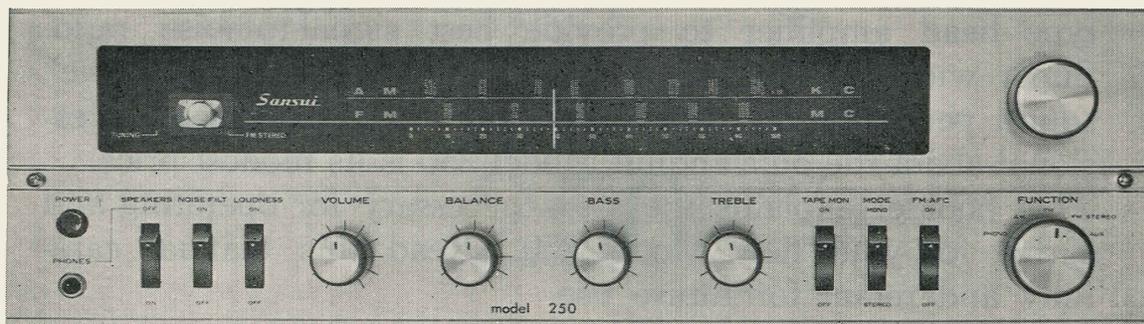


OPERATING INSTRUCTIONS

AM/FM MULTIPLEX STEREO TUNER AMPLIFIER

SANSUI MODEL 250



Sansui[®]

SANSUI ELECTRIC COMPANY LIMITED

Now Sansui puts high-performance stereo within the reach of everyone. Here is your perfect opportunity to take the delightful plunge into the magnificent world of stereophonic sound—in a highly professional manner without putting a dent in your pocketbook.

See what we mean by a truly professional unit. First, the Model 250 is self-contained. Multiplex tuner and amplifier all in one. All reception is high-fidelity: records, AM and FM radio, tape recording and playback.

Many studio-equipment features too. Multiplex circuit. New type head amplifier to provide best signal-to-noise ratio. Super wide-band output transformers to always insure “live” sound performance. You’ll find the only thing not professional about the outstanding Model 250 is its modest price.

This booklet explains the steps necessary for operating and caring for your new Model 250. Read this manual carefully and retain for future use.

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SANSUI

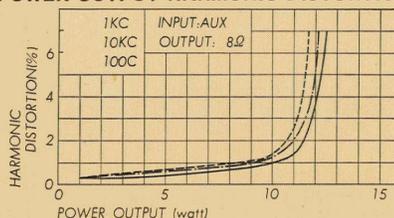
AM/FM MULTIPLEX
STEREO TUNER
AMPLIFIER



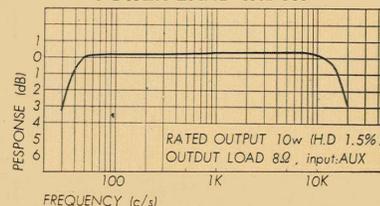
MODEL
250

FEATURES SPECIFICATIONS CHARACTERISTICS

POWER OUTPUT HARMONIC DISTORTION



POWER BAND WIDTH



FEATURES

HIGH PERFORMANCE WITH OUTSTANDING CHARACTERISTICS.

For better performance, the Model 250 employs the latest push-pull connection of super wide-band output transformers to the high-performance multiunit tubes 6BM8, providing moderate music power of 22 watts. The newly designed NF circuit also helps reproduce "live" sound over the entire 35 to 15,000cps range.

NEW TYPE SILICON-TRANSISTOR HEAD AMPLIFIER.

A new type silicon transistor is used as a head amplifier to eliminate hums and noises, and to obtain better signal-to-noise ratio.

SILICON-DIODES IN POWER SECTION.

The rectifying circuit has top-quality silicon-diodes in place of the conventional vacuum tube to give more stability and regulation, to minimize the power loss, to solve the heat problem and lastly to assure its longer life.

ALL HI-FI IN RADIO RECEPTION, RECORD PLAYING & TAPE RECORDING.

Hi-Fi FM and AM reception, hi-fi record playing by using either crystal or magnetic cartridge, and hi-fi tape recording and playback are all yours with the Model 250. It is provided with a direct tape recording terminal plus a tape monitor circuit.

CENTER-CHANNEL OUTPUT TERMINAL.

The Model 250 has an output terminal for the center-channel amplifier. To obtain the 3-dimensional reproduction effect, just connect it to an additional monaural amplifier.

EVERY POSSIBLE CIRCUITS FOR BETTER HI-FI REPRODUCTION.

Headphone jack for private listening. Loudness compensation at low level listening. Tape monitor circuit that makes it possible to record and reproduce simultaneously. Noise filter designed to eliminate noise in higher frequency range.

FUNCTIONAL FRONT PANEL LAYOUT.

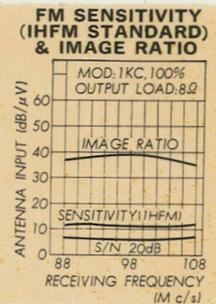
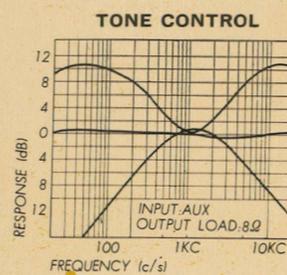
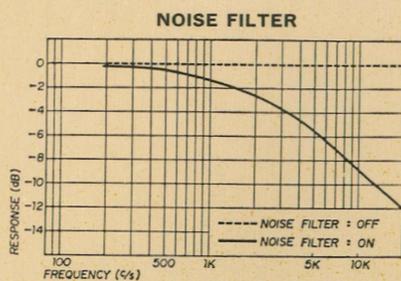
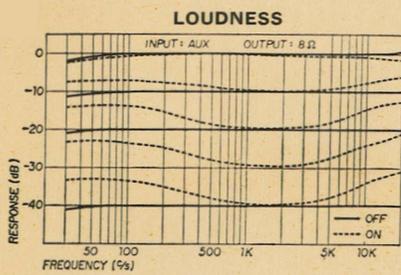
For easier operation and tuning every control knob is specially designed in both size and position.

