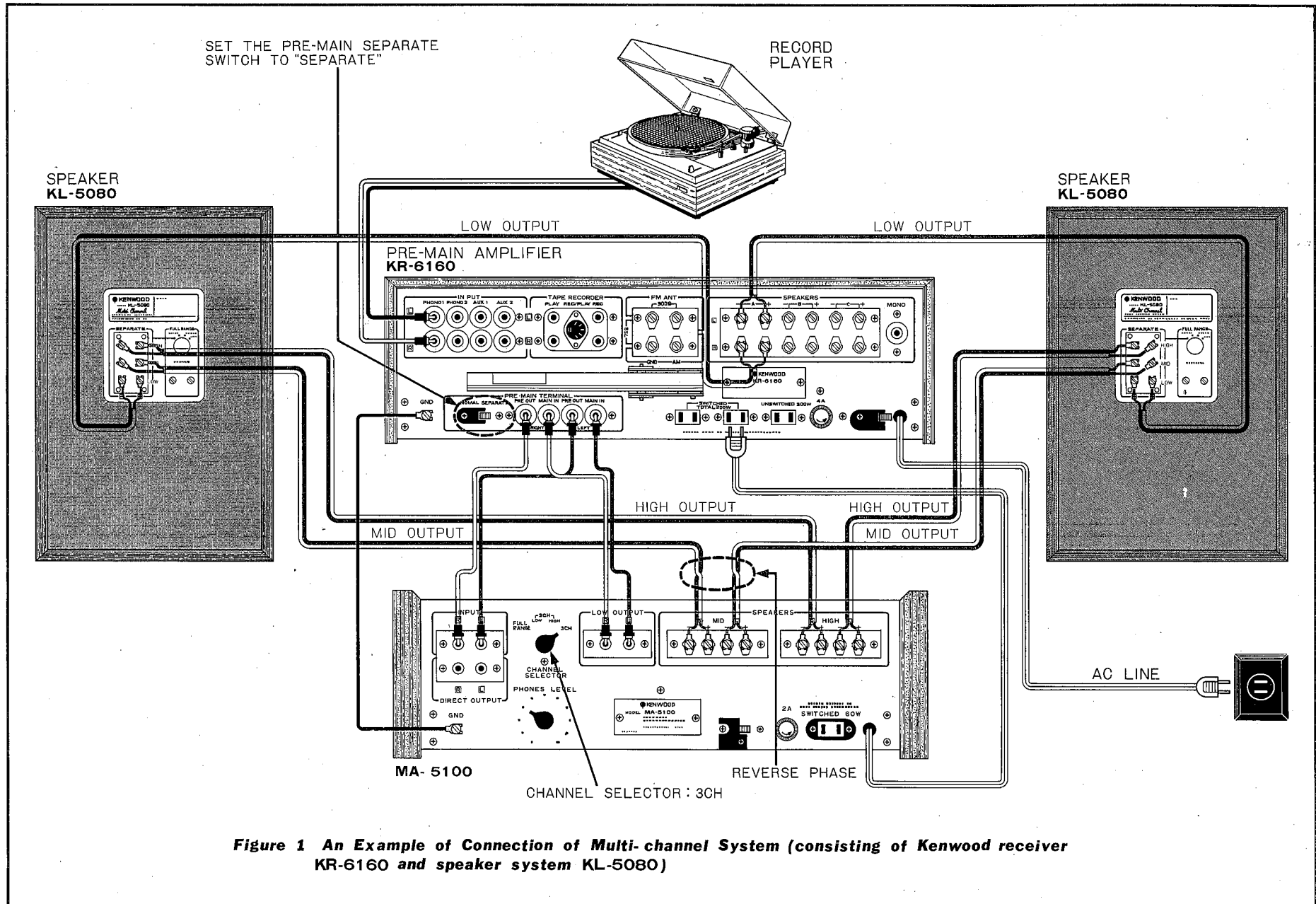
A speaker is generally designed to provide a crossover frequency of 800 and 5000 Hz as a rule. But if this crossover frequency is unknown, set the MID/HIGH and LOW/MID crossover switches for the optimum crossover frequency while listening in it until you feel that the speaker is delivering the best sound output.

### Level setting of each channel

When it is made sure that the components of a multi-channel amplifier system are interconnected properly, proceed to level setting of each channel as described. Repeat this level setting several times until all channels provide the best sound outputs, as delivered from all the speakers. This is because the level setting turns out to be the key point in operating a multi-channel amplifier system.

