

Figure 6. Three Conductor Phone Plug

### PHONES JACK

This jack accepts headphones utilizing a standard three conductor phone plug (see Figure 6). It is internally connected to the power amplifier section through isolation resistors to provide adequate sound level with popular low impedance headphones as well as with high impedance units. Two or more sets of headphones may be used with the aid of "Y" connectors. However, output level will drop as additional headphones are added. The headphone jack output is not affected by the MAIN-SPKR-REMOTE switches.

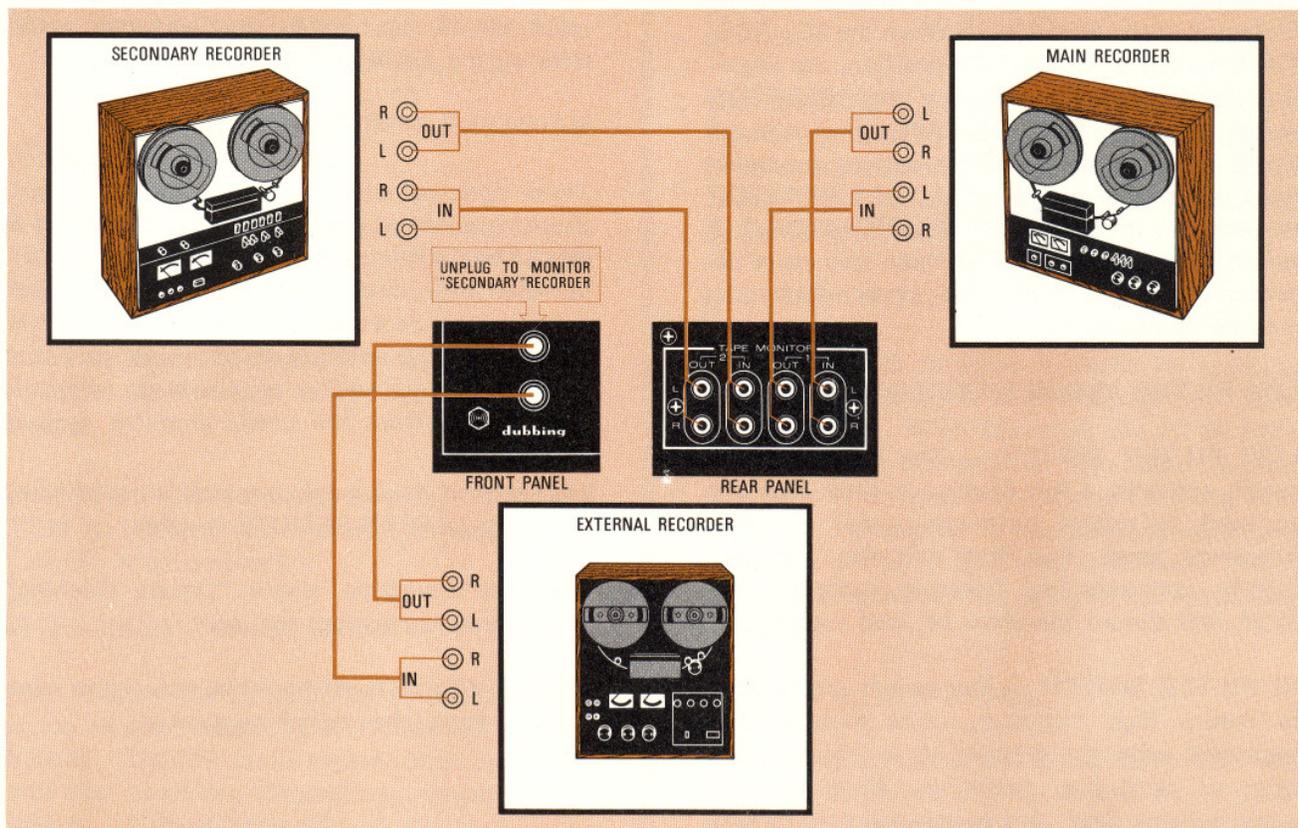
Figure 7. Tape Recorder Connections

## SOME SUGGESTIONS ON USING TAPE RECORDERS WITH YOUR MODEL 2275

The Model 2275 has three sets of inputs and outputs for tape recorders: TAPE MONITOR 1 IN and OUT, TAPE MONITOR 2 IN and OUT, and DUBBING IN and OUT. To simplify this discussion, the tape recorder connected to the TAPE MONITOR 1 jacks will be referred to as the "MAIN" recorder; the tape recorder connected to TAPE MONITOR 2 will be referred to as the "SECONDARY" recorder; the recorder connected to the DUBBING facilities on the front panel will be referred to as the "EXTERNAL" recorder.

