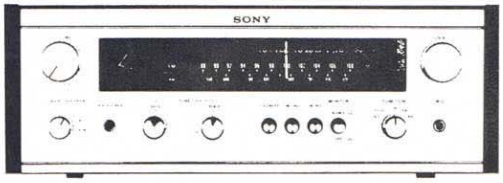
FM STEREO/FM-AM RECEIVER

STR-7015



Owner's Instruction Manual

Please read this manual completely to become familiar with all the features and capabilities of your new high-quality Sony receiver.
Keep this manual handy for future reference.

TABLE OF CONTENTS

PRECAUTIONS

- Operate the set only on 120 V ac, 60 Hz.
- Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified personnel before operating it any further.
- Good air circulation is essential to prevent internal heat build-up in the set. Place the set in a location with adequate air circulation. Do not place the set on a soft surface such as a rug or in an enclosed cabinet that would block the ventilation holes on the bottom.
- Unplug the set from the wall outlet when it will not be used for an extended period of time.
- To disconnect the cord, pull it out by grasping the plug. Never pull it by the cord.
- Don't install the set in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- When the set is not in use, turn the power off to conserve energy and to extend the useful life of the set.

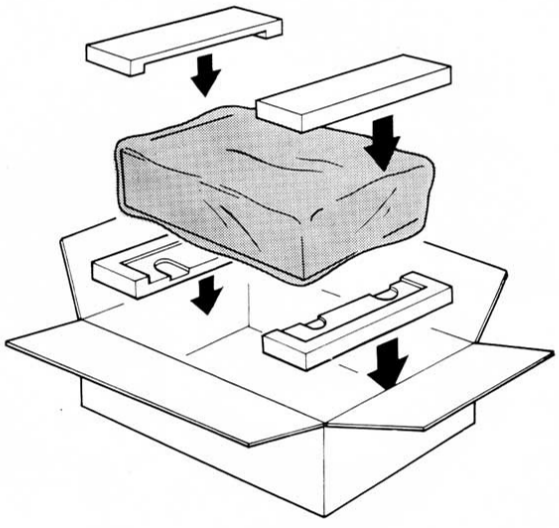
WARNING

- To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
- To prevent shock or fire hazard, do not expose the set to rain or moisture.

UNPACKING

Do not throw away the STR-7015 carton and the associated material ; they will come in handy if you ever have to transport or ship your set. Inspect your STR-7015 immediatelly after unpacking. If any sign of damage is found, consult your local Sony dealer.

When shipping the unit for repair work or to another location, the unit should be repacked in the original carton and packing material just as before.



SYSTEM CONNECTIONS

CONNECTION NOTES

- Be sure to connect the red plug to the right [R] jack and the remaining one to the left [L].
- The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.
- For all program source connections, use a low-capacitance type shielded cable.
- Keep the cables as short as practicable, avoiding horizontal runs. Excessively-long runs (over 6 feet) tend to reduce the high-frequency response, while horizontal runs are susceptible to power line hum pickup.
- Matching of sensitivity and impedance at the input and output terminals : Generally the output level of a signal source (phono cartridge, tape recorder, etc.) should be equal to or slightly greater than the sensitivity of the corresponding input. The output impedance of a signal source should be considerably lower than the impedance of the corresponding input. Please refer to the table of "SPECIFICATIONS" on page 7, and to the specifications given in the instruction manuals provided with the components you wish to connect to this receiver.

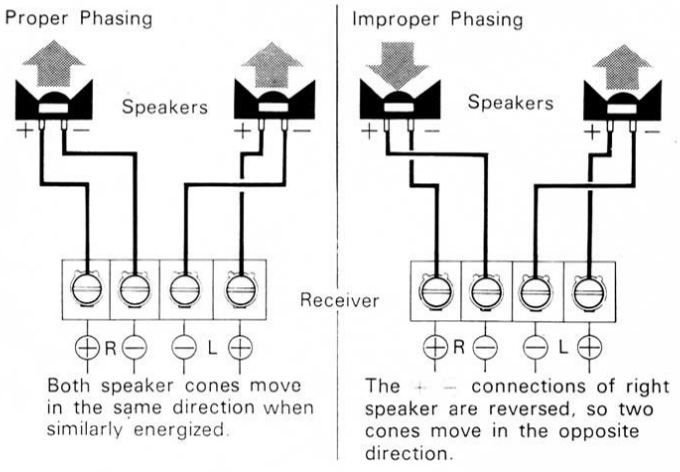
SPEAKERS

Connection

You can connect two pairs of speakers to this receiver, and can drive them independently or simultaneously. Speakers of from 4 to 16 ohms are suitable.

