

# OPERATING INSTRUCTIONS

## AM/FM STEREO TUNER AMPLIFIER

### **SANSUI 350**



*Sansui*<sup>®</sup>

SANSUI ELECTRIC COMPANY LIMITED

In selecting the Sansui 350 AM/FM Multiplex Stereo Tuner Amplifier, you have made a wise choice, one that will offer you years of quality stereo enjoyment.

Like all Sansui products, the 350 combines the finest in internal engineering, performance and design. It has been precision built, tested and re-tested to perform flawlessly within the limits of its specifications.

This manual has been prepared to help you keep the 350 in perfect operating conditions. It explains all of the 350's unique features, installation and playing procedures, as well as some basic maintenance requirements.

Please read the contents of this manual carefully before operating the receiver. You will then be better prepared to hear the 350 perform up to its full capabilities.

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FM STEREO

FM

88 90 92 94 96 98 100 102 104 106 108

AM

55 60 70 80 100 120 140 165

POWER HEAD PHONES SPEAKERS BASS TREBLE VOLUME BALANCE

SELECTOR

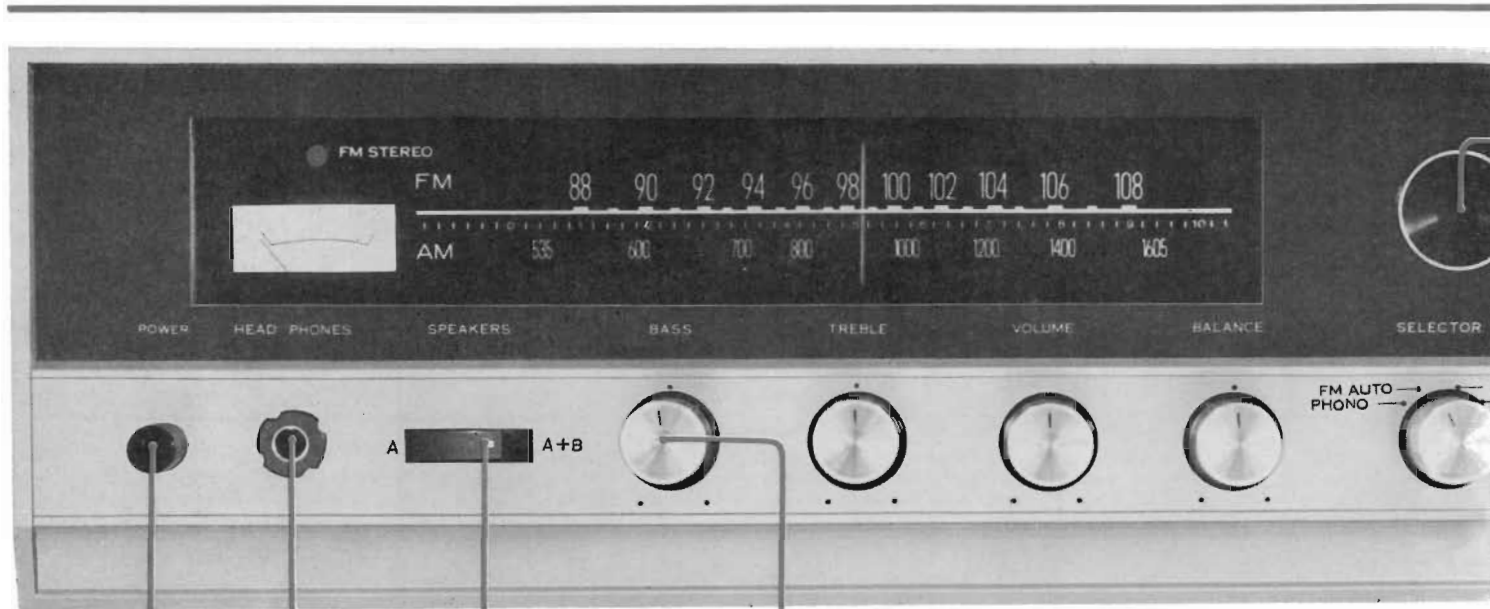
OFF OFF STEREO OFF  
MUSIC CANCELER LOGIC MODE TAP MONITOR

FM AUTO AM AUX

SPEAKER FUSE

*Power Amplifier*  
*Model SR-300*  
**Sansui**

# SWITCHES AND CONTROLS



## Power Switch

When this button is pushed in, power is applied to the amplifier. To shut the power off, push the button again.

## Headphones Jack

To monitor a tape or to enjoy private listening through a headset without disturbing others, plug into the HEADPHONES jack. Dynamic stereo headphones are recommended for use.

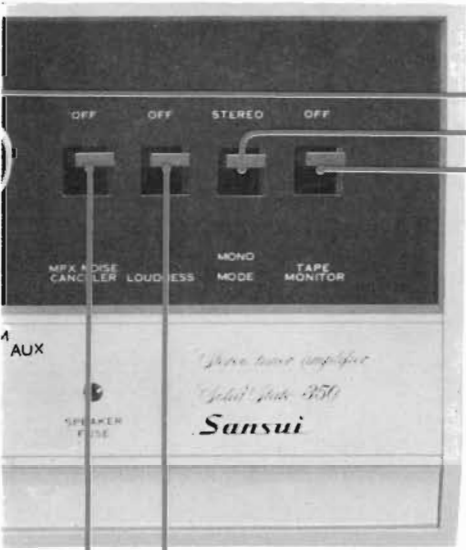
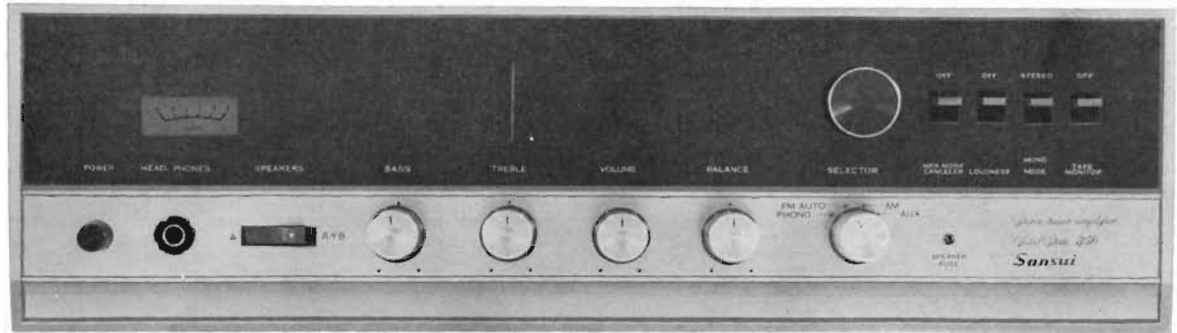
## Bass Control

Boosts or cuts low-end response according to personal taste, speaker response, and listening conditions. With the control in the mid-position, the bass tones will sound exactly as recorded or broadcast. To emphasize the bass, turn it clockwise. To decrease the intensity of the bass tones, turn it counterclockwise.

