

OPERATING INSTRUCTIONS

SOLID-STATE AM/FM STEREO TUNER AMPLIFIER

SANSUI 350A



Sansui

SANSUI ELECTRIC CO., LTD.

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

Like all Sansui products, the 350A 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 350A in perfect operating condition. It explains all of the 350A'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 350A perform up to its full capabilities.

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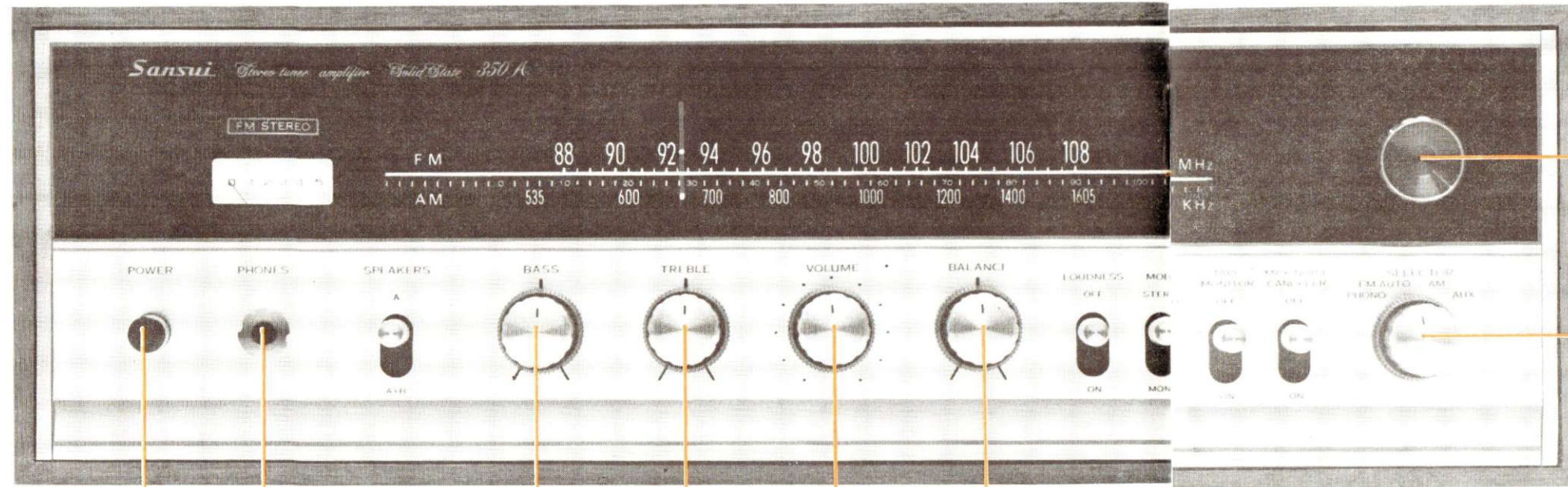
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SWITCHES AND CONTROLS



Tuning Knob

Use to select any desired AM or FM station.

Selector Switch

PHONO—Selects a record player connected to the PHONO inputs on the rear panel.
FM AUTO—Selects automatic switching between FM monophonic and stereo programs.
AM—Selects AM program.
AUX—Selects a component connected to the AUX inputs on the rear panel.

Power Switch

Push to turn the power on; push again to turn the power off. This switch also controls the power to the AC outlet on the rear panel of the amplifier.

Headphones Jack

Accommodates headphones for monitoring or private listening. Dynamic type stereo headphones are recommended for use with the 350A.

Treble Tone Control

Use to boost or cut high-end frequency response according to taste and listening conditions. To boost, turn it clockwise. To cut, turn it counterclockwise.

Bass Tone Control

Use in the same way as the TREBLE control to boost or cut low-end response.

