

AM/FM STEREO RECEIVER

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# SX-5560

OPERATING INSTRUCTIONS

S



This receiver can be used in areas with 110V, 120V, 220V and 240V local power sources. Before using it, be sure to set the Line Voltage Selector Switch correctly as described on Page 15.

 **PIONEER**

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## SX-5560 FEATURES

### Stable Operation in FM Tuner Section

The FM front end includes dual gate MOS FET and a high precision 4-ganged variable capacitor. The IF amplifier circuit employs a high integration density IC developed by Pioneer and three dual-element phase-linear ceramic filters to achieve a maximum of stability. Stable multiplex circuit operation is assured by the PLL IC design to which a newly developed type of negative feedback has been applied. This design provides low distortion with a high degree of reliability. In all important respects, including station drift, image rejection ratio, S/N ratio, capture ratio, and sensitivity, the crystal clear FM reception this tuner provides will satisfy the most discriminating taste.

### Wide Power Bandwidth, Low Distortion Power Amplifier

The use of a first stage differential amplifier, and a pure complementary power amplifier allows high power output over a wide bandwidth to be obtained with a very low distortion rate. SX-5560 delivers

Continuous power output of 50 watts\* per channel minimum RMS at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.1% total harmonic distortion.

The two 15,000  $\mu$ F electrolytic capacitors in the power supply permit high sound quality even at lowest frequencies.

### Pre-Amplifier Design Assures High Fidelity Reproduction

By using a differential amplifier at the first stage input impedance variations due to frequency are minimized, a PHONO input capability of 200mV with a distortion of 0.1% at 1 kHz is obtained. This, in combination with the careful selection of semiconductors used, holds RIAA deviation to within  $\pm 0.2$ dB (30Hz~15kHz). You are assured of faithful reproduction of your records over a wide dynamic range with no discernible distortion.

### High Reliability Protection Circuit

The protection circuit and power relay are designed to instantaneously open the output circuit in the event of a short in the speaker leads or current surges which may occur without warning. This feature prevent, damage to speakers or transistors, and also prevents click noises during operation of the power switch.

### Duplicate Switch for Recording or Editing of Tapes

Two sets of TAPE terminals and the DUPLICATE switch permit one to selectively record from one tape to another when two tape decks are connected to the amplifier at the same time. It is thus possible to record onto a cassette from an open reel tape deck, or vice versa.

### New, Attractive Visual Design

The large tuning scale provides more readable and hence more precise location of the desired frequency. The front panel has been designed for improved operating convenience.

\* Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

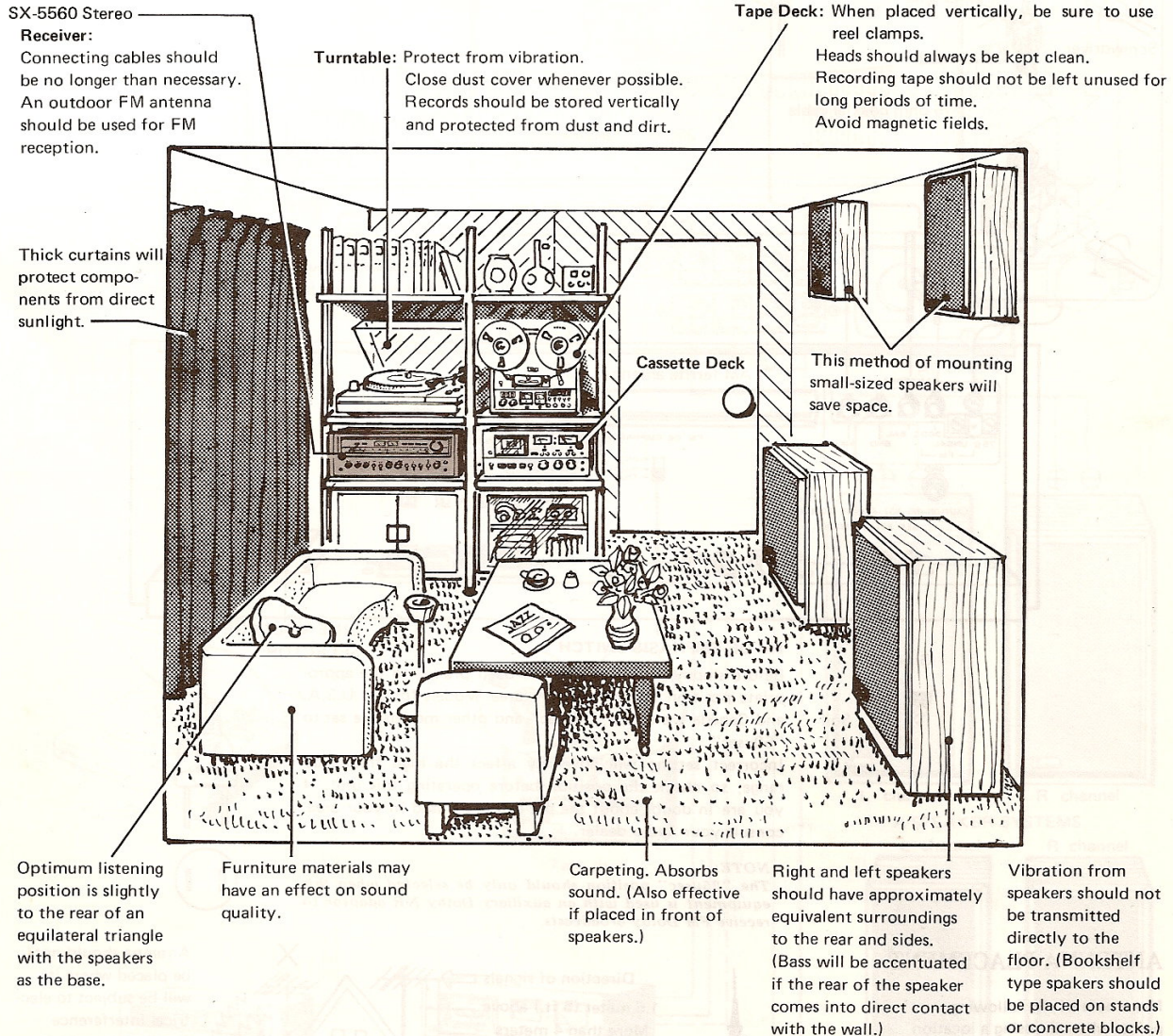
## STEREO SYSTEM SET-UP

The SX-5560 is a stereo amplifier with built-in AM/FM stereo tuner.

Used in combination with separately purchased speakers and, if you desire, other program sources such as turntable or tape deck, you can create a

stereo system which will provide many hours of music listening enjoyment. With use of a microphone, moreover, the SX-5560 will serve as a public address system amplifier.

