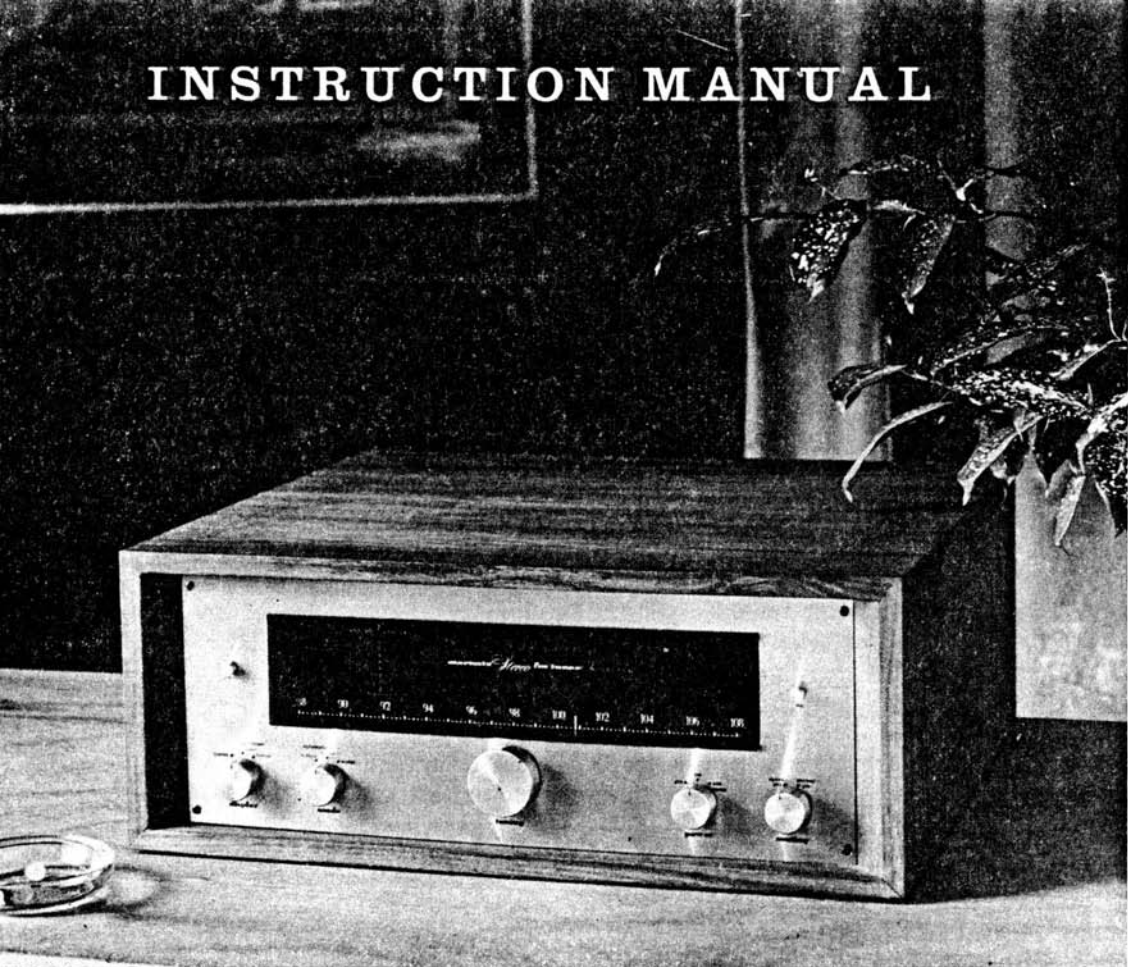


# INSTRUCTION MANUAL



MODEL 10B FM STEREO TUNER

# GENERAL INFORMATION

## **After Unpacking**

Save all packing material, fillers, plastic wrap, etc., as these items will prove useful in preventing damage if it becomes necessary to ship your tuner.

After unpacking the model 10-B, please inspect it for signs of possible transit damage. Your tuner has been subjected to many rigid quality control inspections before packing and should be in perfect operating condition.