- (a) Set the CHANNEL SELECTOR switch on the rear side of MA-5100 to position 3CH.
- (b) Turn both the LOW level controls for the right and left channels on the MA-5100 to the MAX positions respectively and all other level controls to the minimum ( $\infty$ ) positions.
- (c) Adjust the tone control of the amplifier set connected to the MA-5100 until the set operates on the flat range of its characteristic.
- (d) If the amplifier set connected to the MA-5100 as the main amplifier for the low range sound output is provided with a level control, set the level control to the maximum position too.
- (e) Then the multi-channel amplifier system to on and, while playing a record as a program source, slowly turn the master volume control (on the pre-main amplifier or the pre-amplifier) until only a low range sound is delivered from the speakers. Set the volume control at an appropriate position. Use a record familiarized in daily life is selected for the above operation and you may identify the levels of all channels well.
- (f) Gradually turn both the left and right MID LEVEL controls on the MA-5100 clockwise under the above condition and the mid-range speakers start to deliver

# CONNECTIONS AND OPERATIONS



**Figure 1 An Example of Connection of Multi-channel System (consisting of Kenwood receiver KR-6160 and speaker system KL-5080)**

# CONNECTIONS AND OPERATIONS

the mid-range sound output. Set the controls mentioned above until the low and mid range sound outputs are harmonized with each other in the most natural way as an overall sound, although the sound outputs include no high range sound output.

- (g) Then, turn both the left and right HIGH LEVEL controls clockwise until the overall sound becomes uniform from the low to the high range sound outputs with the sound outputs from the left and right channels balanced well.
- (h) It is a general practice for the sound quality adjustment of a multi-channel amplifier system to perform the adjustment on the pre-main amplifier set connected to MA-5100.

But, it is also possible to adjust the system for the sound quality fitted best to you.

## How to use headphones

When listening the sound outputs of a multi-channel amplifier system through headphones, never fail to plug the headphones into the STEREO PHONES jack on MA-5100.

Setting the OUTPUT switch to the PHONES position under the above condition disables the speakers from delivering the sound outputs, thereby allowing the

outputs to appear in the headphones as the full range sound.

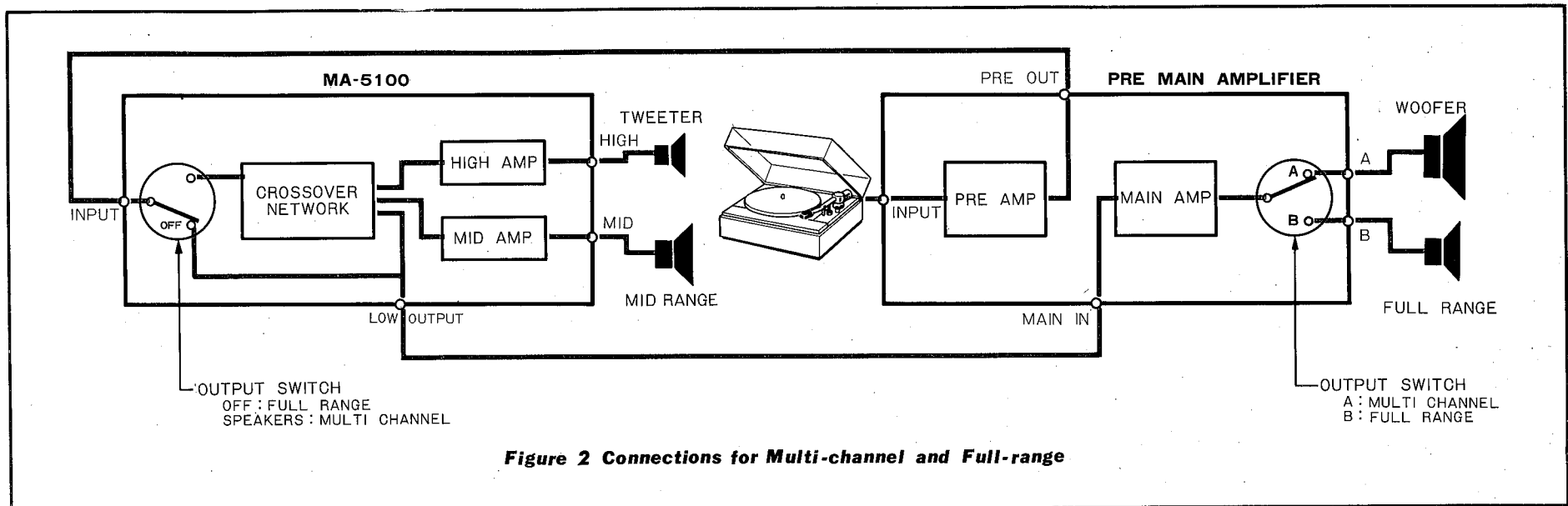
Be careful during the above step not to plug the headphones in the headphone jack on the amplifier set connected to the MA-5100. Otherwise, the speakers will deliver only the low range sound outputs.

