marantz

Model 4270
Stereo 2 + Quadradial 4
Receiver

Handbook of Instructions

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Model 4270
Stereo 2+Quadradial 4
Receiver

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

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In the event that service is required, all necessary parts and labor will be furnished free of charge during the above stated periods. The conditions of this Warranty, and the extent of the responsibility of MARANTZ COMPANY, INC. under this Warranty, are as follows:

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2. The Warranty extends only in favor of the original, registered owner of the product.

3. The Warranty Registration Card must be transmitted to MARANTZ COMPANY, INC., P. O. Box 99, Sun Valley, California 91352, not later than TEN DAYS from date of purchase.

4. The Warranty will become void if repairs are effected by anyone other than an authorized MARANTZ Service Station.

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6. This Warranty shall be valid only if the purchase was made within the United States of America. The Warranty shall not apply unless shipment is made by the purchaser to the MARANTZ Service Station from a point within the United States. If the requested rapairs and/or parts exchange are within the terms of this Warranty, MARANTZ COMPANY, INC. will prepay return shipping charges, provided that such return shipment is to be made to an address located within the United States.

7. This Warranty is void if the Serial Number has been altered or removed. This Warranty shall not apply if the product has not been connected or operated in accordance with the instructions furnished by MARANTZ COMPANY, INC. This Warranty shall also be void if the product has been altered or repaired in any way which MARANTZ COMPANY, INC. believes has affected the stability or reliability of the product.

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Should there be any questions, please contact the
Marantz National Service Manager, Marantz Company, Inc.
P.O. Box 99, Sun Valley, California 91352

PURCHASER'S RECORD ▶

REGISTRATION FOR MARANTZ 3-YEAR GOLDEN WARRANTY

Model: Marantz Model 4270

Serial No. _____

Purchaser's Name _____

Purchased From (Name) _____

Address _____

Price Paid $ _____ Date Purchased _____

Date Warranty Reply Card Mailed _____

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.

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GENERAL DESCRIPTION

Your Marantz Model 4270 is a high-quality Stereo 2 + Quadradial 4 Receiver developed by Marantz, a name famous for quality in the audio component industry. The Model 4270 incorporates Marantz' exclusive Vari-Matrix circuit which simulates 4-channel sound from normal 2-channel stereo programs, and is capable of reproducing 4-channel sound from any matrix-encoded source. The 4270 will also reproduce any discrete 4-channel program as well as regular stereo and monaural programs. An optional plug-in decoder adapts the 4270 for any specific matrix system such as Columbia's SQ.

The FM tuner section employs an FET for the RF amp and Mixer stage. The IF tuning circuit employs ceramic filters of wide bandwidth and high selectivity to provide high sensitivity and unparalleled interference-free operation. The 4270 incorporates a switchable 2-channel DOLBY system to reduce noise, inherent in recording music from records, tape, FM broadcasts and TV.

The FM multiplex circuitry includes a phase locked loop Stereo-Monaural Automatic switching circuit, stereo indicator circuit and a buffer amplifier to obtain output at low impedance. Low pass filters for 19KHz and 38KHz rejection are incorporated. Moreover, the Model 4270 unit has a muting circuit that permits pleasant FM broadcast reception by completely eliminating inter-station interference which is usually generated at the time of selecting FM stations.

FOREWORD

To obtain optimum performance and enjoyment from the Model 4270, please study these instructions carefully. Follow the step-by-step instructions to obtain maximum performance.

The manual is divided into two parts. The first covers installation and operation in simple, non-technical language. The second describes the Model 4270 in more detail with technical specifications and functional explanations.

For quick identification of the controls and connections, references are printed in bold face type.

AFTER UNPACKING

It is advisable to save all original packing material to prevent damage should you wish to transport or ship the Receiver (refer to Figure 15 for packing instructions). Please inspect your Model 4270 carefully for any signs of damage in transit. It has undergone stringent quality control inspection 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 with the carrier for damage during shipment. However, the Marantz Company will co-operate fully in such an event. Save the damaged carton as evidence for inspection by the carrier.