### Some Points to Keep in Mind when Setting Up Your Stereo System



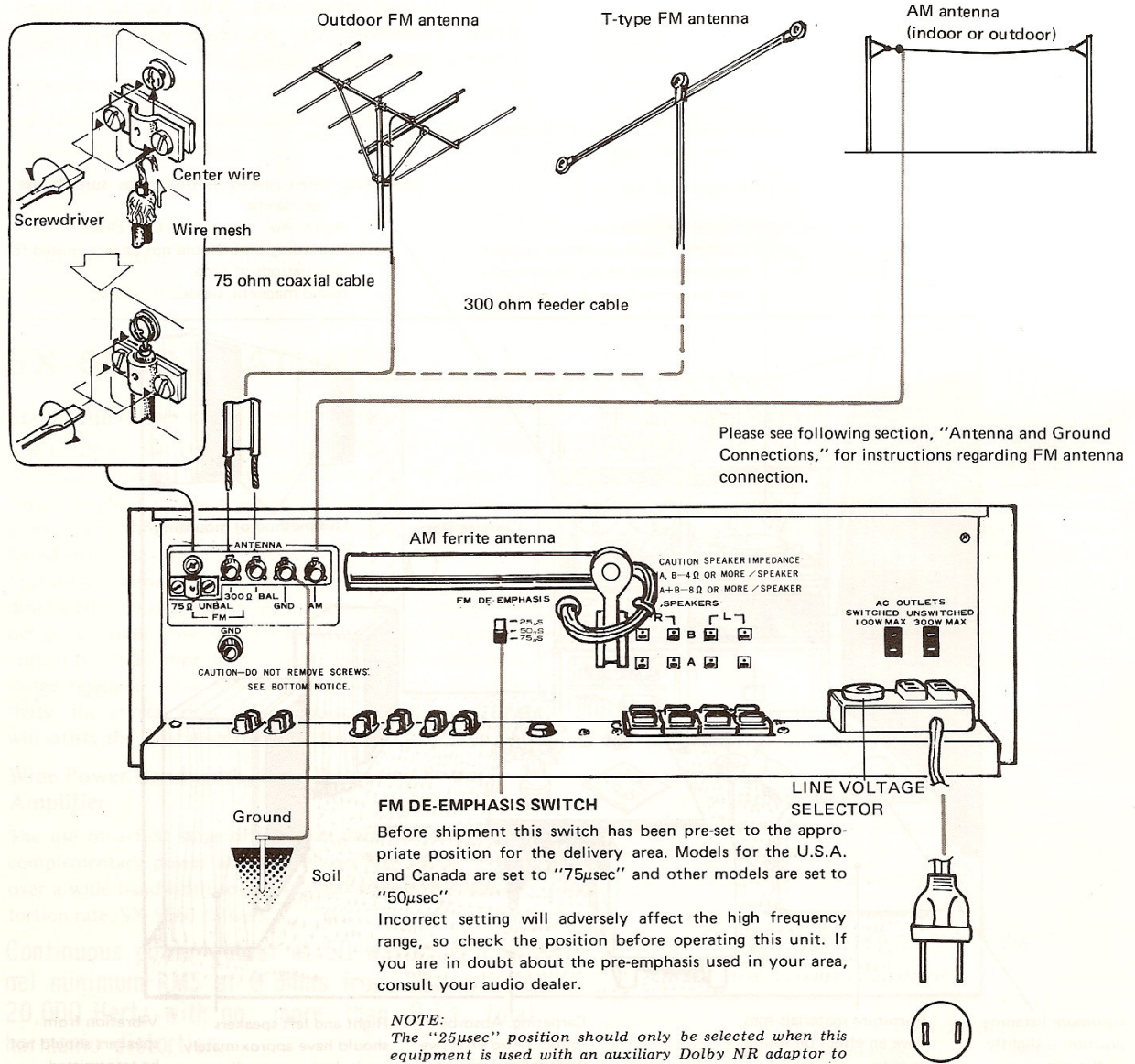
### INSTALLATION NOTE

To insure trouble-free operation, the following conditions should be avoided when choosing the location:

- Direct sunlight or immediate vicinity of heaters, etc.
- Surfaces that are slanted or subject to vibration.
- Poor ventilation, or excessive moisture or dust.
- Spilled alcohol, insecticide sprays, etc. Highly inflammable materials.

# SYSTEM CONNECTION DIAGRAM

## REAR VIEW



## ANTENNA PLACEMENT

Make note of the following points when choosing a location for the FM antenna.

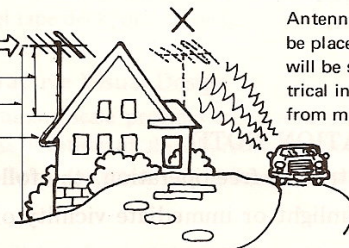


Direction of signals

1.5 meter (5 ft.) above

More than 4 meters (15 ft.) above ground

- Feeder wire and cable should be insulated at mounting points.
- Length should be as short as possible.
- Feeder wire should not be coiled.



Antenna should not be placed where it will be subject to electrical interference from motor vehicles.

Fig. 1

TOP VIEW

Accessory AC outlets:

**Switched** ..... Power to this outlet is controlled by the SX-5560 power switch. When power to the receiver is "On," this outlet will provide AC current ( 100 watts maximum).

**Unswitched** ..... Power to this outlet is not controlled by the SX-5560 power switch. As long as the power cord is plugged into a live outlet, this outlet will supply AC current (maximum 300 watts).

