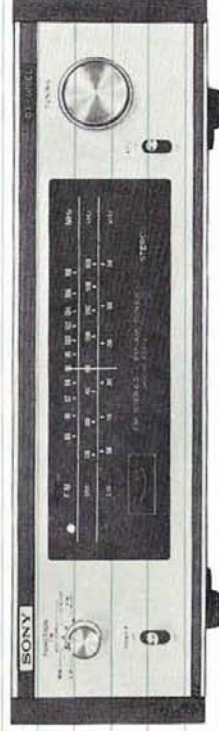


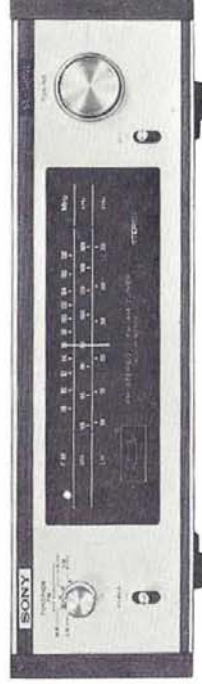
**SONY**

# **FM STEREO/FM-AM TUNER ST-5600L**

**OWNER'S INSTRUCTION MANUAL  
MODE D'EMPLOI  
BEDIENUNGSANLEITUNG**



# OWNER'S INSTRUCTION MANUAL



The all silicon-transistor FM stereo/FM-MW-LW tuner SONY ST-5600L, a product of intensive research combined with superior engineering and careful workmanship, represents the utmost in stereo reception. Sensitivity, interference rejection, and other vital factors which affect the quality of a tuner are greatly determined by the characteristics of its front end. The ST-5600L uses SONY field-effect transistors in its front end, thereby assuring exceptionally high sensitivity, overload capability, image rejection, superior cross-modulation rejection, and low internal noise.

The i-f (intermediate frequency) section uses four solid-state filters (piezoelectric ceramic-disc resonators) instead of conventional tuned circuits to improve the tuners' selectivity and long term stability. The solid-state filters permit reception of weak signals without interference from strong adjacent stations. The small polarized resonators also offer greater reliability since they cannot drift out of alignment or be accidentally detuned.

Precision tuning is easy with the long, accurate, slide-rule dial. Additional features are two pairs of outputs, variable and fixed. A high-blend circuit permits you to reduce noise that originates in certain stereo program material.

Read this instruction manual carefully and save it for future reference in order to take full advantage of all the features of this fine tuner.

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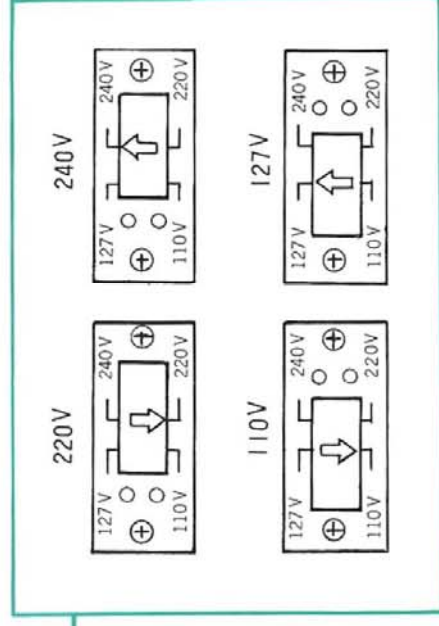
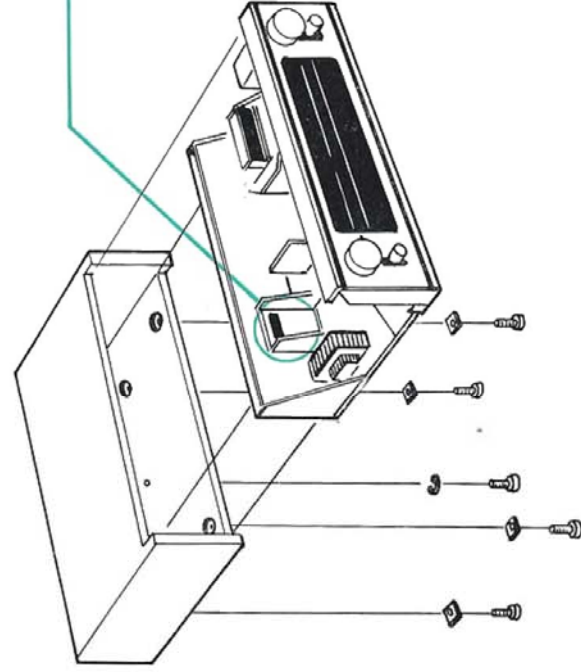
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## PREPARING FOR USE