### DUBBING JACKS

The DUBBING IN jack is the front panel equivalent of the rear panel TAPE MONITOR 2 input jacks and automatically disconnects the TAPE MONITOR 2 input jacks when a standard, three conductor, stereo phone plug is inserted. The line outputs of a tape playback source may be connected to this jack.



The **DUBBING OUT** jack is the front panel equivalent to the rear panel **TAPE MONITOR 2** output jacks and is permanently connected in parallel with the **TAPE MONITOR 2** output jacks. Therefore, any source material available at the rear panel output jacks, except that from the **TAPE MONITOR 2** inputs (when **DUBBING IN** is connected), is simultaneously available at the **DUBBING OUT** jack. The line inputs of a tape recorder may be connected to this jack, using a standard, three conductor stereo phone plug (see Figure 6).

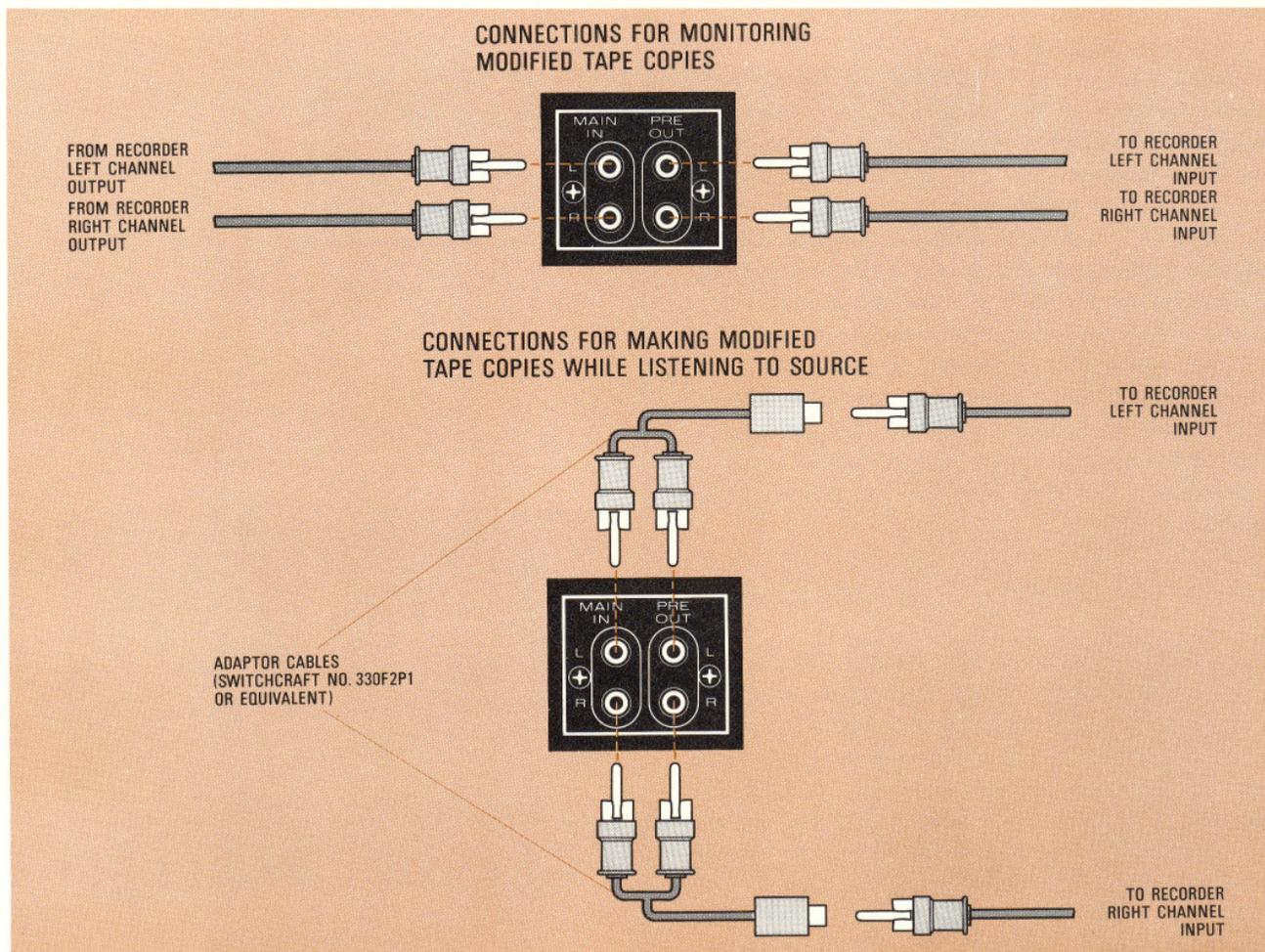
### MAKING TAPE RECORDINGS AND DUBS

The **SELECTOR** switch determines the source input for tape recording. When the **SELECTOR** switch is in **AM**, **FM**, **PHONO** or **AUX**, the source input can be recorded on to the "MAIN," "SECONDARY", and "EXTERNAL" tape recorders individually or simultaneously.

To make a dub (tape copy) from the "MAIN" recorder onto the "SECONDARY" and/or "EXTERNAL" recorders, place the **SELECTOR** switch in **TAPE 1**. The "MAIN" tape recorder then becomes the source input. When this is the case, the **TAPE MONITOR 1 OUT** jacks are muted to prevent feedback oscillations that would occur if the "MAIN" recorder were inadvertently placed in the record mode.

To make a dub from the "SECONDARY" or "EXTERNAL" recorder on to the "MAIN" recorder, place the **SELECTOR** switch in **TAPE 2**. The "SECONDARY" recorder then becomes the source input. If the "EXTERNAL" tape recorder is plugged into the **DUBBING IN** jack, then it pre-empts the "SECONDARY" recorder and becomes the source input instead. The **TAPE MONITOR 2 OUT** and **DUBBING OUT** jacks are muted to prevent feedback oscillations. Therefore, dubs to the "MAIN" recorder may only be made from one of these two recorders at a time.