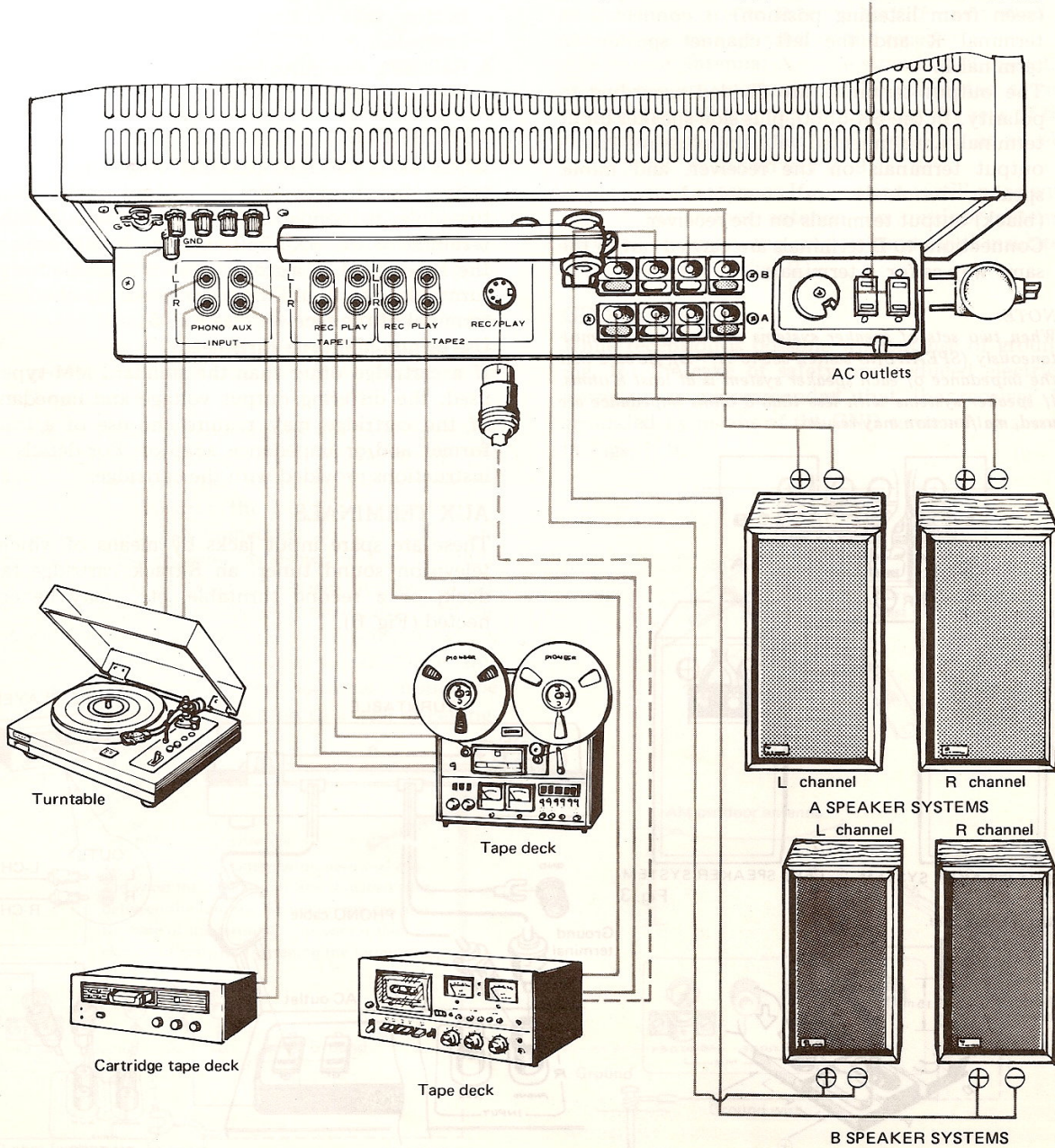


Fig. 2

# SYSTEM CONNECTIONS

## SPEAKER SYSTEMS

To permit connection of two sets of speakers at the same time, the SX-5560 receiver is equipped with two sets of speaker terminals. In normal use, A terminals should be used (and SPEAKERS switch set on "A").

- As shown in Fig. 3, the right channel speaker (seen from listening position) is connected to terminal R and the left channel speaker to terminal L.
- The output terminals are divided according to polarity. In the SX-5560, plus side speaker input terminals are connected with the plus (red color) output terminals on the receiver, and minus speaker terminals are connected to minus (black) output terminals on the receiver.
- Connections to B terminals are carried out in the same way as for A terminals.

### NOTE:

When two sets of speaker systems are being used simultaneously (SPEAKERS switch set to A + B), be sure that the impedance of each speaker system is at least 8 ohms. If speaker systems with less than 8 ohms impedance are used, malfunction may result.

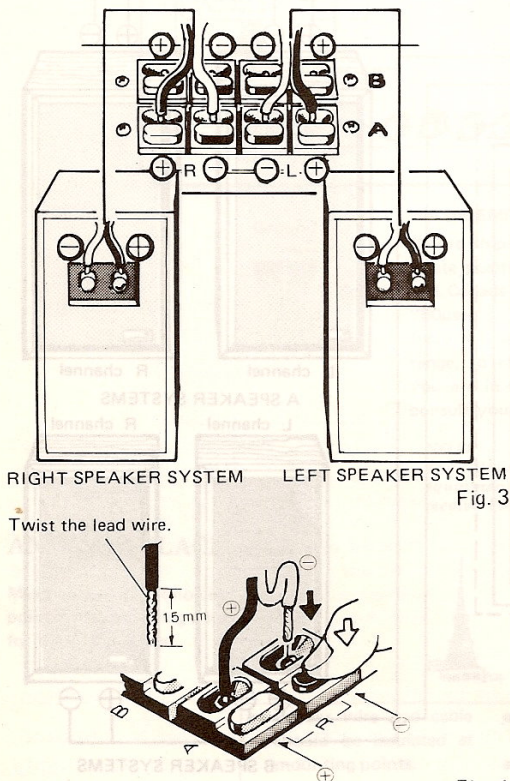


Fig. 3

## Connecting Speaker Wires to Receiver Terminals

1. Strip approximately 15mm of insulation from the end of each speaker lead (Fig. 4).
2. If lead wires are not already twisted, twist the strands together so that they do not become loose.
3. As shown in Fig. 4, while pushing down the button with a finger, insert wire end in the connector.
4. Releasing the button will cause the connector to grip the wire end and hold it securely.

## TURNTABLE

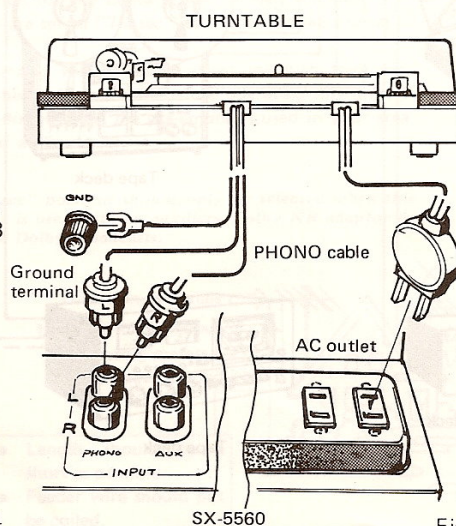
When using an MM (moving magnet) type cartridge, the L side channel output cable of the turntable is connected to the L side PHONO terminal of the SX-5560, and the R side cable to the R terminal. If a ground wire is available for the turntable, it should be connected to the GND terminal of the receiver (see Fig. 5).

### Use of non-MM type cartridges:

If a cartridge other than the standard MM type is used, the differing output voltage and impedance of the cartridge may require the use of a transformer and/or impedance adaptor. For details see instructions provided with the cartridge.

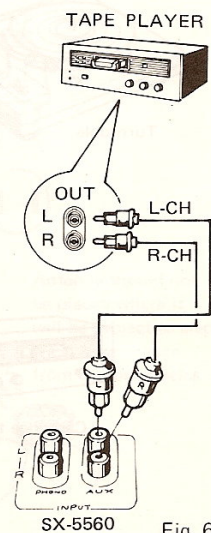
## AUX TERMINALS

These are spare input jacks by means of which a television sound tuner, an 8-track cartridge tape deck, or a second turntable, etc., may be connected (Fig. 6).



SX-5560

Fig. 5



SX-5560

Fig. 6

# ANTENNA AND GROUND CONNECTIONS

## FM ANTENNA

Depending on the strength and quality of the FM transmission itself, and possible interference by mountains, steel girder buildings, etc., the FM signal received may be very weak. It will be necessary to set up an antenna appropriate to strength of signals received and conditions of the surroundings.