## Speaker Selector Switch

**A**—Use this position to select one set of speakers connected to the SYSTEM A outputs on the rear panel.

**A+B**—Use this position to play all speakers connected to both SYSTEM A and B outputs.



**Tuning Knob**

Turn this knob to select FM or AM stations of your choice.

**Mode Switch**

**STEREO:** Use this position for all stereophonic programs.

**MONO:** Use this position for all monophonic programs. The MODE switch in the MONO position connects either right or left, or both right and left programs, to speakers of both channels.

**Tape Monitor Switch**

The Tape Monitor switch enables you to compare a recorded tape with the original program. When this switch is turned down, the tape being recorded is heard from the speakers. Monitoring is possible with 3-head tape recorders only.

When you play back through the amplifier, the TAPE MONITOR switch should be in the down position. In all other cases, make sure the switch is OFF.

**Loudness Switch**

Provides the correct amount of bass and treble boost required to compensate for an apparent loss of bass and treble at low listening levels.

**MPX Noise Canceler**

Eliminates noise in multiplex programs broadcast by weak or distant stations.

# SWITCHES AND CONTROLS

## Dial Scales

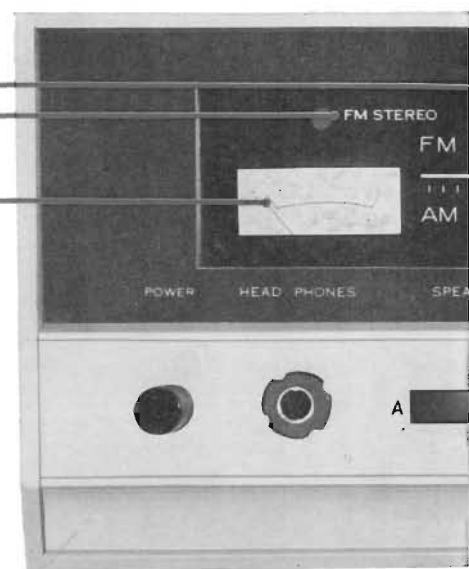
These scales are illuminated whenever the power is switched on. The upper scale is for FM stations and the lower for AM. To select a desired station, turn the Tuning knob which is located to the right of the dial.

## FM Stereo Indicator

Automatically lights up when a stereo program is received. During mono reception, it remains unlit.

## Tuning Meter

This meter aids in pinpointing a station. When the needle moves as far to the right as possible, the station is correctly tuned.

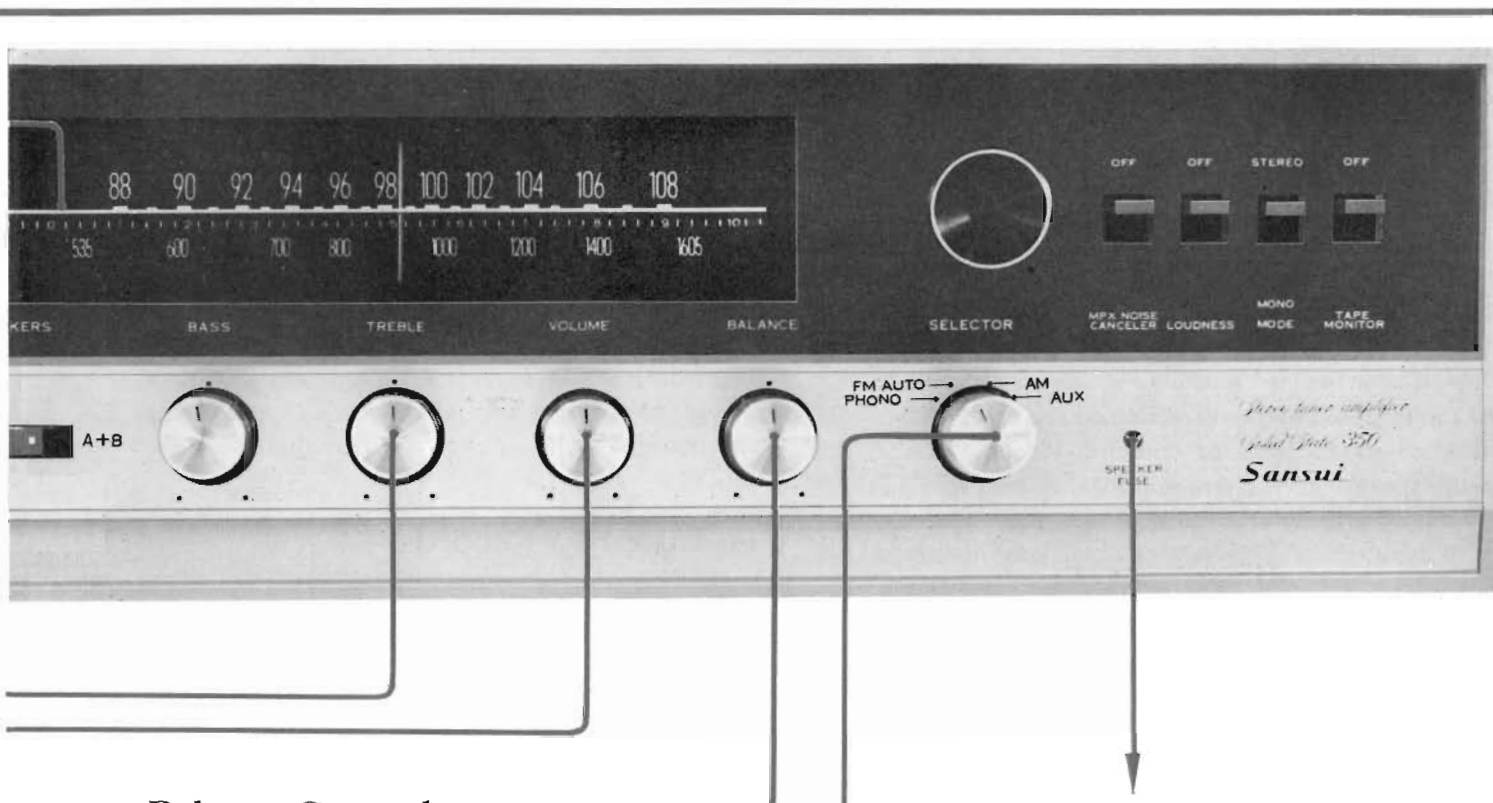


## Treble Control

Boosts or cuts the high-end response in the same way the Bass control handles the low-end response.

## Volume Control

Adjusts the overall sound level of both channels. As the control is turned clockwise, the volume is increased.