BUILT-IN HIGH-SENSITIVITY FERRITE ANTENNA.

The built-in, high-sensitivity ferrite antenna adds to your listening pleasure by reducing noise to less than that of conventional tuners.

AMAZING CHANNEL SEPARATION OF 35dB AND MORE ENSURED BY ADVANCED FM MULTIPLEX CIRCUIT.

The adoption of the most advanced switching matrix method for the multiplex circuit has amazingly improved the performance of the Model 250.



SPECIFICATIONS

AUDIO SECTION

* POWER OUTPUT

- MUSIC POWER (IHFM): 22 watts total
- RMS POWER (Right/Left): 10/10 watts
- RMS STEREO POWER (Both): 8 watts × 2

HARMONIC DISTORTION: 1.5%

POWER BAND WIDTH: (IHFM): 35~15,000 cps

FREQUENCY RESPONSE: 30~20,000 cps ± 2 dB

CHANNEL SEPARATION:

- Phono 40 dB at 1,000 cps
- AUX 50 dB at 1,000 cps

* HUM AND NOISE (IHFM):

- Phono 65 dB below rated output
- AUX 70 dB below rated output

OUTPUT IMPEDANCE: 8 and 16Ω

* INPUT SENSITIVITY (for rated output)

- Phono 3 mV ± 3dB
- AUX 150 mV ± 3dB
- Tape Monitor 660 mV ± 3dB

EQUALIZER CHARACTERISTIC: PHONO RIAA

* CONTROLS AND SWITCHES:

- Bass control 50 cps + 10 dB to -10 dB
Treble control 10,000 cps + 10 dB to -10 dB

LOUDNESS CONTROL: 50 cps + 8 dB 10,000 cps + 8 dB
(Volume control at -30 dB)

NOISE FILTER: 10,000 cps -10 dB

MODE SWITCH: 1. STEREO 2. MONO

SELECTOR SWITCH: 1. PHONO 2. AM 3. FM
4. FM-STEREO 5. AUX

* OTHER SPECIAL FEATURES:

- Headphone jack. Headphone switch.
Center-channel output for connection to a third amplifier.
Recording output. Direct tape monitor.

• FM SECTION

FREQUENCY RANGE: 88~108 MC

SENSITIVITY (IHFM): 4.0μV ± 3dB
2.5μV ± 3dB (for 20dB of quieting)

FM FREQUENCY RESPONSE: 40~20,000 cps ± 2 dB

IF-SELECTIVITY: 200KC -3 dB

HARMONIC DISTORTION: Less than 1.5%

FM STEREO SEPARATION: 35 dB at 1,000 cps

FM STEREO FREQUENCY RESPONSE:
35~15,000 cps ± 2.5 dB

* OTHER SPECIAL FEATURES:

- Tuning eye. Heavy fly-wheel tuning.
Solid-state AFC.

• AM SECTION

* AM FREQUENCY RANGE: 535~1605 KC

SENSITIVITY (IHFM): 30μV ± 3dB

IF SELECTIVITY: 8 KC

IF FREQUENCY: 455 KC

OTHER SPECIAL FEATURES

AM ferrite antenna. fly-wheel tuning. Tuning eye.

* TUBES, TRANSISTORS AND DIODES:

TUBES: 6BM8 × 4, 6AQ8 × 3, 6BE6 × 1, 6BA6 × 3,
6BL8 × 1, 6BN8 × 2, 12AX7 × 1, 6GE-12A × 1

SILICON TRANSISTORS: 2SC-650 × 2

SILICON DIODES: SE-0.5b × 2, SE-05-03 × 1,
IS-180 × 2

GERMANIUM DIODES: OA-91 × 5

* POWER REQUIREMENT

POWER VOLTAGE: 100, 117, 220, 240 Volts, 50 or
60 cps

* POWER CONSUMPTION: 140 VA

DIMENSIONS: WIDTH: 17³/₈" HEIGHT: 5⁵/₃₂"
(Including rubber stands)

DEPTH: 12¹⁹/₃₂" (Including knobs)

WEIGHT: 29.1 lbs.

CONNECTIONS

ANTENNAS

BUILT-IN AM ANTENNA

As shown in Fig. 3, and Fig. 4, move the built-in ferrite bar antenna (B) out of the amplifier by moving the angle (A) on the axis (a). Loosen the screw (c) and then move (B) on the axis (b) to the position where you can receive the broadcast best. This antenna will perform satisfactorily except in ferroconcrete buildings or in areas remote from broadcasting stations.

CONNECTION OF OUTDOOR AM ANTENNA

For the ferrite antenna inadequate to the weak AM broadcasts radio reception, connect the AM antenna (PVC wire) to the terminal AM-A and a ground wire to AM-E. To install, support it horizontally and apart from your building as shown in Fig. 2 and set it for the finest reception. Note that the antenna sensitivity depends largely on the position to which the antenna is installed. For safety reason, be sure to install a lightning arrester with the outdoor antenna.

FM ANTENNA

Connect the FM antenna (feeder wire) to the terminals FM-A1 and -A2. If you live near the station or the signal is strong, put it up like