Figure 8. Arrangement for Making Modified Tape Copies



## TAPE MONITORING

Notice that the **MONITOR** switches operate independently of the **SELECTOR** switch. Thus, any tape recorder can be monitored regardless of the position of the **SELECTOR** switch. Monitoring of any of the tape recorders may be accomplished as follows:

"MAIN" recorder — Depress the **SOURCE/TAPE MONITOR** switch; release the **1, 2 MONITOR** switch to the **1** position.

"SECONDARY" recorder — Depress both **MONITOR** switches.

"EXTERNAL" recorder — With the "EXTERNAL" recorder connected to the **DUBBING IN** jack, depress both **MONITOR** switches.

## MAKING MODIFIED TAPE RECORDINGS

The **PRE OUT** jacks on the rear panel of the 2275 may be used to feed input signals to a tape recorder so that filters, balance, and tone controls can be used to modify the signal prior to recording.

Modified tape copies can likewise be made. First, select the tape to be used as a source on the **SELECTOR** switch. Next, connect the input of the other tape recorder to the **PRE OUT** jacks by one of the two methods illustrated in Figure 8. By using "Y" connectors, the input signal can be monitored through the speakers. By connecting the output of the second tape recorder directly to the **MAIN IN** jacks, the newly recorded tape can be monitored. However, please note that when this method is employed, the volume level of the speakers is determined only by the output level of the tape recorder. Adjustment of volume is possible only if the recorder has output level controls.

## RECORDING DOLBYIZED FM PROGRAMS

Dolbyized FM broadcasts contain Dolbyized audio information to which a special pre-emphasis is applied for the purpose of improving the noise reduction process. 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 purpose, connect the Dolby unit between the line outputs of the tape recorder and the **TAPE MONITOR IN** jacks on the 2275.

