INSTRUCTIONS

KENWOOD DELUXE

AM-FM STEREO MULTIPLEX

RECEIVER

MODEL KW-60

DISTRIBUTOR

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At last, Stereo Multiplex is here and the KW-60 Receiver has all the circuitry necessary to receive the new FCC approved FM multiplex stereo. The KW-60 receiver needs only the addition of two speakers, and it faithfully reproduces the overwhelmingly dynamic climax of the symphonic sound, as well as all the stereo brilliance.

This newest and most impressive FM stereo Multiplex receiver is simple, versatile and handsome and it has been carefully designed under rigid engineering requirements. The KW-60 provides 30 watts per channel with less than 1% distortion, or a total of 60 watts.

1. SPECIAL FEATURES OF KW-60

1. The KW-60 provides output power of 30 watts on each stereo channel or a total of 60 watts on monaural. The KW-60 faithfully reproduces 20-20,000 cps enabling you to obtain maximum enjoyment.
2. The FCC Licensed Built-in Multiplex Adapter is provided for FM Stereo Broadcast.
3. The built-in Noise Filter provides noise-free reception of the FM Stereo Broadcast even in fringe areas.
4. Low-level noise is eliminated by the rumble filter.
5. The loudness control assures the excitement and realism of a live concert.
6. Hum is entirely eliminated with DC filament supply system adapted to the equalizer circuit.
7. Separate FM and AM meters are provided for accurate tuning.
8. KW-60 is provided with a ferrite loopstick antenna for AM. Therefore, the extra AM antenna is not required within a metropolitan area.
9. A convenient stereo headset jack is provided on the front panel. You may enjoy midnight broadcast or record playing without disturbing others.
10. The amplifier may also be used for a three speaker system.

