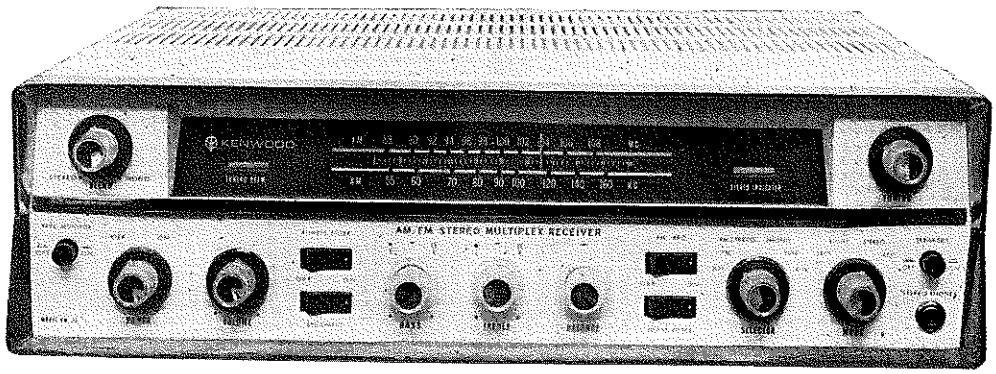
OPERATING MANUAL



KENWOOD

MODEL NO. KW-70

AM/FM STEREO MULTIPLEX RECEIVER

KENWOOD ELECTRONICS INC.

SUBSIDIARY OF AMERICAN COMMERCIAL INCORPORATED

NEW YORK LOS ANGELES

KENWOOD KW-70 AM/FM STEREO MULTIPLEX RECEIVER

KENWOOD KW-70 requires only a pair of loudspeakers to reproduce the thrilling brilliance of stereophonic sound. Built-in FM Stereo multiplex circuits of latest design — featuring KENWOOD's exclusive Stereo Indicator — brings you new simplicity and convenience in FM stereo broadcast listening.

KENWOOD KW-70 also functions as a complete preamplifier-control center with RIAA compensated phono input for magnetic cartridge, plus an input for crystal or ceramic cartridge, plus an input for stereo tape recorder or other program source. A convenient stereo headphone jack on the front panel makes it easy to enjoy fine music in complete privacy.

KENWOOD KW-70 has been designed under KENWOOD's rigid engineering requirements for lasting quality and pleasure.

SPECIAL FEATURES OF KW-70

A) The KW-70 has a rated music power of 32.5 watts on each stereo channel or a total of 65 watts on monaural.

B) The FCC licensed built-in multiplex adapter is provided for FM stereo broadcast.

C) Selection of FM stereo broadcast station is simplified with the help of Stereo Indicator (beam tube) located on the front panel. KENWOOD's Stereo Indicator system is an unique circuitry which is not affected by external noise.

D) Noise Filter eliminating high frequency noise is provided for noise-free reception of FM stereo broadcast even in fringe areas.

E) Rumble Filter is provided to eliminate low frequency noise.

F) Hum is entirely eliminated with DC filament supply system adapted to the equalizer circuit.

G) A convenient stereo Headphone Jack on the front panel provides listening pleasure in complete privacy.

H) RF Amplifier and Ferrite Loopstick Antenna for AM are both provided; thus extra AM antenna is not required within metropolitan area.

CONNECTING LOUDSPEAKERS

The KW-70 has output terminals for connection to speaker system of 4, 8, or 16 ohm impedance. Wherever possible, it is recommended that identical speakers be used. For indoor installations, ordinary plastic-covered lamp cord can be used to connect speakers to the receiver, and may be extended as far as 100 feet without any significant power loss.

Connect the left-hand speaker leads to the terminals designated LEFT SPEAKER and the right speaker leads to RIGHT SPEAKER. Connect the output lead (Blue) to correct impedance terminals (4 ohms, 8 ohms, and 16 ohms).

Warning: Never operate the receiver without first connecting a speaker to each channel output.

CONNECTING STEREO HEADPHONES

Simply plug the headphone into the jack provided and push the SPEAKER switch to OFF position.

Caution: Never leave the SPEAKER switch in OFF position if headphone is not connected to the jack, or in the ON position if speakers are not connected. This may cause damage to the output tube circuitry.

CONNECTING STEREO RECORD PLAYER

The two shielded cables from your stereo record player should be terminated with RCA type phono plugs. To avoid loss in high frequency, cables should not exceed ten feet in length.

Low Level Phono Inputs: Inputs from a magnetic or variable reluctance (constant velocity type) cartridge should be connected to the jacks designated MAG.

