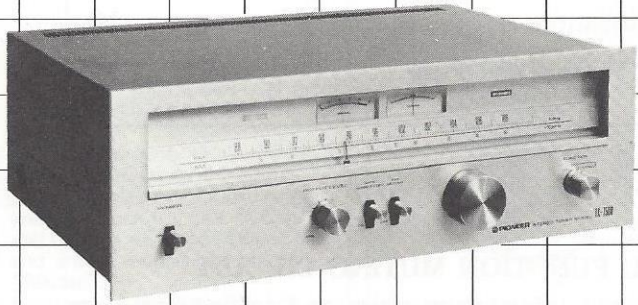


STEREO TUNER

TX-7500

OPERATING INSTRUCTIONS

FP
FV
GN



 PIONEER®

This manual applies to both 220V and 5-voltage models.
If your unit is the latter, the line voltage can be selected
according to description on page 11.

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FEATURES

4-GANG VARIABLE CAPACITOR FRONT END

The precision engineered front end utilizes a 4-gang air spaced variable capacitor and FET (field effect transistor) first stage radio frequency amplifier circuit. All characteristics affecting top performance, including selectivity, imaging and spurious rejection, signal to noise ratio and other factors, are developed to optimum levels.

HIGH STABILITY FM IF SECTION

Three dual element phase linear ceramic filters are employed in the intermediate frequency amplifier circuit. High density IC circuitry incorporates a 3-stage differential amplifier, diode limiter, and quadrature detector to yield effortless selectivity plus superb S/N and distortion characteristics. Capture ratio is also significantly improved.

SUPERIOR FM PROGRAM RECEPTION

A revolutionary phase-locked loop (PLL) circuit assures high stability in the vital stereo demodulator. Impervious to the effects of ambient temperature and aging, this innovation always allows optimum frequency response and separation. The output circuit contains built-in low pass and subsonic filters which block extraneous noise produced in the ultra high and ultra low ends of the frequency spectrum. The result is clear and stable FM stereo reproduction.

ADVANCED IC AM TUNER

Full performance is built into the AM tuner through IC and ceramic filter circuitry, providing improved selectivity and frequency response, together with minimized spurious interference and distortion. The balanced mixer circuit further enhances spurious characteristics to permit refreshing AM sound even in strong signal areas.

DUAL FUNCTION MUTING CIRCUIT

Annoying interstation noise and tuning noise are completely eliminated by the carefully designed muting circuit. The circuit incorporates a semiconductor switch and reed relay to provide comfortable station selection.

VERSATILE ACCESSORY FACILITIES

FM MPX NOISE Filter: Can be employed to eliminate objectionable high frequency noise from FM stereo broadcasts.

2 Sets of OUTPUT Jacks plus OUTPUT LEVEL Control: VARIABLE jacks, which feature adjustable output level, and non-variable FIXED output jacks are both provided.

FM MULTIPATH Jacks: Provided for connection of an oscilloscope or stereo display. FM antenna orientation and height can then be monitored for minimum multipath interference.

INSTALLATION HINTS

Avoid installing the TX-7500 in locations such as the following.

- In direct sunlight, near radiators or other heat sources.
- Above a large heat producing power amplifier, or near an amplifier power transformer.
- In humid or dusty surroundings.
- On an unlevel or unstable surface, or where subject to vibration.