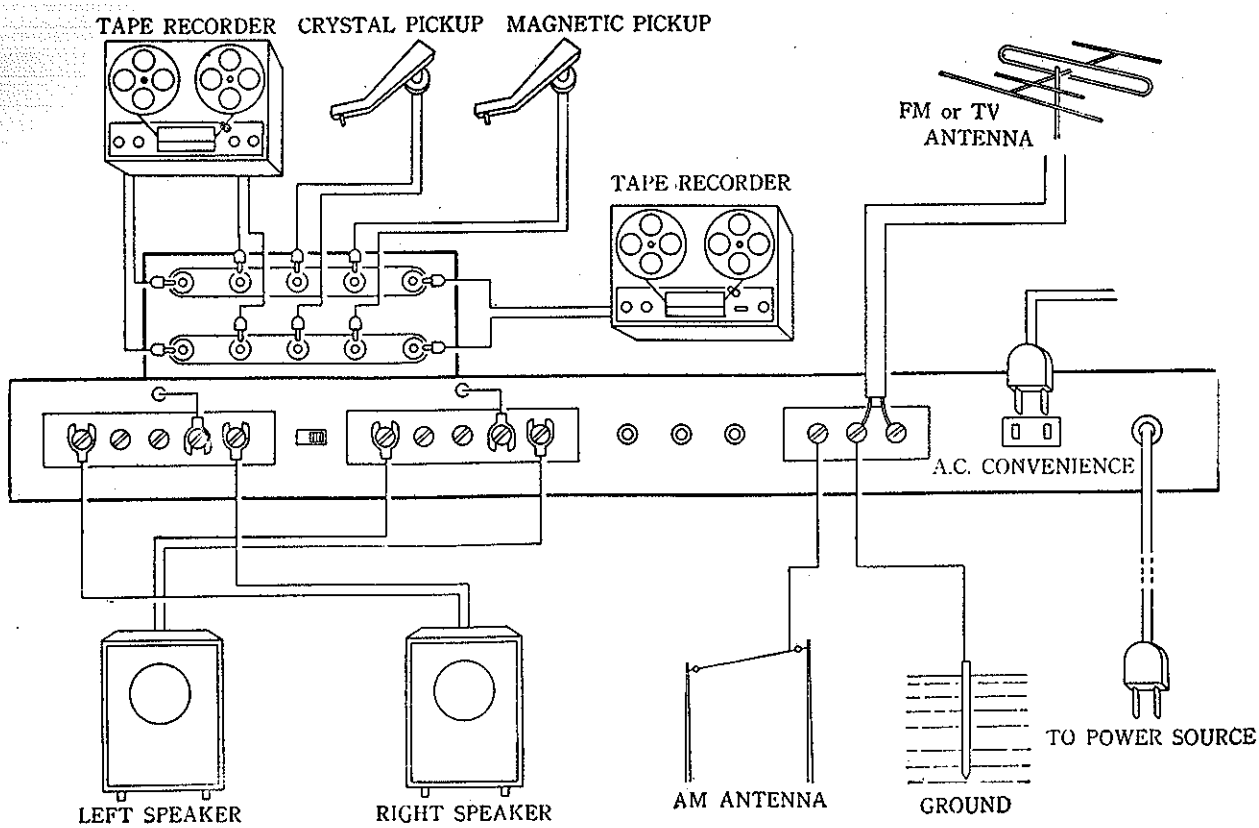

Fig. 1

2. CONNECTIONS

(A) SPEAKER CONNECTIONS . . . .

Please see the back of the amplifier for the terminals designated "LEFT SPEAKER" and "RIGHT SPEAKER".

1. Connections for Stereo

As shown in Fig. 2 connect the left speaker leads to the terminals designated "LEFT SPEAKER" and the right speaker leads to "RIGHT SPEAKER". Connect the speakers' outer terminals and connect output lead (Green) to correct impedance terminals (4 ohms, 8 ohms, and 16 ohms). See REMARKS 1.

2. Three Speaker Connections

A third speaker may be used for so-called third channel operation. When the two main speakers are placed far apart, the third or center speaker is used as a fill-in or center channel. Since the third speaker is used as a fill-in, its level should be lower than that of the two main speakers. Its impedance matching is not critical. The impedance of the third speaker should not be lower than that of either of the two main speakers. Connect one lead of the third speaker to terminal 16 of the right speaker terminal strip, the other lead to C of left terminal strip. A variable wire wound resistor of approximately 100 ohms should be connected in series with either of these leads to attenuate the level into this third speaker.

Note:

(1) Reversing the phase of center speaker will cause to decrease its sound especially in low-frequency. In this case, replace the one lead of the center speaker with the other.