To adjust the headphones for their levels compared with those of the speakers, turn and set the PHONE LEVEL control on the rear side of MA-5100 to a setting for which the headphone deliver their sound output at an appropriate levels. Once set, the above LEVEL control should not be manipulated so often and the levels of headphones should be performed on the pre-main amplifier set connected to MA-5100.

## Connections for multi-channel and full range sound output

The model MA-5100 may be operated for either the multi-channel or the full range sound outputs provided that it is connected to a stereo receiver with 2 or 3 sets of output terminals "A", "B" and "C" as follows: (See Fig. 2).

1. Connect the woofers for the multi-channel sound outputs to the "A" set of output terminals and the speakers for the full range sound outputs to the "B" or "C" set of output terminals.
2. Turn the OUTPUT switch on the MA-5100 to OFF. (This connects the





# CONNECTIONS AND OPERATIONS

INPUT terminal directly to the LOW OUTPUT terminal in the MA-5100 and also turns off the MA-5100.)

Set the OUTPUT switch on the stereo receiver connected to the MA-5100 at the "B" or "C" position. This allows the stereo receiver to deliver its sound outputs through the full range speaker.

- To operate the above receiver and MA-5100 as a multi-channel amplifier unit, set the OUTPUT switch on the MA-5100 to the SPEAKER position and that of the receiver to the "A" position and the receiver and MA-5100 will operate as a multi-channel amplifier system.

## 2. Connections and Operations as Full Range Amplifier System

When this MA-5100 is operated as a full range amplifier system with full range speakers connected to it as they are, proceed as follows (Refer to Fig. 3):

- With the output of a pre-amplifier connected to the INPUT terminal of MA-5100, connect full range speakers to the MID SPEAKER terminals.
- Set the CHANNEL SELECTOR switch on the rear side of MA-5100 to the FULL RANGE position.
- With the MID level control on the front panel of MA-5100 kept in the MAX

position, adjust the volume of speakers by means of the volume control on the pre-amplifier.

- Note that there appears no output at the HIGH SPEAKER terminal provided that the CHANNEL SELECTOR switch on the rear side of MA-5100 is in the FULL RANGE position.

When the CHANNEL SELECTOR switch of MA-5100 is switched to the FULL RANGE position as mentioned above, the MA-5100 can be used in the same manner as ordinary amplifiers. So, it becomes possible to drive center speaker for 3 dimension reproduction by connecting the input of MA-5100 to the MONO OUT. terminal.

### CAUTION

Set the CHANNEL SELECTOR switch without fail in accordance with the purpose of use of this MA-5100. If the switch is turned with the connections of speakers left as they are, it causes the outputs having the frequency outside the allowable frequency range to be applied to the tweeters to result in a damaged tweeter.

