



marantz®

**Model 112
AM/FM Stereophonic
Tuner**

MARANTZ CO., INC. · P.O. BOX 99 · SUN VALLEY, CALIFORNIA · 91352
A WHOLLY-OWNED SUBSIDIARY OF SUPERSCOPE INC., SUN VALLEY, CALIFORNIA 91352

We sound better.

WARRANTY

Marantz Company, Inc., proudly warrants your Marantz product to be free of manufacturing defects in material and workmanship as follows:

From date of purchase

Electronic Components and Receivers	PARTS - 3 years LABOR - 3 years
Headphones	PARTS - 3 years LABOR - 3 years
4-Channel Remote Control	PARTS - 3 years LABOR - 3 years
Plug-in Matrix Decoders	PARTS - 3 years LABOR - 3 years
Speakers and Cabinets	PARTS - 5 years LABOR - 5 years

TO VALIDATE YOUR WARRANTY, YOU MUST FILL OUT AND MAIL THE WARRANTY REGISTRATION CARD TO MARANTZ COMPANY, INC., P. O. BOX 99, SUN VALLEY, CALIFORNIA 91352, WITHIN TEN DAYS FOLLOWING THE DATE OF PURCHASE.

For Warranty repair, send this product to Marantz Company, Inc., 8150 Vineland Avenue, Sun Valley, California 91352, or to an AUTHORIZED Marantz Service Station. All shipping charges must be prepaid, Marantz will pay return shipping charges to any designated point within the United States.

This Warranty is void if the serial number has been altered or removed; if the product is modified or repaired in any manner which Marantz believes may affect the reliability of the product; if the product is not operated in accordance with the instruction manual.

Marantz shall have no liability whatsoever for consequential damages. The sole responsibility of Marantz Company, Inc., under this Warranty shall be limited to the repair of the product, or replacement thereof, in the sole discretion of Marantz Company, Inc.

EXCEPT TO THE EXTENT THAT APPLICABLE LAW PRECLUDES A DISCLAIMER OF WARRANTY, THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS WITH RESPECT TO THIS PRODUCT, NOR ARE THERE ANY OTHER WARRANTIES WHICH EXTEND BEYOND THE PROVISIONS OF THIS WARRANTY.

8150 Vineland Avenue, Sun Valley, California 91352

REGISTRATION FOR MARANTZ 3-YEAR GOLDEN WARRANTY

Model Purchased _____

Date of Purchase _____

Place of Purchase _____

Address _____ City _____ State _____

Serial Number _____

The above information becomes your permanent record of a valuable purchase. It should be promptly filled in at the same time that you fill in and mail the warranty registration reply card to Marantz. This information provides a valuable insurance record and must also be referred to should you have any correspondence with Marantz.

PURCHASER'S RECORD ►

AC Line Operation

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

FOREWORD

For optimum performance and enjoyment from your Model 112 Stereo Tuner, please study these instructions carefully. Operation is not complicated, but its flexibility and features deserve your becoming familiar with its controls and connections. This manual is divided into two parts. The first covers operation in simple, nontechnical language. The second describes the 112 in more detail with technical specifications and functional explanations. For quick identification of the controls and connections, references are printed in **BOLDFACE TYPE**, exactly as they appear on the front and rear panels of your tuner.

GENERAL DESCRIPTION

The Marantz Model 112 is an all solid state AM/FM stereophonic tuner incorporating the advanced innovative design and unparalleled technology that have made Marantz famous in the audio component industry. The Model 112 features a highly selective AM tuner, a superb junction FET FM front end, a phase locked loop stereo multiplex demodulator, ceramic IF filters, provisions for the connection of a four channel adaptor, and a front panel selectable de-emphasis network for Dolbyized FM broadcasts.

Optional Accessory: WC-1 Walnut Cabinet

AFTER UNPACKING

It is advisable to save all original packing material to prevent damage should you wish to transport or ship the Tuner (refer to Figure 7 for packing instructions). Please inspect your Model 112 carefully for any signs of damage in transit. It has undergone stringent quality control inspections and tests prior to packing, and left the factory in perfect operating condition. If the unit is damaged, notify the carrier without delay. Only the consignee may institute a claim against the carrier for damage during shipment. However, the Marantz Company will cooperate fully in such an event. Save the damaged carton as evidence for inspection by the carrier.