(2) Please keep "SPEAKER PHASE" switch to the red dotted side

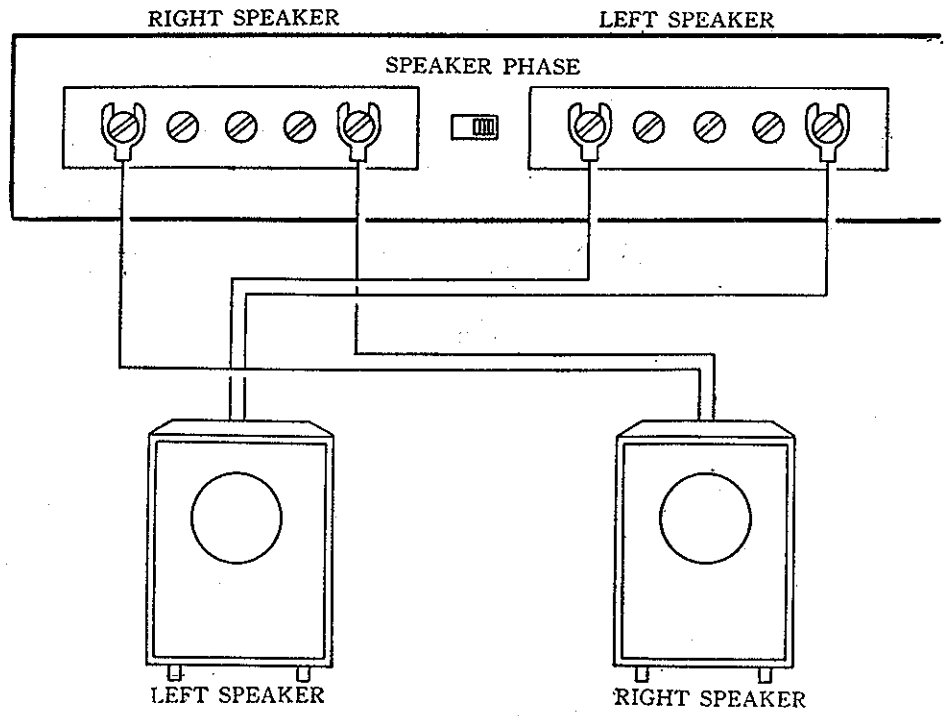

Fig. 2

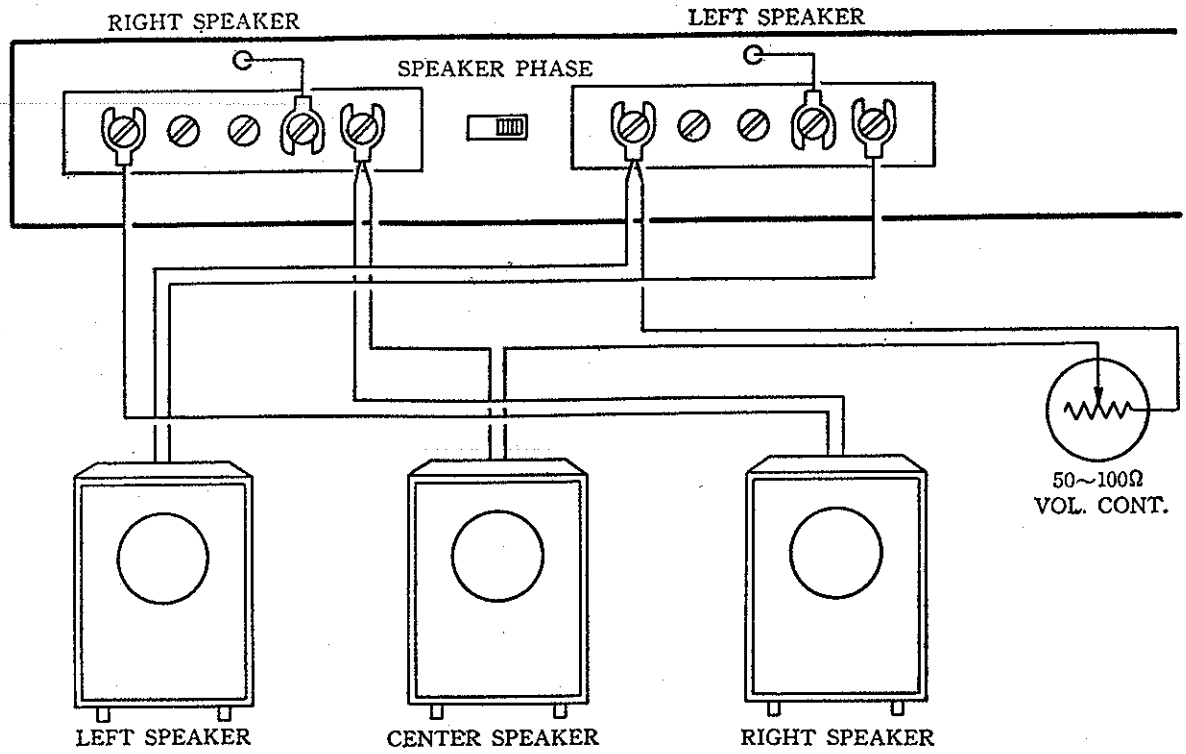

Fig. 3

(B) PICK-UP CONNECTIONS (See Fig. 1)

1 Stereo Pick-up

a. Crystal Pick-up

Connect the two pairs of leads of the player to the terminals designated "XTAL".

b. Magnetic Pick-up

Connect the two pairs of leads of the player to the terminals designated "MAG".

Note 1: Connect the left channel to the upper terminal and the right to the lower.

Note 2: The two pairs of leads are to be twisted or paralleled and fixed to the ground to determine which position provides the least hum. Shielded leads should be used to connect any of these units to the amplifier.

2 Monaural Pick-up

a. Crystal Pick-up

A pair of lead is to be used for the monaural crystal pick-up. Connect the pair of leads to either upper or lower terminal designated "XTAL".

b. Magnetic Pick-up

A pair of leads is also to be used. Connect the pair of leads to either terminal designated "MAG".

(C) TAPE RECORDER CONNECTIONS (See Fig. 1)

1. Directly from the Tape Recorder Head

Playback may be obtained by connecting the amplifier to the recording head directly. The shielded leads are required for the connection to the terminal designated "TAPE HD". In the case of monaural, either upper or lower terminal is to be used.

