

FM STEREO TUNER

Model 600T

INSTRUCTION MANUAL



INTRODUCTION

Thank you for purchasing our tuner. Because we take great pride in the long tradition of quality components the name Kenwood represents, your purchase of a Kenwood tuner places you in a distinguished family of connoisseurs of superb high-fidelity sound reproduction.

The purpose of this manual is to acquaint you with the operating features of your new tuner. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read this manual carefully. Knowing how to set up your tuner, to the best advantage, will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your tuner to meet your special requirements.

Turn the pages and become acquainted with the exciting features of your new tuner that will remain new for endless hours of listening pleasure.

PRECAUTIONS CONCERNING INSTALLATION

- (a) Avoid locations subject to direct sunlight.
- (b) Avoid high or low temperature extremes.
- (c) Keep the tuner away from heat radiating sources.

NOTES

1. Units shipped to the U.S.A. and CANADA are designed to be operated with 120 volts AC only. Units shipped to the Scandinavian countries are designed to be operated with 220 volts AC only. Therefore the above units are not equipped with an AC Voltage Selector Switch so all reference to such a switch throughout this manual should be disregarded.
2. Units shipped to all other countries are equipped with an AC Voltage Selector Switch on the rear panel that is preset at the factory to the voltage generally available in the destination area.

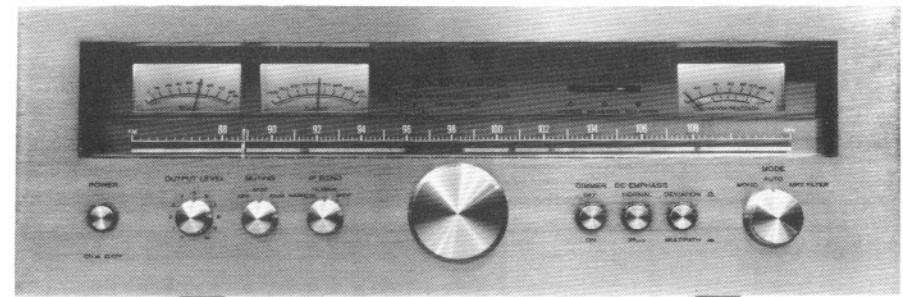
It is very important, however, to check the Voltage Selector Switch setting and make sure that it corresponds to your line voltage before connection the power cord into an AC outlet. If the Voltage Selector Switch requires resetting, follow the directions outlined on page 10.