For speaker connection, common 18-gauge lamp cord is fine for short runs. However 14- to 16-gauge cord may be needed for long runs to prevent excessive power losses in the wiring.

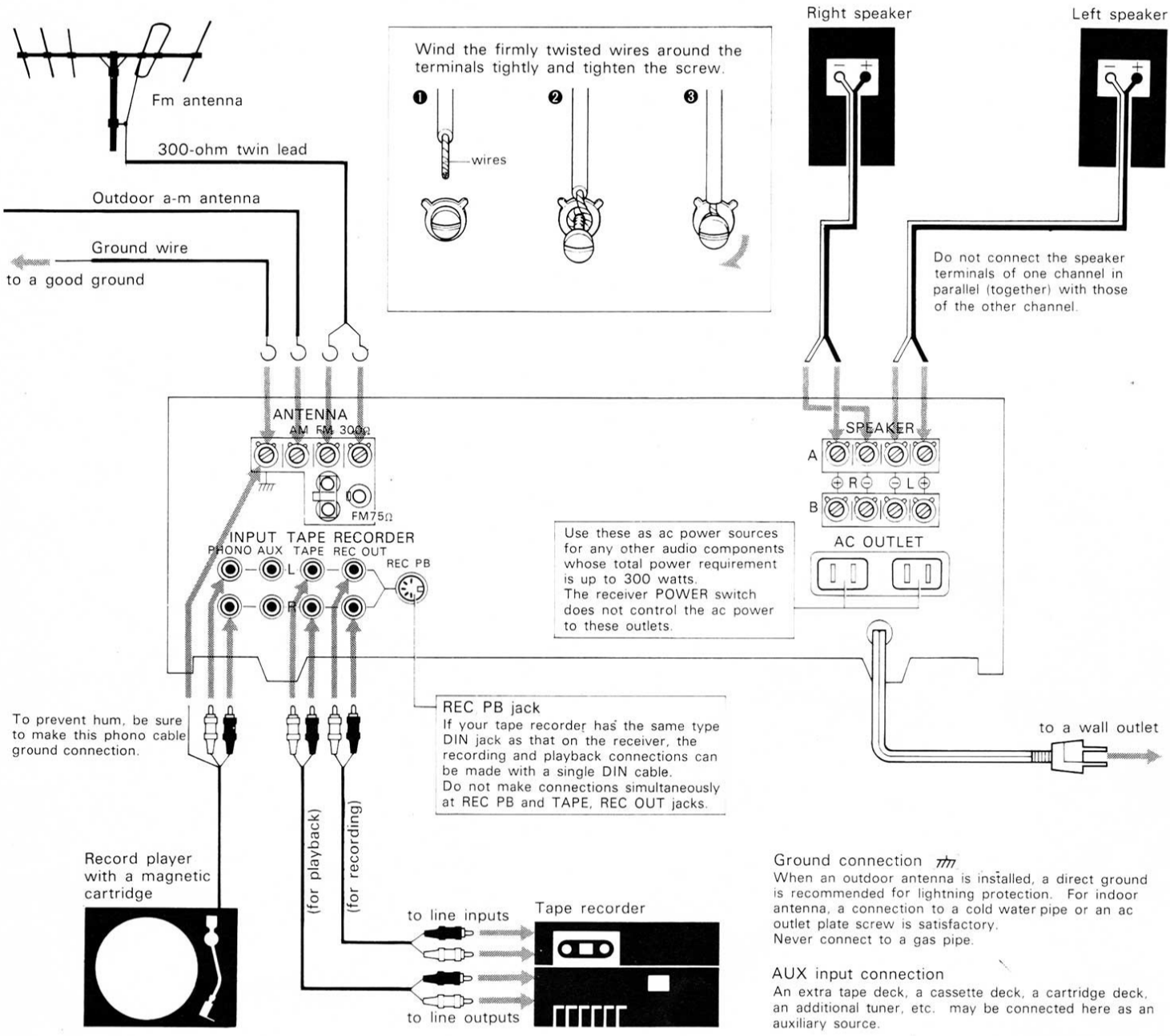
Connect each speaker to the corresponding speaker terminals i.e. right speaker to the R terminals and left to the L, and ⊕ terminal of the speaker to the ⊕ terminal of the receiver and ⊖ to ⊖. If the ⊕ ⊖ connection is reversed, the bass tones seem to be missing and the position of the instruments becomes obscure because the speaker phase is reversed.