2. Recording for Tape Recorder

Connect the leads of the tape recorder input terminal designated "LINE INPUT" to the terminal "TAPE REC". In the case of monaural, connect to either of terminals designated "TAPE REC".

3. Playback through the amplifier of the Tape Recorder

When you wish to playback through the amplifier of the tape recorder, connect to "AUX" of the amplifier. In the case of monaural, connect to either one.

(D) ANTENNA CONNECTIONS

1. AM Receiving Antenna

The AM section of this tuner is equipped with a ferrite loopstick mounted on the rear of the chassis. This type of antenna is designed for reception of local and semi-distant stations.

In fringe areas, an external antenna 15 or more feet in length will sometimes give better reception. It should be connected to the binding post marked AM on the rear of the chassis. However, if there are many neon signs, fluorescent lamps, motors, etc., the external antenna may pick up more local noises than additional signals.

2. FM Receiving Antenna

A short length of ordinary wire, approximately 4 feet in length, will serve as a highly effective antenna for all but most difficult areas. Connect one end to the terminal marked FM on the rear of the chassis and extend the wire in any convenient direction. In fringe areas, either an indoor or outdoor dipole antenna may be used. Excellent results can be obtained by using a TV antenna. Connect one lead of the transmission line to terminal FM, the other lead to terminal G. In some localities, reception of either or both FM or AM may be improved by connecting terminal G to a ground, such as radiator or water pipe. It is best to unplug the unit before attaching the ground wire to the G terminal as there is a slight AC condenser discharge potential between the chassis and ground.

(E) STEREO HEAD-PHONE CONNECTIONS

Insert the plug of head-phone into jack marked "STEREO PHONES". If you wish to cut the speaker sound off, push in the button marked "SPEAKER" located at the front.

3. Playback through the amplifier of the Tape Recorder

When you wish to playback through the amplifier of the tape recorder, connect to "AUX" of the amplifier. In the case of monaural, connect to either one.

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(E) STEREO HEAD-PHONE CONNECTIONS

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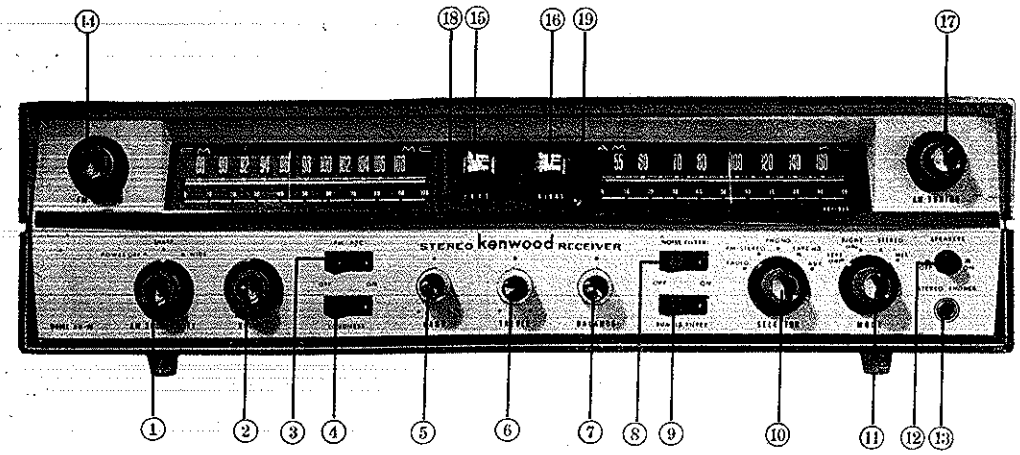
3. DESCRIPTION OF CONTROLS



1. AM Selectivity AM Radio Settings and power Supply Switch

POWER OFF—Electricity is cut off (input in any other position).

SHARP—This position may be used when noise is noticeable on AM receiving.

WIDE—Produces high fidelity and clear sound even in high frequency on AM receiving.

2. VOLUME

Controls the volume for both channels simultaneously.

Clockwise rotation increases volume level.

3. FM AFC

OFF—For the selection FM broadcasts.