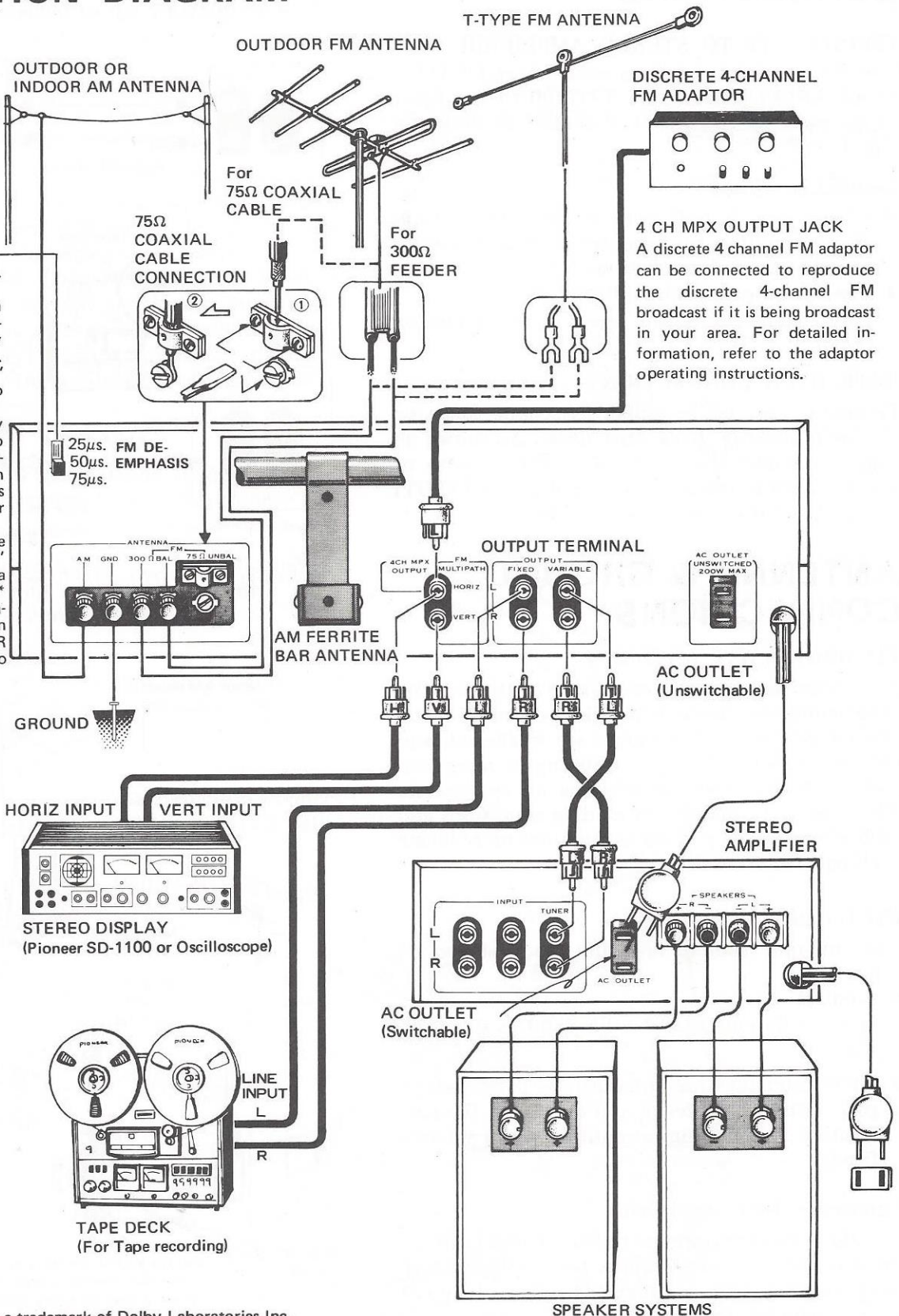
CONNECTION DIAGRAM

FM DE-EMPHASIS SWITCH (5 LINE VOLTAGE MODEL ONLY)

Before shipment this switch has been pre-set to the appropriate position for the delivery area. Models for the U.S.A. and Canada are set to "75 μ sec" and other models are set to "50 μ sec".

Incorrect setting will adversely affect the high sound range, so check the position before operating this unit. If you are in doubt about the pre-emphasis used in your area, consult your audio dealer.

NOTE: Be sure to set the switch to "25 μ sec" only when receiving a special FM Dolby* broadcast (pre-emphasis 25 μ sec) with an auxiliary Dolby* NR adaptor connected to your system.



* The word "Dolby" is a trademark of Dolby Laboratories Inc.

CONNECTIONS

CONNECTION TO STEREO AMPLIFIER

Use the accessory cords to connect the OUTPUT (VARIABLE) jacks of the TX-7500 to the tuner input jacks of the stereo amplifier, as shown in Fig. 1.

Connection Notes

- Observe the L & R jacks of the TX-7500 and stereo amplifier (or tape deck), and be sure to connect L to L, and R to R.
- Insert connecting plugs firmly. Loose connections can cause noise or loss of sound.

TAPE DECK CONNECTION

Programs can be recorded by connecting the TX-7500 directly to a tape deck. As shown in Fig. 2, connect the OUTPUT (FIXED) jacks of the TX-7500 to the recording input (LINE INPUT) terminals of the tape deck.