CAUTION :

The STR-7015 is rated at 15 watts minimum RMS per channel with an 8-ohm load, and may deliver an instantaneous peak power much greater than the rated power. Be sure to use speakers with adequate power handling capabilities. If lower wattage speakers are to be used, reduce the volume when lowering or lifting the phonograph pickup from a record to avoid speaker damage.

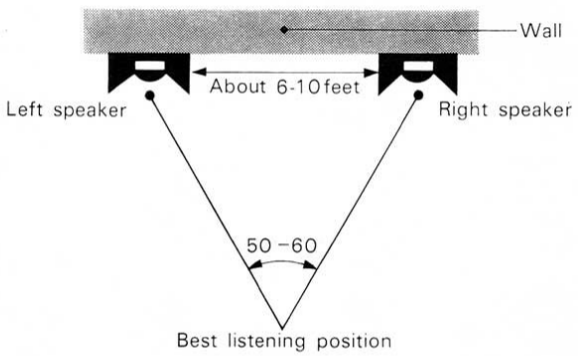
CONNECTION DIAGRAM



Location

Here are a few suggestions for speaker location to optimize your listening pleasure.

- The listening room is recommended to have carpeting on the floor and to have heavy draperies because these minimize the multiple reflections of high-frequency sound which reduce the stereo effect.
- Position the right- and left-speakers in similar acoustic environments, otherwise you will obtain an unbalanced sound. Corner locations are ideal for emphasizing the bass tones.
- Place the speakers on the floor against a wall. If you position them off the floor, do not place them higher than eyelevel.
- The distance between right- and left-speakers is important for stereo effect. The proper distance and the best listening position are as illustrated.



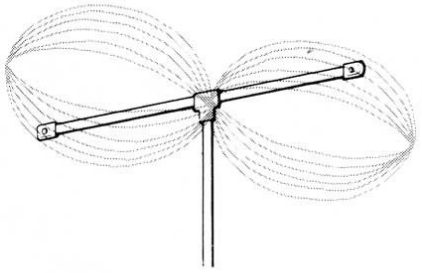
In any case, experiment with different speaker arrangements and listening locations until you find the setup that pleases you most.

ANTENNAS

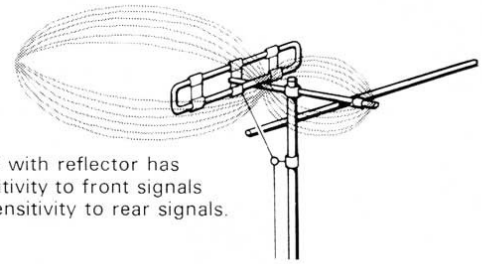
Good fm reception depends not only on the receiver sensitivity but on the quality of the received signals. This is determined by the signal strength, the presence of multipath signal and the geographic location of the desired fm stations. To get the best from your receiver use an antenna suited to your location. Until you install a suitable one, the supplied ribbon antenna may be useful.

In a strong signal area, the familiar "rabbit-ear" antenna is simple to install and is usually suitable for fm reception, since it can be adjusted easily for best signal pickup. If there are many high structures nearby, and evidence of strong multipath reception is present, use a highly-directional rotatable outdoor antenna.