### Balance Control

This control is used to adjust for equal sound from both left and right channels, to compensate for slight imperfections in program materials, variations in speaker output, and the vagaries of room acoustics. Turning it clockwise accents the right channel by reducing the left channel output.

### Speaker Fuse Alarm

Lights up when the Quick Acting Fuses is blown to protect the power transistors from damage caused by shorts or overloads.

### Selector Switch

**PHONO**—Selects a record player connected to the Phono inputs on the rear panel.

**FM AUTO**—Use this position for FM stereo/mono programs.

**AM**—Use this position for AM programs.

**AUX**—Selects the output of a component connected to the Aux inputs on the rear panel.

# OPERATIONS

## — SPEAKER CONNECTION — RECORD PLAYING

### Connecting Speakers

To connect a stereo speaker system:

1. Connect the (+) terminal of the speaker on your left (as viewed from the front of the amplifier) to the terminal marked (+) LEFT SYSTEM A on the back panel of the amplifier.
2. Connect the (-) or common terminal of the left speaker to the terminal marked (-) LEFT SYSTEM A.
3. Connect the (+) terminal of the right speaker to the terminal marked (+) RIGHT SYSTEM A.
4. Connect the (-) or common terminal of the right speaker to the terminal marked (-) RIGHT SYSTEM A.

When you intend to connect two sets of stereo speaker systems to this amplifier, be sure to use speakers having impedance of 8 ohms or more.

If you are using only one speaker, connect the speaker leads to either right or left channel terminals of SYSTEM A or B.

**IMPORTANT:** The speakers of both right and left channels must push the sound waves out together. This is called phasing. If all (+) and (-) connections have not been properly made, one channel will push while the other pulls, causing sound cancellation at some frequencies or in some listening position. To correct, reverse the phase (+ and -) of either speaker system, left or right.

After connection, check to see that wires are not shorted between the terminals. If shorted, the fuse may blow out and the amplifier may be damaged. •

### Connecting Record Players

The following procedures are recommended for use with a record player or turntable utilizing a magnetic cartridge:

1. Connect the left channel output of the stereo turntable to the LEFT PHONO input jack on the rear of the amplifier.

2. Connect the right channel output of the turntable to the RIGHT PHONO input jack.

3. If a monophonic player or turntable is used, it may be connected to either RIGHT or LEFT PHONO input jack.

**NOTE:** There are two categories of pick-ups, one using a crystal element and the other using a magnetic circuit. From a standpoint of tone quality, a 2 to 10 mV magnetic cartridge is recommended for use with this amplifier. If a record player with a crystal cartridge is used, connect the output of the player to the AUX jacks on the rear of the amplifier.

### To Listen to Records

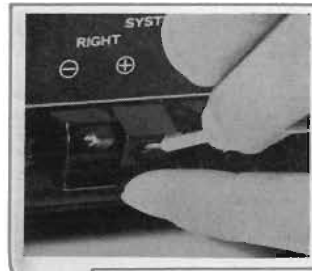
1. Set the Selector switch to the Phono position.
2. Set the Mode switch to either Stereo or Mono, depending on the type of record player used.
3. Switch on the record player and adjust its speed of rotation (RPM) to the record to be played ( $33\frac{1}{3}$ , 45 etc.)
4. After placing the needle on the record, adjust the Balance control for equal sound from both right and left channels.
5. Use other controls and switches according to your taste and listening conditions.

**NOTE:** When playing monophonic records on a stereo record player, follow the same procedures as for stereo records for best results. To balance the sound from both channels, play a monophonic record the same as a stereo record and adjust the Balance control so that the sound is heard from a point midway between the right and left speakers.





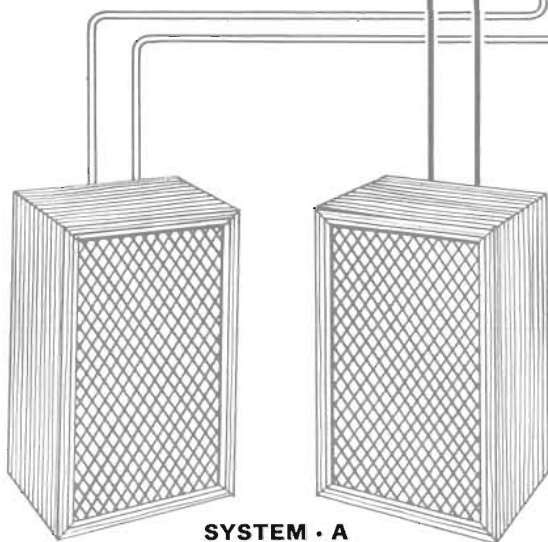
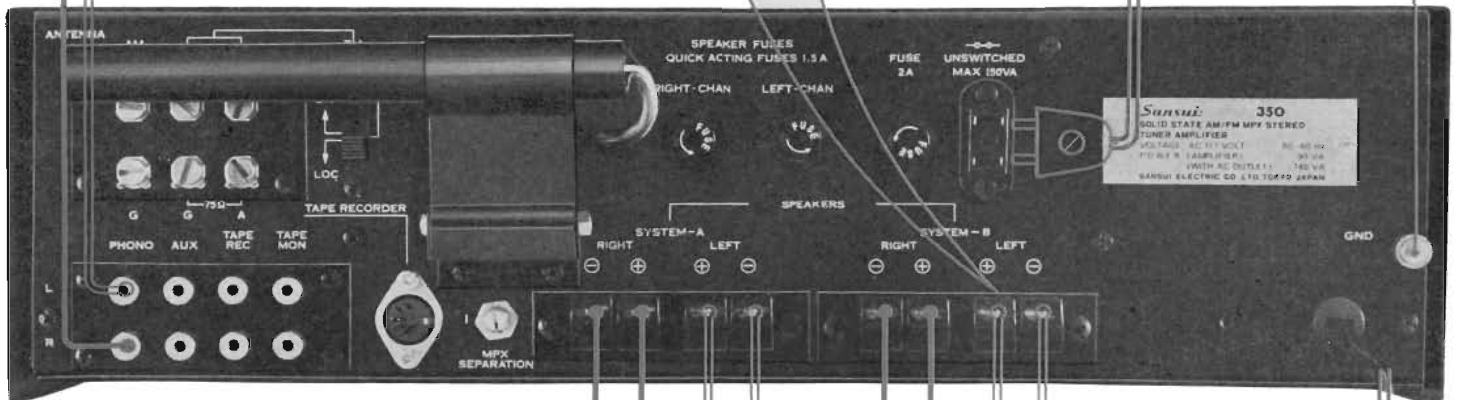
**RECORD PLAYER (MAG)**