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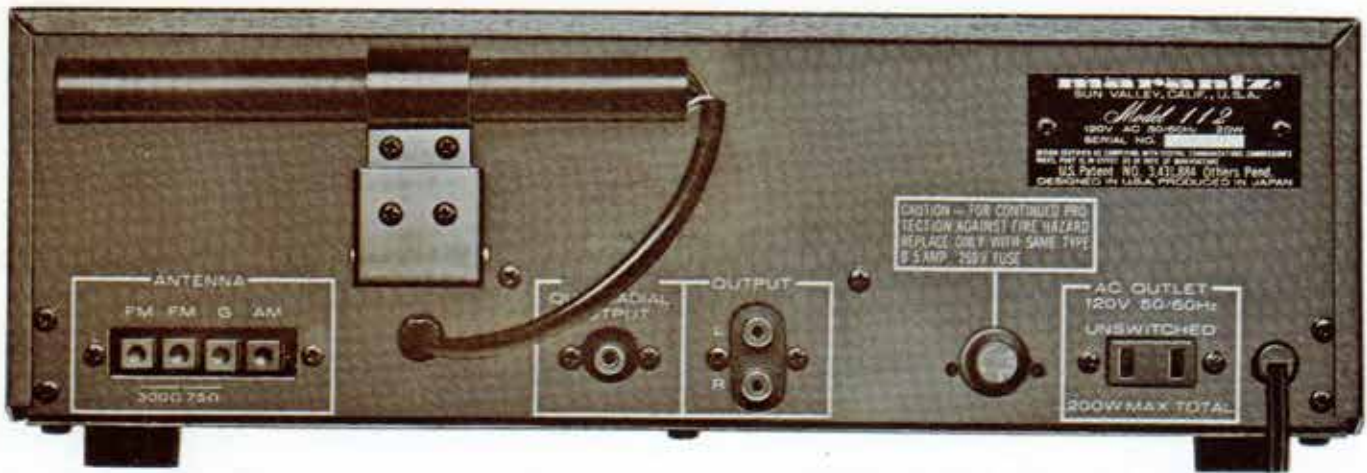


Figure 1. Rear Panel Connection Facilities and Adjustments

PREPARATION FOR USE

REAR PANEL CONNECTIONS

All signal connections to the Model 112, with the exception of the FM antenna, should be made with shielded audio cables. Figure 1 shows the location of input and output jacks on the rear panel. These jacks are for "permanent" connections. Front panel switches and their use will be discussed later.

OUTPUT JACKS

The signal output selected by the AM or FM pushswitch on the front panel is fed to the **OUTPUT** jacks. Both of the output levels have been adjusted to give about one volt signal output for 100% frequency modulated signals.

Connect "R" OUTPUT of the Model 112 to the "R" input of AUX or TUNER jacks of your audio amplifier. Next, connect "L" OUTPUT of the Model 112 to the "L" input of AUX or TUNER jacks of your amplifier. See Figure 2.

QUADRADIAL OUTPUT JACK

In anticipation of future 4-channel quadrasonic broadcasting, your Model 112 is equipped with an **FM QUADRADIAL OUTPUT** jack. The signal available at this jack is the unequalized output of the FM discriminator. Its level, frequency response characteristics, and output impedance are ideal to drive a 4-channel adaptor. This jack can also be used as a simple "white noise" generator for checking the response characteristics of loudspeakers or amplifiers. For this application,

place the Model 112 in FM mode with the muting off, and tune between FM stations to receive interstation noise.

FM ANTENNA

The best FM reception is obtained with a Log-Periodic type antenna mounted on a good quality rotor system. For fringe areas, Marantz recommends a Log-Periodic antenna with six or more elements designed expressly for FM reception.