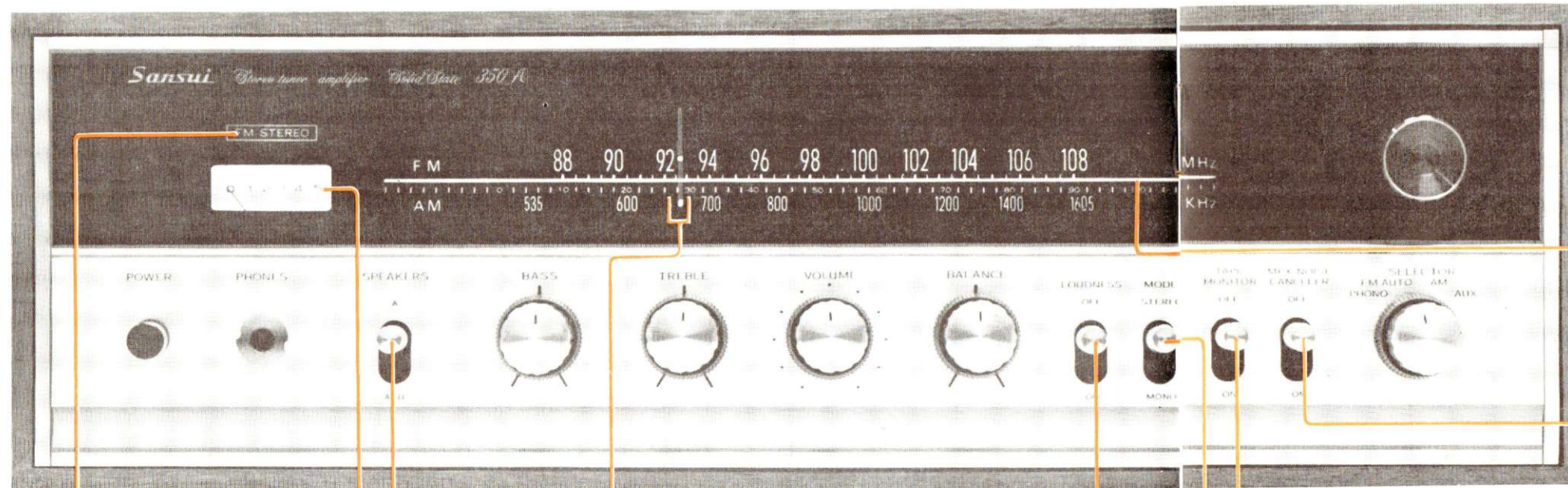
Balance Control

Use to adjust for equal sound from both left and right channels when slight imperfections in program material, variations in speaker output and the vagaries of room acoustics make this procedure necessary. Turning the control clockwise accents the right channel by reducing the left channel output.

Volume Control

Adjusts the overall sound level of both channels. Turn clockwise to increase volume, counterclockwise to decrease volume.

SWITCHES AND CONTROLS



FM Stereo Indicator

Lights up when the dial pointer crosses a station making an FM-MPX broadcast and the receiver is properly set for stereo reception.

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.

Dial Pointer

The dial pointer is illuminated in red when the POWER switch is pushed on.

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.

Dial Scales

Light up whenever the POWER switch is pushed on. The upper scale is for FM, the lower for AM.

MPX Noise Canceler Switch

Eliminates noise accompanying multiplex programs transmitted by weak or distant stations.

Tape Monitor Switch

The switch enables you to compare a recorded tape with the original program. When this switch is turned on, the tape being recorded is heard from the speakers. Monitoring is possible with 3-head tape recorders only. When you playback through the amplifier, the TAPE MONITOR switch should be in the ON position as well. In all other cases, make sure the switch is OFF.

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.

Loudness Switch

Use to boost bass and treble response at low volume listening levels. Due to the sensitivity of human hearing, both bass and treble seem greatly reduced at low listening levels. This switch compensates for this apparent loss.

OPERATIONS

SPEAKER CONNECTIONS

RECORD PLAYING

Connecting a Speaker System

Speakers with nominal impedance of 4 to 16 ohms may be hooked to this amplifier. Avoid using speakers with impedance below 4 ohms.

To connect a stereo speaker system:

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

To connect to the terminals of the amplifier:

1. Depress the colored button, opening a hole in the terminal.
2. Push the stripped end of lead wire in the hole and release the button.

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.

If Speaker Polarities Are Not Properly Matched...

If the polarities (+ and -) of the speakers and the amplifier are not matched correctly, sound cancellation at some frequencies or in some listening position occurs. Particularly when listening to monaural reproduction, this condition is noticeable by an absence of sound at a point midway between right and left speakers. If this situation occurs, check the amplifier and speaker connections once again and reverse the connections between the amplifier and either right or left speaker.

Connecting a Record Player

The following procedures are recommended for use with a player or turntable utilizing a magnetic cartridge with an output voltage between 2mV and 10mV.