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 2275 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, you may decide to expand your stereo component system into a four channel sound system. Marantz simplifies this conversion by offering the Model 4000 Quadradial 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 Quadradial Adaptor:

- Accepts an external CD-4 disc demodulator
- SQ pocket for plugging in Marantz' SQA-1 and SQA-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
- Base and treble controls for the rear channels
- Accepts Marantz' Model RC-4 remote control unit.

The Model 4000 also incorporates Marantz' exclusive VARI-MATRIX feature to synthesize four channel sound from any stereo source. Along with the Model 4000, all that is required is a basic amplifier and a pair of speakers. Further information can be obtained from your local Marantz dealer.

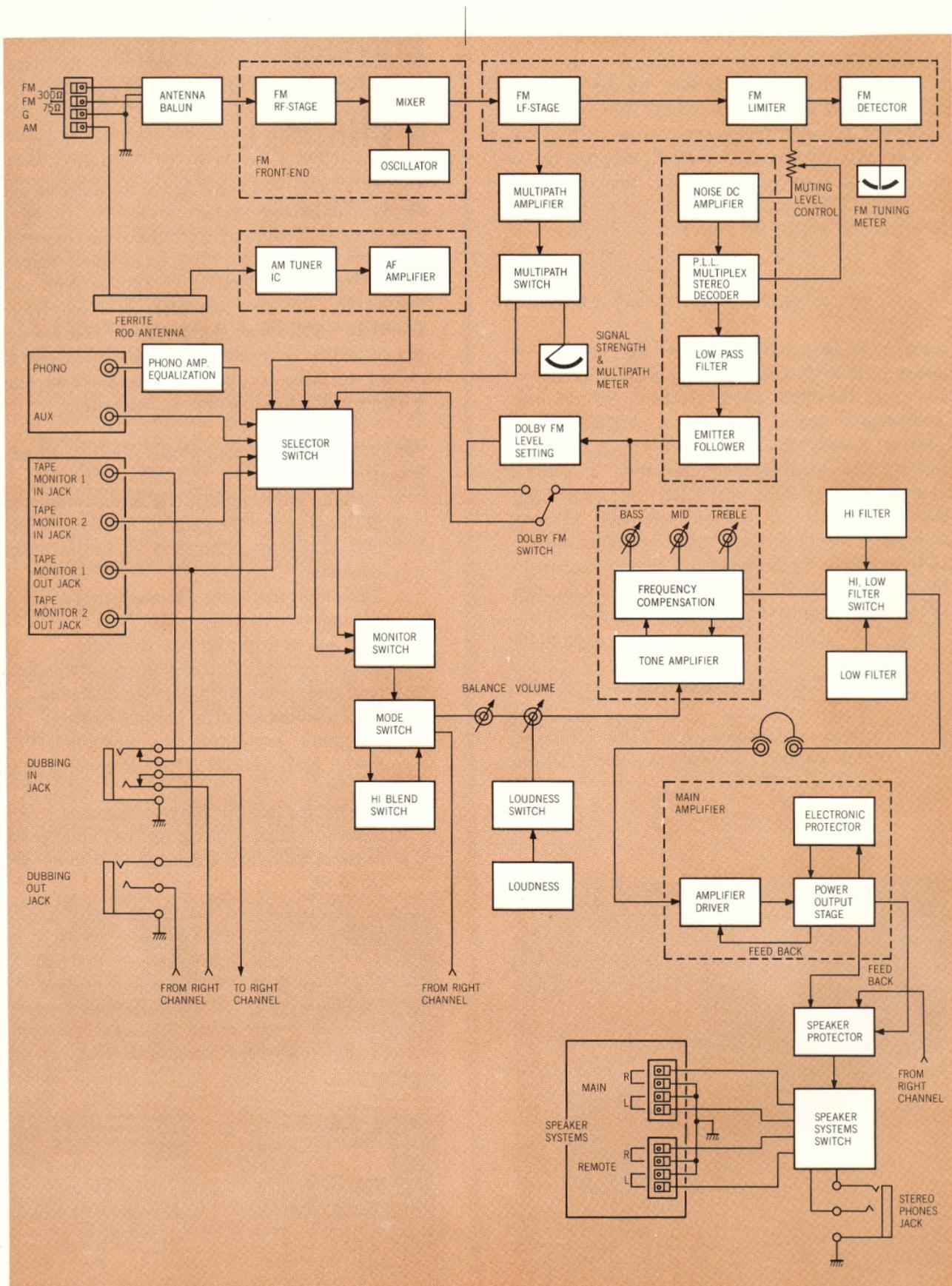


Figure 9. Functional Block Diagram

# TECHNICAL DESCRIPTION

## GENERAL

Figure 9 is a block diagram of the Model 2275 Receiver showing the main functional elements and input and output signal routing. Each AM and FM front end has its own IF stages. For clarity, only the left audio channel is shown; the right audio channel is identical. The **MONO IN** switches are common to both channels. All audio controls are ganged or concentrically clutched to their counterparts in the right channel. The left channel half of the front panel **DUBBING IN** and **DUBBING OUT** jacks are shown interconnected in this diagram. The right channel of each jack is wired to the same circuit point in the right channel.

## FM TUNER SECTION

**FRONT END** — FM antenna signals are applied through a balun transformer to the antenna coil which drives a field-effect transistor RF amplifier. The amplified signals from the RF amplifier are fed through the triple-tuned Butterworth type RF filter circuit to the FET Mixer stage, which also receives the signal generated by the local oscillator. A five section tuning capacitor tunes antenna, interstage and oscillator circuits which provide exceptional selectivity and spurious signal rejection. The mixer converts the carrier frequency to the 10.7 MHz intermediate frequency. Careful attention to the local oscillator's thermal and electrical characteristics has minimized drift, thus obviating the necessity for AFC. The 10.7 MHz converted signal is then fed to the IF amplifier.