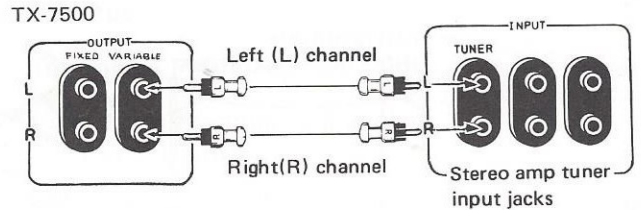


Fig. 1

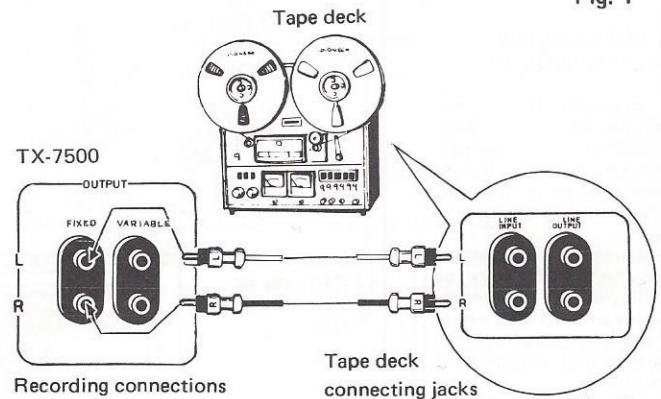


Fig. 2

NOTE:
The level at the OUTPUT (FIXED) jacks cannot be adjusted.

ANTENNA & GROUND CONNECTIONS

FM BROADCAST ANTENNA

FM broadcast signals are sharply affected by intervening mountains or buildings or inside metal framed structures. The signals are weakened, and can be caused reflections, resulting in reception. Care is thus needed in selecting an appropriate FM antenna to match surrounding conditions and field strength. See p. 8 for instructions on reducing multipath interference.

FM Outdoor Antenna

The antenna should normally be installed as follows:

- Connect antenna feeder wire to the 300Ω antenna terminals of the TX-7500 as shown in Fig. 3.
- While listening to a broadcast, as described on p. 7, install the antenna and determine the best location for optimum reception. Secure antenna firmly.

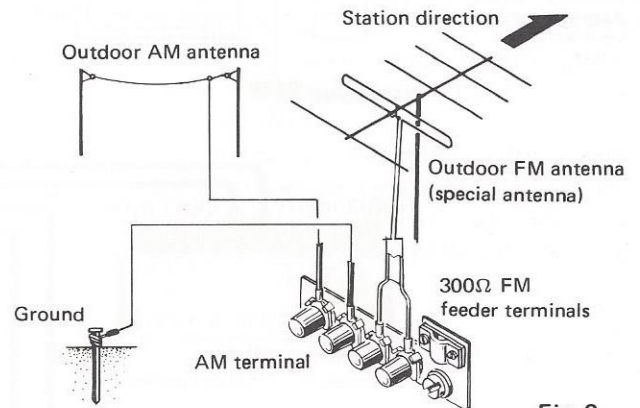


Fig. 3

Connection by Coaxial Cable

In urban locations where traffic is heavy, in industrial zones, or when nearby high voltage power lines are present, an ordinary FM antenna may not be adequate to prevent noise.

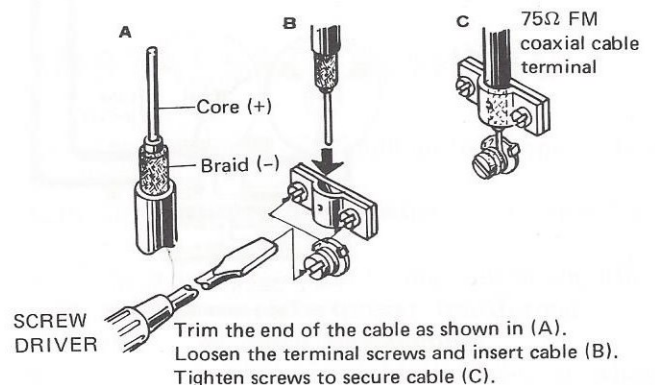


Fig. 4

The problem can often be solved by using a special FM antenna connected to the TX-7500 by a 75Ω coaxial cable. Connect the cable to the 75Ω antenna terminal as shown in Fig. 4.

NOTE:

Consult audio dealer for detailed information on FM antennas and coaxial cable installations.

T-type Antenna

When stations are nearby, and in wooden frame buildings, etc. where FM signals are strong, the accessory T-type antenna can be employed.

- As shown in Fig. 5, connect the T-type antenna to the 300Ω antenna terminals. Spread the two 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.

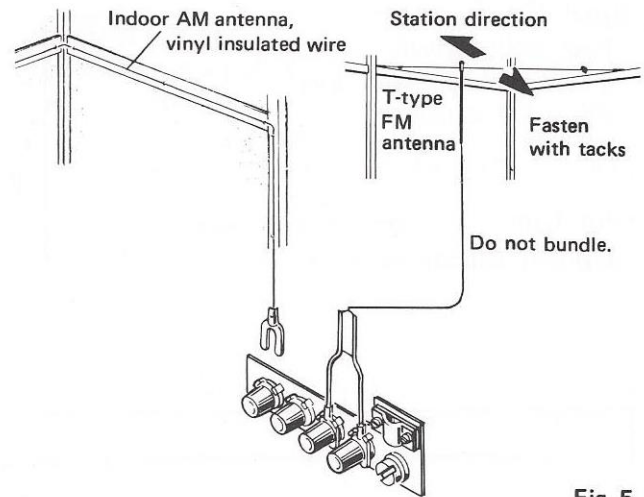


Fig. 5

AM BROADCAST ANTENNA

Position the ferrite bar antenna (Fig. 6) for best reception while listening to an AM station.