### UNPACKING

All SONY equipment comes to you carefully packed in cartons designed to withstand the rigors of shipment. Do not throw the carton or associated packing material away; they will come in handy if you ever have to transport or ship the ST-5600L.

Inspect your ST-5600L immediately for signs of damage incurred in transit. If damage has occurred, consult your local SONY dealer for further instructions. Once again, save all packing material; it will substantiate your damage claim.



### ADAPTATION TO THE LOCAL POWER LINE

The ST-5600L operates on a power line voltage of either 110V, 127V, 220V or 240V. Before operating, check whether or not the ST-5600L is set for operating ac voltage of your local power line. If necessary, reset the ac voltage selector plug as follows:

1. Loosen the five screws of the cabinet and remove it.
2. Pull out the ac voltage selector plug, located as shown, and firmly reinsert it so that the top arrow mark of the plug points to the proper voltage figure.
3. Replace the cabinet.

### SYSTEM CONNECTIONS

No doubt you have already decided on a location for your ST-5600L. However, before going ahead with the installation, make sure that your choice of location agrees with the following list of DO's and DON'T's.

- DO** allow at least 1 inch clearance around the ST-5600L for ventilation.
- DO** allow sufficient room behind the ST-5600L so you can make connections to the rear panel without disrupting your entire setup.
- DON'T** place the ST-5600L in direct sunlight, or rear radiators, hot-air ducts, or any other source of heat. Similarly, don't place it in any area subject to freezing temperatures or excessive moisture.
- DON'T** place the ST-5600L on any soft surface which may block the bottom ventilation holes.

After you have found a suitable location for your ST-5600L, you can begin making the basic connections described in the following paragraphs. Refer to the overall-system connection diagram while making these connections.



## FM Antenna

The sensitivity of the ST-5600L is so great that in most areas it will work well with simple antennas such as the ribbon dipole antenna supplied. However, for the very best FM reception possible, particularly at problem locations, a more elaborate antenna may be necessary.

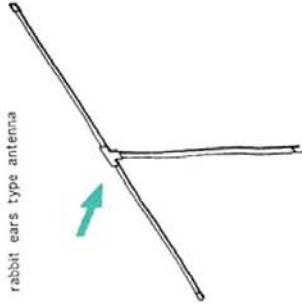
The factors determining the minimum antenna requirements for your location include the following:

1. How strong are the FM signals in your neighborhood?
2. Are all the FM stations in the same direction, or are they scattered all over?
3. Is multipath reception a problem?

As far as signal strength is concerned, many city dwellers do extremely well using just a ribbon-type FM dipole or the familiar "rabbit ears". The rabbit-ear antenna is the more preferable of the two since it can easily be rotated and otherwise adjusted for best reception. However, in the far suburbs, a high-gain highly-directive outdoor FM antenna is necessary to secure the best signal-to-noise ratio on stereo broadcasts.

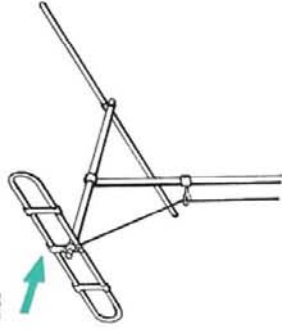
Omnidirectional antennas are quite handy if the local FM stations lie in different directions and you don't want to use a tor. However, if multipath reception causes the problems cribed in the next paragraph, you must use a highly-directive antenna and a rotator, or several highly-directive fixed antennas.