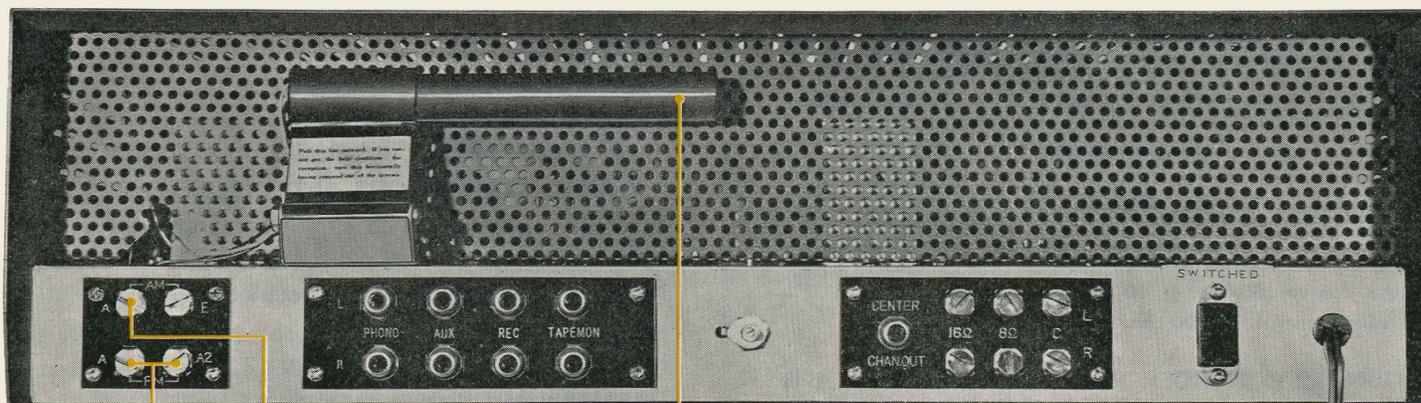
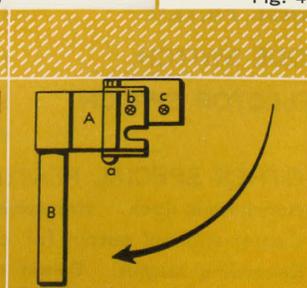
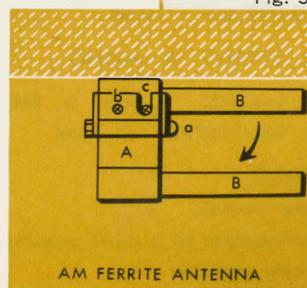
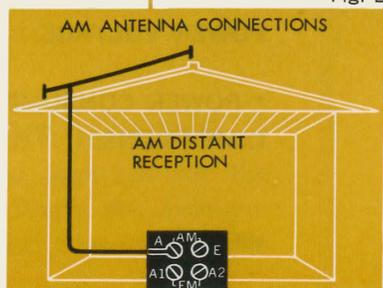


Fig. 1

Fig. 2

Fig. 3

Fig. 4



“T” in your room. If you live in a thick-wall building or far away from your desired station and if the signal is too weak to receive with the indoor antenna, install the outdoor antenna like a TV receiver as shown in Fig. 1. Remember that the proper height and direction (not length) of the antenna are vital to the best reception.

RECORD PLAYER

1. Connect the left output of the record player to the input terminal PHONO CHAN-L of the amplifier.
2. Connect the right output of the record player to the input terminal PHONO CHAN-R of the amplifier.
3. Insert the power plug of the record player into the power socket of the amplifier.

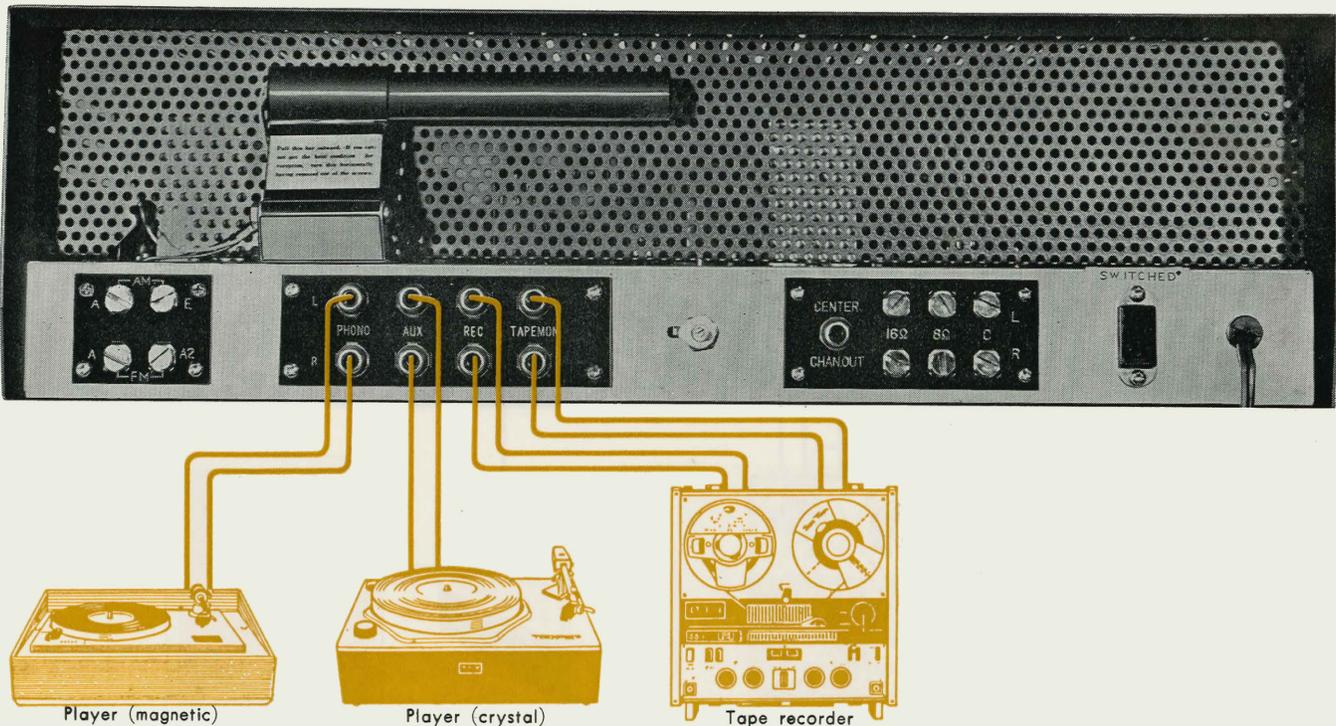
NOTE:

There are two categories of pickups, those using a crystal element and those using a magnetic circuit. Be sure to use the magnetic cartridge with 3 to 10 mV output voltage. If you use the crystal cartridge, connect the output of the record player to the input terminal AUX of the amplifier.

In case of using a monophonic record player, connect the output of the record player to either of the PHONO terminals of the amplifier.