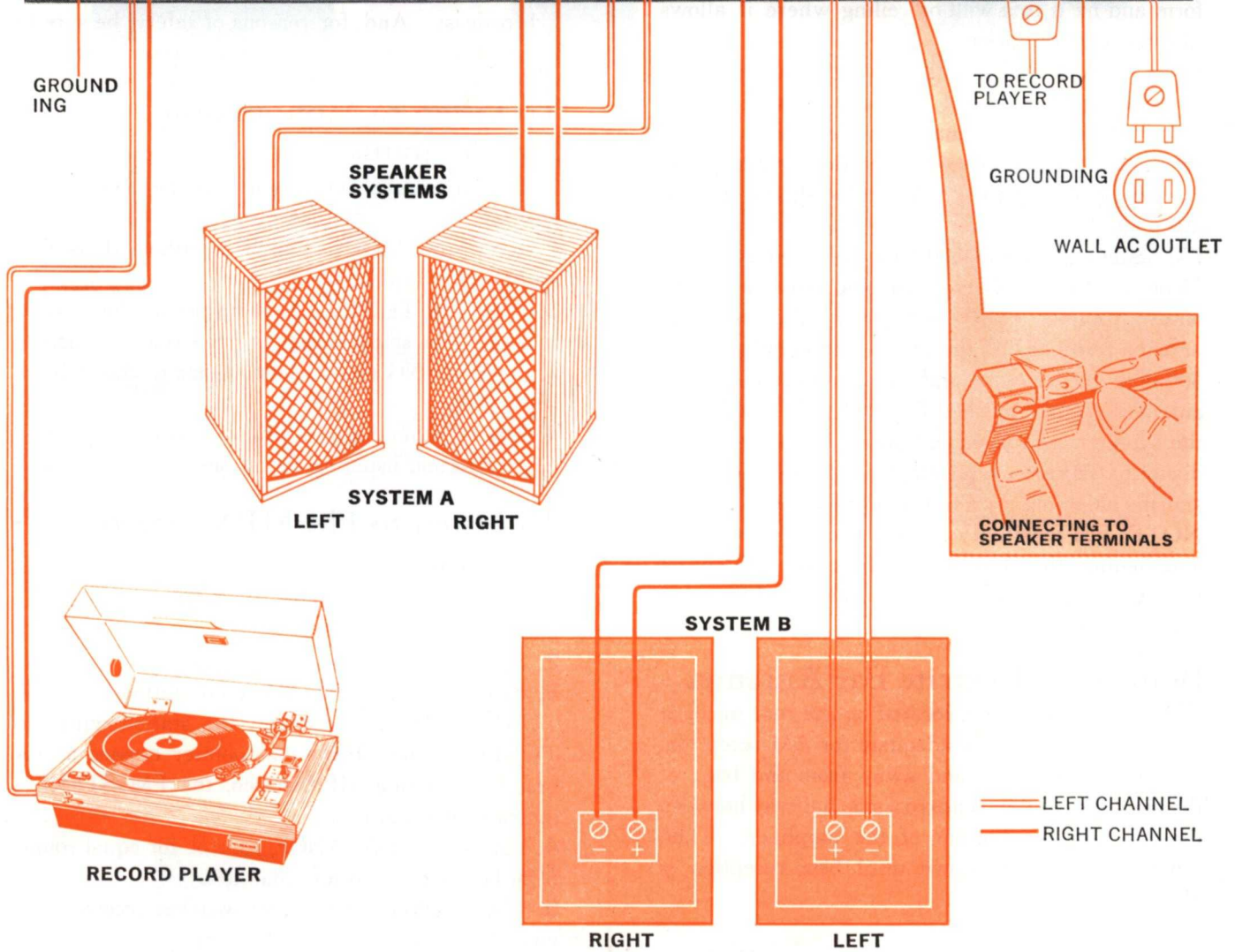
1. Connect the left channel output of a stereo turntable to the LEFT channel (upper) PHONO input jack on the rear panel of the amplifier.
2. Connect the right channel output of the turntable to the RIGHT channel (lower) PHONO input jack.
3. If a monophonic player or turntable is used, it may be connected to either RIGHT or LEFT channel PHONO input jack.

NOTE: Although it is not recommended from a standpoint of tone quality, if a player with a crystal cartridge must be used, connect the output of the player to an input jack labeled AUX 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) for 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.



OPERATIONS

— ANTENNA CONNECTION

— RADIO RECEPTION

The quality of reception that can be expected from the 350A is largely dependent on the correct positioning and use of antennas. The following procedures are recommended for noise-free reception.

FM Antenna

Where FM broadcasting stations are near and FM signals are strong, satisfactory FM reception can be obtained by using the feeder wire accompanying the amplifier. Connect the feeder wire to the antenna terminals marked FM 300 Ω -A1 and A2 on the rear panel, then fully extend the wire to a T form and fix it to a wall or ceiling where it allows the strongest reception.

If the 350A is used in a thick-walled building or in an area remote from FM broadcasting stations, the indoor feeder wire antenna may be inadequate for strong signal reception. An outdoor antenna designed exclusively for FM reception should then be installed.

FM antennas for the 300-ohm balanced type and 75-ohm unbalanced type can be used with the 350A. Connect either antenna to the matching antenna terminals on the rear of the amplifier. The 300-ohm feeder wire should be connected to the antenna terminal marked FM 300 Ω -A1 and A2. If the 75-ohm coaxial cable is used, connect the conductor to the antenna terminal marked FM 75 Ω -A1, and the shielding wire to the terminal G.