**IF AMPLIFIER** — The IF amplifier consists of eight ceramic filters and eight stages of IF amplifiers including four limiter stages. The characteristics of these ceramic filters are such that the 200 kHz passband is phase linear thus eliminating a major source of high frequency distortion and loss of stereo separation. The sharp cut-off slopes improve selectivity, permitting reception of closely spaced channels. The Model 2275 utilizes four symmetrical diode limiter stages consisting of high performance Gold Bond diodes which result in a very small dynamic aperture. Thus, undesirable Amplitude Modulation is removed from the IF signal within the limiter and good capture

ratio is also assured. The amplified and symmetrically limited FM signals are fed to the super-linear discriminator circuit. The detected audio signals are then distributed to the **QUADRADIAL OUTPUT** jack, MPX Decoder circuit, Noise Amplifier, and Muting Circuit.

**MULTIPATH INDICATOR** — The Multipath Indicator circuit is provided to indicate the optimum antenna direction for a desired station. Undesirable Amplitude Modulation resulting from multipath reception is sampled and detected from the IF amplifier and is displayed on the multipath meter when the **MULTIPATH** pushswitch is held "in". By orientating the antenna for minimum meter deflection, minimum multipath condition is obtained.

**STEREO DEMODULATOR** — The stereo composite signal obtained from the buffer amplifier is first fed to the FET muting circuit, then to the phase locked loop stereo demodulator IC circuit where it is decoded into both left and right channel signals.

Each left and right channel signal is then applied to the 16 kHz low pass filter (LPF) and de-emphasis networks to remove the undesired switching carrier signal in the audio signals. Next, each audio signal is applied to an audio amplifier consisting of NPN-PNP direct-coupled transistor feedback pairs and amplified to the required signal of about 755 mV RMS. Finally, each amplified signal is fed to the **SELECTOR** switch.

The phase locked loop IC in the multiplex stereo demodulator circuit is equipped with a separate automatic Stereo/Monaural switching circuit. The circuit examines the input signal intensity and actuates the stereo demodulator and stereo indicator lamp automatically when the input signal is of sufficient strength to provide high quality stereo reception. When the input signal intensity is insufficient for this purpose, the stereo signal is automatically changed to a monaural signal to ensure quality reception and a high signal-to-noise ratio.