TAPE RECORDER

You can enjoy tape recording and playback by connecting a tape recorder to the Model 250. Besides, you can enjoy tape monitoring by use of a 3-head tape recorder.



CONNECTIONS

1. TAPE RECORDING

By using shielded wire, connect the recording inputs of the tape recorder to the REC CHAN-L and -R terminals of the amplifier. For a monaural tape recorder, connect its recording input to either of the REC terminals of the amplifier.

2. PLAYBACK

By using shielded wire, connect the outputs of the tape recorder to the TAPE MON CHAN-L and -R terminals of the amplifier. For a monaural tape recorder, connect its output to either of the TAPE MON terminals of the amplifier.

3. MONITORING

To monitor the tape by use of a 3-head tape recorder, follow the above procedures.

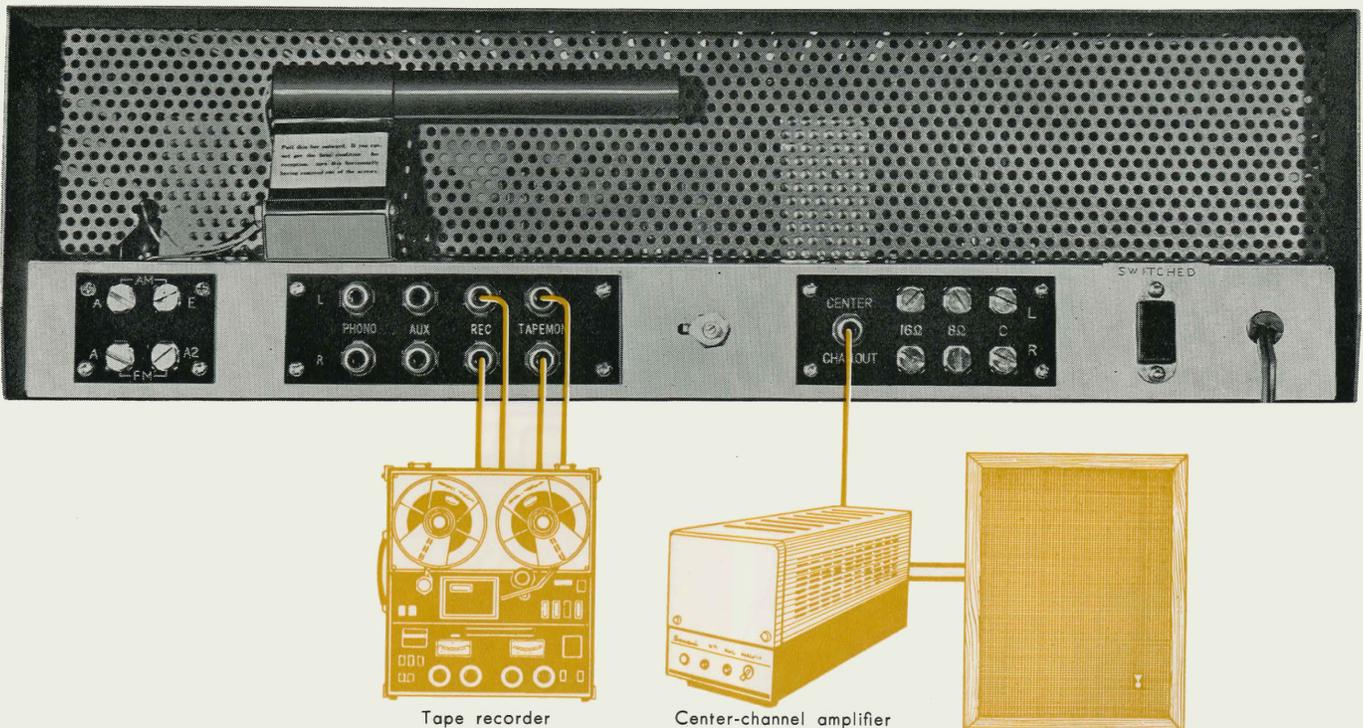
LOUD SPEAKERS

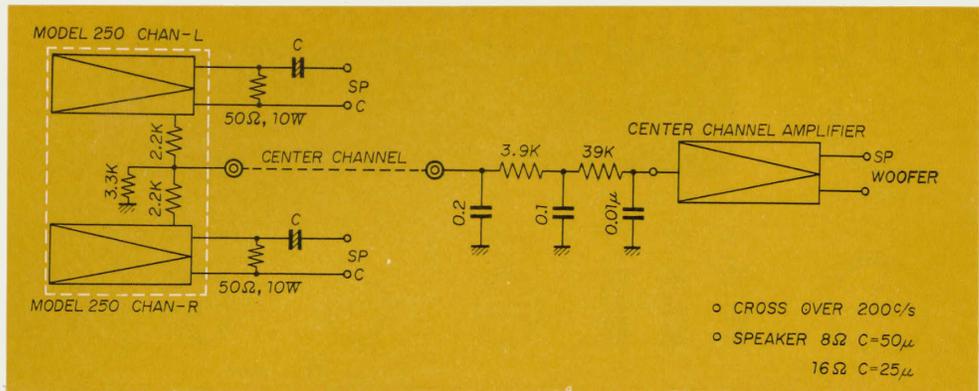
STEREO

1. Connect (+) of the left speaker to the upper speaker terminal CHAN-L 8 or 16 Ω of the amplifier.
2. Connect (-) of the left speaker to the upper speaker terminal C of the amplifier.
3. Connect (+) of the right speaker to the lower speaker terminal CHAN-R 8 or 16 Ω of the amplifier.
4. Connect (-) of the right speaker to the lower speaker terminal C of the amplifier.

MONAURAL

If a 2-speaker system is used as a mono and the speaker impedance is 8 Ω for example, connect the upper and lower 16 Ω terminals (L and R)





and then of the speaker to them; connect the upper and lower C terminals (L and R) and then of the speaker to them.

IMPORTANT: The two speakers or groups of speakers must be properly phased. The speakers for the two channels must push the sound waves out together. If one pushes while the other pulls, there is sound cancellation at some frequencies or in some listening locations. If so, reverse the phase (+ and -) of either group of speakers.