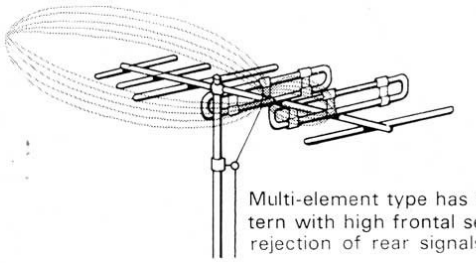
If you wish to receive not only the local stations that an indoor antenna pulls in, but to reach out into areas where there may be programs more to your taste, use a high-gain directional outdoor fm antenna properly installed with a rotator.



Ribbon dipole and rabbit antennas pick up signals from both front and rear equally well.



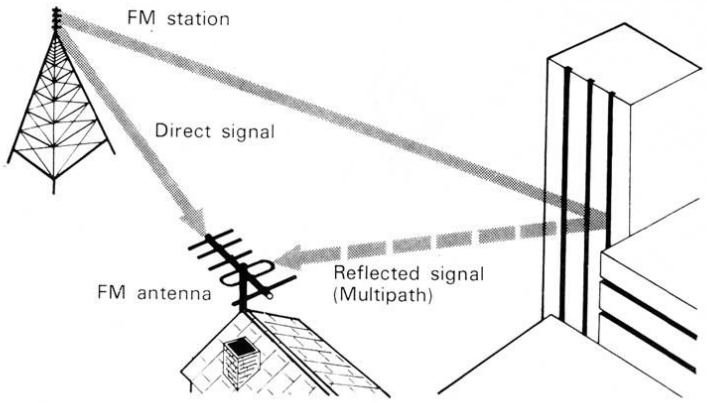
Dipole antenna with reflector has increased sensitivity to front signals and reduced sensitivity to rear signals.



Multi-element type has narrower pickup pattern with high frontal sensitivity and superior rejection of rear signals.

Multipath Reception

The most important factor affecting fm signal quality is multipath reception. Multipath is caused by signal reflections from hills or structures that reach the receiving antenna perceptibly later in time. Particularly with fm stereo, multipath can cause severe distortion and complete loss of channel separation. The effects of a multipath condition appear as high-frequency noise and distortion, particularly noticeable in receivers with extended response. The effects of multipath reception can be avoided to a great extent by using shielded twin lead, and a good directional antenna that is correctly oriented.



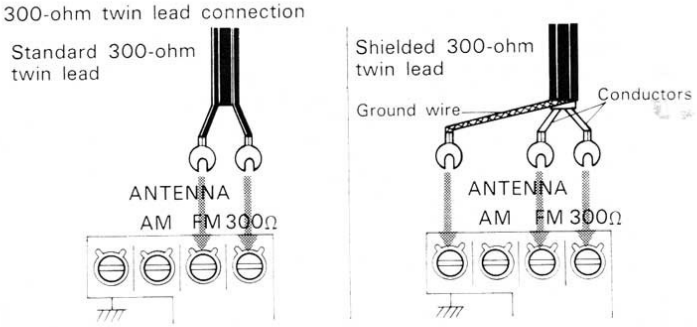
FM Antenna Connection

The receiver accepts 300-ohm twin lead, either the standard or shielded type, and 75-ohm coaxial cable. Standard 300-ohm twin lead will be adequate for most installations. However in cases where local noise or multipath pickup on the transmission line causes interference, a shielded type must be used. In locations where ignition noise is severe, the coaxial cable is recommended.

NOTES :

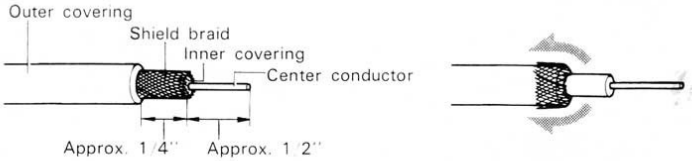
- Use commercially-available stand-off insulators to route the lead over the roof, outer wall, etc.
- Keep the lead as short as possible and avoid long horizontal runs.
- Cut off the unused portion of the lead at the receiver input, rather than folding or bunching it together.