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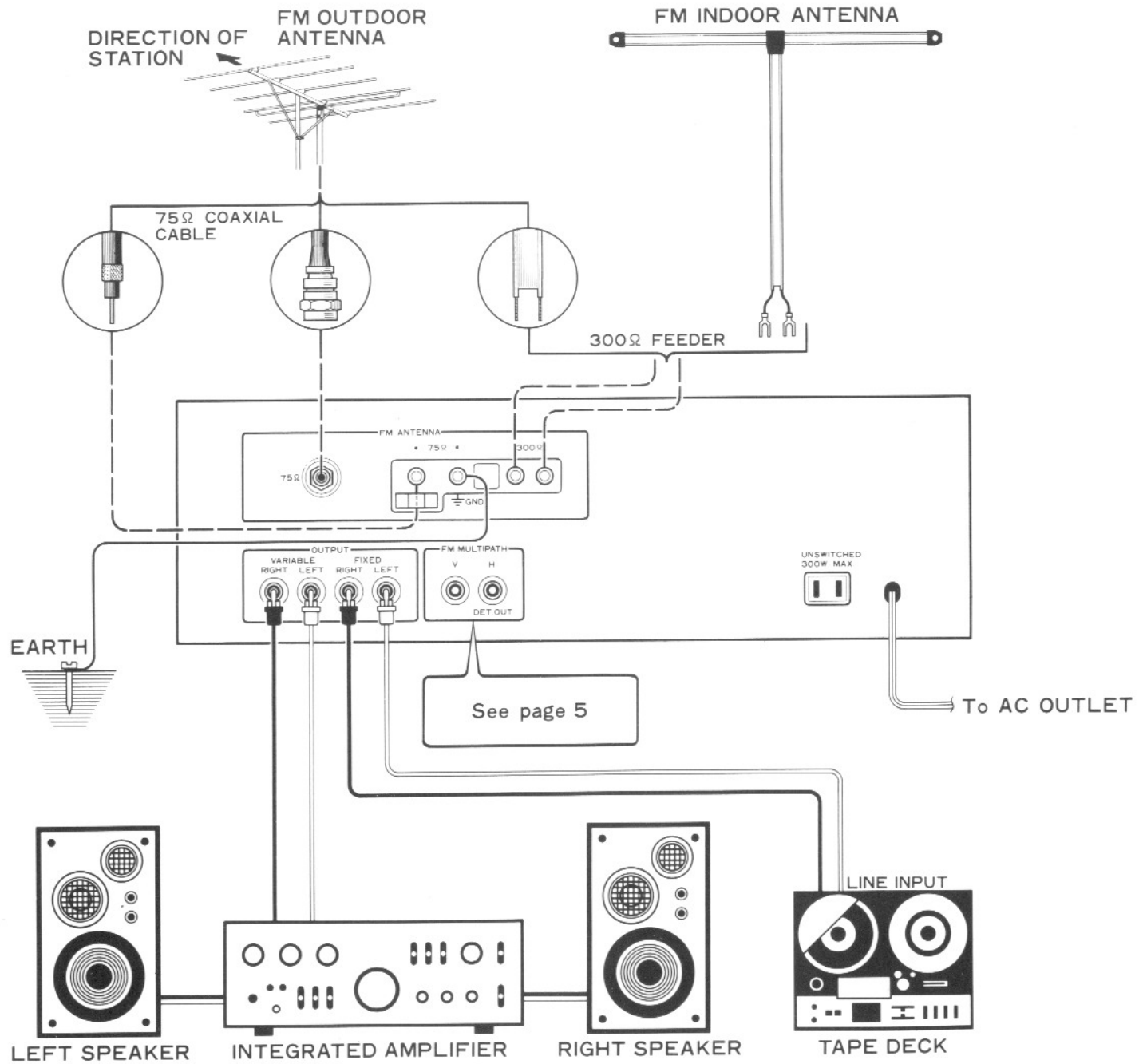
FEATURES

1. Image response characteristic is improved by the adoption of high-accuracy 8-gang variable capacitor.
2. Cross-modulation characteristic is improved by use of a new device "Double Diffused Dual Gate MOS FET" which has excellent linearity and dynamic range necessary for the RF amplifier.
3. A double-balanced mixer is employed for the mixing circuit. Since a double diffused dual gate MOS FET is exclusively used for the mixer, inter-modulation characteristic has been improved remarkably.
4. The IF band selector of WIDE/NORMAL/NARROW is installed. In the NARROW setting, high selectivity is assured by use of a 12-element phase linear ceramic filter.
5. The circuits of WIDE and NORMAL of the IF band are provided with LC concentrated filters. Because of their excellent group delay time characteristics, no distortion is generated in the IF stages.
6. Since the crystal double conversion system is adopted for the IF stages, S/N characteristics are greatly improved.
7. Adoption of pulse count detectors has extremely reduced distortion of FM demodulation.
8. The PLL of MPX is provided with automatic loop response control to reduce distortion in stereo reception.
9. Separation characteristic is quite favorable due to the effect of new D.S.D.C. MPX by FET switching.
10. Since \pm power supply system is adopted for all audio signal lines, dynamic range is very wide.



WARNING:
TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO
RAIN OR MOISTURE.