High Level Phono Inputs: Inputs from "Constant-Amplitude" phono cartridges such as crystal and ceramic types should be connected to the jacks designated X'TAL.

CONNECTING TAPE RECORDER

For Playback Tape Head (without amplifier): Using shielded cables, connect heads to the input jack marked TAPE HEAD. See diagram on page 6.

For Tape Recorder with Pre-amplifier: Using shielded cables, connect the input lead of the tape unit to the jack marked TAPE REC and also connect the output lead of the tape unit to the jack marked TAPE PLAY. See diagram on page 6.

After completing the connections, push in the TAPE MONITOR switch on the front panel to "PLAY" and you can monitor the output sound of the recorder at the same time the recording is being made.

ELECTRICAL CONNECTIONS

POWER

Plug the AC line cord into an outlet furnishing 110 to 120 volts AC, 50 — 60 cps. The AC outlet on the rear of KW-70 is used to supply power to another component, such as a record player, turntable, etc.

AM ANTENNA

The ferrite loopstick built into the KW-70 assures adequate reception of all local AM stations. However, in fringe and high noise areas and where surrounding metal objects interfere with normal reception, a regular antenna lead should be connected to the terminal designated AM.

Note: The ferrite loopstick is mounted on the swivel bracket and to obtain maximum pickup, the loopstick should be swung away from the chassis.

FM ANTENNA

Two terminals are provided for connection to a 300 ohm FM antenna as shown in the diagram on page 6.

For good FM stereo reception, always use the best antenna possible. In areas close to the transmitter, a simple indoor dipole antenna may suffice. It should be remembered, however, that the pick-up of reflections (similar to "ghosts" on TV) will result in poor stereo reception. These reflections must therefore be reduced to a minimum, either by careful orientation of the indoor antenna or, if this will not eliminate them, by using a more directional outdoor type.

In areas further from the transmitter, the use of an outdoor antenna in highly recommended. These are available in various types. For reception of stations scattered in many directions, a non-directional type may be required. If the desired stations lie mostly in one direction, a highly directional type of antenna will provide better results. When using a directional antenna, always orient it for best reception of the desired station.

CONTROLS AND THEIR FUNCTIONS

POWER

Turning the switch to ON will put the unit into operation.

VOLUME

The single control designated VOLUME adjusts the level of both channels simultaneously. To adjust one channel only, use the BALANCE control.

SELECTOR

This switch selects the program source. The following describes each function:

a. AM — Selects the output of the AM tuner section for reproduction through the amplifier.

b. FM — Selects the output of the FM tuner section for reproduction through the amplifier.

c. FM STEREO — In this position, special multiplex circuitry is switched in to produce left and right channels from an FM stereo signal.

d. PHONO — Selects sources connected to MAG and XTAL input jacts and it is therefore not desirable to have equipment connected to both pairs of jacks at the same time.

e. TAPE — This position is used only for tape playbacks directly from the tape head. (See AUX below.)

f. AUX — Selects sources connected to the AUX input jacks. For playbacks from the tape recorder with a compensated preamplifier, the selector is turned to AUX position and the TAPE MONITOR switch is positioned at PLAY. (Because of insufficient output due to low-impedance tape head, additional voltage can be obtained by installing a well shielded input type step-up transformer between the tape head and the PLAY input.)

MODE

This switch determines the manner in which program source (previously selected by the SELECTOR switch) will go through the amplifier section of the KW-70.

a. LEFT — Reproduction is provided through left speaker only.

b. RIGHT — Reproduction is provided through right speaker only.

c. STEREO — This provides stereophonic reproduction of any stereo program source. This position will also provide monophonic reproduction through both channels when the SELECTOR switch is in the AM or FM position.

d. REV — This effectively reverses the positions of the two speakers. This left signal is now heard from the right speaker, and right signal from the left speaker.

BASS and TREBLE

These controls provide over all tone control, either increasing or decreasing the relative level of the bass and treble frequencies. When the indicators on the knobs are set at vertical position (12 o'clock), the amplifier is at its medium response. Clockwise rotation increases bass or treble response, and counter-clock rotation provides a reduction.

BALANCE

This control provides a simple means of adjusting the levels of both channels for proper balance during stereophonic reproduction. (See section "Balancing Channels")

RUMBLE FILTER

This switch inserts a low-frequency filter into the circuit and effectively reduces the rumble from a noisy turntable or changer with minimum effect on program material.

NOISE FILTER

This switch inserts a filter into the circuit and effectively reduces the high-frequency noise.