300-ohm twin lead connection



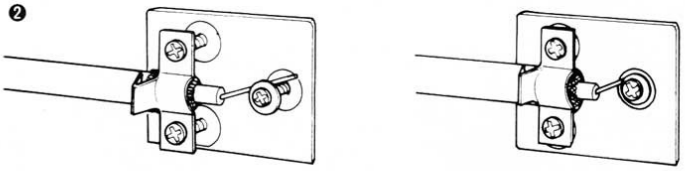
75-ohm coaxial cable connection

❶ Cut and remove the outer covering, shield braid, inner covering as follows, and fold back most of the shield braid. Be careful not to damage the center conductor.



If the center conductor is a stranded type, twist the strands tightly together.

❷



Loosen the screws on the FM 75Ω ANTENNA plate and terminal. Pass the cable under the plate, wind the center conductor round the terminal of the FM 75Ω ANTENNA and tighten screws and terminal.

FM Antenna Orientation

Adjust the antenna direction and height by listening to the desired fm station so that the SIGNAL meter shows the right-most deflection and that the distortion is eliminated.

- In some cases multipath reception on two or more stations may require that the antenna be pointed in different directions. An effective solution to this problem is the use of a remotely-controlled rotatable antenna.
- If an outdoor antenna cannot be erected, use a good indoor antenna ("rabbit-ears" are satisfactory). Adjust the antenna direction for minimum distortion.

AM Antenna Connection

In most areas, the built-in ferrite-bar antenna will provide satisfactory a-m reception. In difficult reception areas it may be necessary to connect a length of insulated wire 20 – 50 feet long, to the AM ANTENNA terminal. Extend this out of doors if possible, keeping the greater portion horizontal. A-m signal strength is indicated on the SIGNAL meter; the stronger the signal, the greater the deflection to the right.

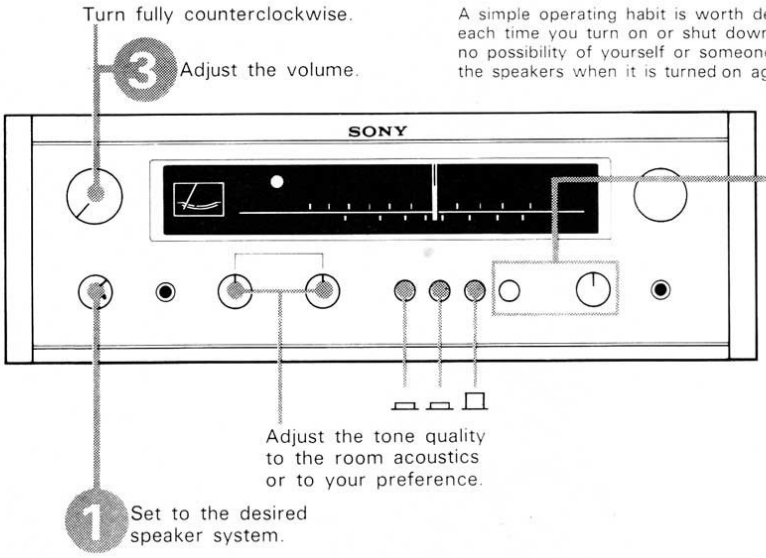
OPERATION

Once your new receiver is in operation as part of your high-fidelity music system, you will find that most of its controls do not require adjustment at each use.

If the unnumbered controls are set as indicated in the illustration, it will only be necessary to select your program source and adjust the volume to your requirements by using the three numbered controls.

NOTES:

- When fm stereo signals are too weak or noisy, the STEREO lamp will flicker. If this happens, depress the MONO switch or adjust the antenna.
- To tune in very weak fm stations, first lower the volume and release the MUTING switch.



	MONITOR	FUNCTION	
FM Reception	SOURCE ⊓	FM	Select the desired station with the TUNING knob.
AM Reception		AM	
Record Playing		PHONO	Play the record.
Tape Playback	TAPE ⊓_	—	Start the tape playback.
Using Mic	SOURCE ⊓	MIC	Connect the mic to the MIC jack and speak to the mic.

TAPE RECORDING

You can record the program selected with the FUNCTION selector.