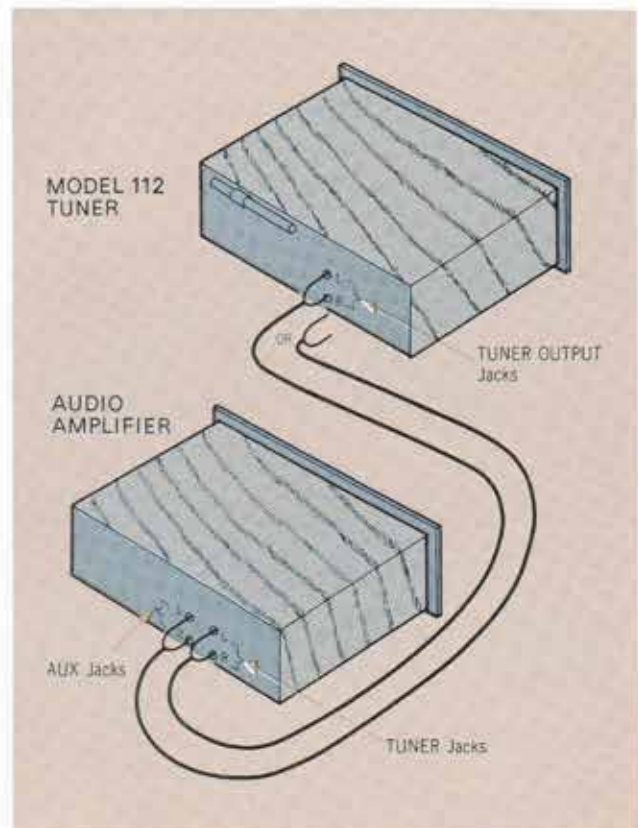


Figure 2. Tuner Output Connection Diagram

To minimize local noise and multipath picked up by the lead-in wires, use a balanced and shielded 300 ohm cable or a coaxial 75 ohm cable with a 300 to 75 ohm matching transformer at the antenna. Unshielded lead-in wires can act as an omnidirectional antenna, and can cancel the directional benefits of your antenna. Low-loss 300 ohm shielded cable consists of two inner conductors plus an outer shield and insulating jacket. This type of shielded cable effectively prevents the lead-in from contributing multipath distortion. For rural areas, it is recommended that a local dealer be consulted about antenna installation and lightning arrestor protection. Master antenna systems are not recommended for use with your Model 112; such systems are usually designed expressly for television reception and frequently suppress FM signals before distribution. In addition, master antenna systems often severely reduce the quality of the FM signal. Where outdoor antennas are prohibited or inconvenient, use a simple form of 300 ohm, TV "rabbit ear" antenna or the simple ribbon-type folded dipole antenna supplied with the Model 112. Both are practical and will give satisfactory results in primary signal areas. Your Model 112 Tuner will accept either a 75 or 300 ohm antenna (See diagram Figure 3). The 300 ohm antenna cable should be connected to the two terminals marked FM on the ANTENNA terminal. When using 75 ohm coaxial antenna cable, connect its shield to the G (GROUND) terminal, and its inner or center conductor to either of the FM terminals.

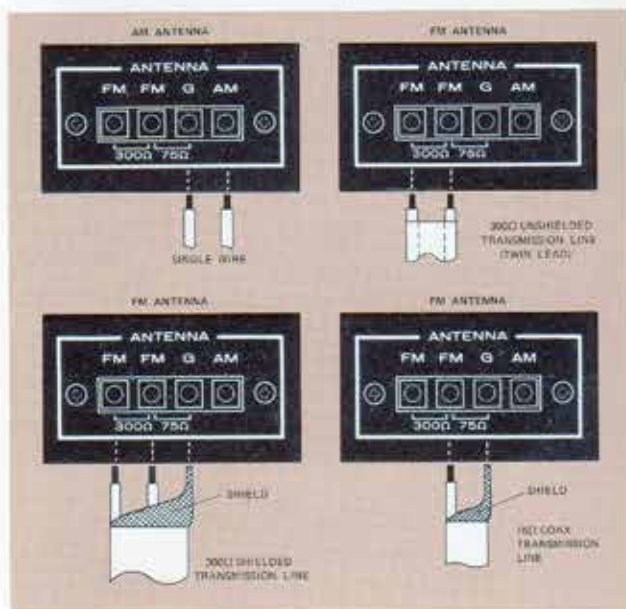


Figure 3. AM/FM Antenna Connection

AM ANTENNA

Your Tuner is equipped with an AM ferrite-rod antenna. **BEFORE USING THE MODEL 112, SWING THE ANTENNA OUT AS SHOWN IN FIGURE 4.**

The ferrite-rod antenna will give you satisfactory results in primary signal areas. However, an outdoor antenna will provide better reception in weaker signal areas. Two single wires are required to make an AM outdoor antenna. First, connect one end of a single wire to the AM ANTENNA terminal on the rear panel, and the other end to a very high horizontal antenna wire of 25 to 75 feet in length suspended between insulators in an outdoor location (the higher the better). Next, connect the other single wire between the "G" terminal of your Model 112 and an authenticated earth ground (such as a metal water pipe).

CONNECTION TO AC OUTLET

With the front panel POWER pushswitch "OUT", plug the line cord into an electrical outlet supplying the proper voltage.