**FM outdoor antenna:** As shown in Fig. 7, connect antenna feeder wire to the 300 ohm terminals of the SX-5560. While FM reception is in progress, install the antenna and determine the location and mounting providing optimum signal strength. Detailed instructions are contained under, "FM Reception."

**Connections using coaxial cable:** In areas with heavy traffic or close proximity to factories or high tension power lines, interference may be experienced even with use of an FM outdoor antenna. If this is the case, it is advisable to use coaxial cable of 75 ohm impedance to connect the antenna to the receiver. Connections are made as shown in Fig. 1 on page 4.

**Indoor antenna:** When stations are nearby and in wooden frame buildings, etc., where strong FM signals are received, the accessory T-type antenna can be used. As with the outdoor antenna, the T-type antenna is connected to the 300 ohm terminals of the receiver, as shown in Fig. 7. While FM reception is in progress, spread the ends of the antenna apart and holding it horizontally, turn the antenna through a 180° arc to determine which orientation provides the best signal. Once this orientation is decided, the antenna should be secured in determined direction to a wall or ceiling.

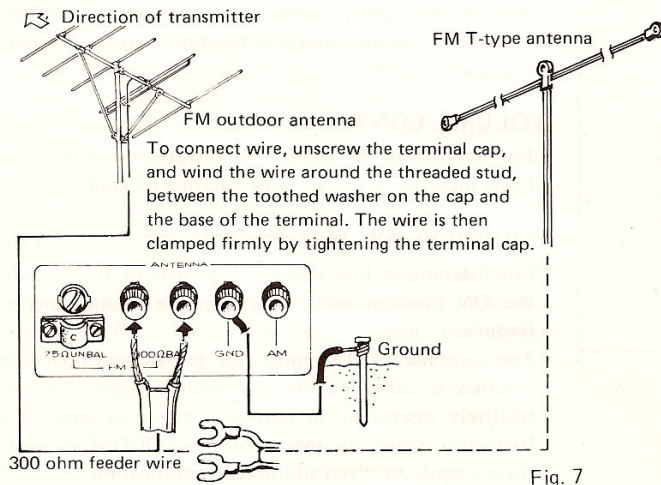


Fig. 7

## AM ANTENNA

A ferrite bar antenna is provided on the rear panel of the receiver (Fig. 8). While listening to an AM broadcast, move the ferrite bar until it is in the position which provides the best reception (see section, "AM Reception").

If reception with the ferrite bar antenna is poor, a vinyl insulated wire antenna may be connected at the AM antenna terminal of the receiver.

**AM indoor antenna:** A single strand vinyl insulated wire 6-8m in length should be connected at one end to the AM antenna terminal on the rear of the receiver, and the other end suspended at an elevated point, as shown in Fig. 9.

**AM outdoor antenna:** If reception is still poor with use of the indoor antenna, an outdoor antenna may be erected using single strand vinyl insulated wire, as shown in Fig. 9.

## GROUNDING

While reception is possible without use of grounding, for the sake of safety and reduced electrical noise, it is recommended that the receiver be grounded by means of the GND terminal, as shown in Figs. 7, 9.

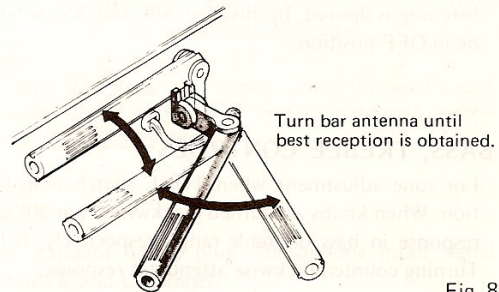


Fig. 8

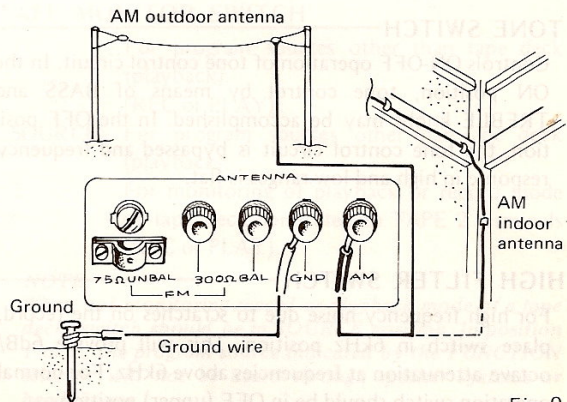


Fig. 9

## FRONT PANEL FACILITIES

### POWER INDICATOR LAMP

Lights when SPEAKERS switch is moved to any position from POWER OFF, and AC power is supplied to the receiver.

### SPEAKERS SWITCH

Functions both as power switch and speaker selection switch.

**POWER OFF:** AC power is off.

**A:** Sound will be heard from speakers connected to A speaker terminals.

**OFF:** No sound will be heard from speaker systems. This position should be used when listening with headphones.

**B:** Sound will be heard from speakers connected to B speaker terminals.

**A + B:** Sound will be heard from speakers connected to A terminals and from speakers connected to B terminals.

### PHONES OUTPUT

Insert headphone plug into this jack when headphone listening is desired. In this case, SPEAKERS switch should be in OFF position.

### BASS, TREBLE CONTROLS

For tone adjustment when TONE switch is in ON position. When knobs are turned clockwise from "0" position, response in bass or treble range, respectively, is boosted. Turning counterclockwise attenuates response.

### TONE SWITCH

Controls ON-OFF operation of tone control circuit. In the ON position, tone control by means of BASS and TREBLE knobs may be accomplished. In the OFF position, the tone control circuit is bypassed and frequency response in high and low ranges is flat.

### HIGH FILTER SWITCH

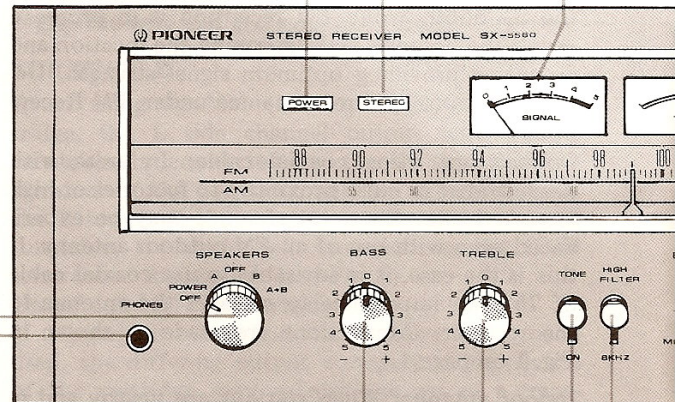
For high frequency noise due to scratches on the record, place switch in 6kHz position. This will provide 6dB/octave attenuation at frequencies above 6kHz. For normal operation switch should be in OFF (upper) position.