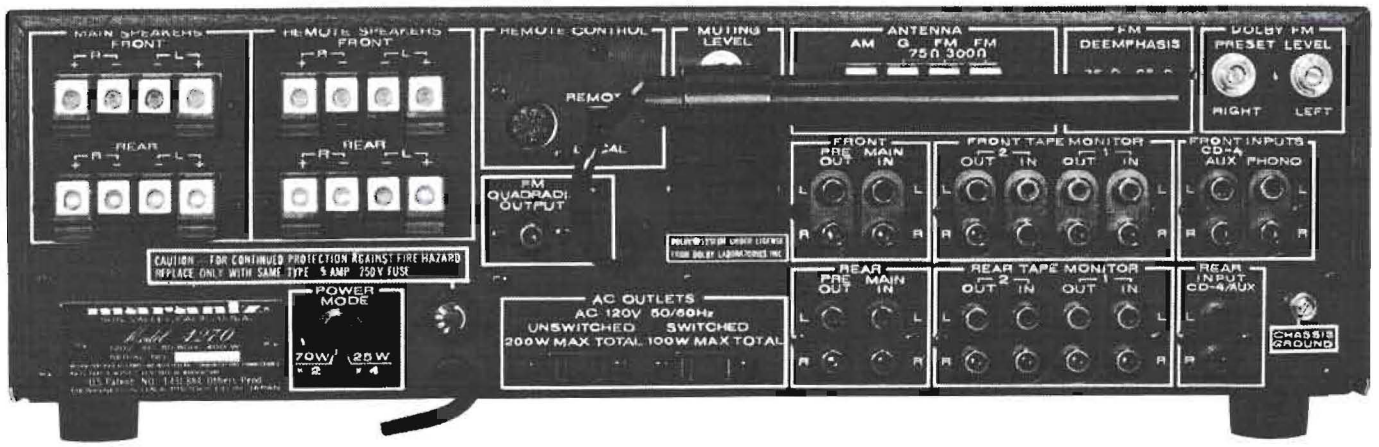

Figure 1. Rear Panel Connection Facilities and Adjustments

CONNECTING THE 4270

The 4270 can be used as a stereo or 4-channel Receiver. When using the 4270 as a stereo unit, the **POWER MODE** Switch on the rear panel should be placed in the **70Wx2** mode. The instructions contained in this manual are to be followed for both stereo or 4-channel operation; however, for stereo operation, the front channels alone will apply.

1. Using a balanced and shielded 300 Ohm cable, connect an FM antenna to the 4270 as shown in Figure 11.
2. Using No. 18, or heavier, lamp cord (zip cord), connect main speakers to the 4270 as follows:

LEFT FRONT SPEAKER	**4270**
– or GND or NEG or COMM or 0	to **MAIN SPEAKERS FRONT L–**
+ or HOT or POS or 1	to **MAIN SPEAKERS FRONT L+**

RIGHT FRONT SPEAKER	**4270**
– or GND or NEG or COMM or 0	to **MAIN SPEAKERS FRONT R–**
+ or HOT or POS or 1	to **MAIN SPEAKERS FRONT R+**

LEFT REAR SPEAKER	**4270**
– or GND or NEG or COMM or 0	to **MAIN SPEAKERS REAR L–**
+ or HOT or POS or 1	to **MAIN PSEAKERS REAR L+**

RIGHT REAR SPEAKER	**4270**
– or GND or NEG or COMM or 0	to **MAIN SPEAKERS REAR R–**
+ or HOT or POS or 1	to **MAIN SPEAKERS REAR R+**

CAUTION: When using the 4270 in the 70 W x 2 mode, do not use 4 Ohm speakers – use 8 Ohms or higher.

3. Using shielded audio cables with phono plugs, connect your record player to the 4270 as follows:

RECORD PLAYER	**4270**
LEFT OUTPUT	to **PHONO L**
RIGHT OUTPUT	to **PHONO R**

4. If a discrete 4-channel playback device (Q-8 cartridge player, 4-channel reel-to-reel player, CD-4 discrete disc demodulator, etc.), is to be engaged in the system, make connections between the device and the 4270 using shielded audio cables with phono plugs.

DISCRETE 4-CHANNEL PLAYBACK DEVICE	**4270**
LEFT-FRONT or LF or CHANNEL 1 or TRACK 1	to **FRONT CD-4/AUX L**
LEFT-REAR or LR or CHANNEL 2 or TRACK 2	to **REAR CD-4/AUX L**
RIGHT-FRONT or RF or CHANNEL 3 or TRACK 3	to **FRONT CD-4/AUX R**
RIGHT-REAR or RR or CHANNEL 4 or TRACK 4	to **REAR CD-4/AUX R**