LOUDNESS

This switch provides the frequency response change (bass and treble boost) required by the ear at low listening levels, and permits the VOLUME control to function as a compensated loudness control.

FM AFC

The FM tuner section incorporates an effective AFC (Automatic Frequency Control) circuit which ensures proper tuning even if the manual tuning has not been accurately carried out. By turning on the AFC switch, the tuner section will automatically lock-in the station for best possible reception when the dial setting is close to the desired station. In addition, AFC will counteract any tendency on the part of the tuner to drift away from the frequency you have tuned to, and thus prevent the need for manual retuning. To more fully understand the function of the AFC circuit, set the AFC switch to OFF and tune in a strong FM station. The middle clear-sounding point is the proper tuning position. Notice the distortion and noise which exists on either side of this point. Tune to one of these points of distorted sound and then set the switch to ON. You will notice that the sound clears up and that the tuning meter will automatically, by the operation of the AFC circuit, restores the tuning electrically to the center of the station channel.

However, AFC should not be used to compensate for inaccurate or hurried initial tuning. Station selection must be carried out with the AFC switch in its OFF position, carefully tuning for its peak reception by use of tuning beam. Thereafter, AFC may be applied to counteract any slight drift that might occur.

Certain conditions may prevail which make the use of AFC undesirable. For example, applying AFC when tuning in a weak station which is adjacent to a strong one may cause the tuning to be pulled towards the stronger station. For optimum reception of a weak station which is adjacent to a strong one, the AFC switch should be left in the OFF position.

BLEND

In the extreme counter-clockwise position (STEREO), complete channel separation is obtained. Advancing the control clockwise gradually reduces the amount of separation, until, in the fully clockwise position, both channels are fully mixed, with a resultant monophonic output. This control may be used to eliminate exaggerated channel separation found in some stereo source material, or to compensate for speakers that have been installed too far apart.

Advancing the BLEND control to the MONO position also permits a single program source connected to either left or right channel to be reproduced through both speakers.

Note: The signals at the TAPE REC jacks are completely independent of this mixing feature which takes place in a succeeding stage in the amplifier.

TUNING

Tuning for either AM or FM Stations is carried out with the single control designated TUNING.

STEREO INDICATOR (Beam)

FM stereo broadcast is received only when the beams of the Stereo Indicator and Tuning Beam come to its narrowest point at the same time.

TUNING BEAM

Fine precision tuning is accomplished by turning the TUNING knob until the beam comes to its narrowest point.