### SIGNAL METER

For FM and AM reception, turn TUNING knob until needle of the SIGNAL meter is deflected a maximum to the right.

### STEREO INDICATOR LAMP

Lights when FM stereo broadcast is being received.



### BALANCE CONTROL

For adjustment of relative output levels of L and R channels of speaker systems or headphones. Clockwise rotation from center position increases volume of R over L channel. Counterclockwise rotation increases volume of L channel over R.

### VOLUME CONTROL

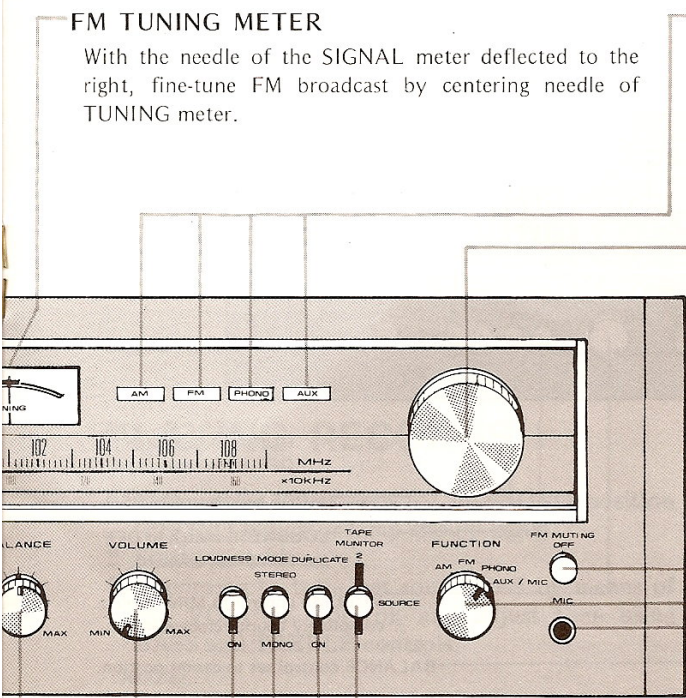
For adjustment of speaker or headphone output level. Level increases with clockwise rotation of knob.

### LOUDNESS SWITCH

For listening at low volume level, placing this switch in the ON position will boost response in low and high frequency ranges.

The response of the human ear to low and high sound volumes is different. At low volume levels, the ear is relatively insensitive to sounds at either extreme of the frequency scale. By means of the LOUDNESS switch, these sounds are given additional amplification.





**FM TUNING METER**

With the needle of the SIGNAL meter deflected to the right, fine-tune FM broadcast by centering needle of TUNING meter.

**PROGRAM SOURCE INDICATORS**

Indicate program source selected by means of FUNCTION switch.

**TUNING KNOB**

For selection of FM or AM stations.

**FM MUTING BUTTON**

For selection of FM broadcasts, button should be in ON (released) position.

When button is in ON position, unpleasant interstation noise is suppressed. When signal strength is poor, it may not be possible to bring in the desired station if MUTING is ON. In this case, press button to place it in the OFF position.

**FUNCTION SELECTOR**

For selection of program source.

- AM: AM broadcasts
- FM: FM broadcasts
- PHONO: Playing records
- AUX/MIC: For use of component connected at AUX terminals of receiver, or microphones which may be plugged into MIC jack.

**NOTE:**

AUX and MIC program sources cannot be used simultaneously. When using AUX hi-fi component, microphone should be disconnected.

**MODE SWITCH**

For selection of stereophonic or monophonic mode of playback. In normal operation, switch should be in STEREO position. In the MONO position, R and L channel signals will be mixed, and sounds coming from speakers of both channels will be the same.

**NOTE:**

Recording stereophonically with the MODE switch in the MONO position may cause channel separation to deteriorate.

**DUPLICATE SWITCH**

With switch in ON position, signals recorded on one of two tape decks connected to the receiver may be recorded onto the other, with or without editing. For normal operation, this switch must be in OFF (upper) position.

**MIC JACK**

Accepts standard 6mmϕ plug. Microphone input signal enters both R and L channels.

**TAPE MONITOR SWITCH**

1: For program sources other than tape deck (playback). (REC or PLAY).

SOURCE: For program sources other than tape deck (playback).

2: For monitoring of playback or record mode of tape deck connected to TAPE 2 terminals (REC or PLAY).

**NOTE:**

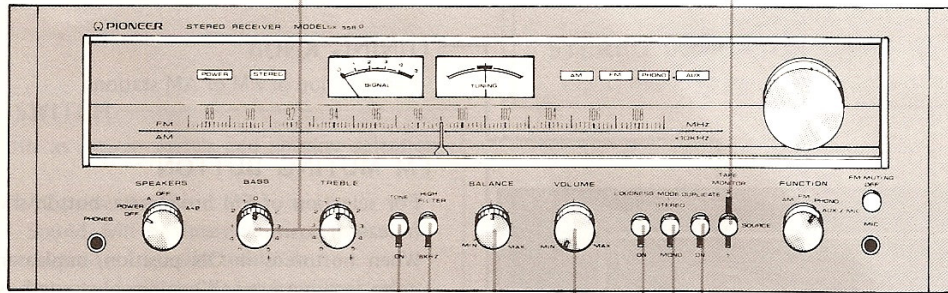
When not monitoring record or playback mode of a tape deck, switch should be in SOURCE position. In position 1 or 2, the program source indicated by the FUNCTION selector will not be heard through speaker systems or headphones.

# EFFECTIVE OPERATION

## BEFORE TURNING ON POWER

BASS, TREBLE controls to center (0) position.

Set TAPE MONITOR switch on SOURCE.



TONE switch OFF (lever in upward position).  
When tone adjustment is desired, place switch in ON position.

HIGH FILTER in OFF position  
(lever in upward position).

DUPLICATE switch to  
OFF (upper position).

MODE switch to STEREO.

LOUDNESS switch in OFF  
position (lever upward).

VOLUME control to MIN (turned  
completely counterclockwise).

BALANCE control set to center position.

### Turning On Power

After the above checklist is completed, power may be turned on.

POWER indicator lamp should light when AC power is being supplied to receiver.

## FM RECEPTION

1. Place FUNCTION selector in FM position (FM indicator lamp should light).
2. Set FM MUTING button to ON (released position).
3. Select station by turning TUNING knob. Station is properly tuned-in when the SIGNAL meter needle is deflected a maximum to the right, and the FM TUNING meter needle points to the center (Fig. 10).
- In areas where signal strength is poor, set FM MUTING button on OFF (depressed).

Meter readings for FM reception.

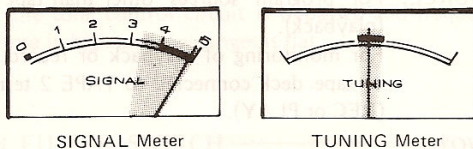
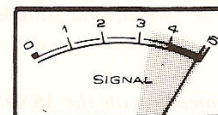


Fig. 10

4. According to preference, set sound level by means of the VOLUME control, and adjust tone by means of BASS and TREBLE controls.