ON—Prevents FM from drifting. Keep in this position while listening to FM broadcasts.

Note: This control has no connections with such other program sources as the AM Broadcast, Record Reproduction, Playback of Tape, etc.

4. LOUDNESS

Loudness Controls
OFF—When at high volume.

ON—When at low volume. This position clears bass and treble tones automatically providing true rich sounds.

5. BASS—Bass Tone Controls

This control adjusts the bass tone for both channels simultaneously. Clockwise rotation increases the bass level.

6. TREBLE—Treble Tone Controls

This control adjusts the treble tone for both channels simultaneously. Clockwise rotation increases the treble level and vice versa.

7. BALANCE—Balance Control

This control makes balance of the volume level of both speakers. To turn the control clockwise increases the level of volume for right speaker and counter-clockwise increases that of left speaker.

8. NOISE FILTER

Filter only for FM stereo reception.

ON—Reduces the noise.

OFF—Listening position when noise is not noticeable.

9. RUMBLE-FILTER

This switch effectively reduces noises in low frequency.

ON—Reduces noises in low frequency.

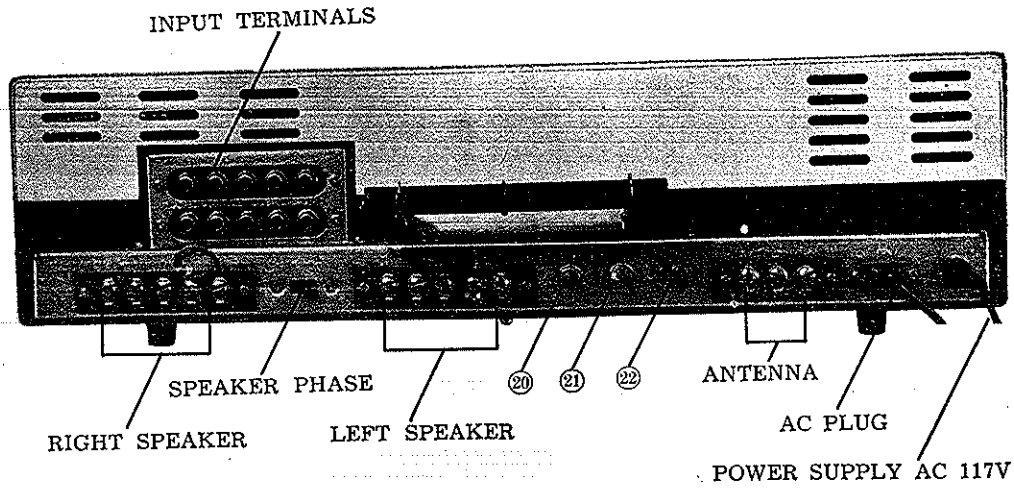
OFF—When noise is not noticeable.

10. SELECTOR—Input Selector Switch

This switch selects your connected program sources such as radio, record, tape, etc. Each switch position is explained below from left to right.

RADIO—Listing position for AM and FM broadcasts.

FM-STEREO—Listening position for FM MULTIPLEX STEREO broadcasts.



PHONO—For the reproduction of stereo and monaural record.

TAPE HD—For the reproduction when connected directly from the tape recorder head.

AUX—This position should be used for the auxiliary input. It can be used for microphones.

11. MODE

This switch should be used for the settings of speakers in monophonic or stereo.

LEFT—Setting the switch to this position allows signals connected to the "LEFT" input to be amplified through both speakers.

RIGHT—Connects signals from the "RIGHT" input to both speakers.

STEREO—For the reproduction of stereo.

MIX—Mixes left and right channels.

12. SPEAKER—Speaker Switch

When using a stereo head-phone, push the button in. The speaker sound will be cut off.

Again by pushing the button, speakers start operating.

13. STEREO PHONE—Stereo Headset Jack

By plugging a stereo head-phone into this jack, wonderful and true reproduction of stereo may be obtained personally.

14. FM TUNING

Selects FM broadcast.

15. FM Tuning Indicator

Selecting the program source by turning the No. 14 knob, this meter will indicate tuning center when tuned in.

16. AM Tuning Indicator

Selecting the program source by turning the No. 17 knob, this meter will indicate tuning center when tuned in.

17. AM TUNING

This control selects right channel on AM stereo providing monophonic reproduction.