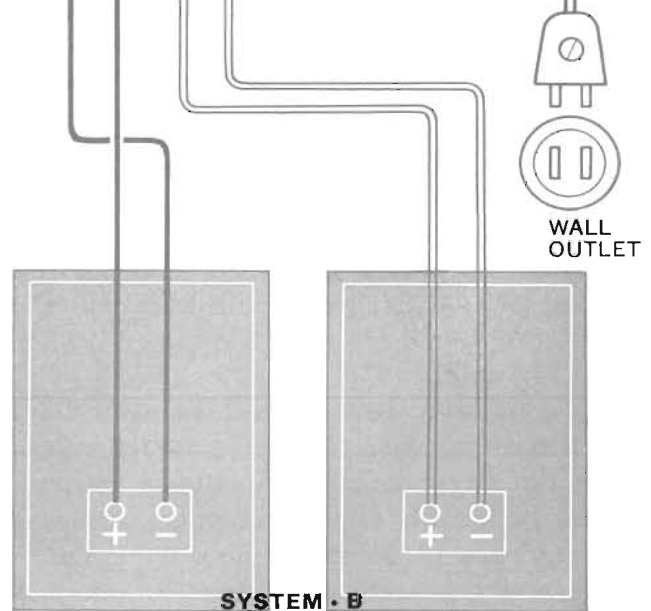
**SPEAKER TERMINALS CONNECTION**

**GROUND**  
(See "MAINTENANCE")

**FOR PLAYER**



**SYSTEM · A**  
**LEFT SPEAKER**      **RIGHT SPEAKER**



**SYSTEM · B**  
**RIGHT SPEAKER**      **LEFT SPEAKER**

# OPERATIONS

## RADIO RECEPTION

### Antenna Connections

#### AM Ferrite Bar Antenna (Fig. 2)

This highly sensitive antenna, located on the rear panel, is usually adequate for AM reception. To use, pull it down and away from the back of the tuner until it comes to a stop halfway between the top and the bottom of the amplifier.

This antenna will perform satisfactorily except in ferroconcrete buildings and in areas remote from the broadcasting stations. If the antenna is inadequate for clear AM reception, the installation of an outdoor AM antenna is required.

#### AM Outdoor Antenna (Fig. 1)

To connect an AM outdoor antenna:

1. Connect the flexible PVC wire (supplied) to the terminal screw marked AM-A on the back panel of the amplifier and install it slightly away from your house.
2. Connect grounding wire to the terminal screw marked GND located in the extreme lower right hand corner of the back panel.
3. For reasons of safety, be sure to use a lightning arrester.

#### FM Antenna (Figs. 3 & 4)

In urban or strong signal areas, the dipole antenna (supplied) should be connected to the terminals marked FM 300 $\Omega$ . Open it in the form of a "T" and rotate it until best reception is obtained before fixing it to a wall.

If the amplifier is used in a thick-walled building or in a fringe area where signals are too weak for adequate FM reception, install an outdoor antenna designed exclusively for FM reception. In this case, FM antennas of 300 $\Omega$  balanced type and 75 $\Omega$  unbalanced type are generally used. Connect either antenna to the matching antenna terminals.

**NOTE:** Optimum FM sensitivity cannot be obtained simply by lengthening the antenna. The proper height and direction of the antenna determines the best reception.

### To Listen to Monophonic FM Programs

1. Set the Selector switch to the FM Auto position.
2. Keep the Mode switch in either Mono or Stereo position.
3. Turn the Tuning knob to select the desired station. Once selected, adjust it so that the needle of the tuning indicator moves as far to the right as possible.
4. Set the Volume control, Bass control, Treble control and Loudness switch to their proper positions according to your taste and listening conditions.

### To Listen to FM-MPX Stereo Programs

1. Set the Selector switch to the FM Auto position.
2. Set the Mode switch to Stereo.
3. Select the desired FM stereo station with the Tuning knob and pinpoint the station with the tuning indicator. If the dial pointer crosses a station broadcasting MPX stereo, the FM Stereo indicator above the tuning meter will light up.
4. Adjust the Balance control for equal sound from both right and left channels.
5. Set the Volume control, Bass control, Treble control, Loudness switch and MPX Noise Canceler to their proper positions according to personal taste and listening conditions.