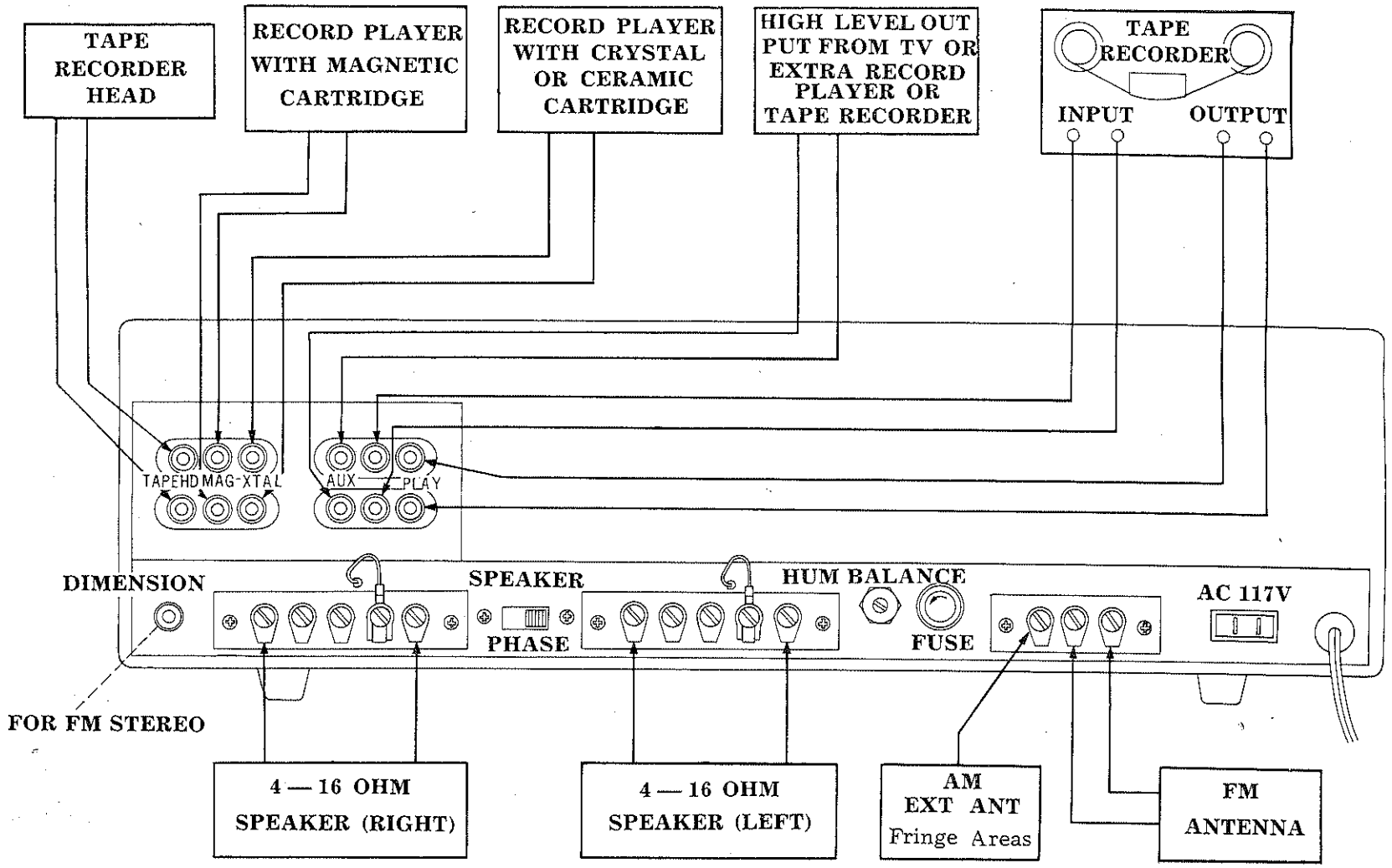
OPERATION

Before operating the stereo receiver make sure you have connected your loudspeakers and any other associated equipment (record player, tape recorder, etc.). Initially, set BASS and TREBLE controls to their mid-positions, BLEND control to STEREO, VOLUME to minimum and BALANCE control to its mid-position.