NOTE: FM sensitivity cannot be raised simply by lengthening the antenna. Adjust the antenna's height and direction while actually listening to a broadcast for the best reception.

Built-in AM Ferrite Bar Antenna

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

Outdoor AM Antenna

In ferroconcrete buildings or in areas remote from the broadcasting station, the built-in ferrite bar antenna may be inadequate for AM reception. An outdoor antenna then becomes necessary. This can be accomplished by connecting the PVC wire accompanying the amplifier to the antenna terminal marked AM-A1 on the back panel. Run this wire to an antenna that has been installed outdoors and away from the building. At the same time, the unit should be grounded. Adjust the outdoor antenna for maximum signal pick-up, while actually receiving a broadcast. And, for reasons of safety, be sure to attach a lightning arrester to the outdoor antenna.

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 meter moves as far to the right as possible.
4. Use all other controls and switches according to your taste and listening conditions.

To Listen to FM-MPX Stereo Programs

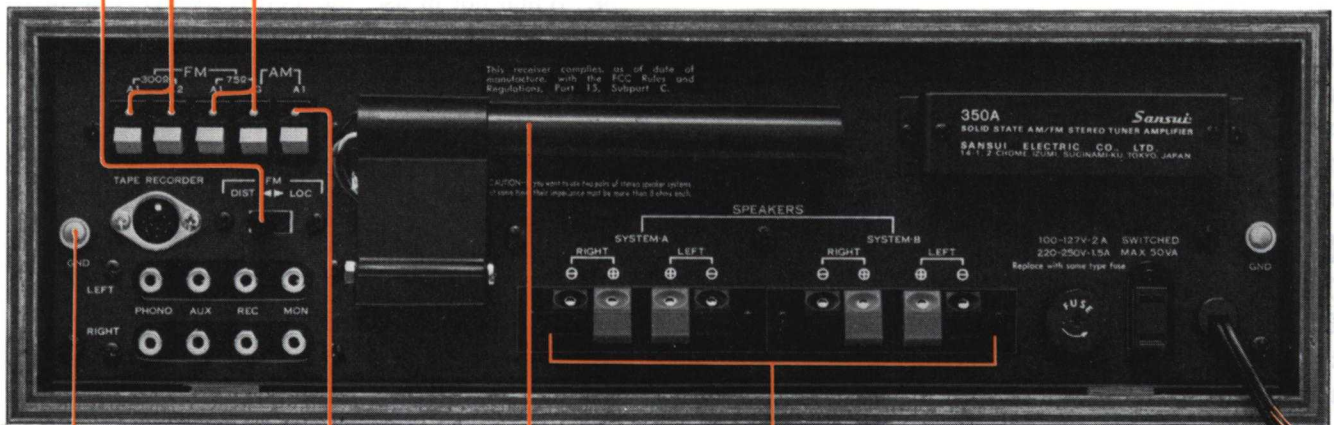
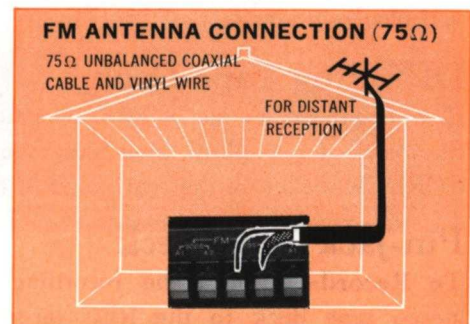
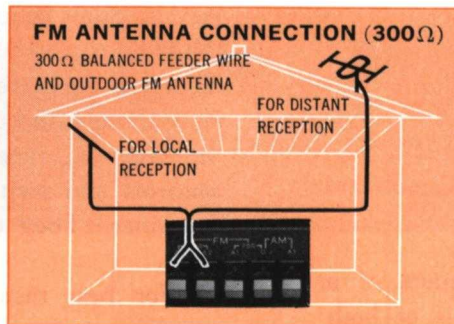
1. Set the SELECTOR switch to the FM AUTO position.
2. Set the MODE switch to STEREO.
3. Select the desired FM stereo station with the TUNING knob and pinpoint the station with the TUNING meter. If the dial pointer crosses a station broadcasting MPX stereo, the FM STEREO indicator will light up.
4. Adjust the BALANCE control for equal sound from both right and left channels.
5. Use all other controls and switches according to your 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.