### To Listen to AM Programs

1. Set the Selector switch to the AM position.
2. Keep the Mode switch in either Mono or Stereo position.

3. Select the desired AM station with the Tuning knob and pinpoint the station with the tuning indicator.

4. Use all other controls and switches according to your taste and listening conditions.

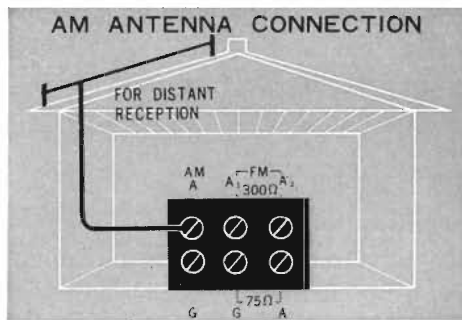


Fig. 1

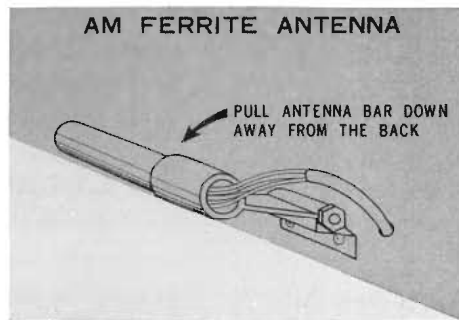


Fig. 2

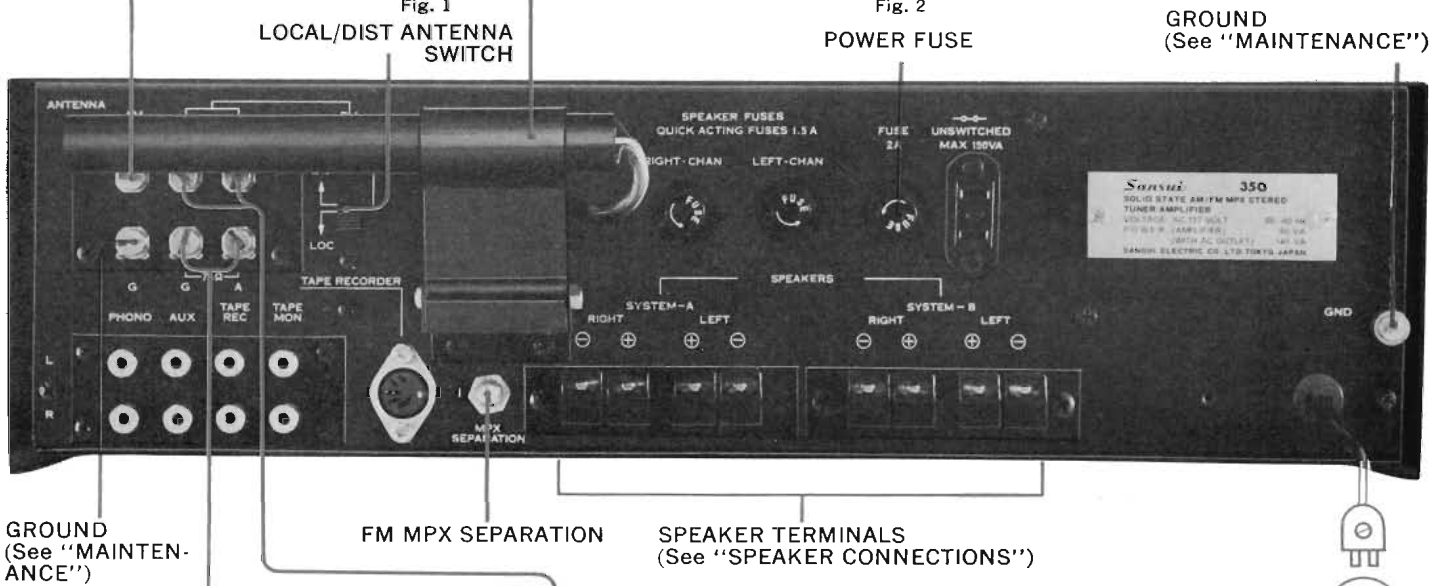


Fig. 3

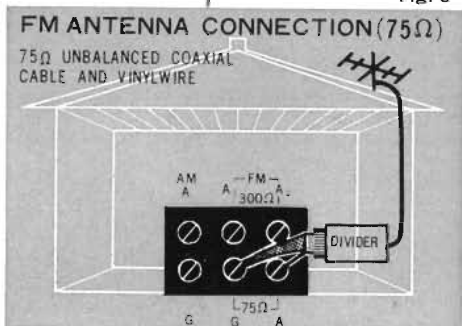
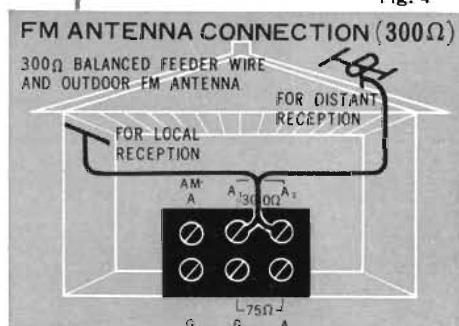


Fig. 4



# OPERATIONS

## — TAPE PLAYBACK

## — TAPE RECORDING

### Connecting a Tape Recorder or Deck

Tape recorders can be connected to record from, and playback through, the amplifier. A tape deck without a playback pre-amplifier can be connected to play back through the set. Tape monitoring is possible only with a tape recorder having a separate playback pre-amplifier as well as separate recording and playback heads.

### DIN Plug Tape Recorder

If your tape recorder has a DIN (German Industrial Standard) 5-pin plug, plug into the TAPE RECORDER socket on the real panel of the amplifier.

### Pin-Jack Tape Recorder

**To Record**—Connect the recording inputs of a stereo tape recorder to the TAPE REC terminals of both channels. If a monophonic tape recorder is used, connect its input to either left or right channel TAPE REC terminal.

**To Play Back**—Connect the playback outputs of a stereo tape recorder to the TAPE MON terminals of both channels. If a monophonic tape recorder is used, connect its output to either left or right channel TAPE MON terminal.

### Monitoring

To monitor a tape while using a 3-head tape recorder, follow the same procedures as in the preceding sections. Be sure to set the Tape Monitor switch to the On position.

### To Record on Tapes

1. Set the Selector switch to the program source to be recorded.
2. Set the Mode switch to the desired position (Stereo or Mono).
3. Operate the tape recorder for recording.
4. Use other controls and switches as required.

### To Listen to Tapes

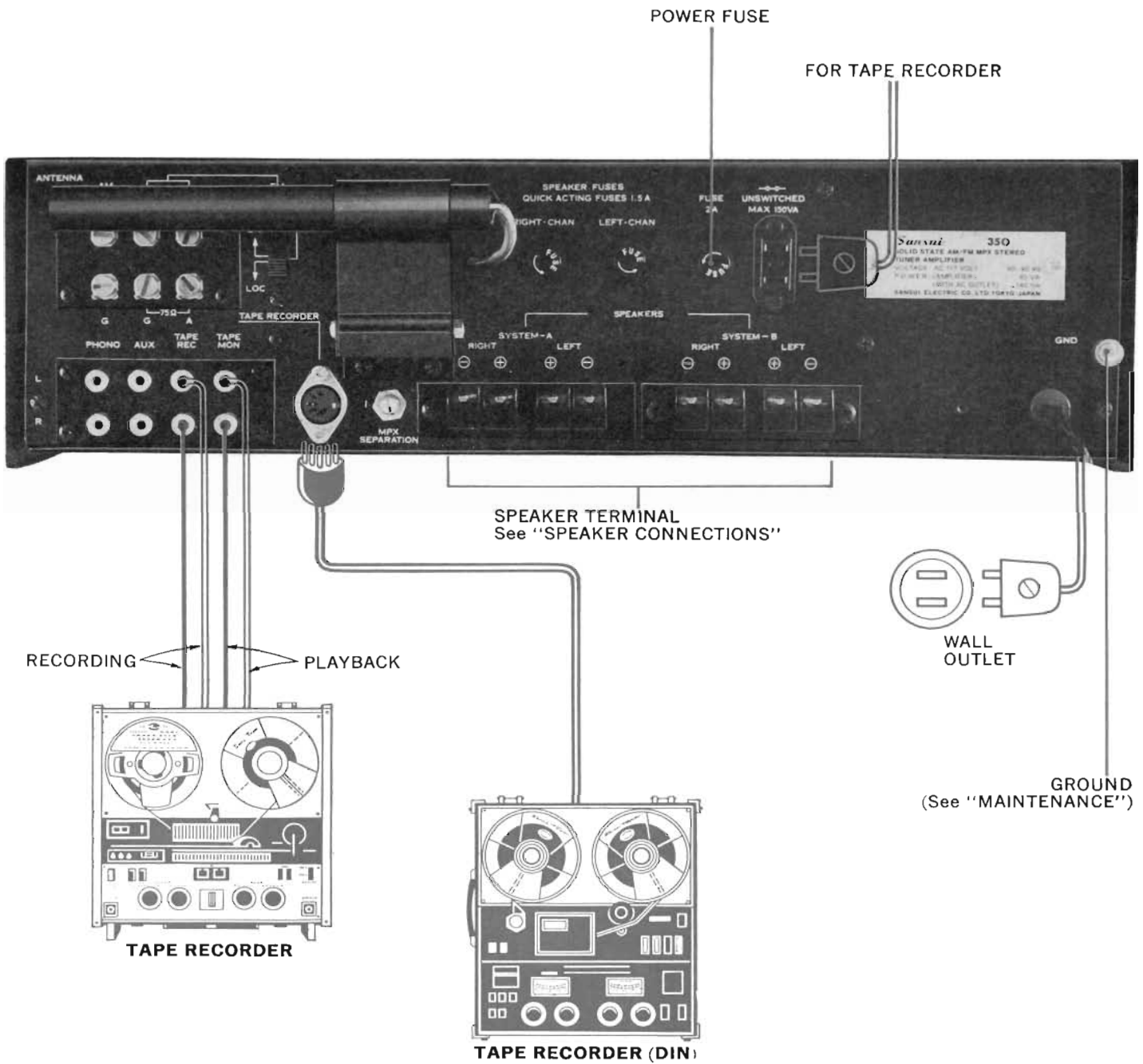
1. Turn the Tape Monitor switch on.
2. Set the Mode switch to Stereo or Mono, depending on the type of recorder used.
3. Set the tape recorder for playback.
4. Use other controls and switches as required.