3-D STEREO SYSTEM

Since this amplifier is provided with an output terminal for a center-channel amplifier, you can enjoy easily the 3-D stereo. By using shielded wire, connect the input of the bass amplifier * to the pin jack

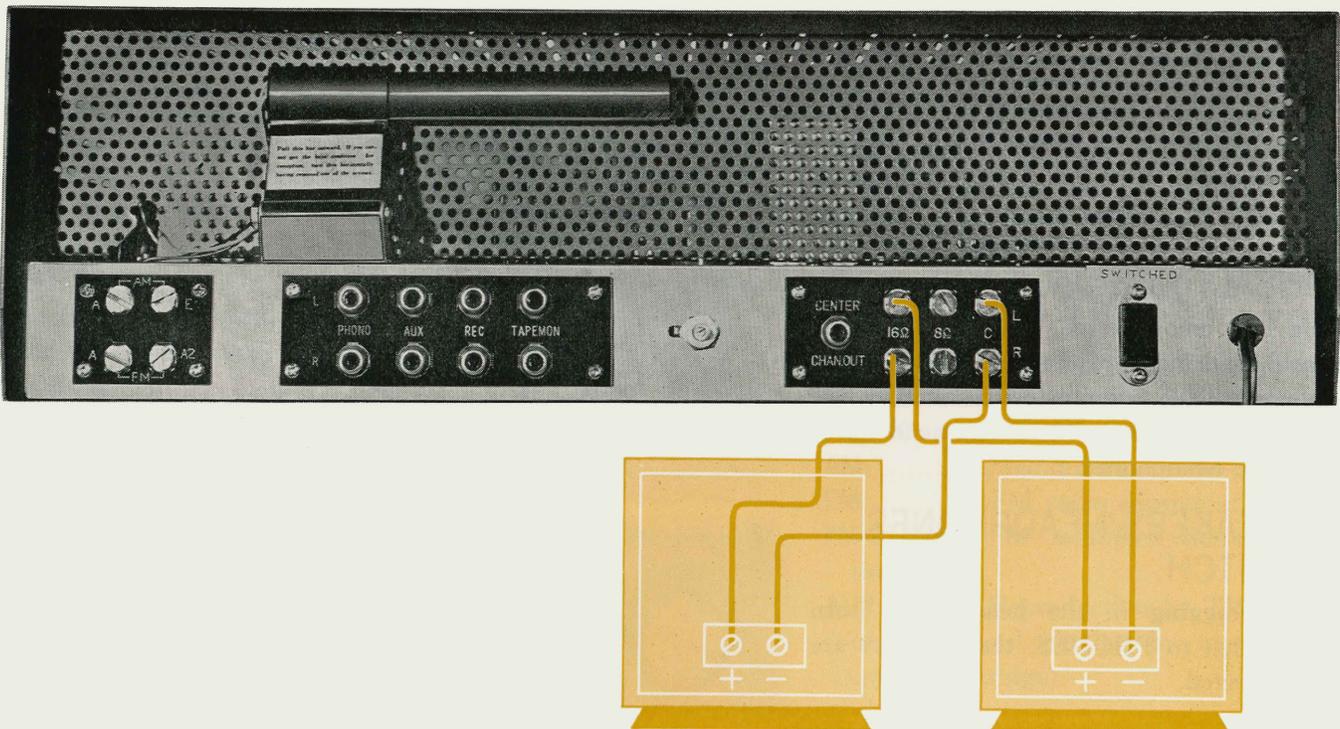
of the output terminal ** for the center-channel of this amplifier; and then connect a woofer to the bass amplifier. Exclusive features and advantages of this system are the effective reproduction of the lowest tones, use of only one woofer and economy.

*) Bass amplifier is built by using a filter circuit on the input side of the main amplifier.

***) Located on the left side of the speaker terminal plate.

See above diagram.

Without the filter, mixed sounds of the right and left channels are heard from this circuit and the effect similar to the 3-D stereo system is obtained.



SWITCHES AND CONTROLS

① TUNING AND FM-STEREO INDICATOR (MAGIC EYE)

This indicator gives a visual indication of tuning and FM-Stereo reception. The closed fluorescent Left pattern means that your desired station, either FM or AM, is properly tuned in, and Right pattern proper reception of FM-Stereo for your desired station.

② DIAL SCALES

The upper scale indicates FM and the lower the medium-wave range. Turn the tuning knob to select your desired station.

③ TUNING KNOB

This knob is used to select your desired FM or MW station.

④ POWER SWITCH

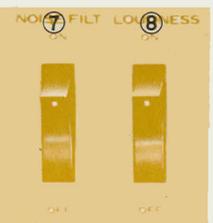
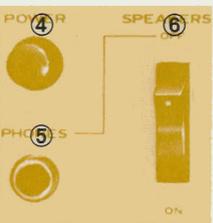
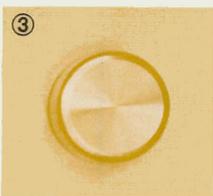
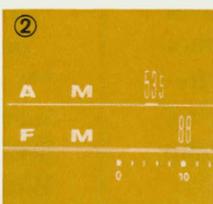
To switch the power on, push the button. To switch it off, push the button again. Switching this on and off, the outlet on the back panel will connect or disconnect.

⑤ HEADPHONE JACK

You can enjoy stereo any time without any disturbance by just plugging in headphones. Tape monitoring is another use of the headphones. We recommend stereo dynamic headphones.

⑥ SPEAKERS/HEADPHONES SWITCH

After plugging in the headphones, turn this switch to PHONES; the speakers are disconnected.