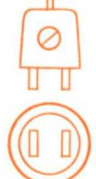
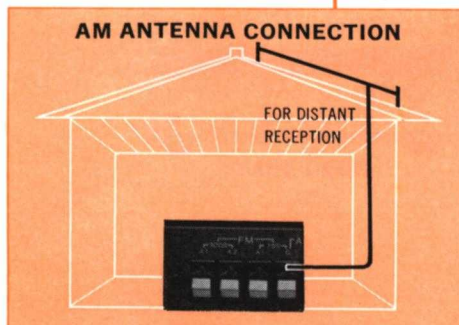
3. Select the desired AM station with the TUNING knob and pinpoint the station with the TUNING meter.

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



GROUNDING

SEE "SPEAKER CONNECTIONS"



WALL AC OUTLET

OPERATIONS

— TAPE PLAYBACK — TAPE RECORDING

Connecting a Tape Deck

Tape decks can be connected to record from, and playback through, the amplifier. Tape monitoring is possible only with a tape deck having a separate playback pre-amplifier as well as separate recording and playback heads.

DIN Plug Tape Deck

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

Pin-Jack Tape Deck

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

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

Monitoring

To monitor a tape while using a 3-head tape deck, 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 deck for recording.
4. Use other controls and switches accordingly.

To Listen to Tapes

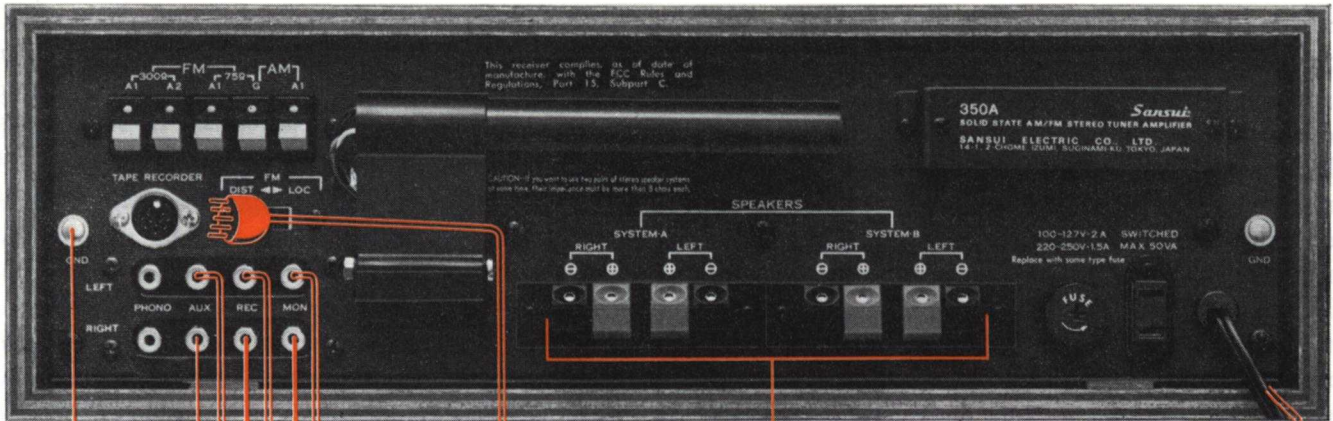
1. Turn the TAPE MONITOR switch on.
2. Set the MODE switch to STEREO or MONO, depending on the type of deck used.
3. Set the tape deck for playback.
4. Use other controls and switches accordingly.

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 deck for recording and monitoring.
4. Use other controls and switches accordingly.

NOTE:

1. Tape decks referred to in this section include only those with built-in playback preamplifiers.
2. Recorded tapes cannot be controlled by the controls and switches on the front panel of the amplifier. They control sound from the speakers only.
3. For best results, record directly through the amplifier, rather than through microphones placed in front of the speakers.
4. When not in use, the TAPE MONITOR switch must be in the OFF position.

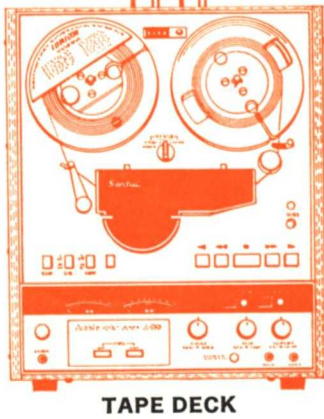


GROUNDING

CONNECT
OUTPUTS OF
AUXILIARY
COMPONENT

RECORDING PLAYBACK

SEE "SPEAKER CONNECTIONS"



TAPE DECK



TAPE DECK (DIN)



WALL AC OUTLET

NOTE:
Do not use REC/MON pin
jacks and TAPE RECORDER
DIN socket simultaneously.

==== LEFT CHANNEL
—— RIGHT CHANNEL

MAINTENANCE

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 well received, resulting in unstable reception and increased noise. If reception is poor, connect a 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 apart from the wall. 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.