AM Indoor Antenna

If reception is difficult with the bar antenna, an indoor AM antenna can be erected with vinyl insulated wire as shown in Fig. 5.

AM Outdoor Antenna

For optimum AM reception, an outdoor AM antenna using vinyl insulated wire can be erected as shown in Fig. 3.

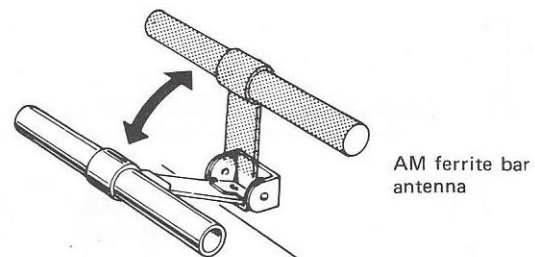
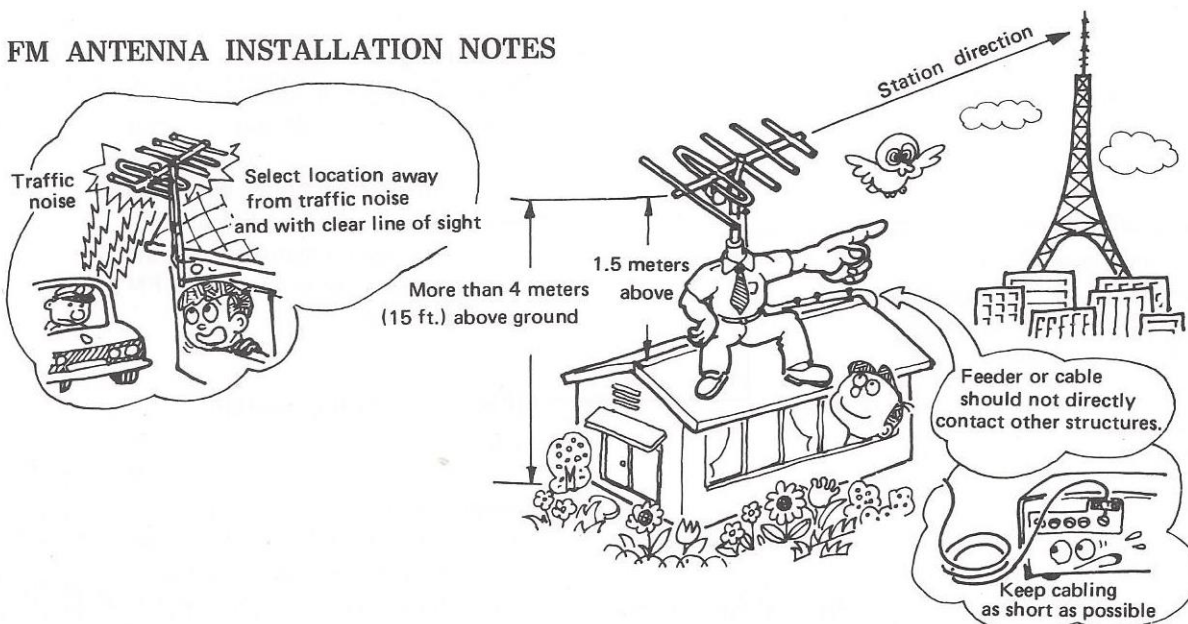


Fig. 6

GROUNDING

For maximum safety and noise reduction, connect the GND terminal to an earth ground (Fig. 3).