⑦ NOISE FILTER

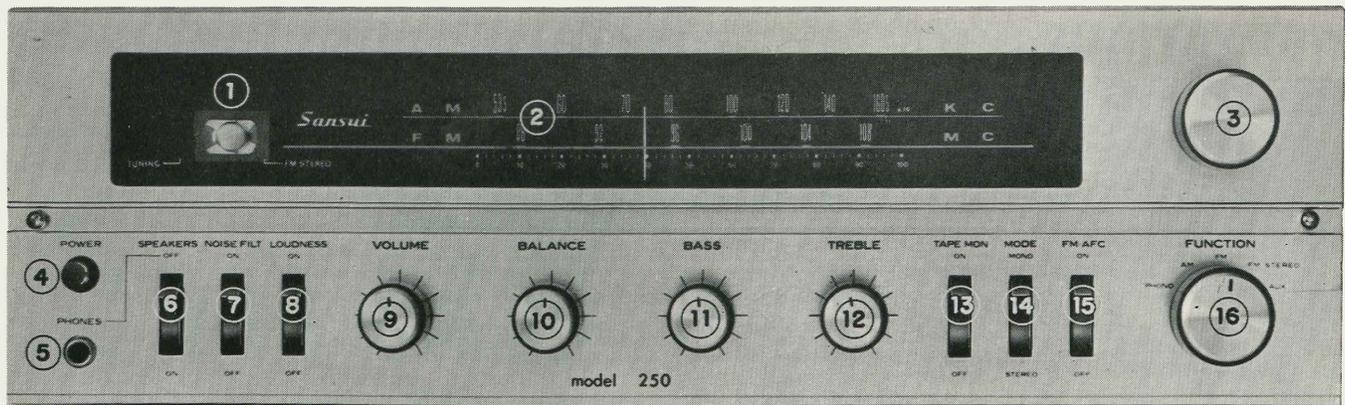
Turn on this switch to eliminate or reduce a record scratching noise or other noises at relatively high frequencies.

⑧ LOUDNESS SWITCH

This switch is used to emphasize the high and low notes only. "Live" sound is reproduced even when you enjoy a music with the volume largely reduced.

⑨ VOLUME CONTROL

This control is used to adjust the volume of the broadcasts, record playing, tape playback, etc. As it is turned clockwise, the volume is increased, or vice versa.



⑩ BALANCE CONTROL

This control is used to keep the volume balance proper between the two speaker groups. Adjust it so that the sound is heard equally from the right and left speakers.

⑪ BASS CONTROL

This control is used to adjust the sound level in bass notes. Turn it further from FLAT to right and the bass notes are more emphasized, or vice versa.

⑫ TREBLE CONTROL

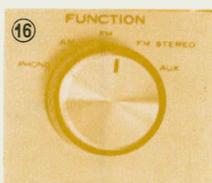
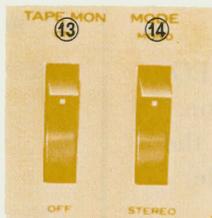
This control is used to adjust the sound level in high notes. Turn it further from FLAT to right and the high notes are more emphasized, or vice versa.

⑬ TAPE MONITOR SWITCH

When recording on the tape by use of a 3-head tape recorder, turn on this switch to make the tape monitor circuit. The sound is recorded and reproduced at the same time.

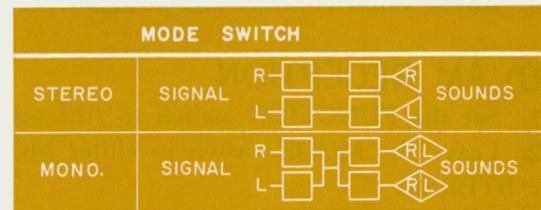
NOTE:

In case of playback, turn it on. Except for the above uses, it must be in OFF position.



⑭ MODE SWITCH (STEREO/MONO)

To enjoy FM MPX stereo broadcast, stereo record or stereo tape, set this switch to STEREO. To enjoy monaural broadcast, record or tape, set this switch to MONO. Regardless of the input signals (R and/or L), the output signals drive right and left speakers.



⑮ FM-AFC SWITCH

This switch is used to prevent the selected FM station from tuning off, maintaining the frequency automatically within specified limits. Be sure to turn it on after selecting your desired FM station. If one station will be affected by another station, it should be turned off.

⑯ FUNCTION SWITCH

This switch is used to select your desired program source.

PHONORecord playing;

AMMedium-wave radio reception;

FMFM radio reception;

FM-STEREO FM multiplex Stereo reception;

AUX.....Reproduction by TV or other inputs (record playing by means of a crystal cartridge).

OPERATIONS

RADIO RECEPTION

A) FM RECEPTION

1. Set the FUNCTION switch to FM position.
2. Leave the MODE switch in either MONO or STEREO.
3. Select your desired station by means of the tuning knob and the magic eye. (Left side)
4. Turn on the FM-AFC switch.
5. Adjust other controls and switches properly.

B) AM RECEPTION

1. Set the FUNCTION switch to AM position.
2. Leave the MODE switch in either MONO or STEREO.
3. Select your desired station by means of the tuning knob and the magic eye. (Left side)
4. Adjust other controls and switches properly.

C) FM STEREO RECEPTION

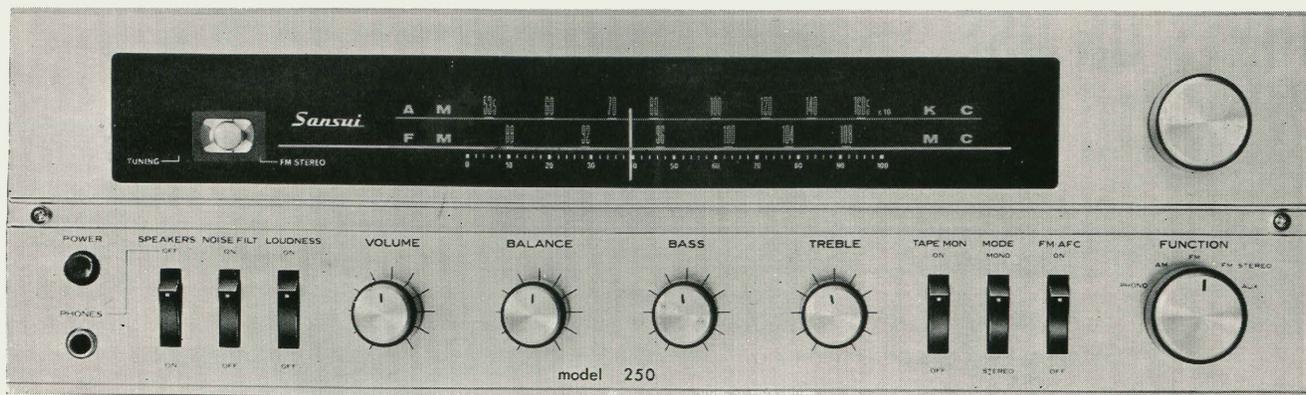
1. Set the FUNCTION switch to FM-STEREO.
2. Set the MODE switch to STEREO position.
3. Select your desired station by means of the tuning knob and the magic eye. (Right side)
4. Turn on the FM-AFC switch.
5. Adjust the BALANCE control to the proper position.
6. Adjust other controls and switches properly.