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 T.V. antenna for both T.V. set and FM unit with a splitter, make sure that the 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

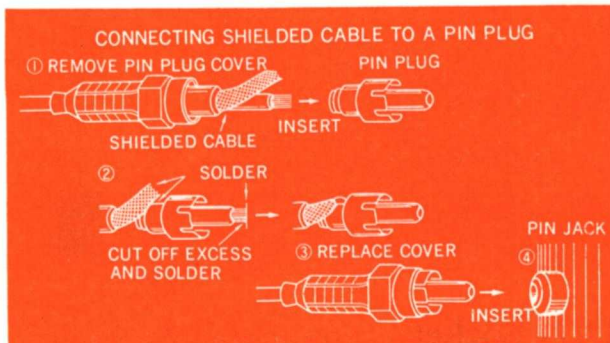
In an area with many ferroconcrete buildings, noise may occur at a particular time of day. This noise is easily distinguished from that described above. To eliminate such noise, attach a noise arrester to the

interfering electrical appliances or to the power source of the 350A. When you are listening to an 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 "flat" or lower.

Wire Connections

When connecting tape decks, record players or other components to the 350A, be sure to use shielded wire. The use of an ordinary cord or vinyl wire may cause humming and buzzing. The length of the shielded wire used should be shorter than 5 feet. Be sure that all lead wires between the amplifier and components are properly connected. If the connections are loose or in touch with other parts, the amplifier will not function properly, may pick up noise, and even breakdown over a period of time. Also be sure to read the manufacturer's instructions for any component before connecting it to the 350A.

The shielded wire is made up for use as illustrated below:



Local-Distant Antenna Switch

This switch adjusts the tuner to the strength of FM radio waves. It should be set to DIST if the receiver is located in an area where FM signals are weak, or to LOC if it is located near broadcasting stations and there is danger of interstation interference.



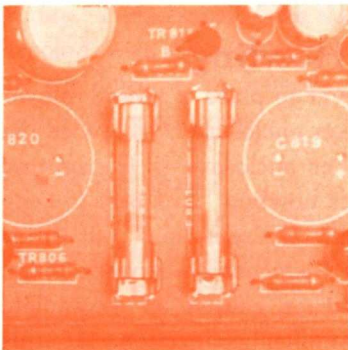
Humming and Howling

Care must be taken never to place a record player on or too near a speaker enclosure. Otherwise the vibration of the speaker enclosure is transmitted to the player and causes howling. It is best to keep these components completely separated, but if this is impossible, to place a thick cushion between them. Humming is a phenomenon caused by incomplete or incorrect player-amplifier connection. If this occurs, check to make sure that all connections are complete and that the thickness of the connecting wire is sufficient. Be sure to connect the grounding lead (or terminal) of the record player to the GND terminal of the 350A. It may suppress the hum noise which may otherwise occur.

MAINTENANCE

Quick-Acting Fuses

These fuses for right and left channels are also designed to protect the transistors by blowing instantly if shorting occurs between connections at a speaker system terminal. If, after the POWER switch is turned on and the dial scales light up, neither channel operates or only one operates normally, is either because one or both Quick-Acting fuses have blown. In this case, remove the 350A's power supply cord from its outlet, remove the wood case from the chassis, and check to see if the fuses are blown. Replace them with identical 2.5A fuses after finding and eliminating the source of trouble that caused them to blow.



AC Outlet

The 350A is provided with an AC outlet on the back panel. It is controlled by the POWER switch on the front panel.

CAUTION: The maximum capacity of this outlet is 50VA. Never use it beyond its rated capacity.

The voltage supplied by the AC outlet is the same as the power supply voltage used.



Power Fuse

Should the amplifier fail to operate and the dial scales fail to light up when the POWER switch is turned on, the probable cause is either a power stoppage or a blown fuse. To check, remove the 350A's power supply cord from its outlet, turn the fuse holder on the rear panel counterclockwise, and remove the fuse. If it is blown, replace it with a new glass-tubed fuse of the same capacity (100~127V—2A, 220~250V—1.5A) after determining and eliminating the trouble source that caused the fuse to blow. Using wire or a fuse of a different capacity as a stop-gap measure is dangerous and should be avoided.



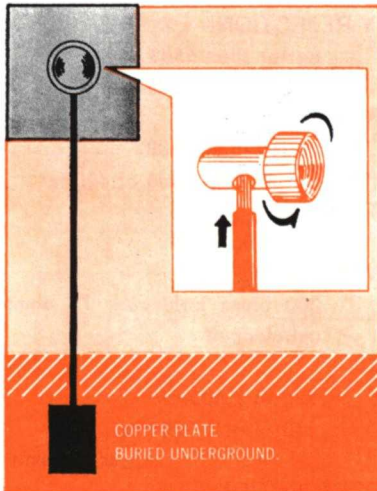
DIN Socket

If your tape deck has a DIN socket, it may be connected to the 350A simply by the use of a cable with a 5-pin DIN connector on each end. Insert each connector to the DIN socket on the receiver's rear panel and into the one on the tape deck. The DIN connection system, designed to simplify interconnections between the tape deck and amplifier, is based on the German DIN Standards.