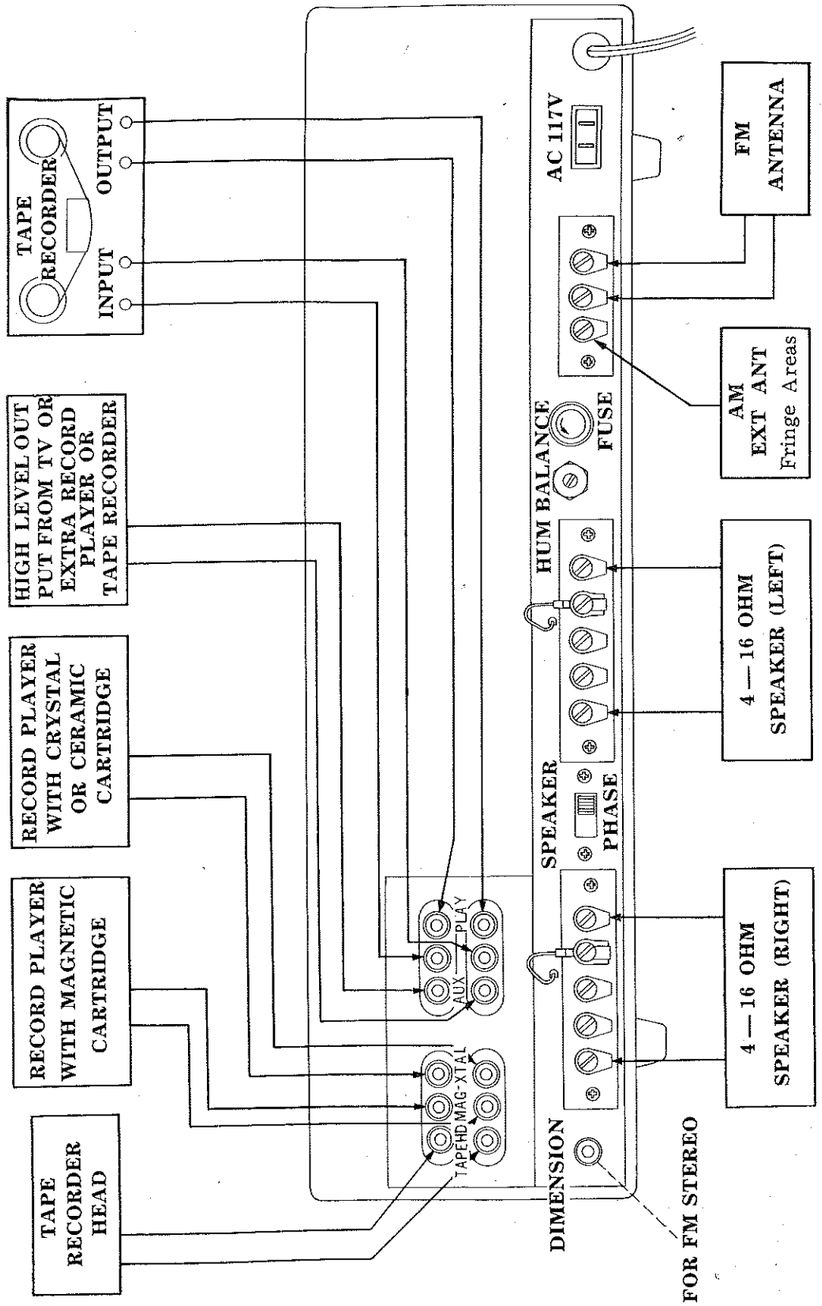
AM or FM OPERATION

To operate the receiver, turn the POWER switch to ON. Set SELECTOR switch to AM or FM and MODE switch to STEREO. Sound will be heard through both speakers. Adjust VOLUME control as necessary and tune in desired station.

INTERCONNECTING DIAGRAM KW-70



INTERCONNECTING DIAGRAM KW-70



FM STEREO OPERATION

Set MODE switch to STEREO and the SELECTOR switch to FM STEREO. While turning the TUNING knob, those stations that become audible when the STEREO INDICATOR beam comes to its narrowest point are broadcasting FM stereo.

The DIMENSION control at the rear of the receiver has been pre-set at the factory for optimum results (maximum channel separation) and will not usually require further adjustment. If the setting of this control is accidentally disturbed, re-set the control to approximately the center of its rotation, or where the maximum separation is heard.

STEREO PHONO OPERATION

Set SELECTOR to PHONO, MODE switch to STEREO and BLEND control to STEREO. Adjust all other controls as necessary for proper stereo operation.

MONOPHONIC RECORD PLAYING OPERATION

Set SELECTOR to PHONO, and MODE switch to LEFT or RIGHT, depending on whether the monophonic record player is plugged into the LEFT or RIGHT phone input jack. Set BLEND control to MONO. The program source will now be heard through both speakers.

BALANCING CHANNELS

PHASING OF THE LOUDSPEAKERS

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

a. Set the SELECTOR to PHONO, all slide switches OFF, MODE to STEREO and BLEND control to MONO. Set VOLUME for desirable listening level.

b. Play a monophonic record containing heavy bass passages and adjust the BALANCE control for approximately equal output from both speakers.

c. Set the PHASE switch first to one position, then to the other, listening carefully to the bass tones in each position. Leave the switch in the position where the greatest amount of bass is heard in the general area between the two speakers.

REDUCING HUM

The hum balance control at the rear of the receiver will enable you to minimize any hum that may originate from the unit during normal operation. The procedure outlined below should be carried out with a turntable or record changer connected to the KW-70.

a. With the pick-up arm at rest, set SELECTOR to PHONO, VOLUME control to maximum, BASS and TREBLE to their midway or "medium response" position, and all other switches set for normal stereo operation.

b. Using a screwdriver, adjust the HUM BALANCE control for minimum hum from both speakers.

AC LINE CORDS

As a general means of reducing hum, the following procedure should be carried out:

1. Turn on all equipment connected to the receiver.
2. Reverse the AC wall plug from the receiver to determine which position provides the least hum. Leave in this position.
3. Repeat this procedure with the AC plugs of the other components, using the selector switch to select the component being tested.

Making a single ground connection between the receiver and a ground point (such as the AC socket wall plate) may further reduce hum. The ground wire should be taken to a point as close to the input jacks as possible.