INTERCONNECTING DIAGRAM



CONNECTING INSTRUCTIONS

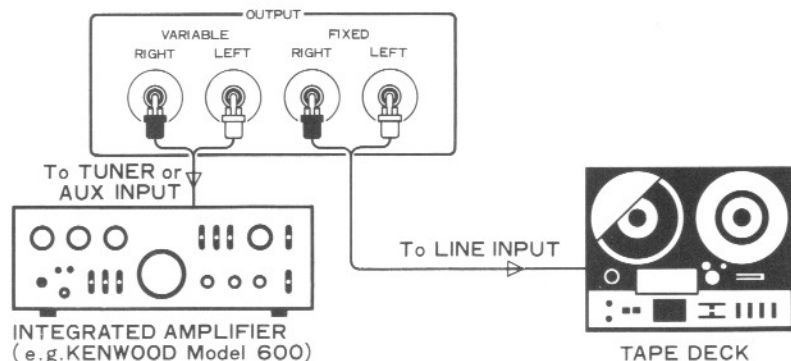
OUTPUT

VARIABLE

These jacks connect to the stereo amplifier's TUNER or AUX input terminals. The output level of these terminals is controlled by the Output Level knob on the front panel.

FIXED

These jacks connect to the tape deck Line Input terminals. The signal level from the output terminals cannot be controlled from the Model 600T; this must be done with the tape deck input level controls.



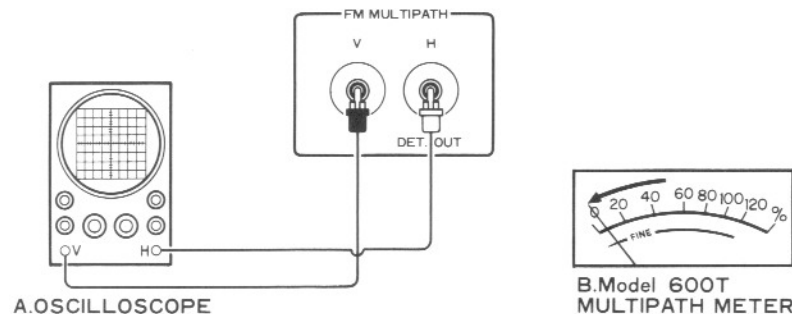
FM MULTIPATH JACKS

FM signals radiate in a straight line path like light rays and are reflected when they encounter obstacles. When a reflected signal and a direct path signal are received simultaneously at the antenna, one affects the other causing what is known as multipath distortion. This adversely affects the quality of reception.

This unit is provided with FM multipath jacks and multipath meter through which multipath distortion can be detected in two ways. In one way FM multipath jacks are connected with an oscilloscope and the antenna is positioned at the optimum height and in the best direction by observing the displayed wave form until distortion can be lowered to a minimum level. In the other way the antenna is positioned in a

direction in which a deflection in the multipath meter on the front panel is reduced to a minimum.

Note: The FM MULTIPATH meter does not function when an FM monaural broadcast is being received. When handling the oscilloscope, please refer to the instruction manual attached to it.



HOW TO DETECT THE MULTIPATH DISTORTION

DET. OUT (DETECT OUT)

The FM detector circuit output is made available here so that this tuner will be ready for 4-channel broadcasting developments in the future. When FM discrete 4-channel broadcasting becomes a reality, a simple demodulator connected here will enable you to fully enjoy this coming development.

AC OUTLET

The AC outlet on the rear panel of the tuner may be used to supply power to other components.

UNSWITCHED outlet

This outlet delivers power at all times. (The total capacity is 300 watts maximum.)

Note: Units shipped to the Scandinavian countries are not equipped with an AC OUTLET.

CONNECTING INSTRUCTIONS

ANTENNA CONNECTIONS

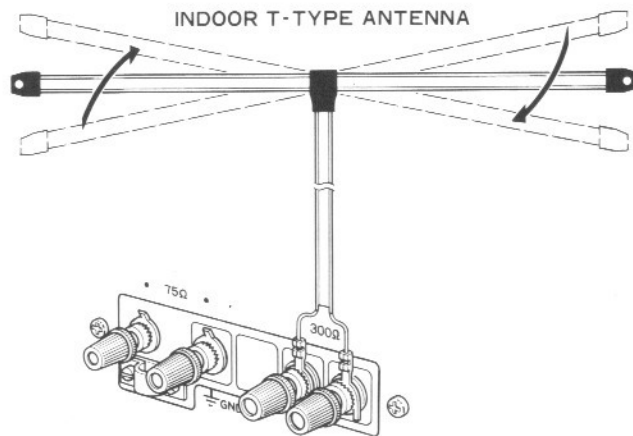
Since FM broadcast signals travel along a straight, direct-line path, they become rather weak behind hills and buildings even in the vicinity of a broadcasting station. FM signals also become weak in areas distant from a station even though there may not be any obstruction to the direct-line path of the signal. Therefore, a good FM antenna should be installed in the most effective manner for best possible FM reception.