CAUTION: DO NOT PLUG YOUR MODEL 112 INTO A DC OUTLET AS SERIOUS DAMAGE WILL OCCUR.

CONVENIENCE OUTLET

One **UNSWITCHED** AC outlet is provided on the rear panel for powering associated components

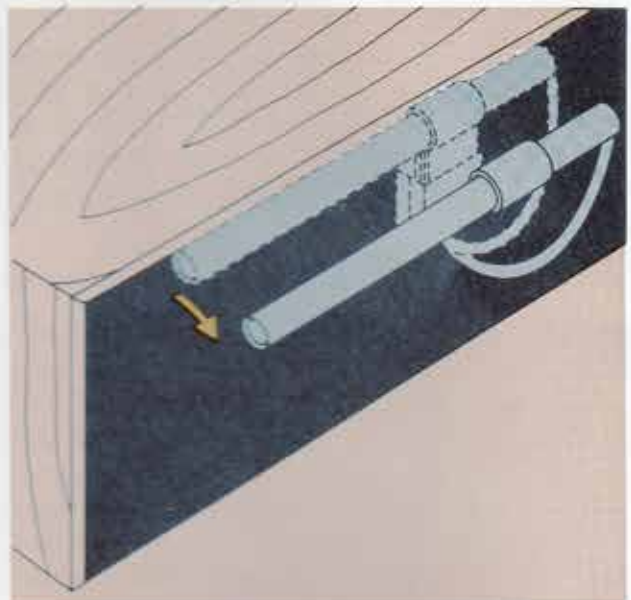


Figure 4. AM Ferrite-rod Antenna

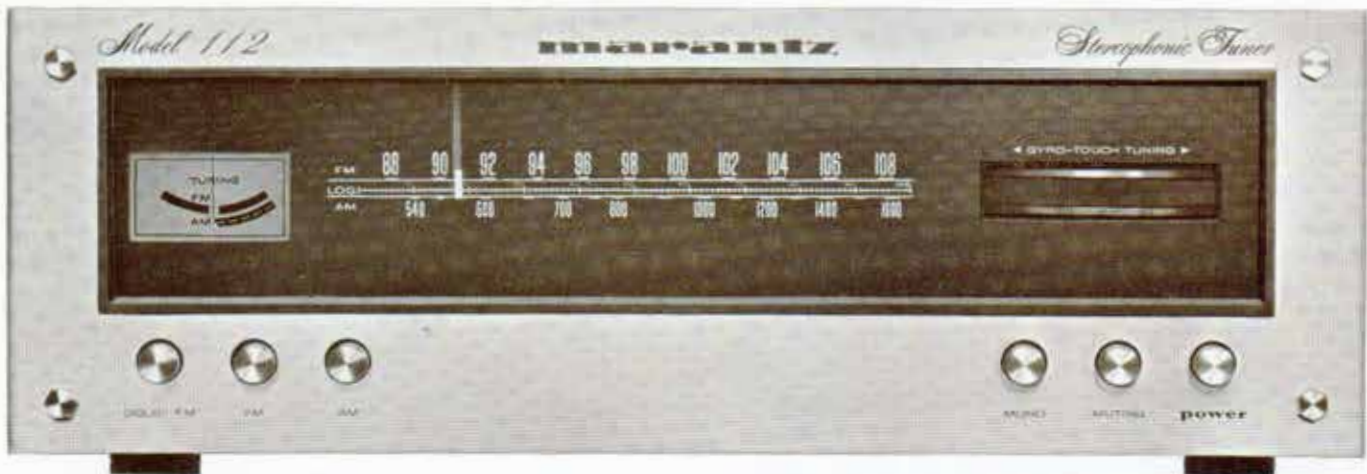


Figure 5. Front Panel Facilities

of your system (tape recorder, record player, etc.).

AC PROTECTOR FUSE

This feature automatically disconnects AC power in the event of a power source or circuit overload. If the **POWER** pushswitch is activated and the front panel fails to illuminate and no sound is heard through the speakers, unscrew the fuse holder on the rear panel and visually inspect the fuse to see if the internal conducting filament has been broken. If so, replace the fuse with one having the same specifications.

SIMPLIFIED OPERATING PROCEDURES

When operating the Model 112 Stereophonic Tuner for the first time, follow these simple directions. Later, full advantage can be taken of its versatility with the remaining pushswitches.