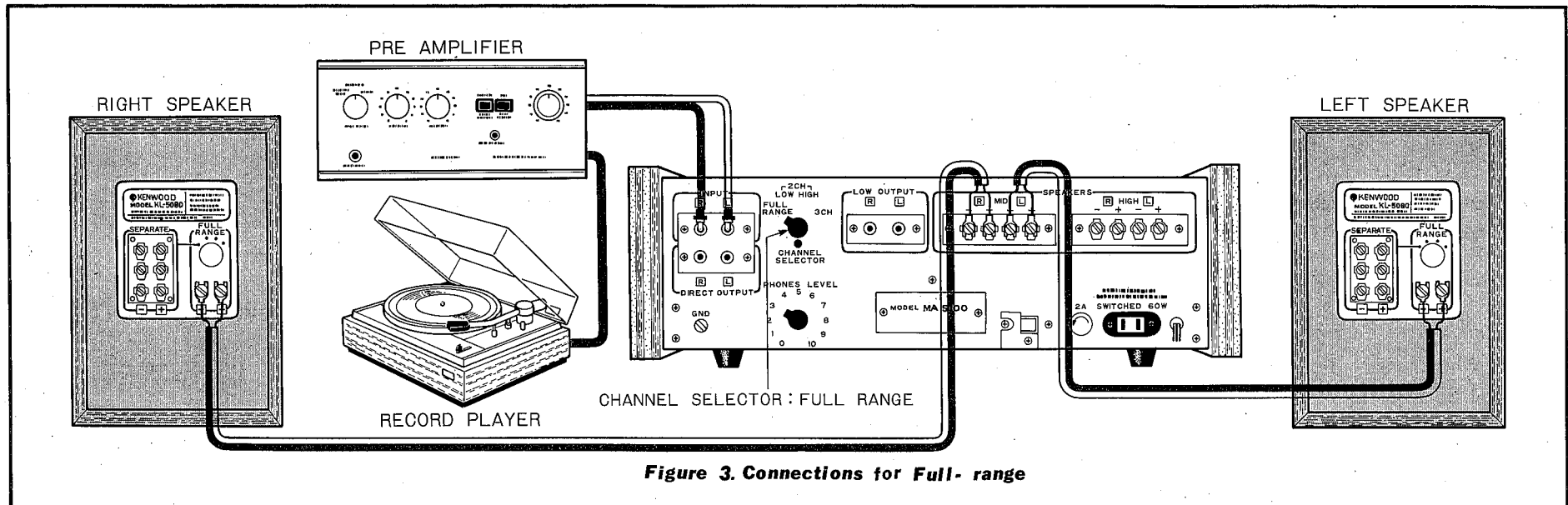


Figure 3. Connections for Full-range

# SUPPLEMENTARY INFORMATIONS

## 1. ABOUT TRANSISTORS

The model MA-5100 stereo amplifier is an all-transistorized product. Therefore, be careful not to operate the amplifier under the direct sunbeams or place it close to a heat-generating object (such as a stove). Also, mind not to operate this amplifier under an extremely high or low temperature. Otherwise the amplifier may suffer from an unstable operation.

## 2. ABOUT PROTECTION FUSE

The model MA-5100 stereo amplifier is provided with a protection fuse for its L and R channels respectively to protect a expensive output transistors (Refer to Fig. 4).

In a transistor amplifier shorting the output circuit damages the output transistors. This, however, does not apply to this model MA-5100 because the protection fuse is blown out to protect the transistors as soon as the output circuit is shorted.

If the MA-5100 fails to deliver only the high range sound outputs during reproduction of a music, check the speaker leads for any short-circuit and replace the fuse with its spare supplied, if necessary.

Note that the fuse should be replaced only after the power cord of MA-5100 is disconnected from the plug socket for AC line.

If the cause of a blown fuse is unknown, please make contact with our agency or the service section of our head office.

## 3. REPLACEMENT OF POWER FUSE

The power fuse is mounted on the rear side of this amplifier. If the fuse is blown out and disables the amplifier, inspect the cause of trouble carefully before proceeding to replacement of fuse.

But, the fuse sometimes is blown out by itself.

To replace the blown fuse, turn the cap of fuse holder in the direction of marked arrow until the fuse is exposed, and replace the blown fuse with a new fuse (2A shielded fuse).