If damage is visible, notify your dealer at once. If the tuner was shipped to you, notify the transportation company. The Marantz Company, Inc., will cooperate fully with you in such an event, but only you, the consignee, may institute a claim with a carrier for damages during shipment. Save the carton with its evidence of external damage for their inspection.

## **Warranty**

Please fill in the Marantz warranty registration card without delay and return it to the factory at once. The Marantz warranty is void unless this registration is in our files.

# INSTALLATION

## **Line Voltage Requirements**

The Marantz model 10-B may be connected to any A.C. receptacle furnishing 105 to 125 volts at 50 or 60 cycles. Power consumption from the line is 100 watts. The design center is 117 volts @ 60 cycles.

## **Ventilation**

The model 10-B was designed so that proper ventilation would be obtained when operated in a horizontal position. This permits a natural flow of air through the bottom plate to cool the internal chassis. Heat is drawn away from the tubes by the continuance of this flow of air through the ventilating holes on top of the chassis.

The model 10-B is supplied with four plastic feet to prevent obstruction of the ventilation. If it should be necessary to remove the feet, do not place it flat on a shelf without first cutting away a portion of about one square foot directly below the chassis. In such a case, do not mount your power amplifier directly under the opening, as the heat from this component will rise through the tuner.

Do not mount the tuner in a small, confined space without providing adequate ventilation. It would be best to allow at least 6" above the tuner, and provide openings in the lower and upper rear portions of the enclosing space to permit a natural flow of air.

### **Mounting**

A rectangular mounting cutout, 14-7/16" wide x 5-3/8" high, will permit clearance of the chassis and projecting screw-heads. Before mounting it will be necessary to remove the bottom feet in order to clear the cutout. Please take note that the feet must not be removed without *first removing the bottom plate*. The feet are fastened with nuts and lockwashers which could cause damage to the circuit if allowed to fall into the wiring. Refasten the bottom plate with *all* the screws except those used for the feet.

Because of its weight, the model 10-B can not be supported by its panel alone. The chassis may be supported by means of an internal shelf, as described above (see "Ventilation"), or by means of a bracket or wood block to support the rear of the tuner chassis.

The bottom of the chassis is furnished with four threaded fittings so that the tuner may be mounted rigidly on a shelf with #10/32 screws (supplied). Care should be taken to see that these screws do not enter the chassis too deeply. About 1/4" to 3/8" should be the maximum.

### **Audio Output Connections**

Left and right channel output receptacles are located on top of the chassis, adjacent to tube number V18 (the second tube in the extreme left row when viewed facing the front panel). These supply audio signals of one volt for a stereo pair of high-impedance preamplifier inputs. A screwdriver level control is located adjacent to each receptacle. They should be turned fully clockwise for maximum output.

Connect a pair of shielded audio cables (supplied) from the output receptacles to a stereo set of high level preamplifier inputs, such as "Tuner," "Aux," etc. Distances up to about 25 feet may be used by employing longer shielded cables.

### **Connecting The Antenna**

The best FM reception can be obtained with either a "Yagi" or a "Log-Periodic" type antenna, used in conjunction with a good quality antenna rotor system. For the greatest amount of immunity from noise and multipath pickup along the lead-in wire, a balanced and shielded 300 ohm cable such as ITT-Federal #K-111 or Columbia Wire #5520 will give the most effective results. These cables consist of two inner conductors plus an outer shield and insulating jacket.