FUSE

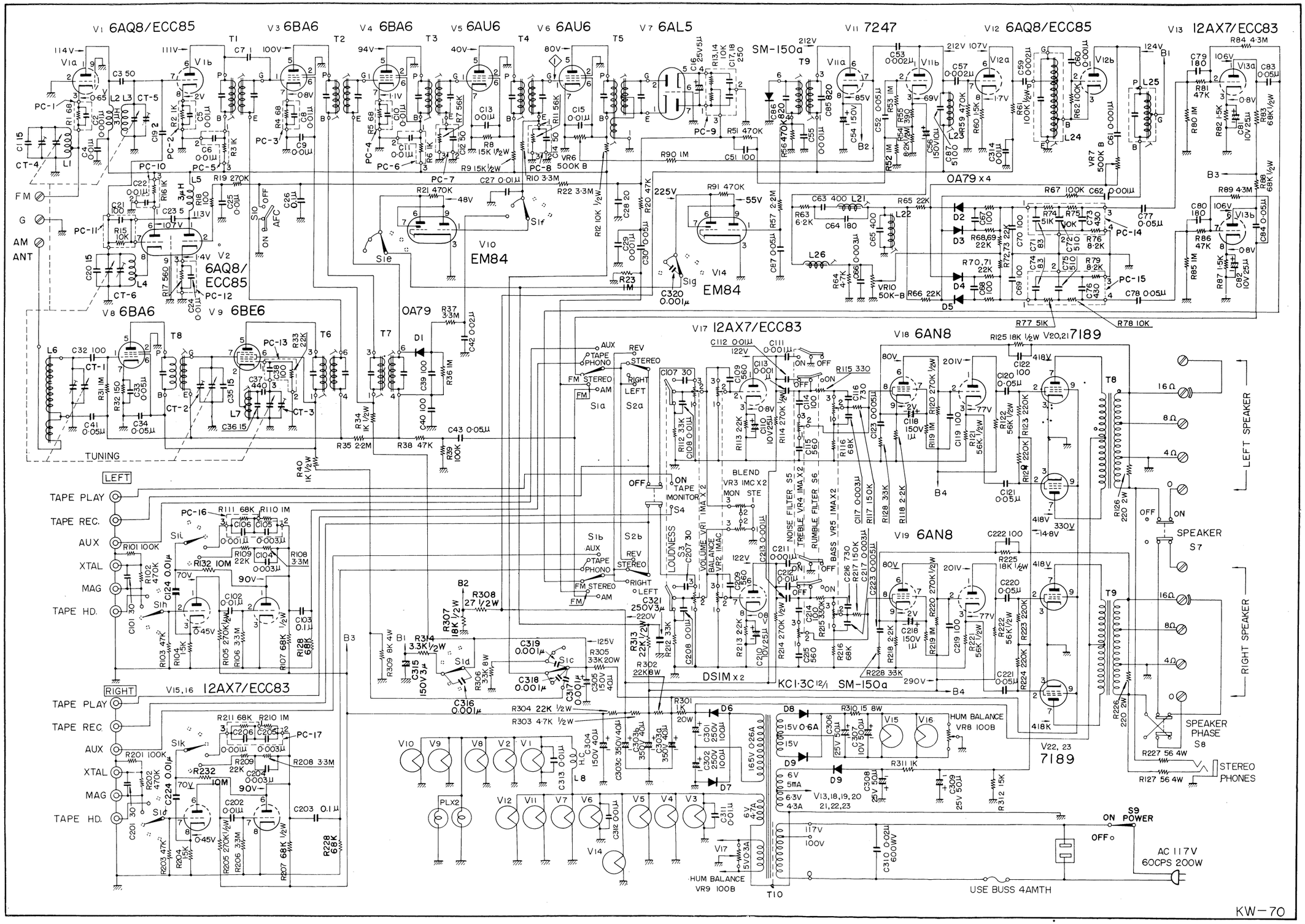
The stereo receiver has a fuse in the AC primary to prevent damage of tubes and components. The value of the fuse is 4 amperes. In the event of its failure, this fuse should be replaced with one of the same rating. Replacing with a fuse of a higher rating will not protect the receiver and may cause severe damage.

SPECIFICATIONS

Tubes Used:	23 tubes and 10 diodes. 6BA6 .... 3, 6BE6 .... 1, 6AU6 2, 6AL5 .... 1, 6AQ8 (ECC85) 3, 12AX7 (ECC83) .... 4, 7247 .... 1, 6AN8 .... 2, 7189 .... 4, EM84 .... 2. Diodes — OA79 5, DSIM .... 2, SM150S .... 2, KC1.3C 12/1 .... 1 (Selenium rectifier).
Frequency Range:	FM 88 — 108MC AM 535 — 1605KC
Sensitivity:	FM — 1.9μV/98 MC (Input required for S/N 20db) AM — 2.0μV/1000KC (Input required for S/N 10db)
Frequency Response:	FM 20 — 20,000 cps (less than 1/2db) FM stereo 50 — 15,000 cps (less than 1/2db)
FM Stereo Separation:	more than 38db (400cps)
FM Stereo Harmonic Distortion:	less than 1% (400cps)
Input:	MAG — 2.2mV; TAPE HEAD — 1.9mV (500cps); XTAL — 24mV; AUX — 140mV
Output Power:	32.5 watts per channel music power (25 watts continuous), or mono 65 watts music power (50 watts continuous) @ 1% Harmonic distortion.
Tone Control:	50cps +11db -10db 10KC +11db -10db
Loudness Control:	Volume Control @ -30db 100cps +10db, 10KC +4db
Equalizer:	RIAA (MAG) NARTB (TAPE)
Special Circuit:	Built-in FM MULTIPLEX ADAPTER, FM STEREO INDICATOR, FM AFC, Rumble Filter, Noise Filter, Stereo Headset Jack.
Power Consumption:	AC 117V 60cps 200 Watts.
Dimensions:	Width 17-3/4″ Height 5-1/3″ Depth 14″.
Weight:	34 lbs.