- Step 1. Connect the FM antenna to the appropriate terminals on the rear panel.
- Step 2. Connect the **OUTPUT** of the Tuner to the **AUX** or **TUNER** input jacks of your audio amplifier.
- Step 3. Check that the selector switch of your audio amplifier is in the **AUX** or **TUNER** position.
- Step 4. Turn on the unit by depressing the power switch.
- Step 5. Select the desired program source by depressing the **AM** or **FM** switch. Rotate the **GYRO-TOUCH TUNING** knob until the desired station is tuned.

FRONT PANEL FACILITIES

TUNING METER

The Model 112 is equipped with a dual purpose **TUNING** meter. The **TUNING** meter displays signal strength during **AM** reception and functions as a center tuning meter in **FM** reception.

GYRO-TOUCH TUNING

AM: Depress the **AM** pushswitch and tune to the desired station. Then, rotate the tuning knob slightly back and forth until the maximum reading is obtained on the **TUNING** meter.

FM: Depress the **FM** pushswitch and tune to the desired station. Then slowly rotate the tuning knob slightly back and forth until the **TUNING** meter points to the center scale position.

The multiplex section of the Model 112 is equipped with electronically triggered circuits which automatically mute interstation noise and automatically switch to the proper mode of operation for stereo and monophonic **FM** broadcasts. In addition, the **STEREO** indicator light automatically indicates a stereo broadcast when the **MONO** pushswitch on the front panel is in its normal **OUT** position.

MUTING SWITCH

When tuning to FM broadcasts with the **MUTING** switch depressed, the muting circuit will eliminate interstation noise. To prevent muting very weak stations along with the noise, the muting function may be defeated by releasing the **MUTING** pushswitch.

MONO SWITCH

When a marginal stereo signal is received, random noise and phase modulation may cause the tuner's multiplex circuitry to trigger the **STEREO** mode intermittently. In this case, it is sometimes desirable to cancel the multiplex operation entirely in favor of obtaining a more listenable signal. The **MONO** switch performs this function and converts all output signals to the **MONOPHONIC** mode.

DOLBY FM SWITCH

When you want to listen to a Dolby FM broadcast, connect a Dolby noise reduction adaptor to the **OUTPUT** jacks of the Model 112 and place the **DOLBY FM** switch on Model 112 in the "IN" position.

When this switch is placed in the "IN" position, the audio output signal levels are preset internally to standard Dolby level and are supplied to both **L** and **R OUTPUT** jacks. The de-emphasis time constant applied to the signals is also switched from 75 μ sec to 25 μ sec automatically.

To make a Dolbyized tape recording of such a broadcast, depress the **DOLBY FM** switch to properly de-emphasize the signal, but bypass the noise reduction adaptor to record the Dolbyized audio directly onto the tape.

The inputs to the tape recorder in this application must be properly calibrated beforehand according to the procedure detailed in the Dolby unit's instruction booklet. To achieve proper calibration, it is necessary that the record level control on the Dolby unit be adjusted to the proper Dolby level by use of the reference tone transmitted by the FM station.

For monitoring purposes, connect the Dolby unit between the line outputs of the tape recorder and the **TAPE IN** jacks on the amplifier system.

When using a tape recorder containing a built-in FM Dolby de-emphasis circuit, a better signal-to-noise ratio can be achieved by using only the **DOLBY FM** circuit in the Model 112 instead of the facilities in the tape recorder. Do not use both de-emphasis circuits simultaneously.

CONVERTING YOUR STEREO SYSTEM TO 4-CHANNEL

In the future, it is conceivable that you may decide to expand your stereo component system into a four channel sound system. Marantz simplifies this conversion by offering the Model 4000 Quadracial Adaptor, which has been specifically designed and engineered to add the dimension of four channel sound to your stereo components. The Marantz Model 4000 incorporates all the technology required to convert your present Marantz components into a four channel sound system.

Features of the Marantz Model 4000 Quadracial Adaptor :

- Ready to accept an external CD-4 disc demodulator
- SQ pocket for plugging in Marantz' SQA-1 and SOA-2 decoders and all future matrix decoders
- Complete provisions for accepting any four channel tape recorder
- Low and hi filters for rear channels
- Master volume control with switchable loudness compensation for all four channels
- Four channel fingertip balance controls
- Complete provisions for switching both **MAIN** and **REMOTE** four channel speaker systems
- Headphone jack for the rear channels
- Bass and treble controls for the rear channels
- Accepts Marantz' Model RC-4 remote control unit

But, that's not all — the Model 4000 also incorporates Marantz' exclusive **VARI-MATRIX** feature to synthesize four channel sound from any stereo source. With the Model 4000, all you require is a basic amplifier and a pair of speakers. Further information can be obtained from your local Marantz dealer.