Ribbon dipole antenna, rabbit ears type antenna

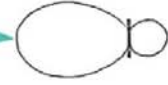


Dipole antenna picks-up signals from both the front and rear equally well.

Directional outdoor antennas

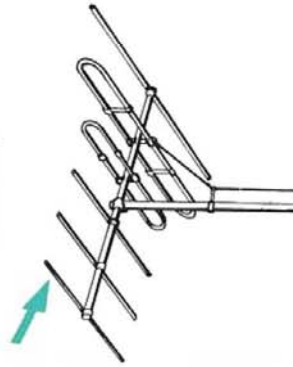


Increased sensitivity to front signals



Reduced sensitivity to rear signals

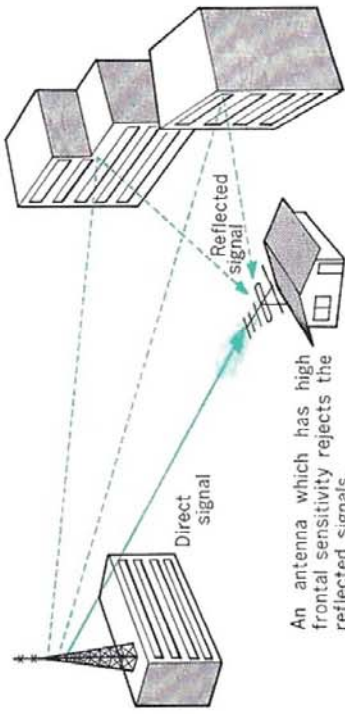
Multi-element type



High frontal sensitivity

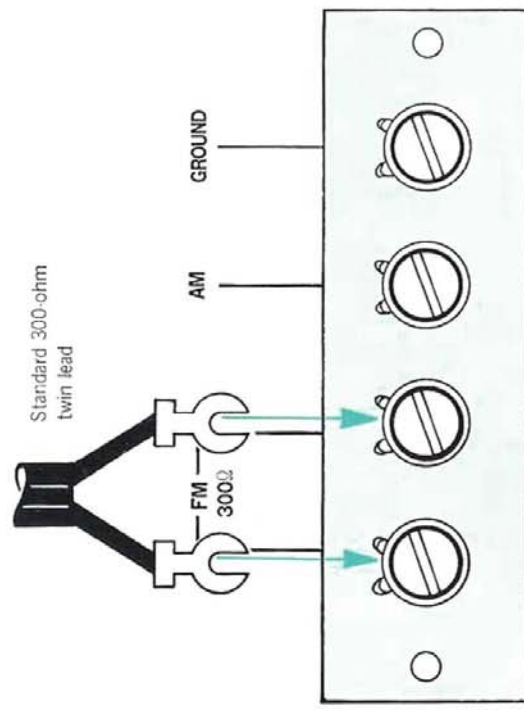
Low sensitivity to rear signals

Multipath Reception: Good FM reception depends not only on the sensitivity of the tuner but on the quality of the received signal. The most important factor affecting signal quality is "multipath" reception. Multipath reception is the arrival of a signal at an antenna from several points, the result of signal reflections from tall buildings or bridges, just to cite a few examples. These signals arrive at the antenna at different times, depending upon the lengths of the paths they travel. The addition of these signals at the tuner can produce audible distortion and loss of channel separation. Multipath reception is a condition that depends solely upon the terrain of the surrounding locality. If you have trouble with "TV ghosts" in your area, FM multipath distortion will probably occur also.