FM ANTENNA INSTALLATION NOTES



FRONT PANEL FACILITIES

Signal Meter

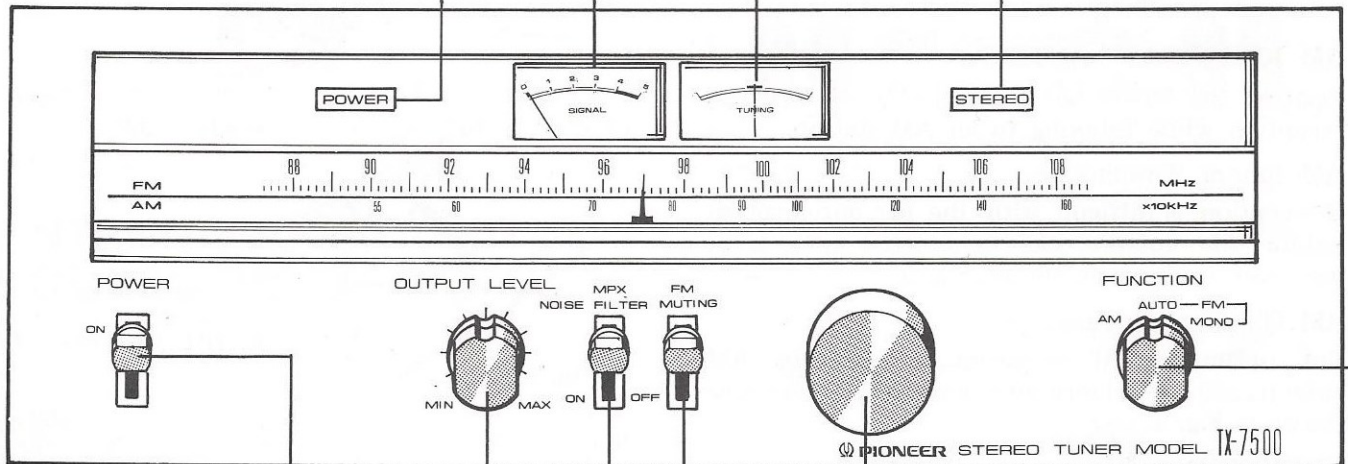
Tune for maximum deflection toward the right when selecting AM or FM station.

Tuning Meter

When selecting FM stations, tune for maximum deflection of the SIGNAL meter and central indication of this meter.

Pilot Lamp

Lights to indicate AC power ON.



Power Switch

Switch for turning AC power ON and OFF.

Output Level Control

Adjusts the output level at the OUTPUT (VARIABLE) jacks. Clockwise rotation increases the level. See additional description on p. 8.

FM Muting Switch

With the switch in the up position (switched on), the FM muting circuit cancels out noise on unused FM bands (inter-station noise), but it also rejects very weak, faint FM stations. To receive such a station, move the switch to OFF to eliminate the FM muting circuit.

MPX Noise Filter Switch

Comparatively high frequency noise, incurred when receiving weak FM stereo signals, can be cut by setting this switch to ON. In this case, however, there will be some loss of stereo separation.

BROADCAST RECEPTION

FM Stereo Indicator

With the FUNCTION switch set to FM AUTO, the STEREO inscription lights while an FM stereo station is being received.

Function Switch

Selects type of reception.

- AM: For receiving AM stations.
- FM AUTO: For FM stereo reception. Automatically receives monophonically during FM monophonic broadcasts. The STEREO indicator lights while FM stereo is being received.
- FM MONO: For monophonic FM reception.

Tuning Knob

Knob for selecting stations. Tune for optimum reception while observing the SIGNAL meter for AM stations, and both SIGNAL and TUNING meters for FM stations.

FM RECEPTION

1. Set FUNCTION switch to FM AUTO.
 2. Set FM MUTING switch to the up position, unless the desired station is weak, in which case set it to OFF.
 3. Rotate TUNING knob to select station. Tune for maximum deflection of the SIGNAL meter toward the right, and central indication of the TUNING meter. See Fig. 7.
- The STEREO indicator lights during FM stereo reception, and does not light during monophonic reception.
- When the stereo amplifier is connected to the OUTPUT (VARIABLE) jacks of the TX-7500 the volume can be adjusted by the OUTPUT LEVEL control.

NOTES:

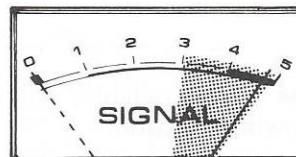
1. With very weak signals, noise may be objectionable when the FUNCTION switch is positioned at FM AUTO. In this case set the switch to FM MONO.
2. If comparatively high frequency noise becomes objectionable during stereo reception on FM AUTO, set the MPX NOISE FILTER switch to ON.

AM RECEPTION

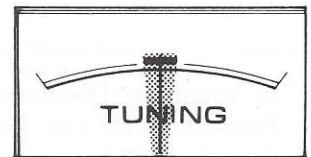
1. Set FUNCTION switch to AM.
 2. Rotate TUNING knob to select station. Observe the SIGNAL meter and tune for maximum deflection toward the right. See Fig. 7.
- When the stereo amplifier is connected to the OUTPUT (VARIABLE) jacks of the TX-7500, the volume can be adjusted by the OUTPUT LEVEL control.

NOTE:

If poor sensitivity or noise occurs during FM or AM reception, inspect the antenna connections, referring to p. 4.



SIGNAL Meter



TUNING Meter
(Does not deflect during AM reception)

Fig. 7

IMPROVING FM RECEPTION

OUTPUT JACKS & OUTPUT LEVEL CONTROL

The output level at the TX-7500 OUTPUT (VARIABLE) jacks is adjustable (50mV to 1.5V) by the OUTPUT LEVEL control on the front panel, while the level at the OUTPUT (FIXED) jacks cannot be adjusted.