❶ To turn on the receiver, set the POWER/SPEAKER switch to the desired speaker systems.
❷ Select the program to be recorded with the FUNCTION selector.
❸ Adjust the recording level at the recorder, and start it in record mode.
❹ Play the recording program.

NOTE:

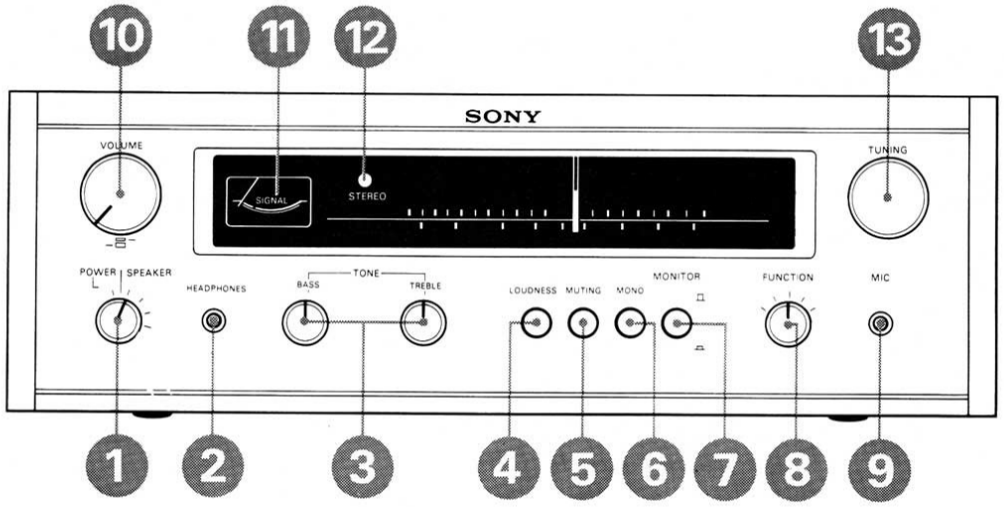
The VOLUME, TONE controls and the LOUDNESS switch of the receiver have no effect upon the recording.

ADJUSTING THE STEREO BALANCE

The feeling of direction and depth that stereophonic sound produces is greatly reduced if the levels of both channels are not balanced. Adjust the stereo balance as follows.

❶ Reproduce a program.
❷ Depress the MONO switch.
❸ Adjust the right and left VOLUME controls so that the sound image is centered between the right and left speakers.
❹ Release the MONO switch.

LOCATION AND FUNCTION OF CONTROLS



❶ POWER/SPEAKER switch
Turning this switch clockwise turns on the receiver and simultaneously selects the desired speaker system. To turn off the receiver, set it to the POWER-OFF position.
B . . . . . for speakers connected to the B SPEAKER terminals.
OFF . . . . to switch off all speakers.
A . . . . . for speakers connected to the A SPEAKER terminals.
A+B . . . for speakers connected to the A and B SPEAKER terminals.
(Be sure that there are speakers connected to both A and B terminals when A+B position is selected. Otherwise no sound will be heard because the A and B terminals are internally connected in series.)

❷ HEADPHONES jack
This accepts headphones of 8-ohms or more. For private listening, merely turn the speaker selector to OFF.

❸ BASS and TREBLE TONE controls
These knobs control the prominence of bass and treble response. Clockwise rotation increases response, counterclockwise decreases it. The center position provides a flat response. Adjust the tones to the acoustic condition of the listening room or to your preference.

❹ LOUDNESS switch
Keep this switch depressed.
At low sound levels, the sensitivity of the human ear is reduced for sounds at the lower and upper extremes of the audible range. This switch will boost the low and high frequency response and the sound will be heard with an apparently flat output. The effects of this switch gradually decrease as the sound level is increased.

❺ MUTING switch
Normally keep this switch depressed to eliminate fm interstation noise while tuning from station to station. Very weak stations are also muted along with the noise, and must be tuned in with the switch released. In this case, keep the volume down to avoid speaker damage caused by the interstation noise.

❻ MONO switch
Normally keep this switch released, and the receiver will operate in the stereo mode. If the switch is depressed, the receiver changes to the mono mode and each speaker provides mono sound. Use this position when an fm stereo program is too noisy, or when you adjust speaker balance.