## AM RECEPTION

1. Place FUNCTION selector in AM position (AM indicator lamp should light).
2. Select station by turning TUNING knob. Station is properly tuned-in when the needle of the SIGNAL meter is deflected a maximum to the right (Fig. 11).



Meter reading for  
AM reception.

SIGNAL Meter

Fig. 11

3. According to taste, set sound level by means of the VOLUME control, and adjust tone by means of BASS and TREBLE controls.

### NOTE:

If during either FM or AM reception, sensitivity is poor, noise is heard, or the sound is otherwise disagreeable, recheck the antenna arrangement according to the section, "Antenna and Ground Connections."

### Protection Circuit

- There will be a delay of 3-8 seconds after turning on power before sound is heard from the speakers. This is due to the action of the protection circuit, which activates a muting device to suppress unpleasant noise which may occur when amplifier is first turned on. The protection circuit also acts to shield the speakers from power surges which likewise may occur during the first few moments of operation.

- If during operation the speakers suddenly become silent and a clicking sound is heard from the built-in relay, the probable cause is insufficient impedance in the output side, either through a short in one of the speaker connections, or the use of a speaker with less than 4 ohm impedance. The protection circuit has been activated to protect the speakers and transistors from damage. The protection circuit will automatically return to normal operation when the cause of the malfunction has been eliminated.

## PLAYING RECORDS

1. Place FUNCTION selector in PHONO position (PHONO indicator lamp should light).
2. Start turntable.
3. According to taste, set sound level by means of the VOLUME control, and adjust tone using BASS and TREBLE controls.

### NOTE:

*If unpleasant noise is heard when the record is started, turn the VOLUME control counterclockwise to MIN. Then, after the stylus tip has begun to track on the record, the VOLUME control may be set to the desired position.*

## FM-DOLBY RECEPTION

With use of a separately purchased Dolby NR adaptor, reception of FM-Dolby broadcasts is possible. In using the adaptor, the following instructions should be noted.

1. Connect Dolby NR adaptor to TAPE REC, TAPE PLAY (1 or 2) terminals.
2. Place FUNCTION selector in FM position. Tune in station transmitting FM-Dolby program (see instructions for FM reception).
3. Place FM DE-EMPHASIS switch on rear panel of SX-5560 in "25 $\mu$ S" position.
4. Set TAPE MONITOR switch to 1 or 2, depending on way in which adaptor has been connected.
5. Turn adaptor on. Set sound level by means of the VOLUME control, and adjust tone using BASS and TREBLE controls.

### NOTE:

*Reference should be made to the instructions supplied with the Dolby NR adaptor for additional recommendations regarding FM-Dolby reception.*

## USING MICROPHONE

1. Insert microphone in MIC jack.
  2. Place FUNCTION selector in AUX/MIC position.
  3. Turning VOLUME control clockwise in small increments, adjust sound level. BASS and TREBLE controls should be set in center positions.
- With the SX-5560, it is not possible to mix the input of a microphone with other program sources.

### NOTES:

1. When employing a microphone, set the output volume of a component connected to the AUX jacks to minimum, or disconnect the component.
2. Feedback howl can easily occur when using a microphone. To prevent this, when using microphone in close proximity to speakers, or in a room in which sound reflectivity is high, care should be taken not to turn volume up too high. BASS and TREBLE controls should be set in center positions (0).

## USING AUX TERMINALS

1. Place FUNCTION selector in AUX/MIC position (AUX indicator lamp should light).
2. Begin operation of the hi-fi component connected to AUX terminals.
3. Set sound level by the VOLUME control, and adjust tone using BASS and TREBLE controls.

### NOTE:

*When a microphone is connected to the MIC jack, the AUX input is cut off. Therefore, when using AUX input, the microphone should be disconnected from the receiver.*

## TAPE DECK CONNECTIONS

Two sets of recording input jacks (REC) and two sets of playback input jacks (PLAY), plus a TAPE 2 REC/PLAY connector, are provided. This allows, in addition to normal playback and record, simultaneous recording on two tape decks and recording from one deck to the other.

### RECORDING

Connect recording input terminals of the tape recorder (LINE INPUT) to the TAPE 1 (or TAPE 2) REC terminals of the receiver. Be sure that L (R) terminals are connected to corresponding L (R) REC terminals on receiver.

### PLAYBACK

Connect playback output terminals of the tape recorder (LINE OUTPUT) to the TAPE 1 (or TAPE 2) PLAY terminals of the receiver. Be sure that L (R) tape deck terminals are connected to corresponding L (R) PLAY terminals on receiver.

#### NOTE:

If recording is made using REC terminal of TAPE 1, PLAY terminal of TAPE 1 should be used for playback. A variety of difficulties will occur if TAPE 1 and TAPE 2 sides are used interchangeably with a single tape deck.

### USE OF RECORD/PLAY DIN CONNECTOR

If the tape deck used has a DIN jack for record/playback, connecting the tape deck to the TAPE 2 REC/PLAY terminal by means of a DIN cable (purchased separately) will provide simultaneous connection for both recording and playback. If the DIN cable is used, the pin connectors at TAPE 2 REC and PLAY terminals should be removed.

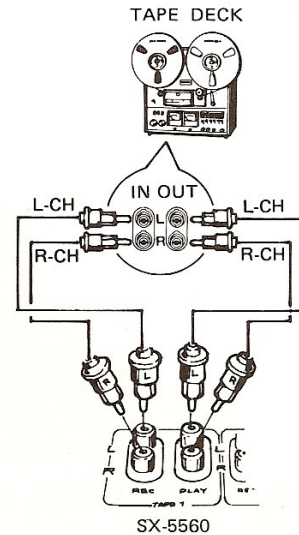


Fig. 12

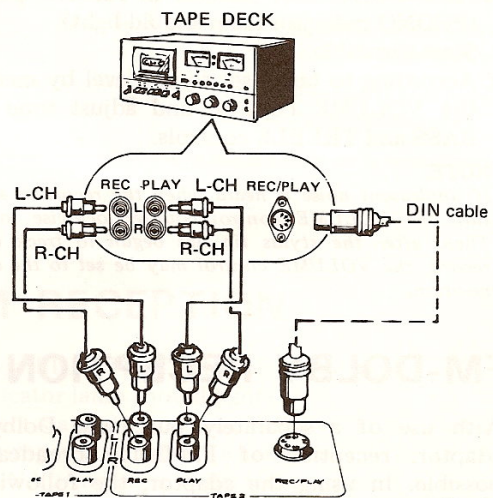


Fig. 13

## TAPE DECK OPERATIONS

### RECORDING

1. Set FUNCTION selector to program source to be recorded.
2. Place DUPLICATE switch in OFF position (upper).
3. Set controls of recording source (turntable, radio broadcast, etc.) so that optimum sound quality is achieved.
4. Set recording level by means of control on tape deck. During recording, the VOLUME, BASS, and TREBLE controls of the SX-5560 have no effect on the recording level.
5. Start recording.