INDOOR T-TYPE ANTENNA

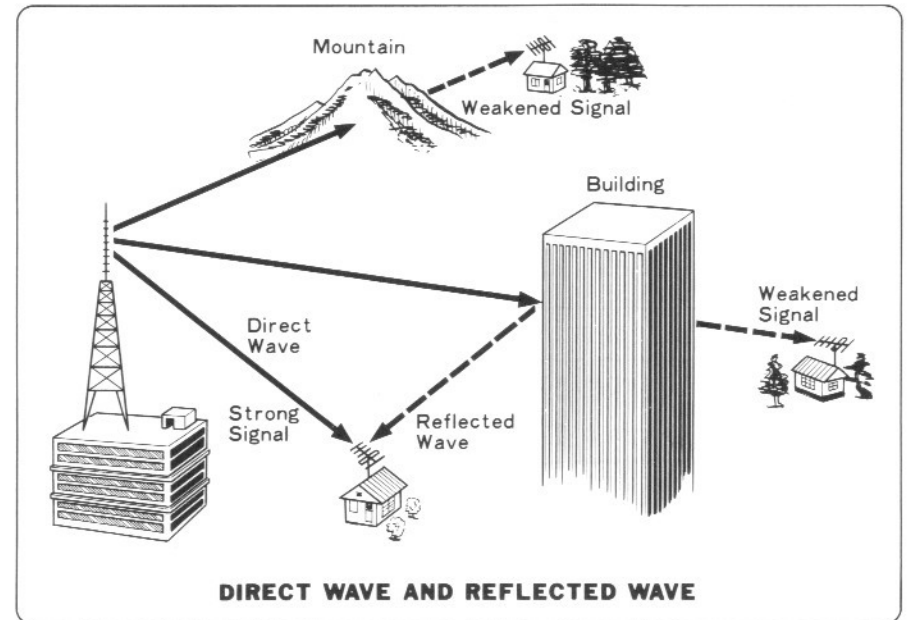
In areas close to the transmitter, a simple T-Type antenna may suffice. It should be remembered, however, that the pickup of reflections (similar to "ghosts" on TV) will result in poor stereo reception.

These reflections must therefore be reduced to a minimum, either by careful orientation of the indoor dipole antenna or, if this will not eliminate them, by using a more directional outdoor type antenna.

Spread the 2 arms of the antenna horizontally and while listening to an FM station, position them for best reception. The antenna can then be taped to a wall or ceiling.



TWIN LEAD (300 Ω) CONNECTION

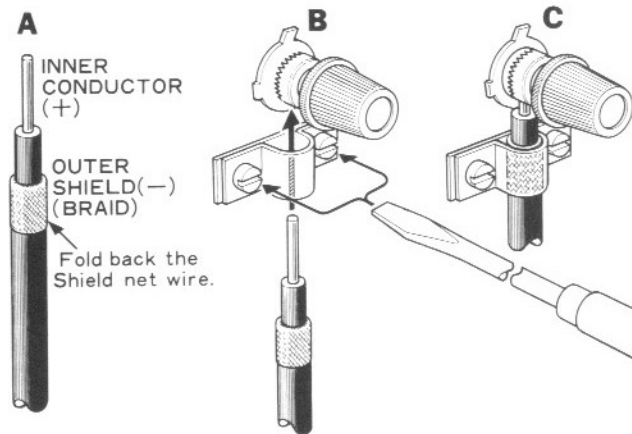


CONNECTING INSTRUCTIONS

OUTDOOR ANTENNA

In areas a greater distance from the transmitter, the use of an outdoor antenna is highly recommended. These are available in various types. For reception of broadcast stations located in many directions, a non-directional type antenna will offer better results. When using a directional antenna, always orient it for the best reception of the desired station. The correct position will be indicated by maximum deflection of the Signal Meter on your tuner.