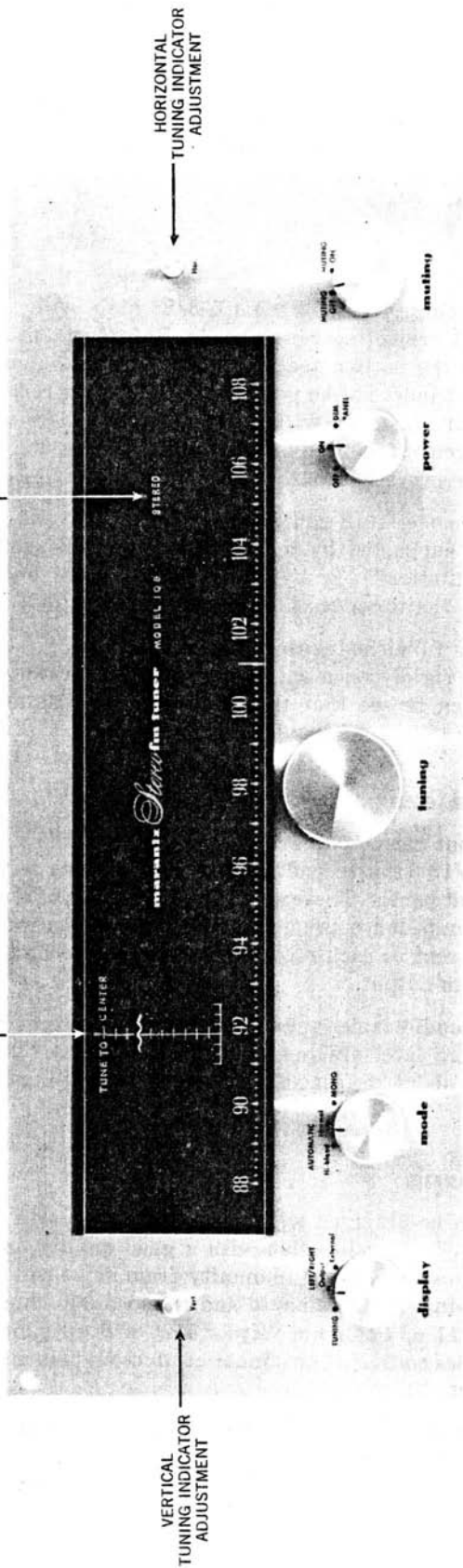
**NOTE:** It is recommended that all outdoor antenna installations be equipped with an approved lightning arrestor system.

TUNING AND MULTIPATH  
INDICATOR

AUTOMATIC  
STEREO LIGHT

VERTICAL  
TUNING INDICATOR  
ADJUSTMENT

HORIZONTAL  
TUNING INDICATOR  
ADJUSTMENT



It is considered good practice to connect the mast to an earth ground, both for reasons of safety and noise reduction. With a grounded mast, the shield of the lead-in should be connected to the mast. Where the mast is ungrounded, the shield should remain unconnected at this end.

At the tuner, the signal leads should connect to the antenna input terminals marked "300 ohms." The shield connects to the terminal marked "Ground" (the antenna terminals are located directly in front of the power transformer). Ordinary unshielded 300 ohm lead-in connects to the two 300 ohm input terminals.

With a 72 ohm transmission line, use a matching 72/300 ohm "balun." These are available at radio supply stores for a few dollars.

Where outdoor antennas are prohibited, the simplest form of "rabbit-ear" TV antenna is the most practical and will give satisfactory results. This type is preferred over a ribbon type folded dipole because it can more readily be rotated for best reception. Connect its two leads to the "300 ohm" terminals.

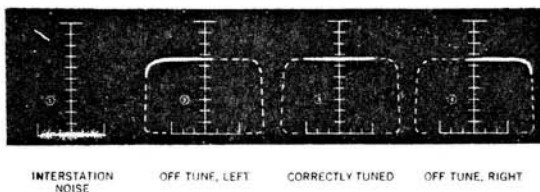
## PANEL CONTROLS

### "Display" Switch

This switch selects the two basic types of display function provided by the Multipath/Tuning Indicator. These are marked "TUNING" and "LEFT/RIGHT" (stereo separation display of both channels). The LEFT/RIGHT section has two positions marked "Output" and "External."

#### TUNING

The display switch must be set to this position when tuning, in order to see station tuning and multipath displays. As each station is tuned, a bright trace formed by its carrier will be seen to rise and move into position on the passband as illustrated below.



#### LEFT/RIGHT

The position marked "Output" provides a stereo display of the tuner's audio output, and can be used to check on the separation of FM transmissions, as well as phase of the program material. The "External" setting permits a similar test display for external material from tape recorders, discs, etc. A pair of receptacles marked

"External Scope Input" is provided for feeding the external signal to this circuit. This signal can be obtained by bridging across the preamplifier recording outputs with "Y" connectors, thus not disturbing the use of the preamplifier for its normal recording function. Typical displays are shown under "Stereo Separation Tests" in the OPERATION section below.