### To Monitor Tapes

1. Turn the Tape Monitor switch on.
2. Set the Mode switch to Stereo or Mono, depending on the type of tape to be monitored.
3. Set the tape recorder for recording and monitoring.
4. Use other controls and switches as required.

#### NOTES:

1. Recorded tapes cannot be controlled by the controls and switches on the front panel of the amplifier. They control sound from the speakers only.
2. For best results, record directly through the amplifier, rather than through microphones placed in front of the speakers.
3. When not in use, the Tape Monitor switch must be in the Off position.
4. To connect a tape deck without a playback pre-amplifier, be sure to use an equalizer.



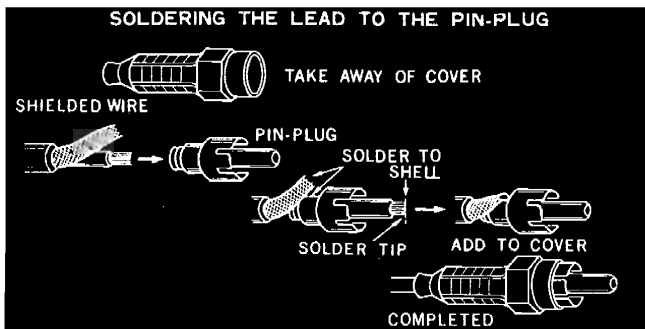
# MAINTENANCE

## Proper Connection of Leadwires

Leadwires should be connected properly to ensure optimum performance. If wires are loose or touching other parts, the amplifier may produce noise and eventually break down. Be sure to read the manufacturer's instructions for your tape recorder or phonograph before making any connections.

## Connecting Wire

Be sure to use adequately thick shielded wire when connecting a tape recorder, tape deck, phonograph or other components to the 350. The use of an ordinary twin lead wire may cause hum or noise. Don't use shielded wire longer than 7 feet(2 meters). The use of a longer wire leads to greater attenuation at high frequencies.



## How to Eliminate Radio Noise

### AM Reception

AM reception noise can often be eliminated by changing the position of the antenna. If you are located far from the broadcasting station, or in the mountains, a thick-walled building or a block of such buildings, radio waves will not be received well, resulting in unstable reception and increased noise. If reception is poor, connect vinyl wire (supplied) to the AM antenna terminal and position it for best reception. If this does not reduce noise or improve sensitivity, erect an antenna outside the building

and away from the wall. In high intensity signal areas, turn the AM Distant-Local antenna switch to the LOC position. This switch is located behind the AM ferrite bar antenna on the back panel of the 350. Some noises are peculiar to a certain broadcasting frequency or a certain time of day. These result from the nature of AM signals. In some cases the noise can be eliminated by grounding the amplifier or reversing the power cord plug-receptacle connections.

**NOTE:** If the antenna terminal marked A is touched with a finger, hum may be heard. This is a natural phenomenon; the unit is not faulty.

### FM Reception

Noise during FM reception can be generally attributed to either insufficient antenna input or interference from other electrical appliances.

Antenna input is insufficient when the antenna is not installed properly or when the station is far away. Extend and fix the attached antenna so that noise is minimized and the antenna input is at maximum. For better results, install an exclusive FM antenna in a position to receive signals most effectively.

If you use a TV. antenna for the TV. set and the FM unit with a divider, make sure that television reception is not affected. To prevent noise, avoid using a long antenna wire.

FM reception is affected considerably by the transmitting conditions of certain stations; usually their power and antenna efficiency. You may receive one station quite well and another poorly.

### Noise Common to FM and AM

In an area with many ferroconcrete buildings, noise may occur at a particular time of day. This noise is easily distinguished from that described above. To eliminate such noise, attach a noise arrester to the interfering electrical appliance or to the power

source of the 350. When you are listening to a FM-MPX program, you may notice a noise not heard with monophonic FM broadcasts. In some cases, you can also eliminate the noise by setting the Treble control to a "flat" or lower position.

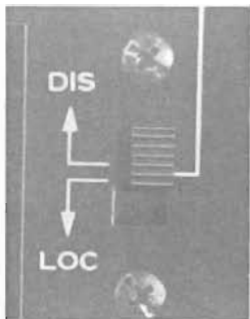
### Where to Place

Transistors are extremely susceptible to heat, so the 350 should not be placed where it is exposed directly to the sun, high temperatures, or in an airtight box. Nothing should be placed on the amplifier.

### Local-Distant Antenna Switch

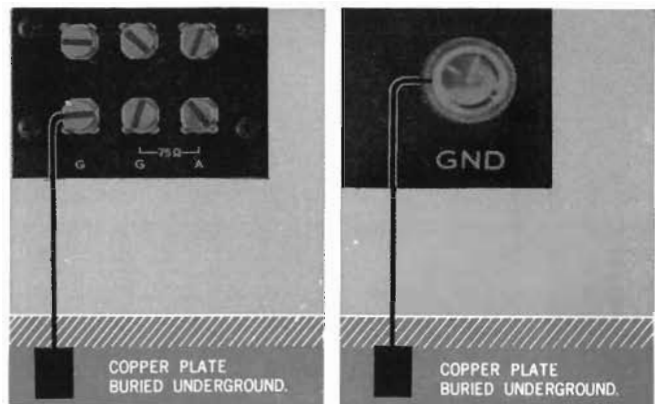
This adjusts the tuner to the strength of FM waves and should be set to DIST if you live in an area where FM signals are weak.