SCHEMATIC DIAGRAM

MODEL KW-70



KENWOOD KW-70
AM/FM Stereo Multiplex Receiver

Every refinement that can contribute to faithful stereophonic reproduction has been engineered into the Kenwood KW-70 AM/FM Stereo Multiplex Receiver.

This handsomely styled system is actually three superb sound components, mounted on a single, compact chassis.

It is an integrated AM/FM stereo tuner, with the most advanced of FM multiplex circuitry. Add loudspeakers and the KW-70 will reproduce AM, FM or FM stereo broadcasts with a sensitivity that is limited only by the quality of the transmission itself. Separation is in excess of an amazing 38db at 400 cps.

It is also a pre-amplifier control console for every conceivable source of stereo or monaural input. There are separate connections for your turntable, changer, tape deck or tape recorder—even TV sound. It enables you to capture a broadcast on tape and with its exclusive Tape Monitor, you can hear and evaluate the quality of the recorded material as you tape it.

And finally, the KW-70 is a power amplifier that delivers 65 watts of music power—32.5 per stereo channel—with a harmonic distortion of only 1%. Even at peak volumes, the most towering musical passages come through with clean, crisp definition.

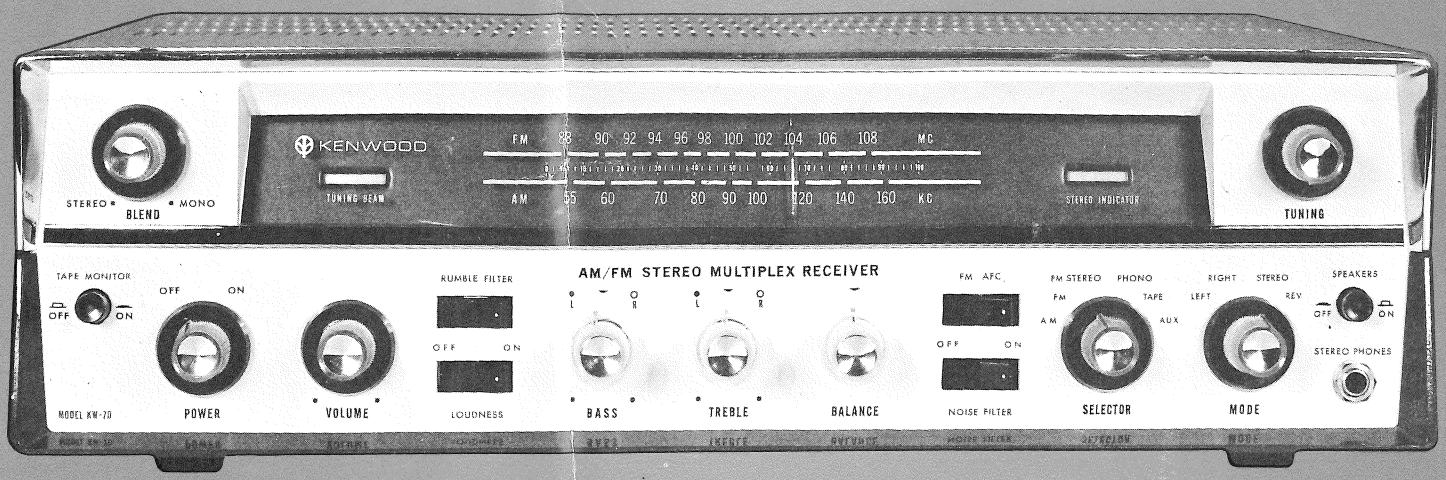
Operating the KW-70 is simplicity itself, thanks to common-sense controls. Filters and special circuits eliminate rumble, hum and noise. With separate tone controls for each channel, plus balance control, you can tailor the tone and separation to your own taste and room acoustics.