RECORD PLAYING

1. Set the FUNCTION switch to PHONO position.
2. Set the MODE switch to STEREO or MONO depending on the type of the record player.
3. Switch on the record player at correct speed (rpm).
4. Place the pickup on the record.
5. Adjust the BALANCE control to the proper position.
6. Adjust other controls and switches properly.

NOTES:

1. To play monaural records on a stereo record player, follow the same procedures for stereo records.
2. To obtain the best balance of sound between both channels, play a monophonic record just like a stereo record and adjust the BALANCE control so that the sound is heard at a point midway between the right and left speakers.



TAPE RECORDING AND PLAYBACK

A) TAPE RECORDING

1. Set the FUNCTION switch to the program source which is going to be recorded.
2. Set the MODE switch to STEREO for stereo recording or to MONO for monophonic recording.
3. Set the tape recorder for recording.
4. Operate the tape recorder and adjust the controls and switches of this amplifier properly.

B) PLAYBACK

1. Turn on the TAPE MONITOR switch.
2. Set the MODE switch to STEREO or MONO depending on the type of the tape recorder used.
3. Set the tape recorder for playback.
4. Adjust the controls and switches of this amplifier properly.

C) MONITORING

To monitor the tape by use of a 3-head tape recorder, follow the same procedures as for playback.

NOTES:

1. The sound level to be recorded on the tape is not controlled by the amplifier knobs.
2. To obtain the best recording result, record on the tape through the amplifier rather than through a microphone placed in front of the speakers.
3. Before use of the tape recorder, be sure to look up the manufacturer's instructions.

4. The TAPE MONITOR switch must be in "OFF" position except for tape monitoring and playback.

HINTS ON USE

HOW TO ELIMINATE UNPLEASANT RADIO NOISE

A) AM BROADCASTS

An AM radio noise is often eliminated simply by replacing the antenna.

Usually the noise is heard in the area where the station signal is too weak due to topography, buildings, etc. To eliminate it, connect PVC wire to the AM antenna terminal of this amplifier and put it up on the wall of your listening room. If the noise is still heard or the sensitivity of the amplifier is still poor, an outdoor antenna should be installed.

A noise may be heard depending on time, frequency, station, etc. To eliminate such a noise, connect ground wire to the amplifier or turn the powerplug upside down.

B) FM BROADCASTS

There are two trouble-sources in the FM radio noises: one is caused by the insufficient antenna input and the other is caused by other electrical appliances placed near the amplifier. The poor antenna input is due to badly installed antenna or remoteness from the station. Change the height and direction of the FM antenna (supplied). If the noise is still heard, use an indoor TV antenna or an outdoor one. When the FM antenna is used together with the TV antenna, make sure the TV picture is not affected.

Note that an excessively long antenna may rather cause a noise.

The sensitivity of the amplifier varies depending on the transmitting conditions of the station. It happens, therefore, that one station signal is well received but the other station signal is ill received.

C) NOISE COMMON TO FM AND AM BROADCASTS

If you live in a closely built-in area, noises may be caused by some outside factors. To eliminate, install a noise arrester with the electrical appliances or the power source of the amplifier.

D) FM MPX STEREO

To eliminate a noise in an FM multiplex stereo, switch on the NOISE FILTER and adjust the TREBLE control to FLAT or turn it further to left.

FM MPX STEREO ON MONO

You can enjoy FM MPX stereo broadcasts just like mono by setting the MODE switch to MONO and the FUNCTION switch to FM. This method is recommended if the station signal is weak and the FM MPX stereo program is impaired by noises.

FM BROADCASTS

The FM broadcasts are characterized by more faithful reproduction of sound than the AM broadcasts. There is no noise and no jamming. One disadvantage in the FM is that the selected station is tuned off from time to time while listening. To prevent it, your Model 250 possesses a built-in FM-AFC circuit. Be sure to select your desired station and then turn on the FM-AFC switch.

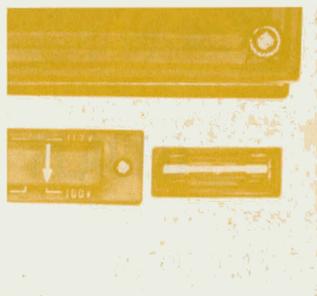
There are two systems in the FM MPX stereo broadcasts: FCC system (AM-FM system) and FM-FM system. Your Model 250 is designed to receive the FM stereo of the FCC system.

In the FCC system, also called "single-wave AM-FM system", the signal that contains the sum of the right and left stereo channels (L+R) is frequency-modulated in the main channel, while the signal that is the difference between the right and left channels (L-R) is amplitude-modulated in the sub-channel.

For easier demodulation, the FCC system employs the Compatible System of the composite signals in which a 19-kc pilot carrier and a 67-kc sub-signal of the SCA channel signal are added to the Main signals of L+R and L-R. This system assures clear and noiseless Hi-Fi music.