If you live near broadcasting stations and there is danger of interference from other stations, set the switch to LOC.



### Grounding

Connect one end of vinyl or enamel wire to the terminal screw marked G on the rear of the amplifier; attach a copper plate to the other end and bury it underground. If an AM outdoor antenna is installed, grounding is necessary. Connect the grounding wire to the terminal screw marked GND, and hum noise will be eliminated.



### FM MPX Separation

If the channel separation during FM-MPX stereo reception is inadequate or excessive, turn the screw marked MPX SEPARATION for natural proportions. Never adjust it without reason.

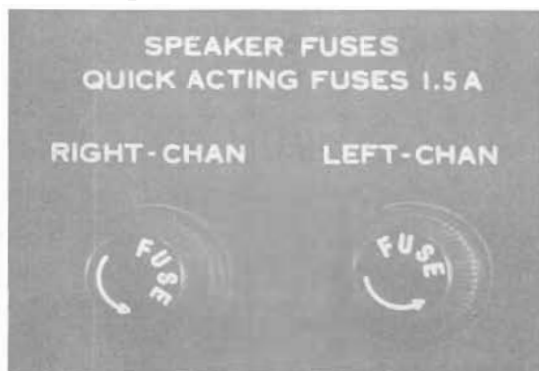


# MAINTENANCE

## Speaker Fuse Alarm

If shorts occur at speaker terminals or input circuits are overloaded, the Quick Acting Fuses on the rear panel will blow to prevent the expensive silicon transistors from being damaged and the Speaker Fuse alarm on the front will glow red to indicate the occurrence of the trouble. At the same time, the sound from speakers will be distorted and reduced in volume. In this case, immediately remove the power cord from the wall outlet and eliminate the source of trouble that caused them to blow. Then, check for the blown fuse or fuses, and replace them with new 1.5-ampere quick-acting fuses (supplied). Never attempt to use other fuses than specified. Such fuses, if used, may damage the transistors.

Note that the Speaker Fuse alarm lights under the conditions described above, only if there is an input signal and the volume control is turned to a sufficiently high level.



## AC Outlet

The 350 is provided with a 150VA power outlet on its rear panel. It can be used as an AC power source for other components such as a turntable, but care should be taken not to use it for any component that exceeds its 150VA power capacity.

## Power Fuse

If the unit does not work due to a blown fuse, remove the power plug from the wall outlet and replace the fuse. Before replacing, find and eliminate the source of trouble.

Use a glass-tubed 2-ampere fuse. Never attempt to use a piece of wire or a fuse with a different capacity.





## Hum and Howling

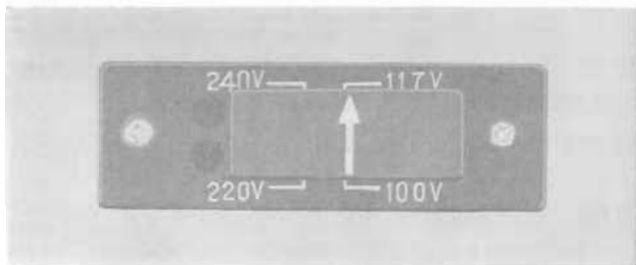
If, when using a tape record or record player, unpleasant humming or howling is heard, it is usually a result of the following.

The record player is placed on or near the speaker box causing sound waves to be transmitted from the speaker to the player (howling). To prevent this, place the record player away from the speaker box or put a thick cushion between the two components.

A low buzzing sound will also be produced if adequately thick shielded wire is not used for connections, or if connections have not been properly made. Be sure that the shielded wire is properly soldered to the pin-plug and that the motor and pickup arm of the record player are properly grounded.

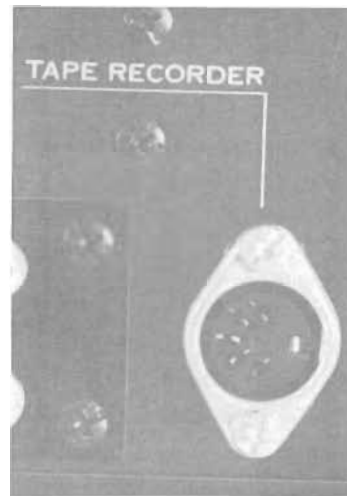
## Voltage Selector Plug

The 350 can be operated at four different voltages: 100, 117, 220 and 240V. The voltage selector plug is adjusted to your area prior to shipment. To change, pull the plug out, move the arrow head to the proper voltage in your area, and re-insert the plug firmly.



## DIN Connector

The Tape Recorder receptacle on the rear panel accepts a DIN (German Industrial Standard) 5-pin plug of a tape recorder. Since the single plug is used for both recording and playback, the tape recorder connection is largely simplified.



## Phasing

The right and left speakers must be properly phased so that the two channels push the sound waves out together. If one pushes while the other pulls, there is sound cancellation will occur at some frequencies or in some listening locations. Incorrect phasing is caused by improper speaker connections and is by a loss of bass when a monophonic record is listened to on a stereo player at a point halfway between the two speaker systems. If incorrect, reverse either the (+) or (-) speaker connection.

# SPECIFICATIONS CHARACTERISTICS

## AUDIO SECTION

### POWER OUTPUT:

MUSIC POWER (IHF): 46W at 8 ohms  
40W at 4 ohms

CONTINUOUS POWER (each chan.):  
18W/18W at 8 ohms  
16W/16W at 4 ohms

HARMONIC DISTORTION: less than 1.0% at rated  
output

INTERMODULATION DISTORTION (60Hz : 7,000Hz =  
4 : 1, SMPTE): less than 1.0%

POWER BANDWIDTH (IHF): from 30 to 20,000Hz at  
8 ohms

FREQUENCY RESPONSE (at normal listening level):

### POWER AMPLIFIER SECTION:

from 20 to 30,000Hz  $\pm 1.5$ dB

AUX: from 25 to 30,000Hz  $\pm 1.5$ dB

CHANNEL SEPARATION (at 1,000Hz, rated output):

PHONO: better than 40dB

AUX: better than 45dB

HUM AND NOISE (IHF):

PHONO: better than 60dB

AUX: better than 65dB

INPUT SENSITIVITY (for rated output at 1,000Hz):

PHONO: 2.2 mV

AUX: 150 mV

TAPE MONITOR (PIN jack): 150 mV

TAPE RECORDER (DIN jack): 150 mV

RECORDING OUTPUT:

TAPE REC (PIN jack): 180 mV

TAPE REC (DIN jack): 30 mV

OUTPUT IMPEDANCE: from 4 to 16 ohms

DAMPING FACTOR: 34 at 8 ohms

EQUALIZER:

PHONO: RIAA, NF type

CONTROLS AND SWITCHES:

BASS CONTROL:  $\pm 10$ dB at 50Hz

TREBLE CONTROL:  $\pm 10$ dB at 10,000Hz

LOUDNESS CONTROL: +8dB at 50Hz, +3dB at  
10,000Hz (volume control at  
-30dB)

SELECTOR SWITCH: 1) PHONO 2) FM AUTO  
3) AM 4) AUX

SPEAKER SWITCH: system A / system A+B

OTHER SPECIAL FEATURES:

Direct Tape Monitor, DIN Connector for Tape Recorder,  
Loudness Control Switch, HEAD PHONE Jack, Speaker  
Fuse Alarm.