TECHNICAL DESCRIPTION

GENERAL

Figure 6 is a block diagram of the Model 112 Tuner showing the main functional elements and input and output signal routing. The **MONO** switch is common to both channels.

FRONT END

FM antenna signals are applied through a balun transformer to the antenna coil which drives an FET RF amplifier. A four section tuning capacitor tunes antenna, interstage and oscillator circuits which provide exceptional selectivity and spurious signal rejection. The signals from the RF amplifier are fed through the double tuned interstage RF tank circuit to the Mixer stage, which is also fed by the signal generated by the local oscillator. This mixer converts the carrier frequency to the 10.7 MHz intermediate frequency. Careful attention to the thermal and electrical characteristics of the local oscillator has minimized drift, thus eliminating the necessity for AFC. The 10.7 MHz converted signal is then fed to three phase linear ceramic IF filters with bipolar and IC amplifying stages. Three stages of limiting are part of and follow the IF stages. It is then, in turn, processed through the FM discriminator. The output of the FM discriminator is fed to a buffer amplifier which then drives the stereo multiplex demodulator.

IF STAGES

The IF section consists of three transistors and one IC amplifier with three stages of dual element crystal filters. The characteristics of these filters are ideal in that the 200 KHz passband is phase linear, with sharp cutoff slopes. Its exceptional phase linearity assures the elimination of a major source of high frequency distortion and a loss of stereo separation. The sharp cutoff slope provides outstanding selectivity, permitting reception of closely spaced channels.

LIMITER

The Model 112 incorporates a multi-staged symmetrical limiter circuit (consisting of limiter diodes, transistors and IC) which provides a very narrow dynamic aperture. Thus it removes un-

desirable amplitude modulation (including AM signals, AM noise and AM distortion) from the received FM signal and improves the capture ratio.

The amplified and symmetrically limited FM signal is delivered to a discriminator having excellent linearity. The detected signal is fed to the **FM QUADRADIAL OUTPUT** jack and the FM multiplexer stereo demodulator.

FM STEREO DEMODULATOR

The stereo composite signal obtained from the buffer amplifier is fed to the phase locked loop stereo demodulator IC circuit and decoded into both left and right channel signals. Each left and right channel signal is then applied to the 19KHz and 38KHz filters and de-emphasis networks, to remove the undesired switching carrier signal in the audio signals. Next, each audio signal is applied to an NPN-PNP transistor feedback pair which amplifies the audio signal to the required signal level of about 1 volt RMS. Finally, each amplified signal is fed to the FM switch. The phase locked loop IC is equipped with a separate automatic Stereo/Monaural switching circuit. This circuit examines the input signal intensity and activates the stereo demodulator circuit and the **STEREO** indicator lamp automatically when the input signal is strong enough to provide quality stereo reception.

When the input signal strength is below the threshold level, the FM stereo broadcast is processed as a monaural signal. Improved signal-to-noise ratio is obtained in the **MONO** mode during low signal levels.

MUTING CIRCUIT

In the absence of an FM carrier, all FM receivers inherently produce interstation noise. The muting circuit eliminates this noise, providing noise-free tuning from station to station. A muting circuit consisting of a two transistor noise amplifier and switching transistors has been incorporated in the Model 112. The muting circuit perfectly mutes out all the interstation noise and also completely mutes out the side slope spurious response of the unit. The circuit has been designed to minimize annoying switching noise as the tuning band is scanned.