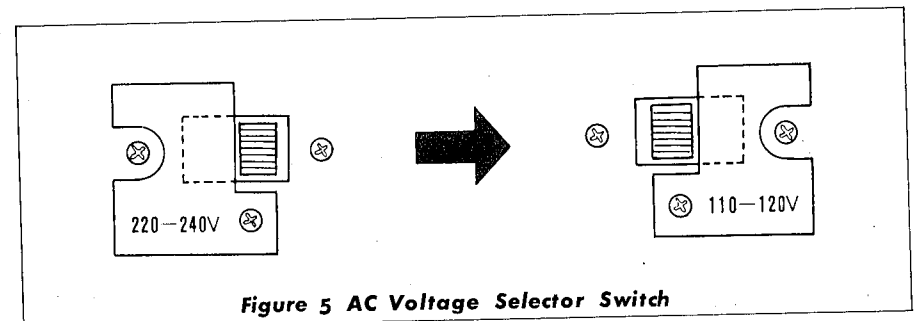
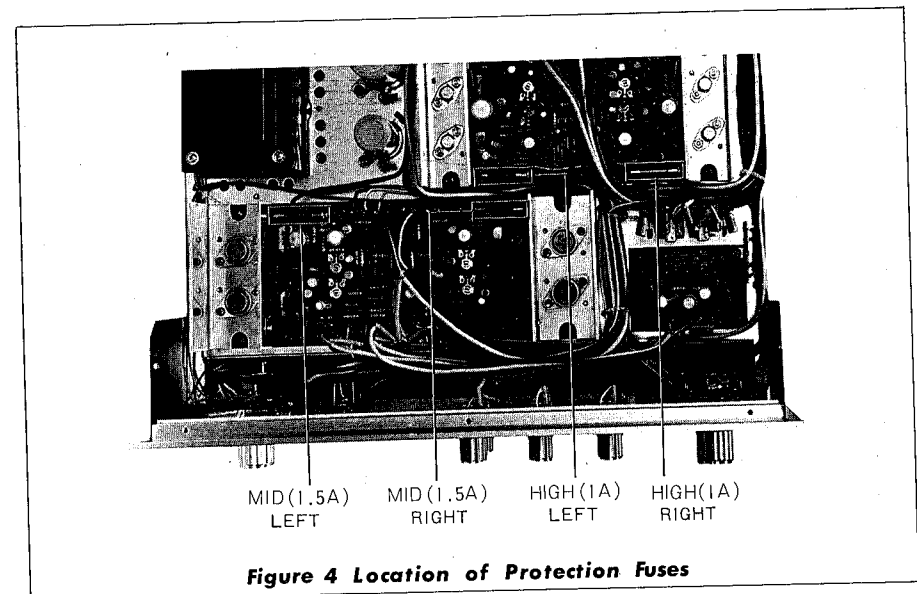
## 4. AC VOLTAGE SELECTION

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. The black plate has 220 – 240V stamped on one side and 110 – 120V stamped on the other side. Affix this black plate so that the 110 – 120V mark is visible.

Fig. 5 illustrates the AC switch set for 110 – 120 volt AC.



# TROUBLE SHOOTING

## INDICATIONS

### During Phono Record Playbacks

Indication	Cause	Correction
Pilot lamp remains unlighted and no sound output even when power switch is turned to ON.	<ul style="list-style-type: none"> <li>Improper insertion of power cord.</li> <li>Blown power fuse</li> </ul>	<ul style="list-style-type: none"> <li>Insert power cord plug completely in plug socket.</li> <li>Replace fuse (if the fuse is blown out again, it suggests a trouble)</li> </ul>
No sound output for all of low, mid and high ranges	<ul style="list-style-type: none"> <li>Partial disconnection of the leads between record player, amplifier and MA-5100</li> <li>Volume control on amplifier set to zero</li> <li>OUTPUT switch kept in position PHONES</li> </ul>	<ul style="list-style-type: none"> <li>Check the leads for proper connection.</li> <li>Adjust volume control until the amplifier system provides an appropriate volume.</li> <li>Set OUTPUT switch to position SPEAKERS to listen in speakers' sound outputs.</li> </ul>
No sound output for any of low, mid and high ranges.	<ul style="list-style-type: none"> <li>Disconnection between terminals LOW OUT and MAIN IN.</li> <li>Protective circuit of amplifier actuated. Or the protection fuse of MA-5100 blown out.</li> <li>All LEVEL controls on MA-5100 placed in their extremely counterclockwise positions.</li> </ul>	<ul style="list-style-type: none"> <li>Reconnect the terminals</li> <li>Check speaker terminal for short-circuit. Replace protection fuse, if required.</li> <li>Proceed to level setting</li> </ul>
Sound output delivered only from either L or R channel	<ul style="list-style-type: none"> <li>Disconnection of leads connecting between record player, MA-5100 and speakers.</li> <li>One of mated level controls placed in extremely counterclockwise</li> <li>Balance control on amplifier turned to extremely one direction.</li> </ul>	<ul style="list-style-type: none"> <li>Reconnect the leads.</li> <li>Adjust L and R channel level controls to balance L and R channel sound outputs</li> <li>Adjust the control to establish balance between L and R channels.</li> </ul>
Noise delivered several seconds after switching on.	Parts of MA-5100 circuit not placed in their complete operating condition.	Operate volume control 5 - 6 seconds after switching on.
No sound output through headphones plugged.	PHONES LEVEL control left in zero position.	Adjust PHONE LEVEL control.
Hum generated.	<ul style="list-style-type: none"> <li>Improper connection between player amplifier MA-5100.</li> <li>Connecting cord between player and amplifier run close to power line.</li> </ul>	<ul style="list-style-type: none"> <li>Check the connection.</li> <li>Separate the connecting cord from the power cord.</li> <li>Adjust location of the connecting cord until the hum is reduced to a minimum and fix the cord in that position.</li> </ul>
Unclear sound outputs	<ul style="list-style-type: none"> <li>Incomplete adjustment of each LEVEL control of MA-5100.</li> <li>Improperly positioned CROSSOVER switch.</li> </ul>	<ul style="list-style-type: none"> <li>Proceed to level setting.</li> <li>Ascertain the crossover frequency of speaker and set the CROSSOVER switch as required.</li> </ul>