Employing VARIABLE Jacks

- This control can be used to match the AM or FM volume with the output levels of other components (turntable, tape deck, etc.) connected to the stereo amplifier.

FM MULTIPATH REFLECTION

This phenomenon is mainly caused as shown in Fig. 8, when the direct signals from an FM station are reflected by objects such as mountains and buildings.

Both direct and reflected signals then enter the receiving antenna from different directions. The slight time delay, due to the differing path, results in mutual interference between the signals. Phase distortion, and impaired SN ratio and channel separation affect the sound received. Minimizing these effects calls for a sharply directional antenna, plus careful selection of the installation site and orientation.

Employing MULTIPATH Jacks

1. With good quality shielded cable, connect the VERT (lower) and HORIZ (upper) FM MULTIPATH jacks with the respective vertical and horizontal inputs of an oscilloscope (or Pioneer SD-1100 Stereo Display).
2. Tune in an FM station (conversation program) with the TX-7500 and adjust the oscilloscope to obtain a waveform on the CRT.
3. Adjust the antenna direction to minimize the vertical component of the waveform as shown in Fig. 9.

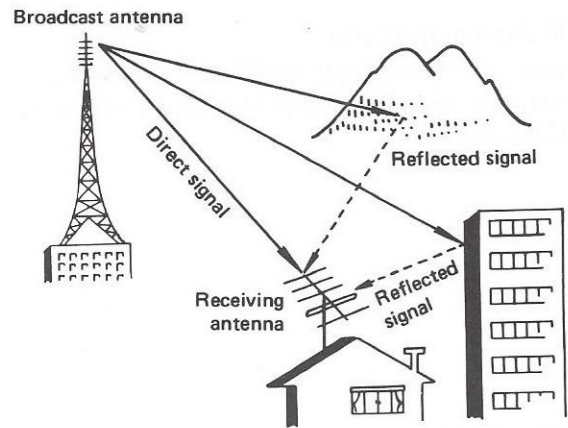
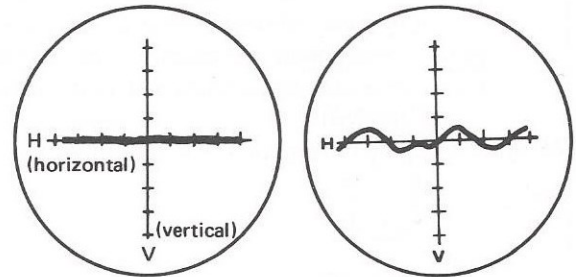


Fig. 8



Low multipath reflection appears as an essentially straight horizontal line as shown at left, while a high multipath reflection percentage introduces a vertical component such as seen at right.

Fig. 9

NOTE:

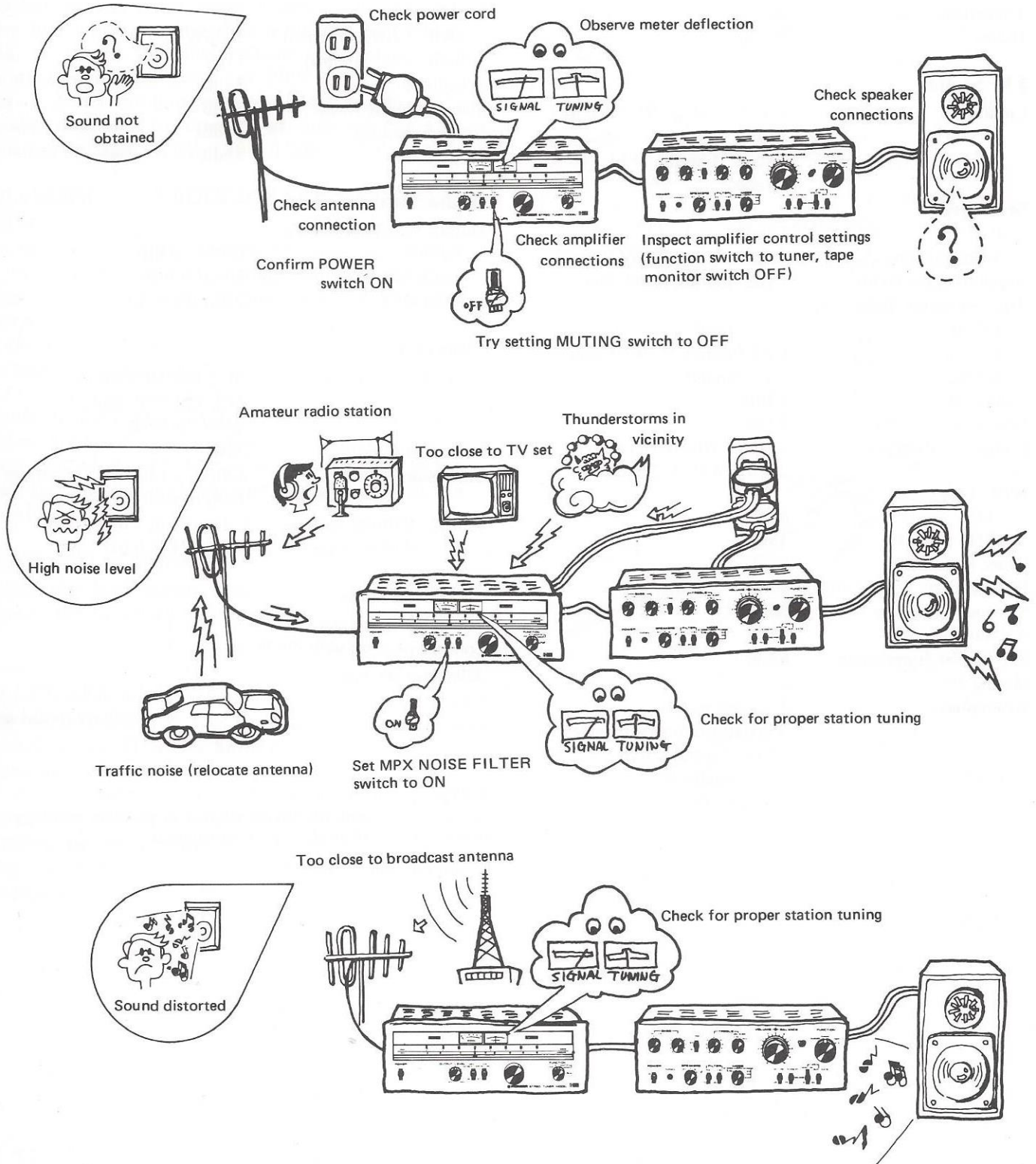
If the waveform is difficult to observe when employing an oscilloscope due to insufficient horizontal axis gain, instead of the MULTIPATH HORIZ jack, connect the L channel OUTPUT jack to the horizontal terminal of the oscilloscope and perform the above adjustment.

In event an Oscilloscope is Unavailable, Adjustment can also be Performed by the Following Method.

1. Connect the FM MULTIPATH HORIZ jack to the Left channel side of either the TUNER or AUX jacks of the stereo amplifier, and the VERT jack to the Right channel side.
2. Tune in an FM station on the TX-7500 and listen via speakers or headphones. The FM broadcast will be audible from the Left channel, while the multipath sound can be heard from the Right channel.
3. Employ the BALANCE control of the stereo amplifier to reduce Left channel sound to the point where only the Right channel becomes audible. Then adjust the antenna direction for minimized multipath sound from the Right channel.
4. After determining the antenna direction by the above steps, disconnect the HORIZ and VERT jacks, and reconnect equipment for normal operation.

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

In the event of trouble, first inspect the points indicated below. If this fails to correct the problem, contact a Pioneer Authorized Service Center.



SPECIFICATIONS

Semiconductor

FET:	1
IC(s):	3
Transistors:	16
Diodes:	7

FM Section

Circuitry	1 FET, 1-stage RF Amplifier 4-gang Variable Capacitor, 5-stage Limiter, PLL MPX Circuit.
Sensitivity	
IHF	1.9 μ V
50dB Quieting	4.0 μ V (mono), 50 μ V (stereo)
Signal-to-Noise Ratio	73dB (mono), 68dB (stereo)
Total Harmonic Distortion	
100Hz	0.2% (mono), 0.3% (stereo)
1 kHz	0.2% (mono), 0.3% (stereo)
10kHz	0.2% (mono), 0.6% (stereo)
Capture Ratio	1.0dB
Selectivity 400 kHz	80dB
Frequency Response	50Hz ~ 10kHz $\begin{smallmatrix} +0.2 \\ -0.5 \end{smallmatrix}$ dB 20Hz ~ 15kHz $\begin{smallmatrix} +9.2 \\ -2.0 \end{smallmatrix}$ dB
Separation	
1 kHz	40dB
50Hz ~ 10kHz	35dB
Image Rejection	85dB
IF Rejection	90dB
Spurious Rejection	90dB
AM Suppression	55dB
Sub Carrier Suppression	65dB
Muting Threshold	2.2 μ V
De-emphasis	5-voltage model; 25 μ s/50 μ s/75 μ s switchable 220 volt model; 50 μ s
Antenna	300 Ω balanced 75 Ω unbalanced