Grounding

Connect one end of vinyl or enameled wire to the terminal screw marked GND at the rear of the amplifier, attach a copper plate to the other end, and bury it underground. Whenever an outdoor AM antenna is used, grounding becomes necessary. In all cases, grounding is desirable since it allows a better SN ratio to be obtained. To ground an entire audio system, connect the grounding wire of each component used to this terminal.



Voltage Adjustment

To reach the Voltage Selector remove the two screws from the nameplate on the rear panel and then remove the nameplate. The Voltage Selector makes it possible to operate the 350A at the correct voltage in any area.

The voltage has been pre-adjusted at the factory, but can be easily readjusted as follows:

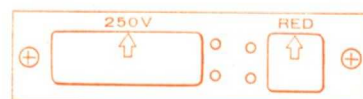
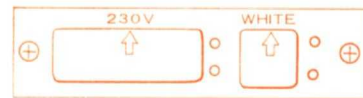
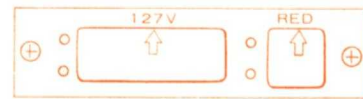
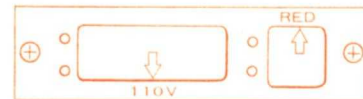
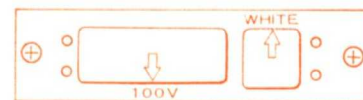
STEP I Set arrow of main Voltage Selector plug to required voltage: 100, 110, 117, 127, 220, 230, 240 or 250 volts.

STEP II If numerals of voltage are printed in red, set arrow of adjacent sub V.S. plug to position marked red. If they are printed in white, set arrow to position marked white.

STEP III The power fuse should also be changed when the AC line voltage is changed. For 100~127

volt operation a 2-ampere fuse is required. For 220~250 volt operation the fuse should be changed to a 1.5 ampere unit.

NOTE: The Voltage Selector can be used to eliminate the trouble caused by the considerable voltage fluctuation. In this case, it should be set to the peak voltage.



SPECIFICATIONS

AUDIO SECTION

POWER OUTPUT:

MUSIC POWER (IHF): 54W at 4 ohms load
46W at 8 ohms load

CONTINUOUS POWER: 22/22W at 4 ohms load
20/20W at 8 ohms load

TOTAL HARMONIC DISTORTION:

less than 1% at rated output

POWER BANDWIDTH (IHF):

30 to 30,000Hz

INTERMODULATION DISTORTION:

(60 Hz: 7,000 Hz=4:1 SMPTE method)

less than 1% at rated output

FREQUENCY RESPONSE: (at normal listening level)

AUX OVER ALL: 30 to 30,000Hz \pm 1dB

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

PHONO: better than 50dB

AUX: better than 50dB

HUM AND NOISE (IHF):

PHONO: better than 65dB

AUX: better than 70dB

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

PHONO: 2.2mV (50k ohms)

AUX: 150mV (100k ohms)

TAPE MON (PIN): 150mV (100k ohms)

TAPE RECORDER (DIN):

150mV (100k ohms)

RECORDING OUTPUT: (at rated output, 1,000Hz)

TAPE REC (PIN): 150mV

TAPE RECORDER (DIN):

30mV

LOAD IMPEDANCE: 4 to 16 ohms

EQUALIZER

PHONO: RIAA NF type

DAMPING FACTOR: 45 at 8 ohms load

TONE CONTROLS

BASS: \pm 10dB at 50Hz

TREBLE: \pm 10dB at 10,000Hz

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

SWITCHES

MODE: STEREO, MONO

TAPE MONITOR: OFF, ON

MPX NOISE CANCELER:

OFF, ON

SELECTOR: PHONO, FM AUTO, AM, AUX

SPEAKER SELECTOR: SYSTEM-A, SYSTEM-A+B

TUNER SECTION

FM

TUNING RANGE: 88 to 108 MHz

SENSITIVITY

(20dB quieting): 2.5 μ V

(IHF): 3 μ V

TOTAL HARMONIC DISTORTION:

less than 1%

SIGNAL TO NOISE RATIO:

better than 60dB

SELECTIVITY: better than 32dB

CAPTURE RATIO (IHF): 3dB

IMAGE FREQUENCY REJECTION:

better than 65dB

IF REJECTION: better than 70dB

SPURIOUS RESPONSE REJECTION

better than 70dB

STEREO SEPARATION: better than 30dB at 400Hz

SPURIOUS RADIATION:

less than 34dB

ANTENNA INPUT IMPEDANCE:

300 ohms balanced, 75 ohms unbalanced

AM

TUNING RANGE: 535 to 1,605kHz

SENSITIVITY: 350 μ V at 1,000kHz

(bar antenna)

IMAGE FREQUENCY REJECTION:

better than 65dB at 1,000kHz

IF REJECTION: better than 55dB at 1,000kHz

SELECTIVITY: better than 20dB

SWITCHES

FM ANTENNA SWITCH: DISTANT, LOCAL

SEMICONDUCTORS:

TRANSISTORS: 38 FET: 1

DIODES: 17 ZENER DIODE: 1

POWER REQUIREMENTS:

POWER VOLTAGE: 100,110,117,127,220,230,240, 250V 50/60Hz

POWER CONSUMPTION:

57W (rated)

DIMENSIONS: 416mm (16 $\frac{3}{8}$ " W

145mm (5 $\frac{3}{4}$ " H

300mm (11 $\frac{7}{8}$ " D

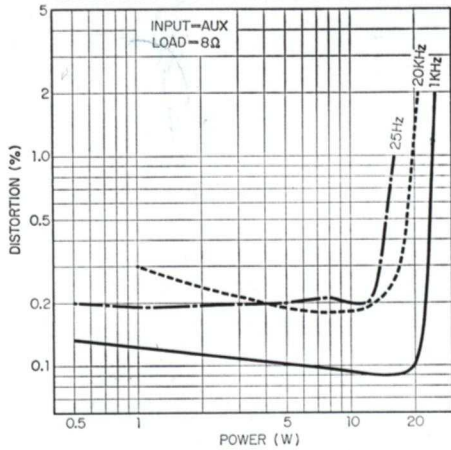
WEIGHT:

9kg (19.8lbs)

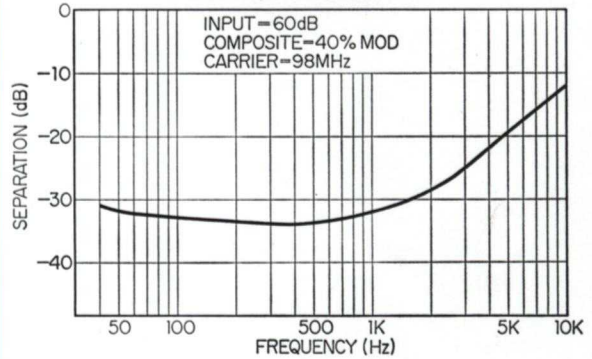
CHARACTERISTICS / ACCESSORIES

* Design and specifications subject to change without notice for improvements.

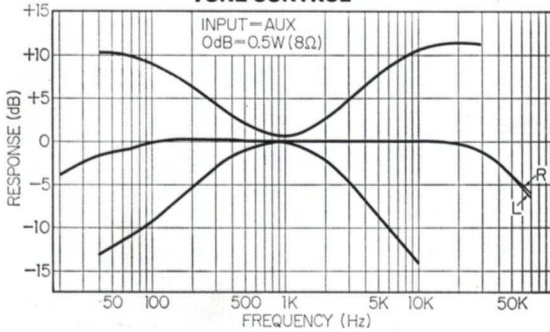
POWER OUTPUT HARMONIC DISTORTION



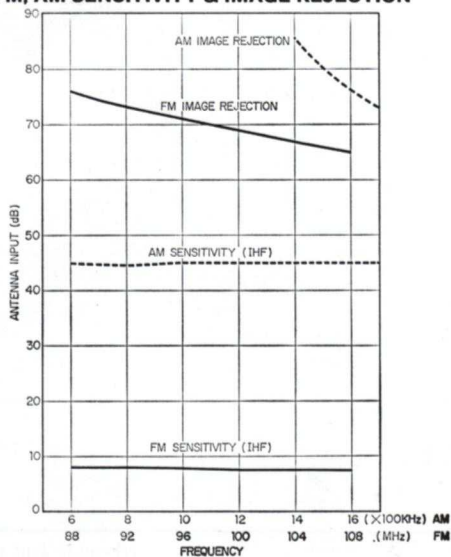
FM STEREO SEPARATION



TONE CONTROL



FM, AM SENSITIVITY & IMAGE REJECTION



ACCESSORIES

1. FM ANTENNA 1
2. AM ANTENNA 1
3. OPERATING INSTRUCTIONS 1
4. SERVICE MANUAL 1
5. OPERATING SHEET 1
6. PIN-PLUGS 2
7. POLISHING CLOTH 1
8. QUICK ACTING FUSES (2.5A) 2



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