### **"Mode" Switch**

This 3-position control has two "AUTOMATIC" settings ("Normal" and "Hi-blend"), and one position marked "MONO."

With either AUTOMATIC setting, stereo and monophonic programs switch automatically to the proper playing mode by means of a unique photo-electronic switching circuit. A stereo indicator light turns on in the presence of a stereo program.

The Mode switch should ordinarily be left in the "Normal" position. "Hi-blend" should be used only with distant *stereo* programs with excessive background noise or interference. By switching to this position the left and right channels are blended at the higher frequencies, reducing noise while maintaining full frequency-response. This method differs from ordinary FM stereo filters which eliminate noise by reducing the high frequency response. Note that there will be a reduction in separation in the Hi-blend position.

The MONO position converts *all* programs to the monophonic mode. Use this setting only to further improve the worst cases of noisy stereo reception.

### **"Tuning" Knob**

A heavy machined flywheel, well counterbalanced, makes tuning smooth and effortless. The 10" linear slide-rule dial permits tuning with great accuracy.

### **"Power" Switch**

The Power switch turns the tuner on and off. A third position DIMS the intensity of the panel and indicator illumination.

### **"Muting" Switch**

Interchannel muting greatly reduces noise when tuning from station to station. Since very weak stations may also be muted along with the noise, muting may be turned off by means of this switch when tuning to a weak station.

To reduce interstation noise turn this switch to "Muting On." To defeat the circuit, set the switch to "Muting Off."

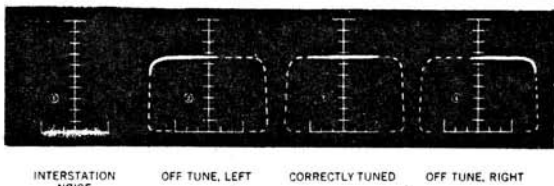
# OPERATION

## 1. — First, set controls as follows:

- “Display”; to “Tuning” position. (This actuates the tuning display.)
- “Mode”; set to “Normal.” (for automatic stereo/mono switching).
- “Power”; turn “ON,” and allow a few minutes for warmup.
- “Muting”; set to “Muting On” (reduces between-station noise).

## 2. — Tune to a local station;

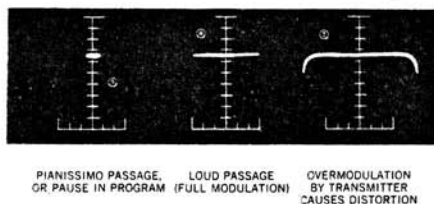
Note that as you tune past each station, a bright trace appears in the Tuning Indicator located in the left part of the dial. This trace follows an approximately rectangular path as it is tuned. To be properly tuned, the trace should be adjusted so that it is centered in the upper portion of the rectangle as shown below.



Weak distant stations can be seen when they are below the muting threshold. Often, orientation of the antenna will increase signal strength sufficiently for reception. In extreme cases, it can be made audible by defeating the MUTING switch (“Muting Off”).

Signal strength will be indicated by the relative height of the trace above the horizontal base line. Strong stations will appear higher on the indicator's center-line, and weaker signals will be lower. This indication is approximately logarithmic.

Modulation or deviation is shown by the instantaneous horizontal expansion and contraction of the trace from its central point. The maximum deviation (expansion) permitted by the FCC is 75 kc, indicated by the maximum limits of the horizontal tuning line.

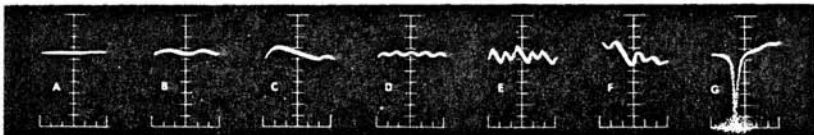


## 3. — Adjust antenna direction if necessary;

The trace on the tuning indicator serves another very useful function by showing the user when his antenna is rotated in the best



possible direction. If the trace should assume a snake-like or distorted shape, rather than the relatively smooth horizontal line shown in illustration A, this indicates that the antenna is pointing in a direction which is unfavorable for good reception from that station. This type of departure from a smooth line shows the presence of multipath reflections (identical to TV "ghosts") received along with the wanted signal.