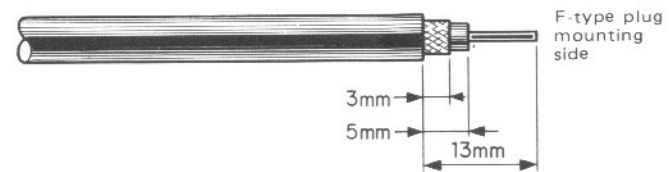
Connections should be made as indicated by figures. Keep FM antennas away from roads.



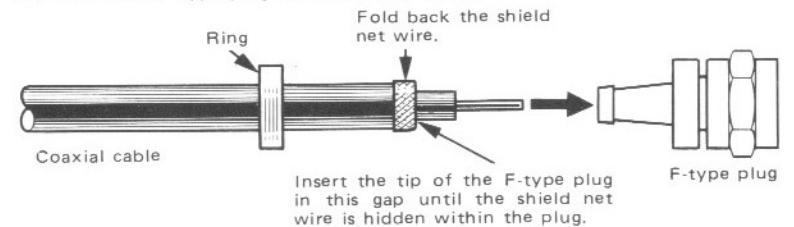
Strip the coaxial cable as shown in (A).
Loosen the screws and connect the cable as shown in (B).
Then tighten all screws for a connection like (C).

COAXIAL CABLE (75Ω) CONNECTION

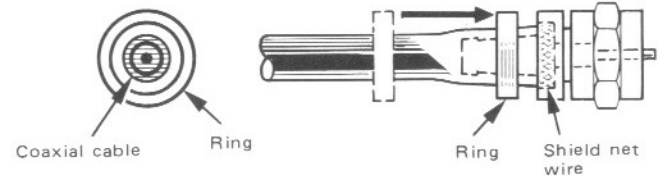
1. Arrange the coaxial cable as illustrated.



2. Mount the F-type plug on the coaxial cable.



3. Move the ring to the illustrated position and flatten it with pliers.



Pull it by means of pliers, etc.



F-Type Coaxial Cable (75Ω) Connection

CONTROLS AND THEIR FUNCTIONS

① POWER SWITCH

This pushswitch turns the Power on or off. When the POWER SWITCH "in", the dial lamp illuminates. Be sure to turn the POWER switch off before plugging or unplugging the power cord.

② OUTPUT LEVEL CONTROL

The signals passing from the OUTPUT (VARIABLE) terminals can be controlled by the OUTPUT LEVEL knob. Use the controls in the following situations:

- 1) When this unit is connected to a stereo amplifier and the output level is too high for the input terminals, or too low.
- 2) When the tuner output level does not match that of other units (turntable, tape deck, etc.) connected to the amplifier.

③ MUTING SWITCH

This switch silences interstation noise on the FM band.

The switch positions and functions are as follows:

- 20 dB — Use this setting when the "40 dB" setting cancels the desired station along with the noise.
- 40 dB — To tune in a clear and strong signal stations, and have no need to receive distortion-prone weak and distant stations.

Note: When tuning to a weak signal station, turn the MUTING switch off.

④ IF BAND SELECTOR

NARROW— This setting is suitable for that radio interference with an adjacent station is rigorous.

NORMAL — This setting is suitable for normal usage.

WIDE — This setting is suitable for usage in an area where no radio interference occurs. Reception with a low distortion can be expected.