**MUTING CIRCUIT** — In the absence of an FM carrier, all FM receivers 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 a three transistor (including one FET) switching circuit, has been incorporated in the Model 2275. 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.

## AM TUNER SECTION

The AM tuner section of the Model 2275 is composed of one IC (incorporating an RF amplifier, local oscillator, mixer, IF amplifier and detector) and three transistors. One of them is a signal strength indication amplifier, while the other two are used for amplifying detected audio signals. A three section variable capacitor is used to insert two tuned circuits into the RF stage 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 to the **SELECTOR** switch. The AM tuner and IF amplifier are subjected to the action of an effective automatic gain control circuit which maintains a constant signal level for all stations in the AM band.

## AMPLIFIER SECTION

**SELECTOR SWITCH** — The **SELECTOR** switch selects one of six inputs for selection to the **MONITOR** switches and **TAPE MONITOR 1 OUT**, **TAPE MONITOR 2 OUT**, and **DUBBING OUT** jacks.

**PHONO AMPLIFIER** — Phono signals of up to 100 millivolts can be handled without overloading. The RIAA equalization network provides precise equalization and sets the voltage gain of the phono preamplifier to 40 dB (at 1,000 Hz).

**HI BLEND AND MONO (L and R) FUNCTIONS** — When the **HI BLEND** switch is depressed, the left and right channel outputs of the **SELECTOR** switch are connected together through mixing resistors and a capacitor. The value of the capacitor has been selected to effect moderate suppression of out-of-phase noise and distortion components while maintaining moderate stereo

separation. When both **MONO IN (L and R)** switches are in the "in" position, the two channels are connected directly together through mixing resistors. In addition, the left and right channel tape input signals are connected together through a similar resistor network. This facility allows all inputs to be converted to the monophonic mode.

**BALANCE CONTROL** — The **BALANCE** control is a wide range control which permits attenuation of each channel to cutoff. The change of attenuation in each channel as the control is moved from center has been designed to maintain total apparent loudness from both channels. This feature makes it a true stereo balance control.

**VOLUME CONTROL** — The **VOLUME** control attenuates both channels simultaneously and maintains tracking to within 3 dB at any point of attenuation to 50 dB from maximum. Since the control is situated at the input of the tone amplifier, there is no possibility of overloading the amplifier stages under maximum rated output conditions. Thus, distortion is kept to a minimum. After attenuation by the **BALANCE** and **VOLUME** controls, the signal is applied to the tone control amplifier.

**TONE CONTROL AMPLIFIER** — The **TONE CONTROL AMPLIFIER**'s circuitry uses a continuously variable R-C feedback-type configuration. Turnover frequencies for **BASS** and **TREBLE** are determined by the **TONE MODE** switch. The signal from the **TONE AMPLIFIER** feeds the hi/low filter circuit.

**HI AND LOW FILTERS** — When depressed the **HI** and **LOW FILTERS** provide 6 dB roll off per octave, beginning at 5 kHz and 150 Hz, respectively.

**OUTPUT STAGE AND PROTECTIVE CIRCUITS** — With the controls set for flat response and **VOLUME** control at maximum, the over-all voltage gain from any high-level input to the loudspeaker terminals is approximately 43 dB. The differential amplifier and pre-driver circuit amplify the signal from the **HI** and **LOW FILTERS** to sufficient levels to drive the output stages. From the input of the differential amplifier circuit, the amplifier stages are direct coupled through to the loudspeakers (and headphones) providing instantaneous recovery from any over-

driven condition. The output stage consists of a pair of push-pull, complementary symmetry transistors (PNP, NPN), having massive current and dissipation capabilities. The electronic protective circuit senses excessive output current and voltage conditions and limits the signal to the driver transistors to a safe, predetermined value. This limiting action protects the driver and output transistors from excessive overdrive and short circuit conditions. This instantaneous acting safety circuit gives constant and unobtrusive protection without causing annoying program interruptions. Thermal compensation circuits are also provided to ensure highly stable operation under severe temperature and signal handling conditions.