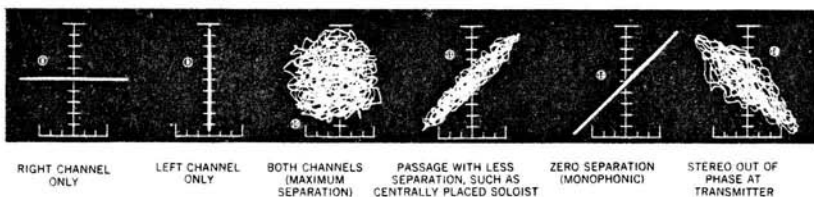
IDEAL TRACE

To obtain the best reception quality from each station, adjust the antenna to the direction which results in the smoothest and most horizontal indication. For example; the shape of figure B with its long gentle curves, is preferable to figures C through G, and should yield good reception. In turn, figures C and D are preferred to E and F. Finally, figure G indicates a very poor antenna setting resulting in an actual signal cancellation, with unacceptably noisy and distorted reception.

#### 4. - Stereo Separation Tests:

It occasionally happens (by accident or intent) that a selection is transmitted monophonically during a stereo program. This sudden loss of stereo separation might cause some misgivings to the listener if it were not for a simple test built into the model 10-B.

By setting the Display switch to "Output," a display of left and right audio channels is presented in place of the normal tuning trace. (Technically, this is an "X-Y plot," or Lissajou figure.) With the use of the chart below, the user can quickly analyze the program material.



When connected as described above under the "Panel Controls" section, the same test can be made for tapes and discs by turning the switch to "External." It may be necessary to adjust the gain controls of the tape recorder to properly fill the area of the indicator face. Both channels should be set to the same level of output.

*NOTE:* The switch must be returned to "tuning" position in order to see the station tuning display.



# ADJUSTMENTS

## Multipath/Tuning Indicator

When properly calibrated, a station will be accurately tuned when its trace is centered over the vertical center line. Adjustment of the center calibration can be made as follows:

1. — Turn on the model 10-B and allow a full ten or fifteen minute warmup.

2. — Tune to a point on the dial where no station is located. The trace will drop to the horizontal baseline of the tuning indicator scale and will appear as a horizontally elongated smudge of light (see figure 1). This area should be centered over the juncture of the inverted "T" of the indicator scale as shown.



3. — Its position can be adjusted vertically by means of the small adjustment knob marked "VERT" which is located directly to the left of the dial.

4. — If off center to the right or left, readjust horizontally with the small knob to the right of the dial marked "HORIZ."

After these adjustments have been made, tuning will be correct when the trace is merely centered over the vertical line. Extreme accuracy is not required, and the trace can be off center as much as 1/8" without noticeable effect.

Relative signal strength will be indicated by the height of the trace above the baseline of the indicator scale. This indication is logarithmic, with vertical displacement compressing with higher signal strength.

Additional adjustments for the Indicator circuitry are located on top of the chassis. It is recommended that these adjustments, when required, be made by someone technically familiar with oscilloscopes and their use.

**Intensity;** brightness of the tuning trace can be set with this control. It is located near tube number V21, in the center row. As with any TV cathode ray tube, excessive brightness will shorten its life drastically. The recommended setting is as follows: 1.—Tune in a station so that the trace is seen; 2.—Turn the power switch to the position marked "Dim Panel"; 3.—With a small screwdriver, set the "Intensity" adjustment to the point where the tuning trace is just barely visible, or just disappears. (This should be judged in a dimly lit room.)

**Focus;** located in the same position as the intensity control, the Focus adjustment can be used to sharpen the trace.

Adjustments to the "Vertical Gain" and "Horizontal Gain" controls are interacting with the Vertical and Horizontal centering controls on the front panel. Any change made in these adjustments will require a corresponding readjustment of the panel centering controls.