# MA-5100 SPECIFICATIONS

## POWER OUTPUT

Both Channel	Total	80 watts $\pm$ 1 dB at 4 ohms 71 watts $\pm$ 1 dB at 8 ohms
	High range amplifier:	27 watts $\pm$ 1 dB at 4 ohms 21 watts $\pm$ 1 dB at 8 ohms
	Mid range amplifier:	53 watts $\pm$ 1 dB at 4 ohms 50 watts $\pm$ 1 dB at 8 ohms

## DYNAMIC POWER OUTPUT (IHF)

Both Channel	Total	68 watts at 4 ohms 60 watts at 8 ohms
	High range amplifier:	22 watts at 4 ohms 18 watts at 8 ohms
	Mid range amplifier:	46 watts at 4 ohms 42 watts at 8 ohms

## CONTINUOUS POWER OUTPUT

Each Channel	High range amplifier:	9/9 watts at 4 ohms 8/8 watts at 8 ohms
	Mid range amplifier:	20/20 watts at 4 ohms 18/18 watts at 8 ohms
Both Channel	High range amplifier:	6/6 watts at 8 ohms
	Mid range amplifier:	13/13 watts at 8 ohms

## FREQUENCY RESPONSE (fc: cut off Frequency)

High range amplifier:	fc $\sim$ 50 kHz $\pm$ 1 dB
Mid range amplifier:	20 $\sim$ 50 kHz $\pm$ 1 dB

## POWER BANDWIDTH (IHF)

High range amplifier:	$\frac{1}{2}$ fc $\sim$ 30 kHz
Mid range amplifier:	25 $\sim$ 40 kHz

## HARMONIC DISTORTION

High & Mid range amplifier:	Less than 0.7% at rated output Less than 0.09% at -3 dB rated output
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INPUT SENSITIVITY AND IMPEDANCE 100 mV (20 K $\Omega$ )

MAX. INPUT VOLTAGE 3 V

## "LOW" TERMINAL OUTPUT VOLTAGE

input to output: 1 : 1

HUM & NOISE 85 dB

CROSSOVER FREQUENCY M/H 3.5, 5 kHz  
L/M 400, 800 Hz

SLOPE -12 dB/oct.

## DAMPING FACTOR

High range amplifier: 24 (8 $\Omega$ )  
Mid range amplifier: 32 (8 $\Omega$ )