18. LEFT-FM Indicator Lamp

Indicates the input in FM monophonic reproduction.

19. RIGHT-AM Indicator Lamp

Indicates the input in AM monophonic reproduction.

Note: No. 18 and No. 19 lamps will be on in case of stereo reproduction.

20. AM LEVEL

Controls the level of right channel on AM broadcast.

21. DIMENSION

This control is factory adjusted, but when you can not obtain a real stereophonic effect, adjust until you can obtain a perfect three-dimensional effect while listening to an FM stereo broadcast.

22. HUM BALANCER

Minimizes any hum that may originate from the amplifier during normal operation (Refer to Item 4, "REMARKS")

4. REMARKS

1. Phasing of the Speakers

If the speakers are out of phase, i. e. + and — of both speakers are not corresponded, they will work in opposition to each other and there will be a noticeable loss in the low frequencies.

Listen carefully to bass tones in normal and reverse position. Then set the switch to the position in which greatest amount of bass is heard.

2. Hum Control

The hum control (refer to Item 3. "Description of Controls", No. 22) should be used as follows: Connect all input to the amplifier, switch on, and turn the "VOLUME" to maximum. Using a screwdriver, set this control to the position that has the least hum (unpleasant buzzing noise). Moreover, to reduce hum, reverse the AC plug and keep it in the position that has less hum.

3. Howling

Placing a player directly on a speaker or placing it very close to a speaker may cause howling or buzzing noise transmitting the vibration from speakers to the point of the pick-up stylus. Under such condition bass and treble tones cannot be reproduced. The trouble exists in other equipment than the amplifier. Position player away from speaker enclosure. If you have to install player directly on speaker enclosure, use a thick cushion such as a rubber mat or pad to separate both instruments.

4. To avoid over-heating

This amplifier is carefully designed to insure proper ventilation to avoid over-heating.

However, do not place books or other objects on top of the amplifier, since covering the perforated cover will reduce ventilation effects.