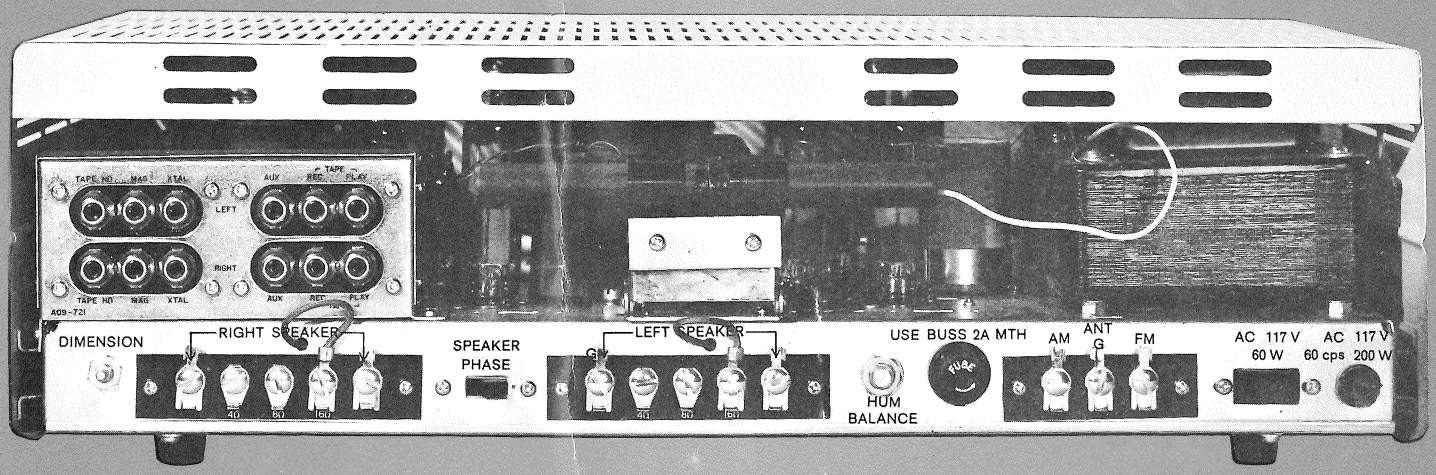
Other features include a Stereo Indicator that instantly locates FM stereo broadcasts; a headphone jack for listening privacy; an exceptionally sensitive, built-in AM antenna; loudness switch; an AFC circuit that rules out FM drift; a tuning meter, and inputs for every type of cartridge.

To own the Kenwood KW-70 is to enjoy direct access to every form and source of home listening at its brilliant best.

KENWOOD

KENWOOD KW-70 AM/FM Stereo Multiplex Receiver





SPECIFICATIONS

TUBES: 23 tubes and 10 diodes
(3) 6BA6, (1) 6AL5, (1) 7247, (2) EM84, (1) 6BE6, (3) 6AQ8, (2) 6AN8, (2) 6AU6, (4) 12AX7, (4) 7189. Diodes—(5) OA79, (2) DSIM, (2) SM150S, (1) KC1, 3C 12/1 (Selenium rectifier)

TUNING RANGE: FM 88—108 MK
AM 535—1605 KC

SENSITIVITY: FM—1.9 uV/98 MC (Input required for S/N 20 db at 400 cps ± 22.5 KC deviation)
AM—2 uV/1000 KC (Input required for S/N 10 db at 400 cps 30% modulation)

AUDIO RESPONSE: FM mono—20 to 20,000 cps (less than ½ db)
FM stereo—50 to 15,000 cps (less than ½ db)

OUTPUT POWER: 32.5 watts per channel music power (25 watts continuous or total.)
65 watts music power (50 watts continuous @ 1% Harmonic distortion.)

FM STEREO HARMONIC DISTORTION: Less than 1% at 400 cps.

INPUT: MAG-2-2mV; TAPE HEAD-1.9mV (500 cps); XTAL-24mV; AUX-140mV.

FM STEREO SEPARATION: More than 38 db at 400 cps.

POWER CONSUMPTION: AC 117V, 60 cps, 200 Watts.

SPECIAL CIRCUITS: Built-in FM MULTIPLEX ADAPTER, FM STEREO INDICATOR, FM AFC, Rumble Filter, Noise Filter, Stereo Headset Jack.

TONE CONTROL: Bass: 50 cps + 11 db — 10 db
Treble: 10 KC + 11 db — 10 db

LOUDNESS CONTROL: Volume Control at — 30 db
100 cps + 10 db, 10 KC + 4 db

EQUALIZER: R1AA (MAG) NARTB (TAPE)

DIMENSIONS: Width 17¾", Height 5⅓", Depth 14".

WEIGHT: 34 lbs.

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