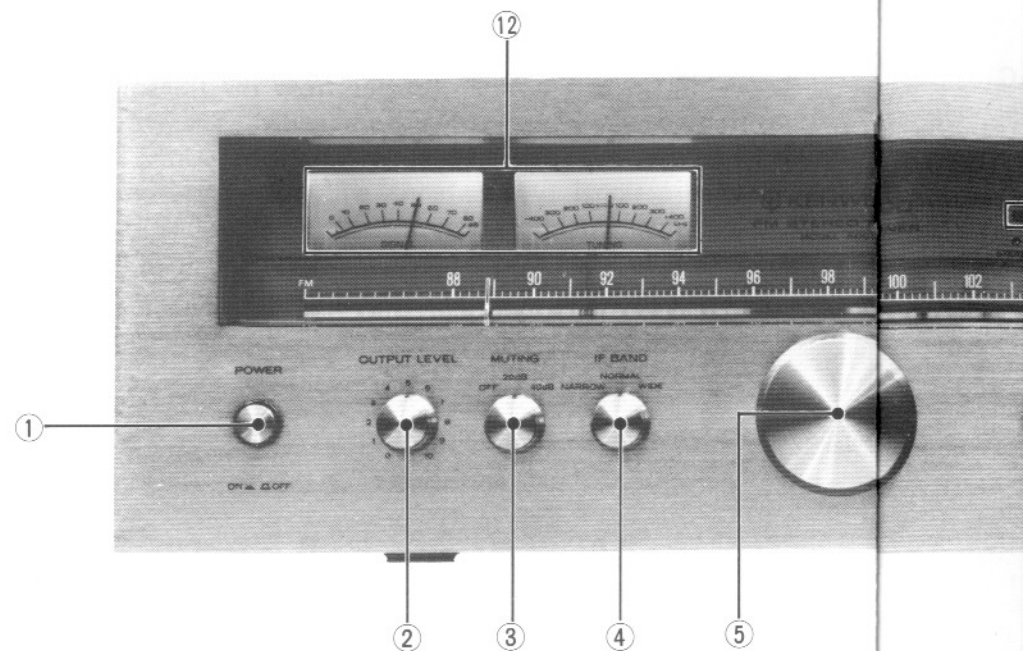
⑤ TUNING KNOB

Use the tuning knob to select the FM station desired.

Adjust further by tuning for maximum deflection of the SIGNAL meter while listening to the speaker output.

⑥ DIMMER SWITCH

The dial illumination can be dimmed if desired by setting this ON-OFF switch to ON.



⑦ DE-EMPHASIS SWITCH

Selects $75\mu\text{s}$ ($50\mu\text{s}$) or $25\mu\text{s}$ FM DE-EMPHASIS for accurate reception of Dolbyized FM signals. Normally, this switch should be left in the NORMAL position. However, if the station is broadcasting the Dolbyized program using a $25\mu\text{s}$ pre-emphasis, put this switch in the "25 μs " position to obtain flat FM frequency response. If in doubt, call the station.

Note: For optimum reception of Dolby broadcast, the Dolby Adaptor must be used without fail.