POWER VOLTAGE AC 110-120/220-240 V  
50/60 Hz

POWER CONSUMPTION 9 watts at no signal  
120 watts at full power

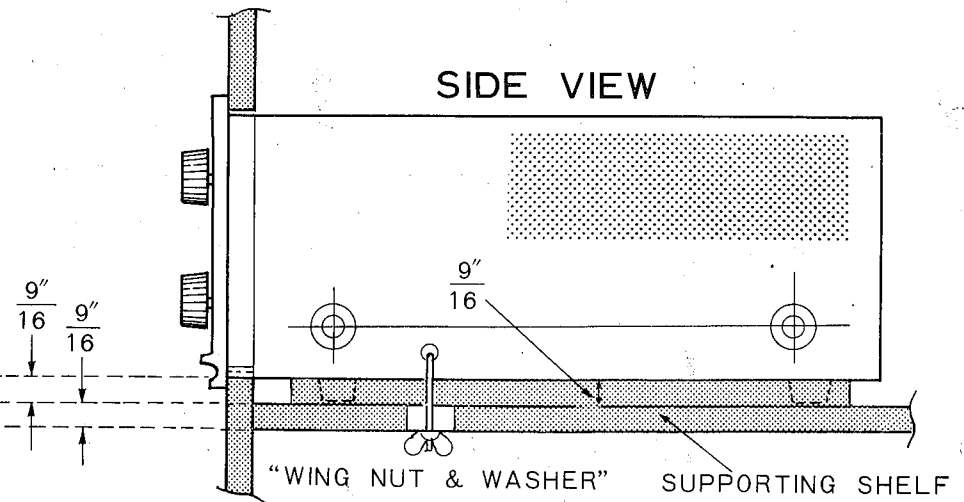
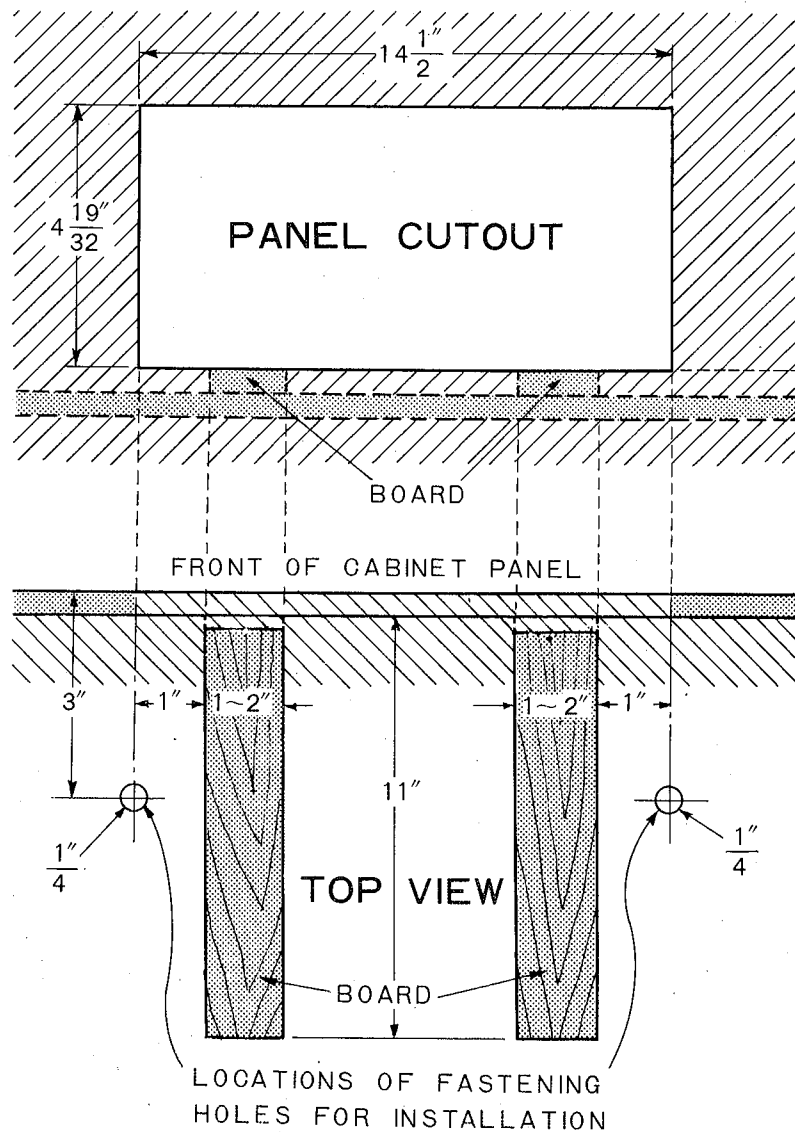
DIMENSION 16-5/16" (W) 5-5/32" (H) 11-1/32" (D)

WEIGHT 16.5 Lbs.