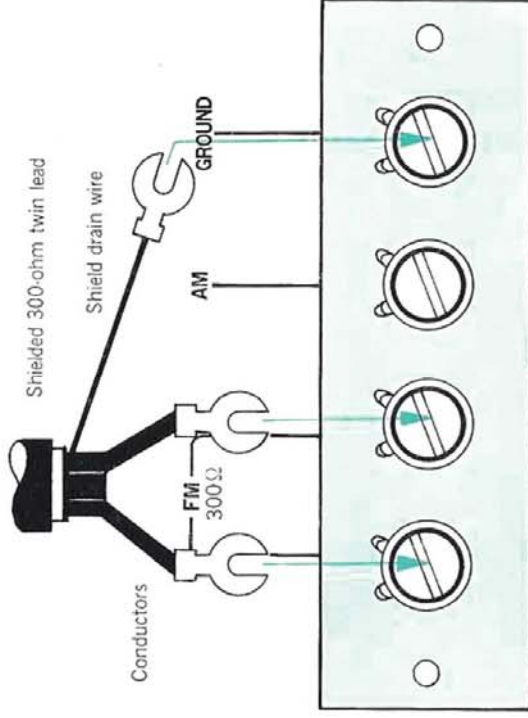


Connecting the FM Antenna Lead: The ST-5600L accepts either standard 300-ohm transmission line (twin lead) or the shielded type. Standard 300-ohm twin lead is inexpensive and will be perfectly adequate for most installations. However, in cases where local noise or multipath pickup on the transmission line causes interference, shielded transmission line must be used.

To connect standard 300-ohm twin lead to the ST-5600L, loosen the antenna terminals marked FM 300Ω. Strip the plastic insulation from the two-conductor lead-in wire and wrap each conductor around a terminal. Tighten the terminal screws.



To connect shielded 300-ohm twin lead to the ST-5600L, connect the two conductors, then connect the shield drain wire to the GROUND terminal.



**Antenna Orientation:** The signal strength of FM stations are indicated on the TUNER INPUT meter; the stronger the signal, the greater the deflection toward the right. For proper orientation, tune in the desired station accurately and adjust the antenna position and height while watching the TUNER INPUT meter and listening to the sound quality.

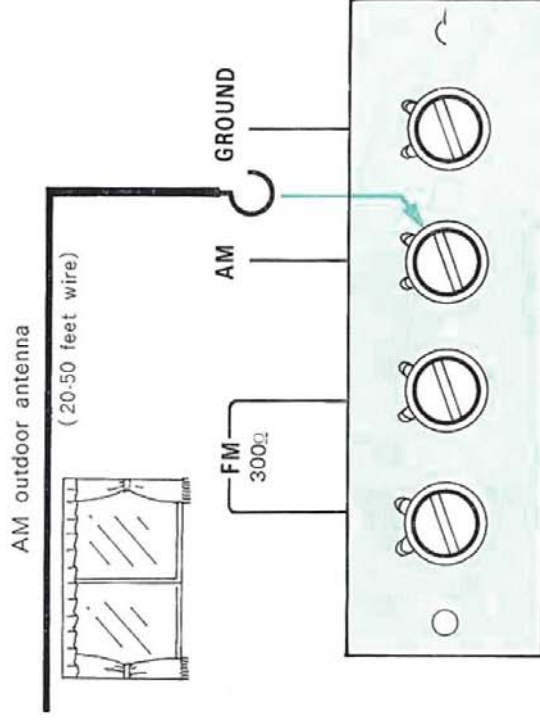
- Point the antenna in the direction that yields the highest average readings on the TUNER INPUT meter.
- If distortion is audible, adjust the direction and/or height of the antenna until the distortion is eliminated. Often, a slight turn will be sufficient.
- In some cases multipath reception on two or more stations may require the antenna to be pointed in several different directions. An effective and relatively inexpensive solution to this problem is the use of a remote-controlled antenna rotator.
- Keep the antenna lead-in wire as short as possible and avoid long horizontal runs to minimize signal pickup on the line.

#### AM (MW and LW) Antenna

In most areas, the built-in ferrite bar antenna will provide optimum MW reception.

In difficult reception areas (where the pointer stays in the red zone), an outdoor antenna will be helpful.

For LW reception an outdoor antenna should be connected. Connect a length of wire 20 - 50 feet long, to the AM ANTENNA terminal.



#### Output Connections

The OUTPUT terminals (FIXED and VARIABLE) supply audio signals to the TUNER or AUX input terminals of your amplifier. Both fixed and variable outputs are provided to suit the needs of your amplifier. Be sure to connect the LEFT channel output of the tuner to the left-channel input of the amplifier, and do like-wise for the RIGHT channel.