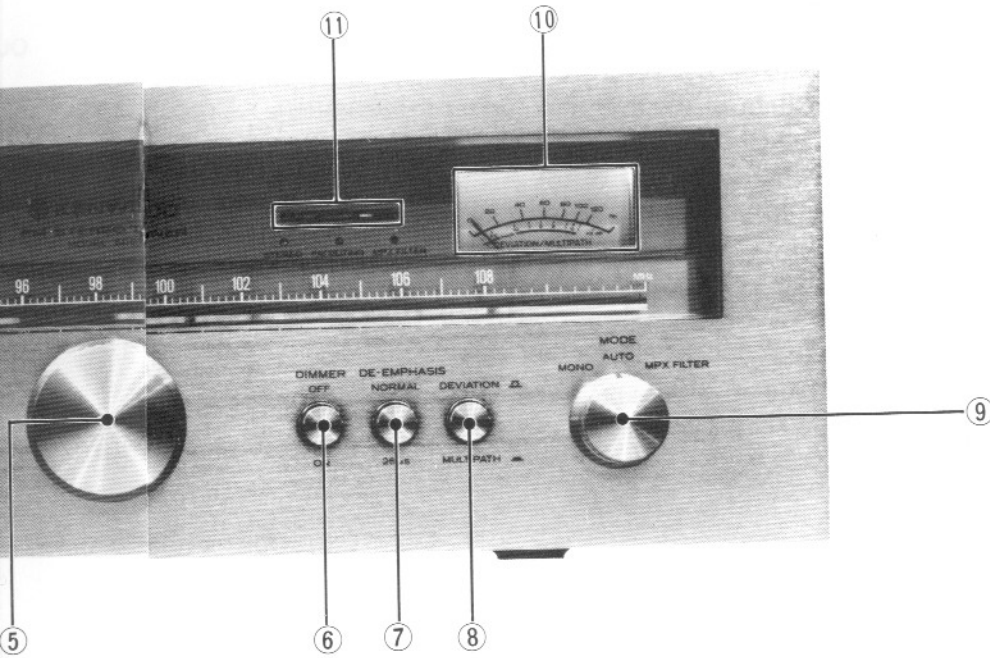
⑧ METER SWITCH

Switch positions and functions are as follows:

BUTTON DEPRESSED — The DEVIATION/MULTIPATH Meter acts as a MULTIPATH Meter.

BUTTON RELEASED — The DEVIATION/MULTIPATH Meter acts as a DEVIATION Meter.

CONTROLS AND THEIR FUNCTIONS



⑨ MODE SWITCH

Switch positions and functions are as follows:

MONO – For FM monaural reception.

AUTO – For reception of both FM monaural and stereo. The tuner will automatically identify and separate FM stereophonic broadcasts. When an FM stereo broadcast is tuned in, the STEREO indication lights up.

MPX FILTER – Unlike FM monaural reception, high frequency noise may sometimes be encountered when receiving FM stereophonic broadcasts. The MPX FILTER in this tuner effectively cuts such disturbances. This switch has nothing to do with monaural reception.

⑩ DEVIATION/MULTIPATH METER

DEVIATION – Functions as a meter which indicates a peak value of the modulation degree for FM broadcast. This meter makes it possible to monitor the maximum modulation degree for the received FM broadcast signal. If used in combination with the VU meter of the tape deck, and optimum recording level can be obtained.

MULTIPATH – Functions as a multipath detection meter. Reception with a minimal distortion is possible by depressing this switch and positioning the antenna in a direction where this meter gives a minimum deflection.

⑪ IF BAND INDICATOR

Shows at a glance the IF band width that is being used. (NARROW, NORMAL or WIDE). Indicator width advances in that order as it is interlocked with the IF BAND SELECTOR SWITCH.

⑫ SIGNAL/TUNING METER

SIGNAL METER – This meter indicates incoming field strength at the antenna with correct linearity from the weakest to the strongest signals. Scale is graduated in dB and it means that precise reading can be performed. The input level of this tuner can be obtained from the dB read-out at the SIGNAL meter by use of the following conversion table.

TUNING METER – This meter is used for precise tuning to the center of the FM channel. Turn the tuning knob until meter pointer is at the center of the meter scale. Center tuning provides maximum separation and minimum distortion.

This meter also enables reading the detuned frequency accurately.

CONVERSION TABLE OF ANTENNA TERMINAL VOLTAGE

dB	dBf	V/300	V/75	dB	dBf	V/300	V/75
0	5.2	1 μ	0.5 μ	50	55.2	316 μ	158 μ
10	15.2	3.16	1.58	60	65.2	1m	500
20	25.2	10	5	70	75.2	3.16	1.58m
30	35.2	31.6	15.8	80	85.2	10	5
40	45.2	100	50				

OPERATING INSTRUCTIONS

FM RECEPTION

1. Set the Mode switch to AUTO.
2. Set the MUTING LEVEL switch to OFF.
This switch cuts FM noise between stations with an efficiency that varies according to 20 dB or 40 dB settings. But it also affects reception of weak FM signals.
For details, see the facing page.
3. Turn the TUNING knob to select a station. First tune so that the SIGNAL meter needle swings as far to the right as possible, then finish the precise tuning by centering the TUNING meter needle. If the STEREO indicator lamp lights, the broadcast is in stereo; if not, it is moniphonic.
4. Set the OUTPUT LEVEL knob to its optimum position. For details, see the facing page.
5. If you are using a stereo amplifier, set its controls for the desired volume level and tonal quality.
6. If continuous high-frequency noise occurs during FM stereo listening, set the Mode switch to MPX FILTER position.