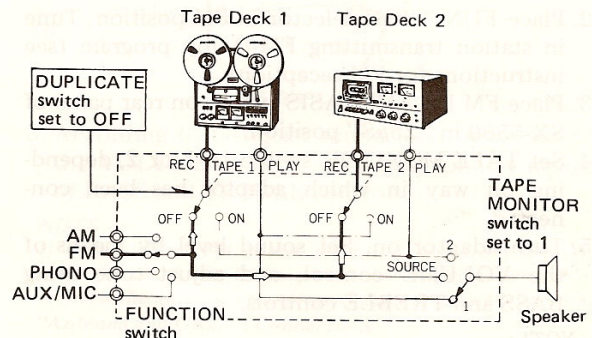


Fig. 14

**PLAYBACK**

1. If the tape deck is connected at TAPE 1, place the TAPE MONITOR switch on 1; if connected at TAPE 2, set TAPE MONITOR switch on 2.
2. Set DUPLICATE switch to OFF.
3. Playback the recorded tape.
4. According to taste, set sound level by means of the VOLUME control, and adjust tone using BASS and TREBLE controls.

**NOTES:**

1. Unless tape is being played back, the TAPE MONITOR switch must be in the SOURCE position.
2. In tape playback, the setting of the FUNCTION selector is of no consequence.

**MONITORING CONDITION OF RECORDED SIGNAL**

When recording is being performed on a tape deck equipped with three heads, placing the TAPE MONITOR switch on 1 or 2, depending on which TAPE terminals the tape deck is connected to, will enable the recorded signal to be monitored over the loudspeakers. For this purpose, both recording and playback connections should be made.

**DUPLICATING OR EDITING MAGNETIC TAPE**

With use of two tape decks, desired selections from a tape on which, for example, an FM broadcast was previously recorded can be recorded onto a second tape. This permits complete freedom in editing recordings to be included in a tape library or the like.

1. As shown in Fig. 16, connect one tape deck each to TAPE 1 and 2 terminals.
  2. Place DUPLICATE switch in ON position.
  3. Play the previously recorded tape on one deck, while recording on the other.
- The recorded signal can be monitored during duplication. This is done by placing the TAPE MONITOR switch 1 or 2, depending on which tape deck the recording is being made.

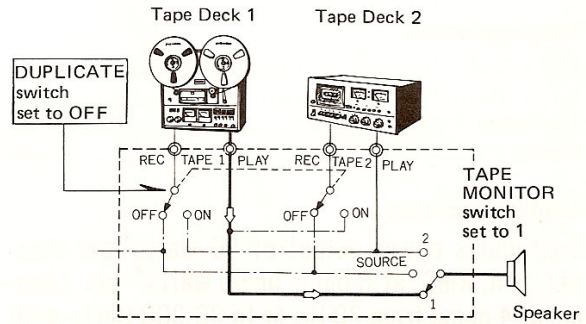


Fig. 15

*Tape playback: Playback signal sent from TAPE 1 (or 2) PLAY terminals through either side 1 (or 2) of TAPE MONITOR switch to the speakers.*

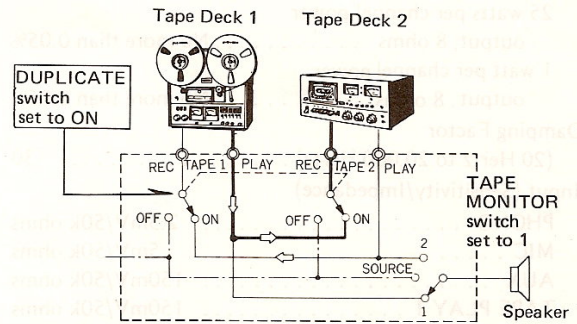


Fig. 16

*Duplicating: Playback signal sent from TAPE 1 PLAY terminals through DUPLICATE switch (ON) to tape deck 2, where it is recorded. Working in reverse, playback signal from tape deck 2 may be recorded onto tape deck 1.*

# SPECIFICATIONS

## Semiconductors

FET .....	1
ICs .....	9
Transistors .....	34
Diodes .....	40

## Amplifier Section

Continuous power output of 50 watts\* per channel, min. RMS, at 8 ohms or 60 watts\* per channel at 4 ohms from 20 Hertz to 20,000 Hertz with no more than 0.1% total harmonic distortion.

### Total Harmonic Distortion

(20 Hertz to 20,000 Hertz, from AUX)

Continuous Rated Power Output . . . No more than 0.1% 25 watts per channel power	
output, 8 ohms .....	No more than 0.05%
1 watt per channel power	
output, 8 ohms .....	No more than 0.05%

### Intermodulation Distortion

(50 Hertz: 7,000 Hertz=4:1, from AUX)

Continuous Rated Power Output . . . No more than 0.1% 25 watts per channel power	
output, 8 ohms .....	No more than 0.05%
1 watt per channel power	
output, 8 ohms .....	No more than 0.05%

### Damping Factor

(20 Hertz to 20,000 Hertz) .....

### Input (Sensitivity/Impedance)

PHONO .....	2.5mV/50k ohms
MIC .....	5mV/50k ohms
AUX .....	150mV/50k ohms
TAPE PLAY 1 .....	150mV/50k ohms
TAPE PLAY 2 .....	150mV/50k ohms
TAPE PLAY 2 (DIN connector) . . .	150mV/50k ohms
PHONO Overload Level (T.H.D. 0.1%)	
.....	200mV (1kHz)

### Output (Level/Impedance)

TAPE REC 1 .....	150mV
TAPE REC 2 .....	150mV
TAPE REC 2 (DIN connector) .....	30mV/80k ohms
SPEAKER .....	A, B, A+B
HEADPHONES .....	Low Impedance

### Frequency Response

PHONO (RIAA equalization)	
.....	30 Hertz to 15,000 Hertz $\pm 0.2$ dB
AUX, TAPE PLAY	
.....	10 Hertz to 50,000 Hertz $\begin{matrix} +0 \\ -1 \end{matrix}$ dB

### Tone Control

BASS .....	+8dB, -7dB (100 Hz)
TREBLE .....	+9dB, -7dB (10 kHz)

### Filter

HIGH .....	6 kHz (6dB/oct.)
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### Loudness Contour (Volume control set

at -40dB position) . . . . .	+6dB (100 Hz), +3dB (10 kHz)
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### Hum and Noise

(IHF, short-circuited, A Network, rated power)

PHONO .....	70dB
AUX, TAPE PLAY .....	90dB

## FM Section

Usable Sensitivity	MONO .....	10.7dBf (1.9 $\mu$ V)
	STEREO .....	19.0dBf (4.9 $\mu$ V)

### 50dB Quieting Sensitivity

MONO .....	17.2dBf (4.0 $\mu$ V)
STEREO .....	39.2dBf (50 $\mu$ V)

### Signal to Noise Ratio at 65dBf

MONO .....	72dB
STEREO .....	67dB

### Distortion at 65dBf

100Hz	MONO .....	0.15%
	STEREO .....	0.3%
1kHz	MONO .....	0.15%
	STEREO .....	0.3%
6kHz	MONO .....	0.4%
	STEREO .....	0.4%

Frequency Response .....