The FIX terminals provide a fixed 750 millivolt output. A SONY stereo amplifier or any high-quality amplifier can be connected to these outputs.

The output levels at the VARIABLE terminals can be varied continuously from 0 to 1.5 volts by turning the associated LEVEL CONTROLS. These outputs are useful in equalizing the volume produced by the tuner with that provided by other signal sources such as tape players, phono players, etc.

#### Ground Connection

Loosen the GROUND terminal screw and wrap the ground wire around the terminal; then tighten the screw. Connect the other end of the grounding wire to a good earth ground (the center screw on the cover plate of an ac outlet should be an earth ground).

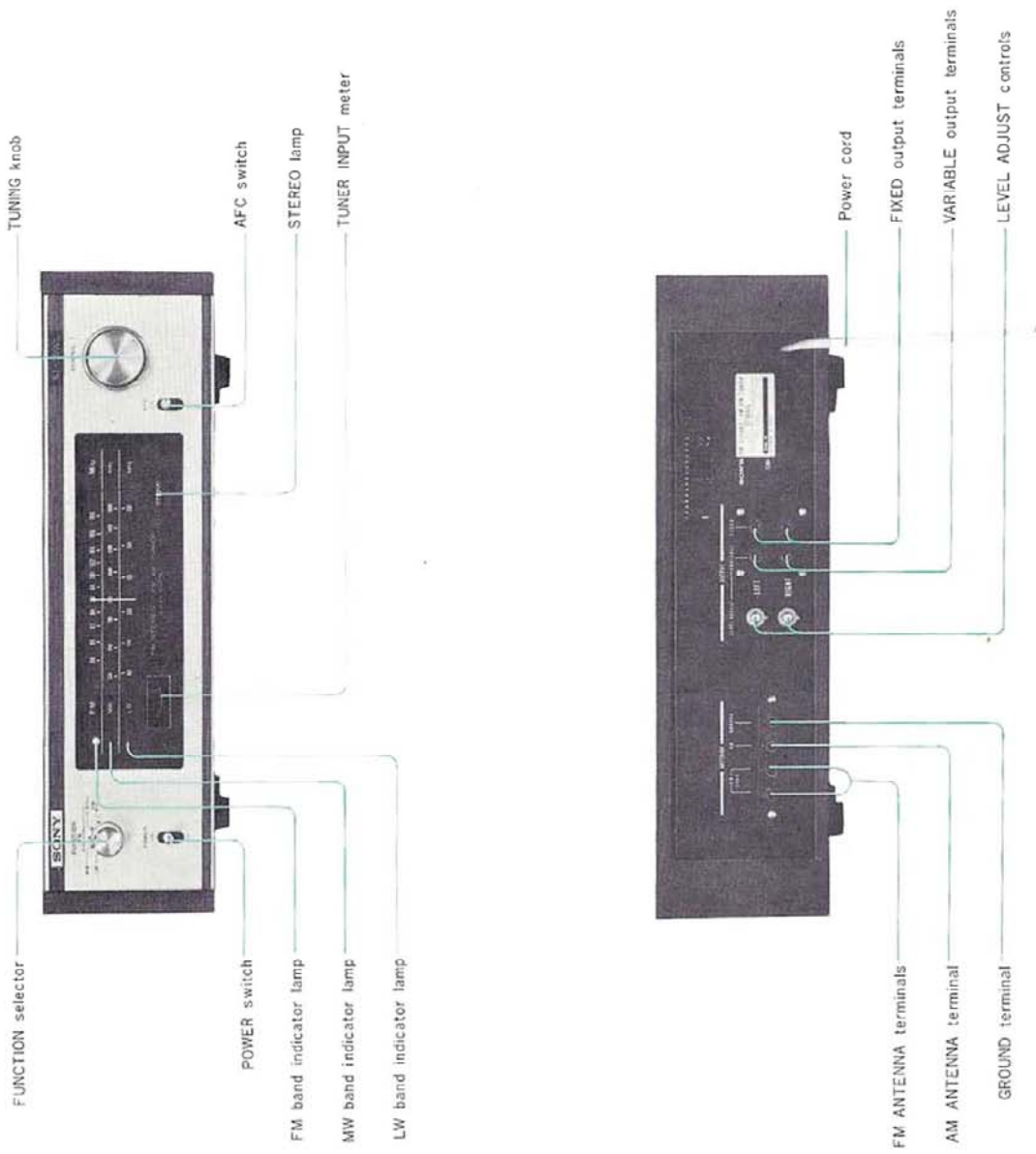
#### Power Connection

Connect the power cord to an ac wall outlet.

## OPERATING INSTRUCTIONS

### LOCATION AND FUNCTION OF CONTROLS AND CONNECTORS

Before attempting to operate your ST-5600L, you will be wise to learn the function and location of the controls, connectors, and other parts mentioned in the operating instructions. The locations are shown in the illustration, and the functions are described on next page.



### FUNCTION selector

LW: For LW reception.

MW: For MW reception.

**FM AUTO STEREO:** When receiving FM programs, the selector is normally set to this position. The tuner then adjusts itself automatically to stereo or mono (FM reception) depending upon the signal received. When a stereophonic signal is received, the STEREO lamp will light.

**FM HI BLEND:** If the received FM stereo signal is weak and noisy, set the selector in this position. The high-blend circuit blends the high frequency components of the left and right channels. Thus, the cancellation of noise is accomplished without affecting frequency response.

**FM MONO:** In this position, the tuner is locked into the monophonic mode for reduced noise.

### STEREO lamp

This lamp lights when the tuner receives an FM stereo broadcast of sufficient signal strength.