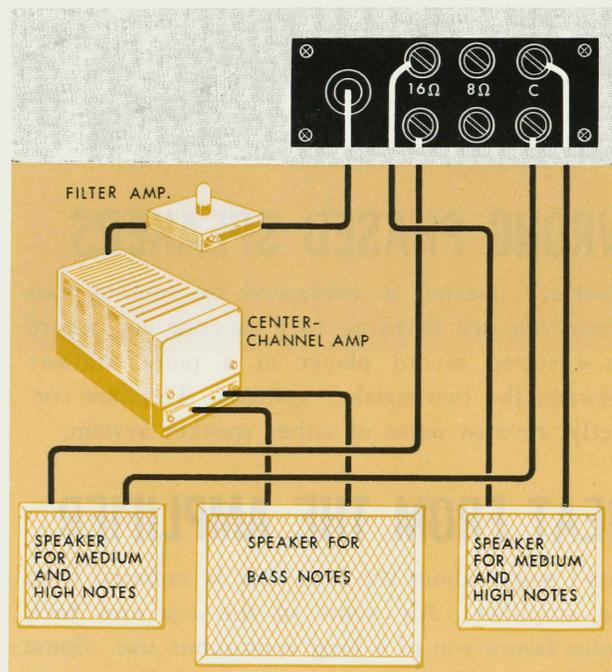
FUSE

If the amplifier does not function at all due to the blown fuse, remove its line cord from the outlet and then replace the fuse. Use a 3-ampere cartridge fuse. Never attempt to use a wire or a fuse with improper capacity. Before replacing, be sure to trace the trouble source and repair.



3-D STEREO SYSTEM

The 3-D stereo system has become popular in the increasing number of stereo fans. The speaker arrangement for this new system is characterized by a woofer installed at a point midway between right and left groups of tweeter/midrange speakers. This idea is based on the fact that human ears are not sensitive to the direction of sound whose frequency is less than 200 to 300 cps. Therefore, only one woofer is good enough for this system. You can enjoy the 3-D stereo system by connecting a bass amplifier together with a woofer to the center-channel terminal of this amplifier as described in Section "3-D STEREO SYSTEM".



HINTS ON USE

TO CONNECT TAPE RECORDER TO AMPLIFIER

To connect a tape recorder, record player, etc. to this amplifier, be sure to use shielded wires. The use of an ordinary cord or PVC wire may cause hum or buzz. The maximum length of the shielded wire is 5 Feet.

TO ELIMINATE DEEP HOWLING

Deep howling or buzzing on record playing is caused not by the amplifier, but by the record player placed on or near the speaker box. To eliminate it, keep a proper distance between them or place it on a thick cushion. Other causes may be the use of other than the shielded wire, defective connecting wire, improper connection or no grounding of the record player.

WRONG PHASED SPEAKERS

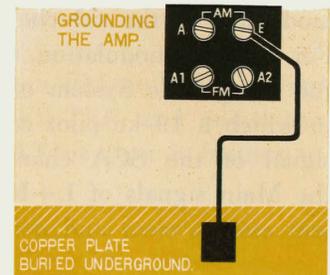
Incorrect phasing is evidenced by loss of bass when you are listening to a monophonic record on a stereo record player at a point midway between the two speaker systems. To phase correctly, reverse wires of either speaker system.

HEAT FROM THE AMPLIFIER

Don't worry about the heat that is radiated from the amplifier. Air vents in the top and back plates assure you of a long continuous use. Some simple precautions should be observed: Place nothing on the amplifier. Don't install the amplifier in an air-tight box.

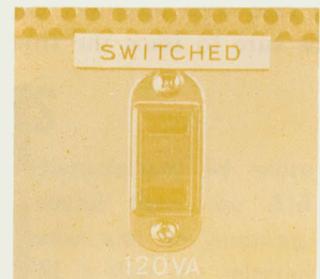
GROUNDING

Connect one end of a PVC wire or enamel wire to the E terminal of the amplifier and another end to the ground by using a copper plate as shown above. Radio noise is reduced.



AC OUTLET

The AC outlet on the back panel is connected or disconnected by the power switch on the front panel. The capacity is 120VA. Be sure to use it within the limit.



CONNECTION MUST BE PERFECT

Lead wires must be connected correctly and firmly to the speaker outputs and inputs. Loose and/or wrong connection may cause noises and malfunction of the amplifier. Before the connection, be

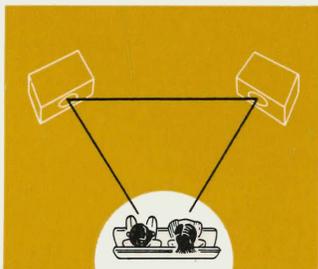
sure to look up manufacturer's instructions of the record player and tape recorder used.

FOR THE BEST STEREO EFFECT

The spacing between speakers, the location of the listener, and room acoustics, all effect the performance of the stereo system.

Positioning of speakers is just as phasing in the stereo system. If the speakers are separated too much, or if the listener gets too close to the speakers, there may be a sound hole in the middle. Arrange them as illustrated in the figure below.

The amplifier and the record player should be kept away from the speakers not only for convenience but for eliminating any troubles caused by the vibration of the reproduced sound.



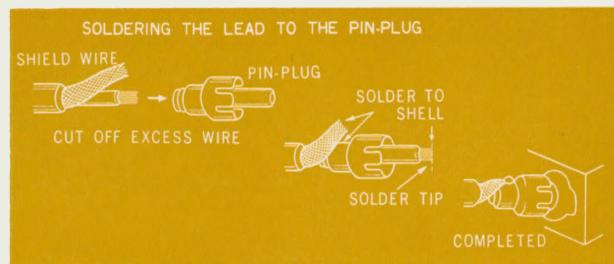
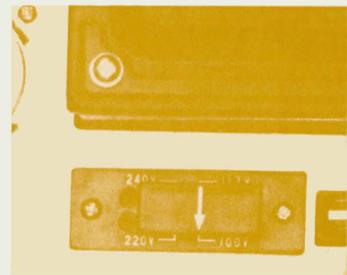
WHERE TO BE PLACED

The amplifier should be installed to the place as given below:

1. Easy to ground;
2. Floor not vibrated;
3. Not wet and dusty;
4. Not exposed to the sun;
5. Well ventilated.

VOLTAGE SELECTOR PLUG

The voltage selector plug allows you to use this amplifier at any of the four different supply voltages: 100, 117, 220 and 240 volts. If you move to the area where the supply voltage is not the same as before, pull out the plug and reset the arrow (➔) marked on it to the figure of volts in the new area.





Sansui[®]



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Printed in Japan (37050M4)