AM Section

Circuitry	1-stage RF Amplifier, 2-gang Variable Capacitor.
Sensitivity	
(IHF, Ferrite antenna)	300 μ V/m
(IHF, Ext. antenna)	15 μ V
Selectivity	35dB
Signal-to-Noise Ratio	50dB
Image Rejection	40dB
IF Rejection	55dB

Audio Section

Output Level/Impedance	
FIXED	650mV/5k Ω
VARIABLE	50mV ~ 1.5V/2.5k Ω
4CH MPX	250mV/680 Ω

Miscellaneous

Power Requirements	AC 220V 50/60Hz or 110, 120, 130, 220 or 240V 50/60Hz
Power Consumption	20W
Dimensions	420(W) x 150(H) x 365(D)mm 16-9/16 x 5-7/8 x 14-3/8 in.
Weight: Without Package	8.2kg (18 lb 1 oz)
With package	9.7kg (21 lb 6 oz)

Furnished Parts

FM T-type Antenna	1
Connection Cord with Pin Plugs	1
Allen Hex Wrench	1
Fuse 0.5A	1
Fuse 1 A	1 (5-voltage model only)

NOTE:

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

LINE VOLTAGE AND FUSE

TX-7500 tuners are designed to accept different line voltages, according to the country in which they are to be used, although the operation of the various models is the same in every other respect. The line voltage connection is on the rear panel, Fig. A shows the line voltage connection of a model designed to operate at 220V only.

Fig. B shows the line voltage selector and fuse of a model designed to operate at any of five pre-selected voltages (110V, 120V, 130V, 220V, 240V).

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, unscrew the fuse cap located in the center of the line voltage selector and withdraw it, together with the fuse. Next, pull the line voltage selector plug out of its socket, rotate it until the cutaway aligns with the appropriate line voltage marked on the back of the unit, then push it back into its socket. It is important to check the rating of the fuse; a 0.5A fuse should be used with either 220V or 240V, while a 1A fuse should be used for 110V, 120V or 130V operation. If the fuse rating is correct, replace it and screw in the fuse cap.

FUSE REPLACEMENT

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

ALLEN HEX WRENCH

The accessory Allen hex wrench is provided for removing the TUNING knob or tightening its setscrew in event it becomes loose.

If required, loosen the setscrew by inserting the wrench into the hole on the side of the knob and turning the wrench counterclockwise. Be particularly careful not to scratch the front panel when employing the wrench.

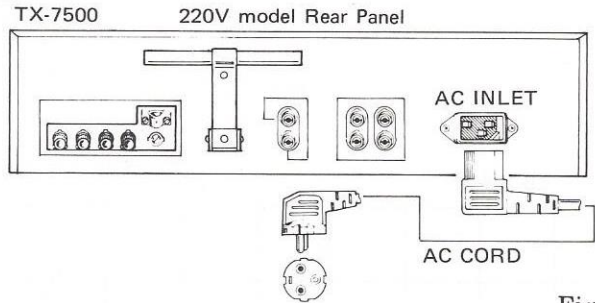


Fig. A

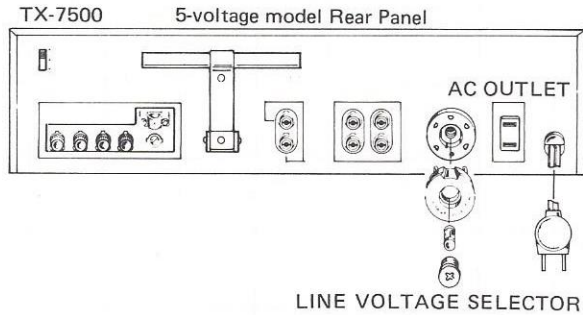


Fig. B

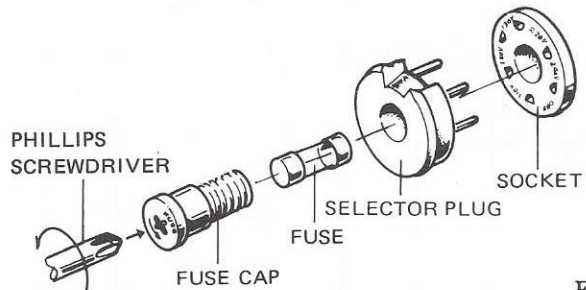


Fig. C

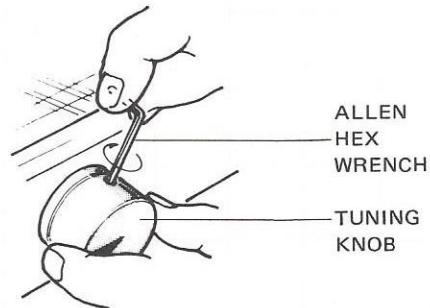


Fig. D

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