### POWER switch

Set to ON to apply power to the tuner. The dial will then light with a soft green glow.

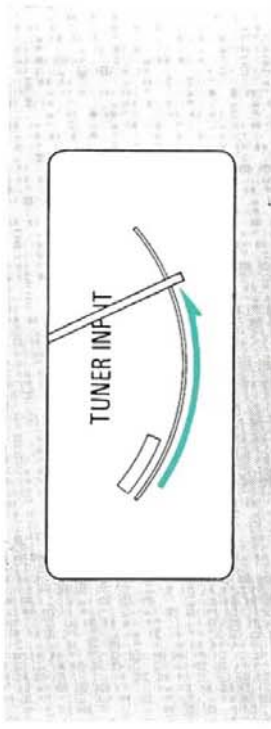
### AFC switch

Effective only for FM broadcasts. This switch turns on or off the automatic frequency control circuit which locks the tuner on an FM signal to prevent drifting and keep out noise and sideband hiss.

When tuning, flip the AFC switch to OFF and precisely tune in the desired FM station. After tuning, return the switch to ON. If the station adjacent (within 1 MHz) to the tuned-in station has a stronger signal, the tuning may be affected when the AFC is operating. In this case, flip the AFC switch to OFF.

### TUNER INPUT meter

Correct tuning and signal strength are indicated by this meter. The rightmost pointer deflection means best tuning of the signal. The relative strength of the 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, especially for FM stereo reception.

## HOW TO USE YOUR ST-5600L FOR FM RECEPTION

1. Flip the POWER switch to ON. The markings on the dial scale light up in green when power is applied to the tuner.
2. Turn on the amplifier and speaker system you are using with the ST-5600L.
3. Set the FUNCTION selector to FM AUTO STEREO and flip the AFC switch to OFF. The FM band indicator lamp will light.
4. Tune in the desired station by turning the TUNING knob. Tune for maximum reading on the TUNER INPUT meter. The STEREO lamp lights when a multiplex FM stereo broadcast is received. When stereo signals shift to monophonic, the lamp goes out indicating that the tuner has automatically switched to monophonic reception.  
When an FM stereo signal is too weak or noisy for enjoyable stereo listening, set the FUNCTION selector to FM HI BLEND. If an FM program is weak (the STEREO lamp flickers) or noisy, set the FUNCTION selector to FM MONO.  
In poor reception areas, connect an external FM antenna according to the instructions on pages 5 and 6.
5. Adjust the sound level and tone quality to your preference by turning the volume, bass and treble controls of your amplifier.