## GENERAL SPECIFICATIONS

Power Requirements . . . . .	120V AC, 50/60 Hz
At rated output, both channels operating . . . . .	390 Watts
Idling Power (Volume control at zero) . . . . .	45 Watts
Dimensions:	
Panel Width . . . . .	17-5/16 inches
Panel Height . . . . .	5-3/8 inches
Depth . . . . .	14-3/8 inches
Weight:	
Unit alone . . . . .	37.9 lbs.
Packed for shipment . . . . .	45.1 lbs.

## SERVICE NOTES

Because the Model 2275 Stereo Receiver is completely solid state, replacement of parts should never be required. If the pilot lamp burns out, have your serviceman replace it.

### FUSE REPLACEMENT

The Model 2275 is protected by a 5-amp fuse. In the event the fuse blows out, replace it ONLY with a fuse of the same type and rating. Replacement with fuse of higher rating will not protect the instrument and will void the warranty.

### CLEANING

Your Model 2275 Stereo Receiver has a very durable finish. The front panel and knobs are gold anodized for lasting beauty. You can clean the panel and knobs with a liquid solution of mild detergent and water applied with a soft cloth or cotton-tipped swab. Never use scouring powder or any abrasive cleaner.

### REPAIRS

Only the most competent and qualified service technicians should be allowed to service the Model 2275 Stereo Receiver. The Marantz Company and its factory trained warranty station personnel have the knowledge and special equipment needed for repair and calibration of this precision instrument.

In the event of difficulty, write directly to the **Marantz Technical Service Department, P.O. Box 99, Sun Valley, California 91352**, for the name and address of the Marantz warranty or authorized service station nearest your home or business. Please include the model and serial number of your unit and a description of what you feel is abnormal about its operation.

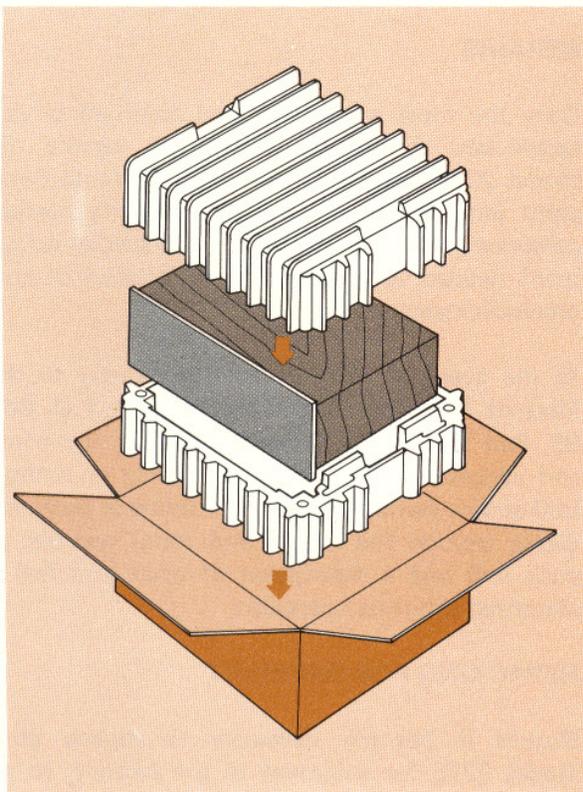
### REPACKING FOR SHIPMENT

Should it become necessary to repack your Model 2275 for shipment to the factory, to an authorized service station, or elsewhere, please observe the following precautions:

- a. Do not ship your unit to the factory without an Authorized Return Label, which the Marantz Company will supply if the description of difficulties appears to warrant factory service.
- b. Do not ship the unit installed in its accessory walnut cabinet; remove the unit from the cabinet before packing.
- c. Pack the unit carefully, using the original material as shown in Figure 10.

**PLEASE NOTE** that if you have discarded, lost, or damaged the packing material, new packing material may be obtained by writing to the **Marantz Technical Services Department**. The carton, its fillers, and packing instructions will be returned to you at a nominal charge.

- d. Ship via a reputable carrier (**do not use Parcel Post**) and obtain a shipping receipt from the carrier.
- e. Insure the unit for its full value.
- f. Be sure to include your return address on the shipping label.



**Figure 10. Packing Instructions**

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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