**Vertical Gain;** this is adjusted at the factory as follows: 1.—the tuning trace is set to a between-station position, and centered on the indicator scale baseline; 2.—an FM Signal Generator is connected to feed a signal of 100,000 microvolts into the tuner antenna input terminals; 3.—tune the model 10-B to the same frequency as the generator so that the test trace is visible on the indicator; 4.—adjust the trace so that it lies on the first division below the top of the vertical indicator scale. By detuning from the generator frequency, a continual check and readjustment can be made to the baseline centering position.

In the absence of an FM generator, the strongest local station can be tuned into position and its height adjusted as above.

**Horizontal Gain;** This too can be adjusted by tuning in a strong local station. This should be set so that when detuning to either side of the station, the vertical movement of the tuning trace follows a path which remains comfortably within the indicator area.

### **Muting Threshold**

This control is located on top of the chassis near tube number V19. Adjustment is as follows:

- 1.—With the front panel Muting control turned to "Muting Off," tune in to the weakest station in your area that you wish to receive regularly;
- 2.—Detune the station so that you can hear interstation noise;
- 3.—Turn the switch to "Muting ON";
- 4.—with a small screwdriver rotate the Muting Threshold adjustment fully clockwise, and then back it counterclockwise until the interstation noise suddenly lowers to a quiet hiss;
- 5.—Tune in the weak station again. If it can still be heard, and the noise present when detuned off-station is negligible, the adjustment may be considered satisfactory.

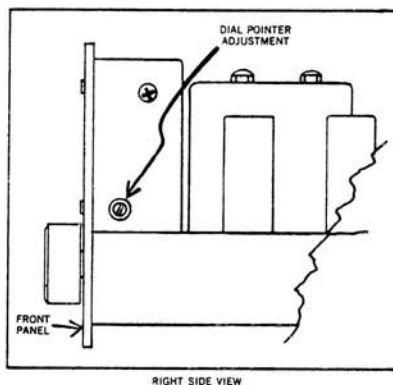
### **Stereo Threshold**

Adjustment of this control presets the signal level at which automatic stereo switching occurs. Weak stereo stations will remain in the monophonic mode unless they are strong enough to give acceptably quiet reception. To make this adjustment, tune to a distant stereo station with excessive background noise. The Stereo Threshold control is then turned to the point where the Stereo Light extinguishes. Do not overdo the adjustment or it may affect stronger stations which you may wish to receive in stereo.

## Dial Pointer Positioning Adjustment

The dial pointer has been factory adjusted to a tuning accuracy of 50 kc, or about a pointer-width. However, it is possible for the pointer to shift its position slightly in shipment or through slight stretching of the dial cable. An adjustment has been provided for convenience in recalibration. On the right *end* of the chrome-plated housing on the back of the panel you will find a round opening which gives access to a slotted black screwdriver adjustment. This adjustment may be turned to shift the pointer in either direction, taking care that it is not turned so far that it loosens and falls out.

To make the adjustment, follow this procedure:



- 1.—Tune to a station located in the central portion of the dial. Use the Tuning Indicator for correct station setting, recentering the indicator if necessary as described above under Multipath/Tuning Adjustments.
- 2.—Reset the pointer to its correct location on the dial by turning the Dial Pointer Adjustment. Consult your newspaper for the correct tuning frequency of the station.
- 3.—Check by tuning to stations at the upper and lower ends of the dial. If necessary, a compromise adjustment should bring all stations to pointer-width tuning accuracy.

## Fuse

The model 10-B is protected by a 1¼ Amp slow-blow fuse. In the event the fuse should blow out, replace **ONLY** with the same type and rating specified. Replacement with a fuse of higher rating will not protect the tuner and will void the warranty.

## Repairs

Only the most competent and qualified service technicians should be employed to service the model 10-B. **NEVER PERMIT ANYONE TO ATTEMPT TO MAKE ADJUSTMENTS TO THE I.F. PASSBAND FILTERS.** Only the Marantz Co. has the knowhow and special equipment needed for adjustment of this wholly new type of I.F. circuit. In any case, these filters should not require any adjustments. I.F. tubes may be replaced as required without any need for realignment.

In the event of difficulty write directly to the factory for the name of the Marantz service station nearest your home. Please list the model and serial numbers of your unit together with a description of what you feel is wrong with its behavior.



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