## HOW TO USE YOUR ST-5600L FOR MW AND LW RECEPTION

1. Flip the POWER switch to ON.
2. Turn on the amplifier and speaker system you are using with the ST-5600L.
3. Set the FUNCTION selector to MW or LW. The lamp of the selected band will light.
4. Tune in the desired station by turning the TUNING knob. Tune for maximum indication on the TUNER INPUT meter.
5. Adjust the sound level and tone quality to your preference by turning the volume, bass and treble controls of your amplifier. In poor reception areas, connect an external AM antenna according to the instructions on page 6.

## LEVEL CONTROLS

If the VARIABLE output connectors are being used, adjust the LEVEL CONTROLS as follows.

1. Tune in an FM program, and set the FUNCTION selector to FM MONO.
  2. Switch the input selector on your amplifier to PHONO, and play a record to establish a normal listening level.
  3. Compare the volume level of the phonograph with that of the tuner by switching the amplifier's input selector back and forth between PHONO and TUNER.
  4. Adjust the LEVEL CONTROLS on the ST-5600L to produce the same volume as the phonograph. Turn these controls clockwise to increase the volume. Make sure you keep the amplifier's volume control at the original setting (Step 2) while the output-level adjustments are being made.
- NOTE: Be sure to balance the volume of both left and right channels precisely.



## CARE OF YOUR TUNER

### CLEANING

Finger prints, the kind's chocolate candy, and similar household annoyances can mar the beauty of your ST-5600L. These can be cleaned up by wiping the panel and knobs with a soft clean cloth moistened with water. Do not use any type of scouring powder, abrasive pad, or solvent.

### TROUBLE CHECKS

If trouble with the ST-5600L arises, make the following simple checks to determine if the trouble is really in the ST-5600L, or external to it. Quite often hi-fi equipment fails to work properly because of incorrectly made system connections. If the trouble persists after you have made these checks, consult your SONY dealer for further instructions.

Symptom	Remedy
<b>Stereo reception</b>	
1. Stereo broadcast is noisy and distorted.	Adjust the antenna for maximum signal strength. Set the FUNCTION selector to FM HI BLEND or FM MONO.
2. STEREO lamp blinks on and off.	Adjust the antenna to eliminate weak or multipath reception.
3. Unbalanced output (connections made to VARIABLE outputs)	Readjust the output levels.
<b>Noise</b>	
4. Severe hum or noise	Connect the ST-5600L to a good earth ground. Use shielded connection cables. Avoid long horizontal runs. Keep cables away from transformers or generators, and at least 10 feet from TV sets and fluorescent lights. Reverse the ac plug in the receptacle.
5. Distortion or beat signals	Adjust the antenna to eliminate multipath reception.

### Sound cannot be regulated properly at the amplifier

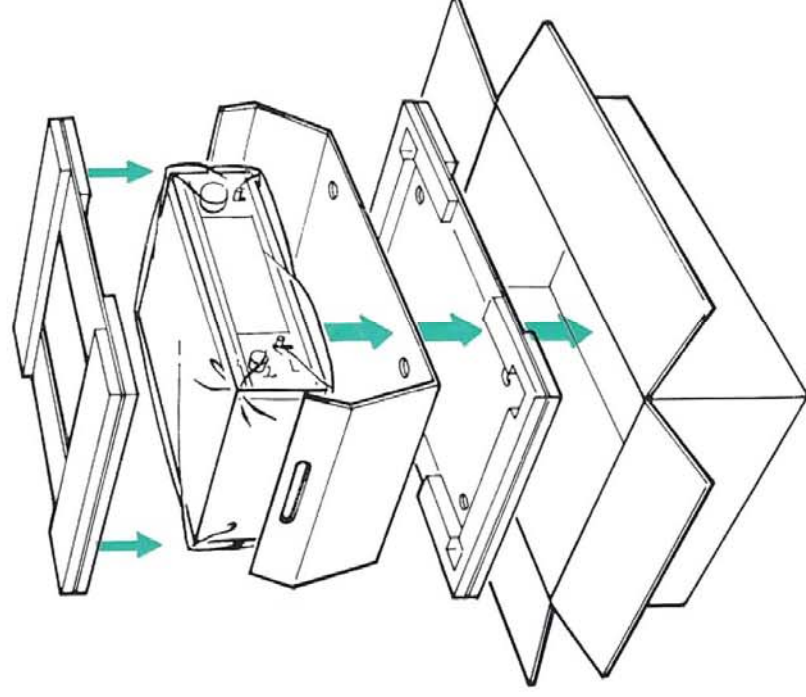
- Volume level is too high or too low.  
Reconnect the amplifier to the VARIABLE outputs and adjust the output level.
- No sound  
If you are using the VARIABLE outputs, adjust the output level.