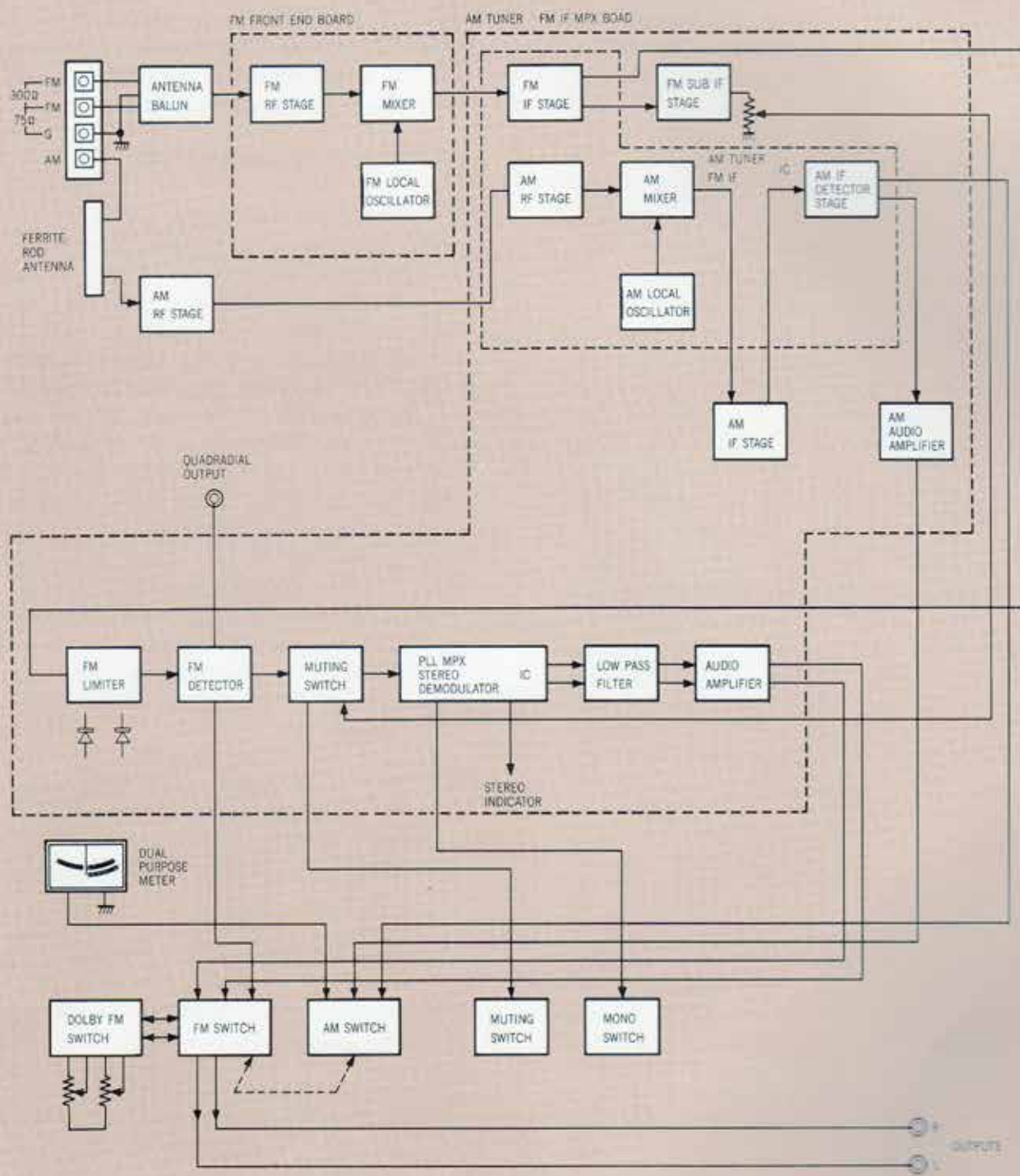


Figure 6. Functional Block Diagram

AM TUNER

The AM tuner section of the Model 112 is composed of an RF amplifier, IC local oscillator and mixer, IF amplifier, detector and one transistor amplifier which amplifies the detected audio signals. A three section variable capacitor is used to tune the antenna and RF stages for high selectivity and improved spurious signal rejection performance. The ceramic filters utilized in the AM IF amplifier are designed for higher selectivity and wider bandwidth for interference-free high quality AM reception. Following the AM IF amplifier, the AM detector recovers the audio modulation and presents this signal through the audio amplifying stage to the mode selection switch. The AM tuner and IF amplifier are subjected to the action of an effective automatic gain control circuit which maintains a constant volume level for all stations in the AM band.

GENERAL SPECIFICATIONS

Power Requirements 120V AC, 50/60 Hz

Power Consumption 20 watts

Dimensions:

Panel Width 14-1/8 Inches

Panel Height 4-3/4 Inches

Depth 11 Inches

Weight:

Unit alone 14.1 lbs.

Packed for shipment 21.6 lbs.

CABINET MOUNTING

The Marantz 112 may be installed in your own custom cabinet. The following procedures will ensure an attractive and safe installation. Contained in the Accessories Kit Envelope you will find a template which corresponds to the outside dimensions of the unit's metal cabinet. Trace the template outline on the section on which you wish to install your Marantz 112.