## TUNER SECTION

FM:

FREQUENCY RANGE: from 88 to 108MHz

SENSITIVITY: 2.5 $\mu$ V (20dB quieting)  
3 $\mu$ V (IHF)

HARMONIC DISTORTION: less than 1%

SIGNAL TO NOISE RATIO: better than 50dB

SELECTIVITY: better than 45dB

IMAGE FREQUENCY REJECTION: better than 40dB

IF REJECTION: better than 45dB

FM STEREO SEPARATION: better than 30dB

SPURIOUS RESPONSE REJECTION: better than 50dB

SPURIOUS RADIATION: less than 34dB

AM:

FREQUENCY RANGE: from 535 to 1,605kHz

SENSITIVITY (IHF): 25 $\mu$ V at 1MHz

IMAGE FREQUENCY REJECTION:

better than 40dB at 1,000kHz

IF REJECTION: better than 45dB at 1,000kHz

SELECTIVITY: better than 20dB

OTHER SPECIAL FEATURES:

Tuning Meter, Fly-wheel Tuning, FM Stereo Auto,  
FM Stereo Indicator, 300 ohms balanced and 75 ohms  
unbalanced Antenna Terminal for FM, FM Local/Distant  
Switch. AM Ferrite Bar Antenna.

## SEMICONDUCTORS

TRANSISTOR AND FET: 31

DIODE: 21

VARISTOR: 2

THERMISTOR: 1

**POWER REQUIREMENTS**

**POWER VOLTAGE:** 100, 117, 220 and 240V. 50 or 60Hz

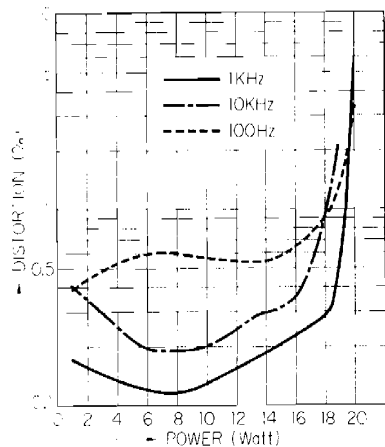
**POWER CONSUMPTION:** 40VA (zero signal)  
90VA (max. signal)

**DIMENSIONS (Without knobs, rubber stands and bar antenna):**

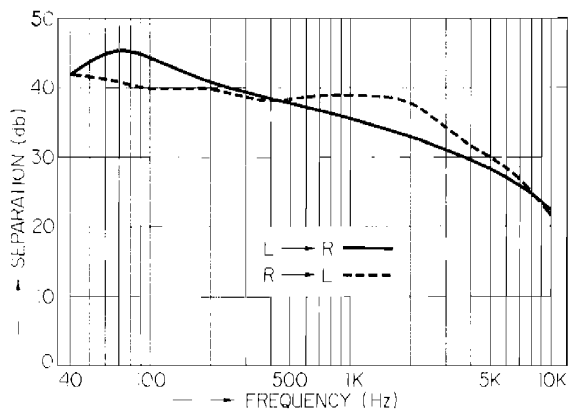
**WIDTH:** 15 7/8"  
**HEIGHT:** 4 7/32"  
**DEPTH:** 13 1/8"  
**WEIGHT:** 19.4 lbs.

\* All rights reserve specifications subject to change without notice.

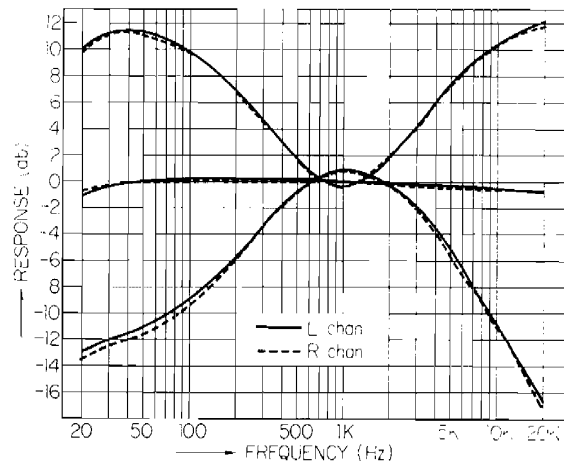
**POWER OUTPUT HARMONIC DISTORTION**



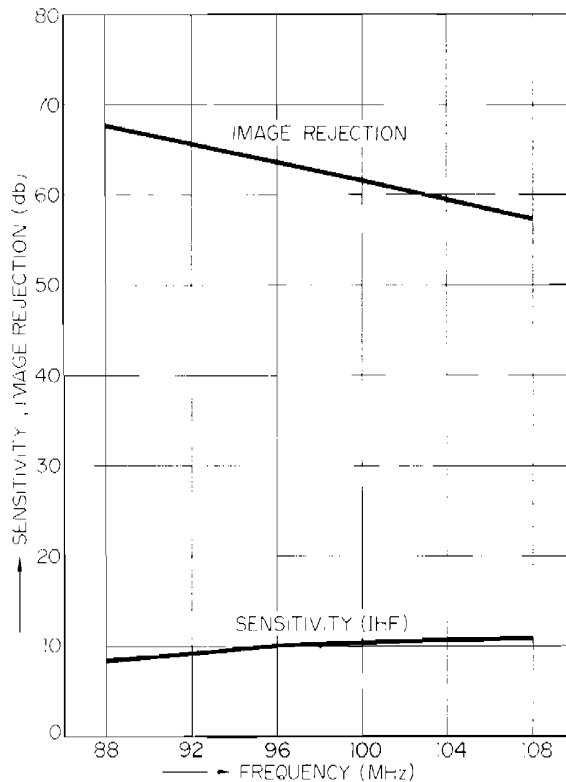
**FM MULTI SEPARATION**



**TONE CONTROL**



**FM SENSITIVITY & IMAGE REJECTION**



The Sansui logo is centered between two thick, dark horizontal bars. It features the word "Sansui" in a stylized, italicized serif font, with a registered trademark symbol (®) to its upper right.The company name "SANSUI ELECTRIC COMPANY LIMITED" is centered between two thick, dark horizontal bars. The text is in a clean, uppercase, sans-serif font.

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