30Hz to 15,000Hz	$\begin{matrix} +0.2 \\ -2.0 \end{matrix}$ dB
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Capture Ratio .....	1.0dB
Alternate Channel Selectivity .....	80dB
Spurious Response Ratio .....	90dB
Image Response Ratio .....	80dB
IF Response Ratio .....	100dB
AM Suppression Ratio .....	55dB
Muting Threshold .....	14dBf (2.8 $\mu$ V)
Stereo Separation .....	40dB (1kHz), 30dB (30Hz ~15kHz)
Subcarrier Product Ratio .....	62dB
SCA Rejection Ratio .....	62dB
Antenna Input .....	.300 ohms balanced 75 ohms unbalanced

**AM Section**

Sensitivity (IHF, Ferrite antenna) . . . . .	300 $\mu$ V/m
(IHF, Ext. antenna) . . . . .	15 $\mu$ V
Selectivity . . . . .	35dB
Signal to Noise Ratio . . . . .	50dB
Image Response Ratio . . . . .	40dB
IF Response Ratio . . . . .	65dB
Antenna . . . . .	Built-in Ferrite Loopstick Antenna

**Miscellaneous**

Power Requirements . . . . .	110V, 120V, 220V, 240V/50Hz, 60Hz
Power Consumption . . . . .	350W (max.)
Dimensions . . . . .	480(W) x 149(H) x 371(D)mm 18-7/8 (W) x 5-7/8(H) x 14-5/8(D)in.
Weight without package . . . . .	13.7kg(30 lb 2 oz)
with package . . . . .	15.3kg(30 lb 11oz)

**Furnished Parts**

FM T-type Antenna . . . . .	1
Operating Instructions . . . . .	1
Fuse 2A . . . . .	1
Fuse 4A . . . . .	1

\*Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

**NOTE:**

Specifications and design subject to possible modification without notice, due to improvements.

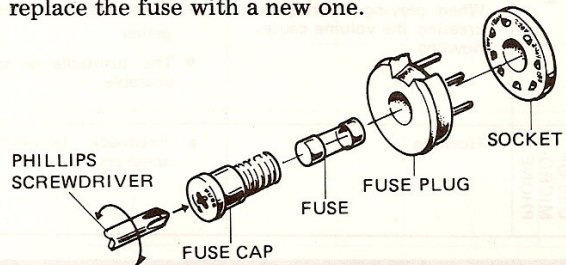
**LINE VOLTAGE AND FUSE**

**CHANGING LINE VOLTAGE SETTING AND FUSE**

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction indicated by the arrow. Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug. Whenever the position of the selector is changed, check the rating of the fuse. A 2A fuse is to be used for either 220V or 240V operation and a 4A rating for 110V or 120V operation. If the rating of the fuse is correct, replace cap.

**FUSE REPLACEMENT**

When the fuse blows, remove the fuse cap and replace the fuse with a new one.



## CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTIONS

If your stereo system appears to malfunction, first check such things as the fuse, controls (power switch, function selector, tape monitor, etc.) and connections between various components.

Noise: There are a variety of noises relating to the operation of a hi-fi unit. These are generally divided into two types: (1) the unit is faulty (a transistor or other part is defective and (2) an external source is affecting the unit.

When a hi-fi unit produces an unpleasant noise, it is

often assumed that the unit is faulty, but statistical records indicate that the majority of noises produced in hi-fi units result from external sources of noise: Due to the inherent high sensitivity and the high fidelity in reproduction, the unit amplifies and reproduces extraneous electrical noises, however small, into audible output noise. If your receiver produces noise, check according to the following table and trace the cause for the appropriate corrective action.

	SYMPTOM	SUSPECTED CAUSE	DIAGNOSIS AND REMEDY
RADIO RECEPTION	Continuous or intermittent buzzing noise.	<ul style="list-style-type: none"> <li>● Static (lightning)</li> <li>● Fluorescent lamp, motor, or thermostat operating in the vicinity.</li> </ul>	In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	Low-pitched noise (hum) in program.	<ul style="list-style-type: none"> <li>● Poorly shielded fluorescent lamp, motor, or electric heater operating in the vicinity.</li> </ul>	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing noise in AM (medium wave) reception.	<ul style="list-style-type: none"> <li>● The frequency of an adjacent station is interfering with that of the station being turned in.</li> <li>● TV set operating in the same house.</li> </ul>	Impossible to remove such interference. If the cause of such noise is the TV set, increase the distance between the TV set and receiver.
	Crackling noise (in particular, when automobiles run close to the house).	<ul style="list-style-type: none"> <li>● Noise generated by automobile engines.</li> <li>● High frequency sewing machine or welding machine being used near your house.</li> </ul>	In an area surrounded by hills or high buildings, FM signals are very weak and easily affected by noise. Set up an FM outdoor antenna with multiple elements.
	FM stereo programs noisy, but FM mono programs o.k.	<ul style="list-style-type: none"> <li>● Note that the service area covered by an FM stereo broadcast is only about half that of a mono broadcast.</li> </ul>	Use good, high-gain FM outdoor antenna.
RECORD PLAYING	Hum or buzz. When switched to radio reception, the noise disappears.	<ul style="list-style-type: none"> <li>● Poor connection of phono cable. (a)</li> <li>● Jack connection is loose. (b)</li> <li>● Line cord of fluorescent lamp passes near the phono cable. (c)</li> <li>● Poor grounding. (d)</li> <li>● Ham radio station or TV transmitter operating nearby. (e)</li> </ul>	Correct conditions stated (a), (b), (c) or (d). In case of (e), report to an official authority.
	Output tone quality is poor and treble is not clear.	<ul style="list-style-type: none"> <li>● Stylus is worn. (a)</li> <li>● Record is worn. (b)</li> <li>● Dust adhering to stylus. (c)</li> <li>● Stylus is improperly mounted. (d)</li> <li>● Tracking force is not correct. (e)</li> <li>● The TREBLE level is too high. (f)</li> </ul>	Check (a) through (e) and correct the condition.  Lower the TREBLE level.
	When playing records, increasing the volume causes howling.	<ul style="list-style-type: none"> <li>● Turntable and speakers too close together.</li> <li>● The turntable or speaker supports are unstable.</li> </ul>	Increase the distance or rearrange the installation of the unit and speakers. (Installing the turntable on a firm, solid base may alleviate this problem.) Do not turn up the BASS tone control excessively.
USE OF MICROPHONE	Howling	<ul style="list-style-type: none"> <li>● Feedback between microphone and speakers.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep microphone away from speakers.</li> <li>● Do not set the VOLUME control too high.</li> <li>● Set BASS and TREBLE controls at center positions.</li> </ul>

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