Using a small keyhole saw, cut along the outline. When completed, the cut-out will accept your Marantz unit. The Front Panel of your unit is larger than the cut-out and will neatly cover the edges of the cut. To provide adequate ventilation, allow at least one inch clearance between the Marantz unit and cabinet surfaces and additional components. Adequate bracing across the inside front and rear of the cabinet must be located to provide support for the unit.

If you are installing the unit into a cabinet that uses a solid shelf to support the unit, provide one inch spacers (wood) each corner to allow the unit to have proper clearance from the shelf.

When the above procedure is completed, remove the rubber feet and slide the unit into the cut-out.

SERVICE NOTES

REPAIRS

Only the most competent and qualified service technicians should be allowed to service the Marantz Model 112 Tuner. The Marantz Company and its warranty station personnel have the knowledge and special equipment needed for the repair and calibration of this precision instrument. In the event of difficulty, write directly to the factory (to the attention of the **TECHNICAL SERVICES DEPARTMENT**) for the name and address of the nearest Marantz warranty or authorized service station. Please include the model and serial number of the unit together with a description of the problem. If it should ever be necessary to ship the unit to the factory or authorized service station, and your Tuner is mounted in its accessory walnut cabinet, **REMOVE IT FROM THE CABINET BEFORE PACKING. DO NOT SHIP THE ACCESSORY WALNUT CABINET.**

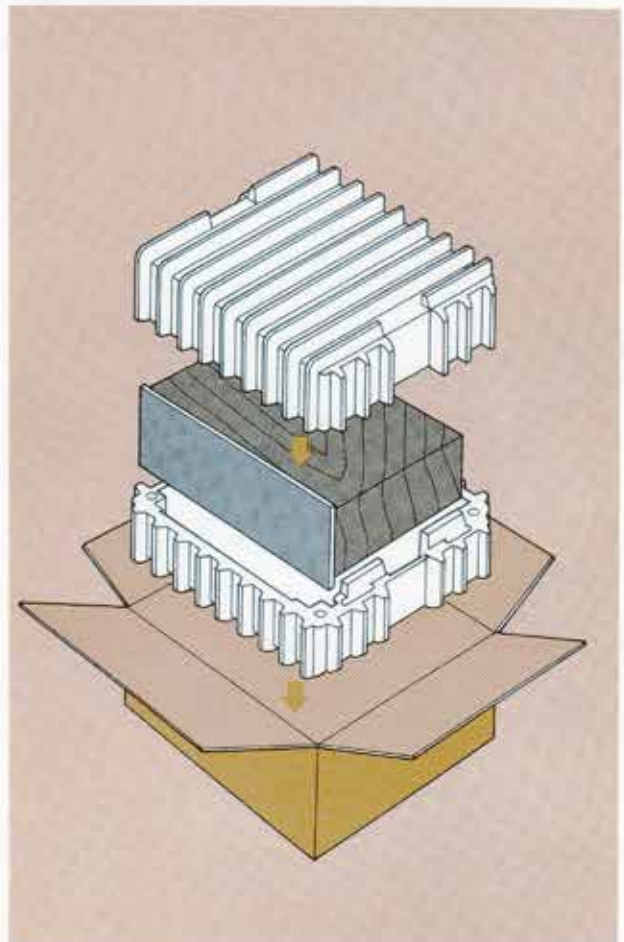


Figure 7. Packing Instructions

Pack the unit carefully, using the original packing material. If the packing material has been discarded, lost, or damaged, write to the factory (to the attention of the **TECHNICAL SERVICES DEPARTMENT**) for new packing material. Carton, fillers, and packing instructions will be shipped to you at a nominal charge. No Tuner should be returned to the factory without an Authorized Return Label which the Marantz Company will supply if the description of difficulties appears to warrant factory service.

Please Pack the Tuner as Illustrated in Figure 7.

CAUTION

Please **DO NOT** ship your Tuner mounted in its accessory walnut cabinet.

Insure the Tuner for its full value.

Make sure that your correct return address is on the shipping label. Ship via a reputable carrier. **DO NOT USE PARCEL POST.** Be sure to obtain a receipt from the carrier.

The Sound of Marantz
is the compelling warmth of a Stradivarius.
It is a dancing flute, a haughty bassoon
and the plaintive call of a lone French horn.
The Sound of Marantz is the sound of beauty,
and Marantz equipment is designed to bring you
the subtle joy of its delight.
Wonderful adventures in sound await you
when you discover that the Sound of Marantz
is the sound of music at its very best.

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