### Others

- Poor reception  
Tune accurately for maximum deflection on the TUNER INPUT meter. Adjust the antenna for maximum signal strength. To receive a weak fm program, set the AFC switch to OFF.

## REPACKING FOR SHIPMENT

The ST-5600L original shipping carton and packing material (which we asked you to save) is the ideal container for shipping the unit for repair work, or simply to another location. However, to achieve the maximum protection, the ST-5600L must be repacked in this material precisely as before. The proper repacking procedure is as shown in the illustration.



## TECHNICAL DATA

### SPECIFICATIONS

#### FM Tuner Section

Tuning range : 87.5 MHz – 108 MHz  
Antenna terminals : 300 ohm balanced  
Intermediate frequency : 10.7 MHz  
Sensitivity : 3 $\mu$ V, IHF  
1.4 $\mu$ V, S/N=30 dB  
Image rejection : 43 dB  
I-f rejection : 82 dB  
Spurious rejection : 78 dB  
AM suppression : 50 dB  
Capture ratio : 1.6 dB  
Selectivity : 60 dB  
S/N ratio : 65 dB  
Frequency response : 30 Hz – 15 kHz,  $\pm$  1 dB  
Harmonic distortion : Mono 0.3% at 400 Hz,  
100% modulation  
Stereo 0.7% at 400 Hz,  
100% modulation  
FM stereo separation : Better than 38 dB at 400 Hz  
19 kHz, 38 kHz suppression : 50 dB

#### AM (MW and LW) Tuner Section

Tuning range : MW 530 kHz – 1,605 kHz  
LW 150 kHz – 350 kHz  
Antenna : MW Built-in bar antenna and external  
antenna terminal  
LW External antenna terminal  
Intermediate frequency : 455 kHz  
Sensitivity : MW 48 dB/m built-in antenna  
20  $\mu$ V, external antenna  
LW 200  $\mu$ V, external antenna  
Image rejection : \* MW 40 dB at 1,000 kHz  
LW 70 dB at 250 kHz  
I-f rejection : MW 40 dB at 1,000 kHz  
LW 50 dB at 250 kHz  
S/N ratio : 50 dB  
Harmonic distortion : 0.8%

#### General

Outputs : FIXED 750 mV, 5k $\Omega$  impedance  
VARIABLE 0 – 1.5 V,  
2.5 k $\Omega$  impedance  
(at maximum output)  
Circuit system : FM stereo FM-MW-LW superheterodyne  
Semiconductors : 1 FET + 17 transistors for reception  
2 transistors for auxiliary circuits  
18 diodes  
Power requirements : Ac 110, 127, 220 or 240 V adjustable,  
50/60 Hz  
Power consumption : 13 watts  
Dimensions : 16 $\frac{3}{8}$ (w) $\frac{1}{8}$  x 4 $\frac{3}{8}$ (h) $\frac{1}{8}$  x 10 $\frac{1}{2}$ (d) $\frac{1}{8}$   
Weight : 9 lb  
Supplied accessories : Dipole ribbon antenna (1)  
Connecting cord RK-74 (1)  
Polishing cloth (1)

Design and specifications subject to change without notice.  
Hz (hertz) ; Cycles per second

**BLOCK DIAGRAM**