❼ MONITOR switch
For listening to a tape program, depress this switch [TAPE ⊓]. For listening to all programs except for tape, keep this switch released [SOURCE ⊓].

❽ FUNCTION selector
Selects the desired program :
AUX . . . . . for listening to the program connected to the AUX inputs.
PHONO . . . . . for listening to records.
FM . . . . . for listening to fm programs.
AM . . . . . for listening to a-m programs.
MIC . . . . . for using a mic connected to the MIC jack.

❾ MIC jack
This accepts a high-quality, low-impedance mic with a standard phone plug.

❿ VOLUME controls
These concentric knobs regulate the right and left volume simultaneously or independently. The outer knob controls the right volume, and the inner controls the left. To increase the volume, turn the knob clockwise. Grasp both knobs for simultaneous control.
Stereo balance is also adjusted with these knobs.

⓫ SIGNAL meter
Correct tuning and the signal strength of fm and a-m broadcasts are indicated by this meter. This maximum pointer deflection to the right means best tuning of the signal. Relative strength of received signal is shown by the amount of pointer deflection. If the pointer stays in the red zone, the signal level is too weak for full performance. In this case, adjust the antenna.

⓬ STEREO lamp
This lamp will light when an fm stereo program of sufficient signal strength is tuned in with the MONO switch released.

⓭ TUNING knob
Selects the desired fm or a-m station.

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8-ohm loads, both channels driven, from 40 – 20,000 Hz; rated 15 watts per channel minimum RMS power, with no more than 0.8% total harmonic distortion from 250 milliwatts to rated output.

OTHER SPECIFICATIONS

Amplifier Section

Intermodulation (IM) distortion (60 Hz : 7 kHz=4 : 1)
Less than 0.8% at rated output
Less than 0.1% at 1 watt output
Residual noise — Less than 0.08 microwatt
Damping factor — 25 at 1 kHz, 8 ohms

Input sensitivity, impedance and Signal/Noise ratio

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5 mV	47 kohms	60 dB	B
MIC	2 mV	47 kohms	60 dB	B
AUX	250 mV	100 kohms	70 dB	A
TAPE REC/PB (input)	250 mV	100 kohms	80 dB	A

Measured with rated output power into 8-ohm loads (both channels driven simultaneously) at 1 kHz.

Output voltage and impedance

	Voltage	Impedance	Input level
REC OUT	250 mV	10 kohms	PHONO 2.5 mV MIC 2 mV
REC/PB (output)	30 mV	82 kohms	AUX, TAPE, REC/PB (input) 250 mV

HEADPHONES — Accepts 8 ohm – 10 kohm headphones.
SPEAKER — 4 – 16 ohm speakers are suitable.
Frequency response — PHONO RIAA equalization curve ±2 dB
MIC 30 Hz – 10 kHz $^{+0}_{-3}$ dB
AUX, TAPE, REC/PB (input) 30 Hz – 40 kHz $^{+0}_{-3}$ dB
Tone control — BASS ±10 dB at 100 Hz
TREBLE ±10 dB at 10 kHz
Loudness — +8 dB at 50 Hz, +4 dB at 10 kHz (att. 30 dB)

FM Tuner Section

Tuning range — 87.5 – 108 MHz
Intermediate frequency — 10.7 MHz
Antenna terminals — 300 ohm balanced
75 ohm unbalanced
Sensitivity — 2.2 μV, IHF
1.7 μV, S/N=30 dB
Image rejection — 55 dB
IF rejection — 90 dB
Spurious rejection — 78 dB
AM suppression — 55 dB
Capture ratio — 3 dB
Selectivity — 60 dB, IHF
Signal/Noise ratio — 68 dB
Harmonic distortion — Mono 0.3%
Stereo 0.8%
at 400 Hz, 100% modulation
Stereo separation — 35 dB at 400 Hz
Frequency response — 30 Hz – 15 kHz $^{+0}_{-2}$ dB