Note: It may be impossible to eliminate noise from an FM stereo broadcast if the signal is extremely weak. In such a case the relative signal strength can be improved by switching to MONO with the Mode switch. While the stereo effect will be lost somewhat, a great deal of the noise can be substantially eliminated in this way.

GROUND

For optimum safety and noise-free performance by sure the GND terminal is connected to a good ground.

CLEANING PRECAUTIONS

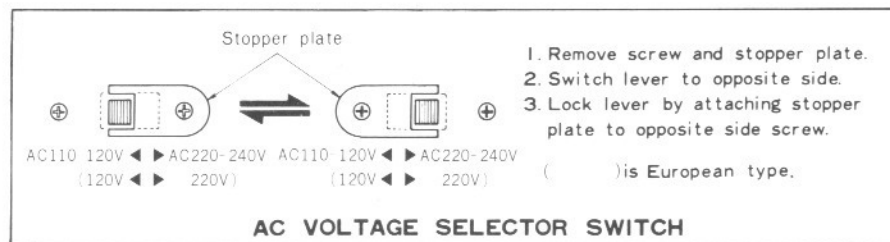
Do not use alcohol, thinner or gasoline when cleaning the tuner surface. Use a silicon cloth or soft dry cloth.

AC VOLTAGE SELECTION

This unit operates on 110 ~ 120 volts AC or 220 ~ 240 volts AC. The AC Voltage Selector Switch on the rear panel is set to the voltage that prevails in the area to which the tuners are shipped. Before operating this tuner, make sure that the position of the AC Voltage Selector Switch matches your line voltage. If not, it must be changed to the proper setting.

To change, first disconnect the AC power cord. Then remove the stopper plate and slide the AC Voltage Selector Switch to the opposite side. Then reattach the stopper plate to the other side.

Note: Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector Switch.



TROUBLE SHOOTING

Operation under unfavorable conditions is often considered as trouble. Before you ask a service agency for troubleshooting, please check the present symptom in accordance with the following table.

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Continuous z, z, z, . . . noise enters with a broadcast signal. This noise increases in stereo reception.	Intensity of input broadcast signal is very low at the antenna terminal.	Install an FM antenna outdoors. In a remote place from the broadcast station, it is necessary to install an antenna (5 ~ 8 elements) exclusively designed for FM reception.
Shock noise is occasionally heard.	Ignition noise by cars enters with broadcast signals. This tendency is eminent where the broadcast signal level is low.	Use a coaxial cable and install an FM antenna outdoors. This antenna should be positioned as far away from the street as possible.
When only a left-channel signal is received during FM stereo test broadcast, this signal is slightly heard also in the right channel.	This trouble is called cross-talk.	If leakage on right channel is very smaller than that on the left channel, this is not regarded as failure.
Stereo lamp is not lit in FM stereo reception.	Signal level is extremely low. There is no FM antenna stretched.	Install an FM antenna outdoors. Install an FM antenna indoors or outdoors.
When mpX filter is used in FM stereo reception, separation characteristic becomes slightly worse.	This is due to adoption of noise canceling system, in which high-frequency zones of right and left channels are mixed together.	Though separation becomes worse slightly, this need not be regarded as failure.
Sound is interrupted momentarily when the IF band selector switch is operated.	This is because circuitry is made to prevent shock noise.	Though sound is interrupted momentarily, this need not be regarded as failure.

RATING

Power Consumption:	30 watts
Dimensions:	W 17-5/16" (440mm)
	H 6-1/16" (154mm)
	D 14-7/8" (378mm)
Weight:	25.4 lbs. (11.5kg) net
	29.8 lbs. (13.5kg) gross