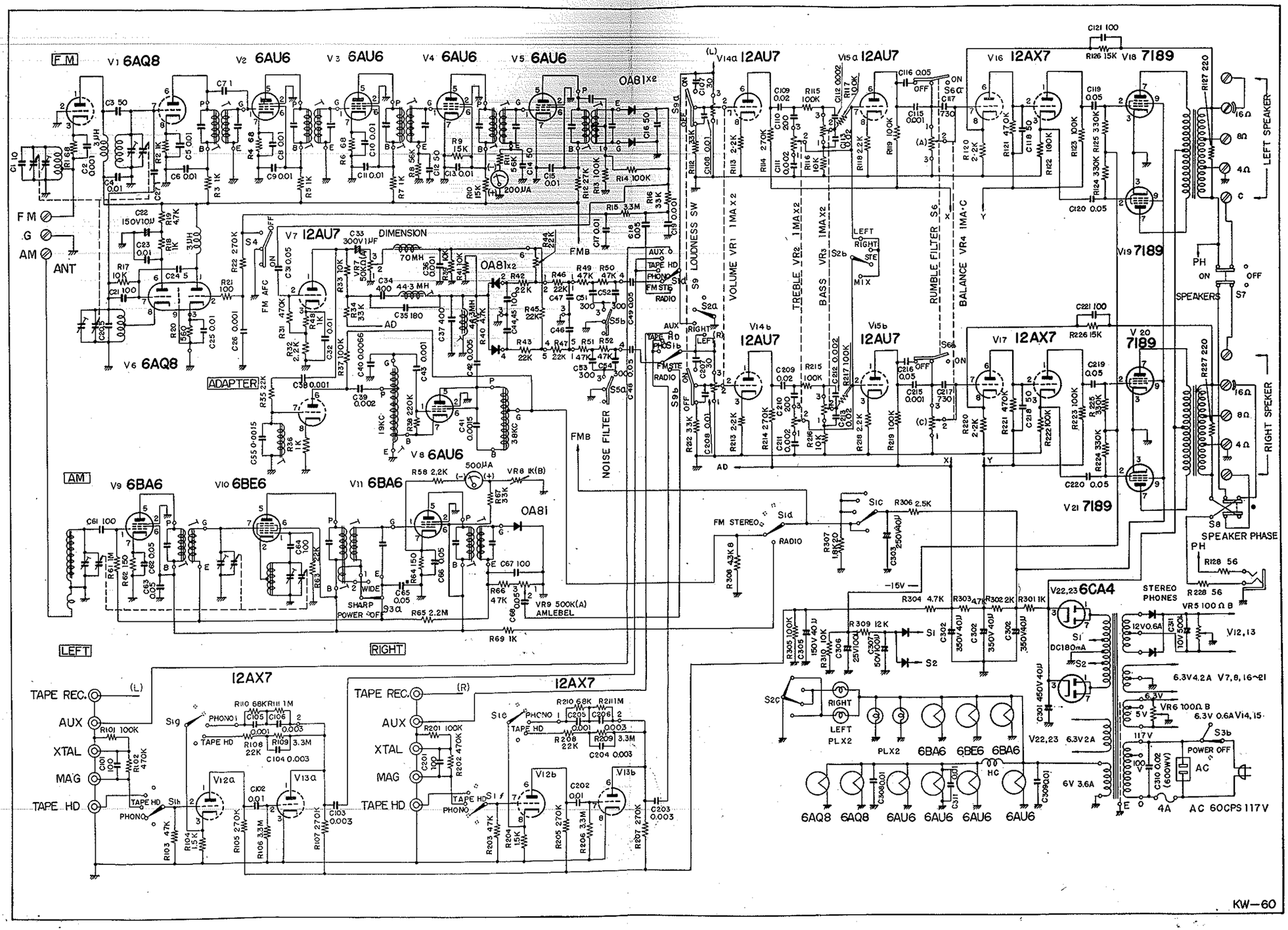
5. Speaker On-Off Switch

The speaker on-off switch, described in the Item 3 "Description of Controls" No. 12, should be kept at "ON" position always except in use of a stereo head-phone.

6. FM-Stereo Reception

1) Place SELECTOR SWITCH in "FM-STEREO" position.
2) Place MODE SWITCH in "STEREO" position.
3) Have your choice station in perfect tune.
4) Check whether the sound from the two speakers in use is completely separated (stereophonic). If not, adjust "DIMENSION" control until you can obtain perfect stereophonic effect. The DIMENSION control, once properly adjusted, needs not be adjusted further.
5) Place "NOISE FILTER" in ON position when noise is noticeable while listening to a stereo broadcast or recording a stereo broadcast on tape.

SCHEMATIC DIAGRAM KW-60



5. SPECIFICATIONS

Tubes Used : 23 tubes And 5 Diodes.

6BE6.....1,	6BA6.....2,	6AU6.....5,
6AQ8.....2,	12AU7.....3,	12AX7.....4,
7189.....4,	6CA4 2,	Diode OA81..... 5.

Frequency Range : FM; 88-108 Mc
AM; 535-1605 Kc

Sensitivity: FM; 1.8μV/98 Mc (input required for S/N 20 dB)
AM; 11μV/1000 Kc (input required for S/N 20 dB)

Gain: MAG; 2.8 mV (input for 1 Kc required for 25 W output)
TAPE HD; 2.3 mV (input for 500 cps required for 25 W output)
AUX; 160 mV (input for 1 Kc required for 25 W output)

Tone Control: 50 cps $\pm$15 dB
10 Kc $\begin{cases} +15 \text{ dB} \\ -17 \text{ dB} \end{cases}$

Frequency Response: 20~20,000 cps (less than —0.5dB)

Output: Max. 30 Watts per channel 25 Watts per channel with 1% Harmonics distortion

Loudness Control: Volume Control at — 30 dB
50 cps + 15 dB, 10 Kc + 4 dB

Rumble Filter: 50 cps —14 dB

Noise Filter: 10 Kc —7 dB (FM stereo only)

Equalizer: RIAA, NARTB

Residual Noise: AUX 10 mV
MAG 80 mV
TAPE HD 80 mV
Maximum Volume control, Tone Control Flat

Special Circuit: FM-AFC, Rumble Filter, Noise Filter, Stereo Headset Jack & Built-in FM MULTIPLEX ADAPTER.

Dimension: Width 19¾", Height 6", Depth 13½".

Weight: 37.5 Lbs. (17kg.)

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