AM Tuner Section

Tuning range — 530 – 1,605 kHz
Intermediate frequency — 455 kHz
Antenna — Built-in ferrite-bar antenna and external antenna terminal
Sensitivity — 48 dB/m, built-in antenna
30 μV, external antenna
Image rejection — 56 dB at 1,000 kHz
IF rejection — 40 dB at 1,000 kHz
Signal/Noise ratio — 50 dB
Harmonic distortion — 0.8%

General

Circuit system — Superheterodyne fm/a-m tuner, Direct coupling power amplifier (SEPP OTL)
Power requirements — 120 V ac, 60 Hz
Power consumption — 85 W
AC OUTLET — 2 unswitched, total 300 W
Dimensions — Approx.
16 7/8 (w)×5 7/8 (h)×13 3/8 (d) inches
including projecting parts and controls
Weight — Approx. 16 lb 5 oz (net)
Approx. 21 lb 6 oz (in shipping carton)
Supplied accessories — Fm ribbon antenna 1
Polishing cloth 1

Design and specifications subject to change without notice.

CARE OF YOUR EQUIPMENT

CLEANING

Clean the cabinet, panel and knobs periodically with a soft cloth. If finger prints, food and beverage stains, etc. are difficult to remove, use a cloth moistened with a mild soap solution. Do not use any type of scouring powder, abrasive pad or solvent.

TROUBLE CHECKS

If some trouble should arise with this receiver, first refer to "CONNECTION DIAGRAM" on page 3, and "OPERATION" on page 5, then check the following chart. This will help in isolating any trouble which you may have with this receiver. If the trouble persists after you have made these checks, consult your Sony dealer.

Off-the-air Programs

Stereo lamp not lit when receiving stereo programs
- Release the MONO switch.

Stereo lamp flickers
- Tune accurately.
- Readjust the antenna.
- Depress the MONO switch.

Poor reception
- Tune accurately.
- Adjust the antenna.

Ignition noise
- Tune accurately.
- Install the outdoor antenna away from any heavy traffic.

Other Program Sources

No audio
- Check that the ac power cord is plugged into a working outlet.
- Check the speaker connections.
- Turn the VOLUME controls clockwise.
- Check the MONITOR switch setting.
- Check the FUNCTION selector setting.
- Check the POWER/SPEAKER switch setting.

No audio from one channel or unbalanced left and right volume
- Check the speaker and input connections of the inoperative channel.
- Check the stereo balance.

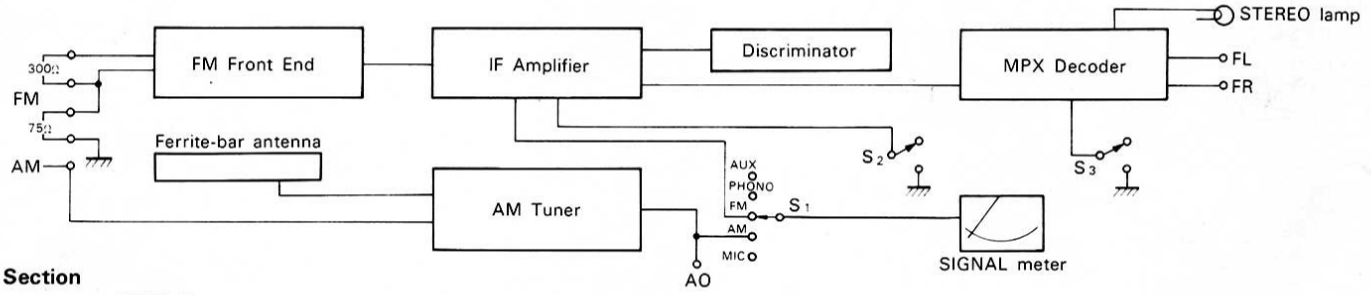
Reverse left and right sound
- Check the speaker location and connections.

Severe hum or noise
- Use shielded connecting cords.
- Keep connecting cords away from transformers or motors, and at least 10 feet from TV sets and fluorescent lights.
- Ground the receiver.

Rustling sound
- Make secure connections.
- Wipe the plugs and jacks with a cloth lightly dampened with methanol.

BLOCK DIAGRAM

Tuner Section



Amplifier Section