## ACCESSORY CIRCUIT

Headphones amplifier and jack,  
channel selector, crossover frequency  
selector (400, 800 Hz and 3.5, 5 kHz),  
direct output terminal, and signal  
through circuit

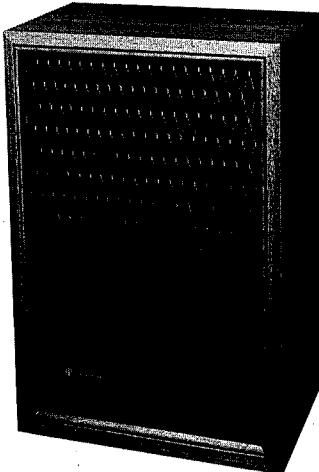
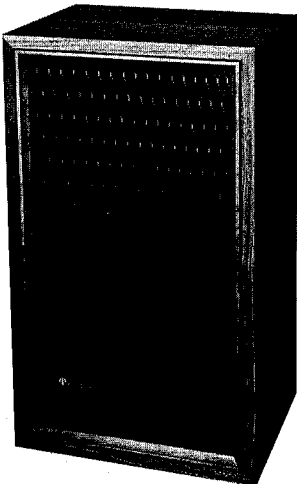
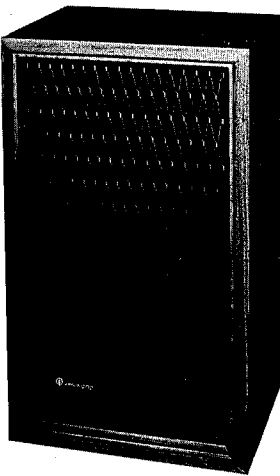
# MOUNTING TEMPLATE



## DIRECTIONS FOR PANEL MOUNTING

1. Locate the supporting shelf at the height you wish the amplifier positioned.
2. Using the full scale "Cutout Template" make a  $4\frac{19}{32}$  x  $14\frac{1}{2}$ " cutout in the cabinet panel. 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  $\frac{9}{16}$ ."
3. 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  $\frac{1}{4}$ " in diameter or somewhat larger.
4. Remove the wooden side plate only from amplifier.
5. Remove the four bottom legs.
6. 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  $\frac{9}{16}$ " thick by 1" or 2" width between chassis and the supporting shelf.

# RECOMMENDABLE SPEAKERS FOR MA-5100

MODEL	KL-7080	KL-5080	KL-4080
<b>MOUNTED SPEAKERS</b>	15" free-edge type woofer x 1 5" cone type mid-range x 1 Horn type high-mid-range x 1 Horn type tweeter x 2 1-1/4" metal cone type super tweeter x 1	12" free-edge type woofer x 1 6-1/2" cone type mid-range x 1 Horn type tweeter x 2 1-1/4" metal cone type super tweeter x 1	12" free-edge type woofer x 1 5-1/8" cone type mid-range x 1 2-3/4" cone type tweeter x 2
<b>ENCLOSURE</b>	Acoustic suspension type	Damped pipe duct bass reflex type	Damped pipe duct bass reflex type
<b>MAXIMUM INPUT</b>	80 watts	70 watts	50 watts
<b>IMPEDANCE</b>	8 ohms	8 ohms	8 ohms
<b>SENSITIVITY</b>	102 dB	102 dB	101 dB
<b>FREQUENCY RESPONSE</b>	25 Hz to 22,000 Hz	30 Hz to 22,000 Hz	35 Hz to 20,000 Hz
<b>CROSSOVER FREQUENCY</b>	600 Hz, 2000 Hz, 5000 Hz, 10,000 Hz	600 Hz, 5000 Hz, 10000 Hz	800 Hz, 5,000 Hz
<b>CROSSOVER NETWORK</b>	12 dB/oct	12 dB/oct	12 dB/oct
<b>SPECIAL FEATURES</b>	Built-in 3 step tone selector Multi-channel amplifier system connection terminals.	Built-in 3 step tone selector Multi-channel amplifier system connection terminals.	Built-in 3 step tone selector Multi-channel amplifier system connection terminals.
<b>MULTI-CHANNEL AMPLIFIER SYSTEM</b>	570 Hz-800 Hz, 5,000 Hz	570 Hz-800 Hz, 5,000 Hz	570 Hz - 800 Hz, 5,000 Hz
<b>CROSSOVER FREQUENCY</b>			
<b>DIMENSION</b>	16-3/4"(W) x 25"(H) x 11"(D)	15"(W) x 25-1/2"(H) x 11-5/8"(D)	14-1/2"(W) x 24-1/2"(H) x 11-5/8"(D)
			

# NOTES

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*MA-5100 Serial No.* \_\_\_\_\_

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



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A Product of  
**TRIO ELECTRONICS, INC.,**  
TOKYO, JAPAN.