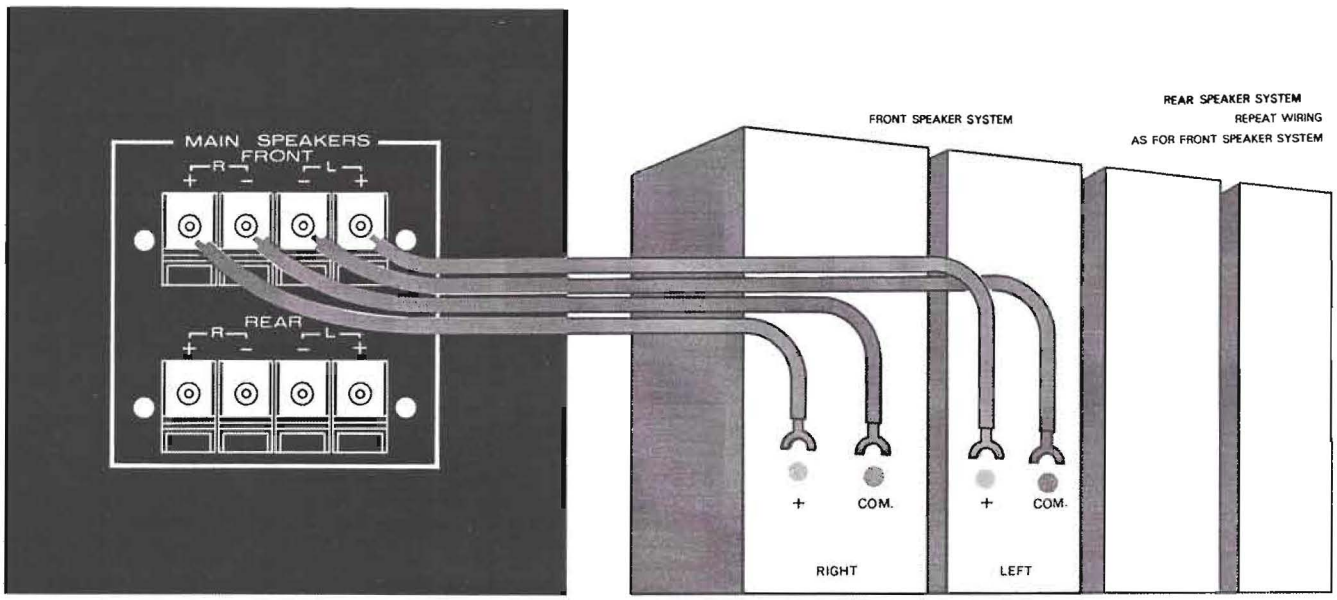

Figure 2. Loudspeaker System Connections

5. Using shielded audio cables with phono plugs, connect a discrete 4-channel tape recorder to the 4270 as follows:

DISCRETE 4-CHANNEL TAPE RECORDER	**4270**
LEFT-FRONT OUTPUT or LINE OUT	to **FRONT TAPE MONITOR IN L**
LEFT-REAR OUTPUT or LINE OUT	to **REAR TAPE MONITOR IN L**
RIGHT-FRONT OUTPUT or LINE OUT	to **FRONT TAPE MONITOR IN R**
RIGHT-REAR OUTPUT or LINE OUT	to **REAR TAPE MONITOR IN R**
LEFT-FRONT INPUT or LINE IN	to **FRONT TAPE MONITOR OUT L**
LEFT-REAR INPUT to LINE IN	to **REAR TAPE MONITOR OUT L**
RIGHT-FRONT INPUT or LINE IN	to **FRONT TAPE MONITOR OUT R**
RIGHT-REAR INPUT or LINE IN	to **REAR TAPE MONITOR OUT R**

6. Pull the AM ferrite-rod antenna out as shown in Figure 12.

7. Set the controls and switches as follows:

FRONT L-R BALANCE	Mid position
REAR L-R BALANCE	Mid position
FRONT-REAR BALANCE	Mid position
MODE	**VARI-MATRIX**
DIMENSION	Mid position
BASS and **TREBLE** Controls	Mid position
VOLUME	Minimum (fully counter-clockwise)
MAIN SPKR	ON (in)
REMOTE SPKR	OFF (out)
FM MUTING	ON (in)
MONITOR (TAPE/SOURCE)	**SOURCE** (out)
HI FILTER	OFF (out)
LOUDNESS	OFF (out)
DOLBY	**OFF**
400Hz TONE	OFF (out)
POWER	OFF (out)

8. Plug the 4270 into the AC wall outlet.

9. Turn the **POWER** Switch ON.

10. Select the desired program source by setting the **SELECTOR** Switch to appropriate position.

11. If phono is selected, put on a stereo record. If FM is selected, tune to a stereo broadcast.

12. Increase the **VOLUME** control to a comfortable listening level.

Your complete 4-channel or stereo system is now operative, and you may experiment with the various controls to discover their effects.

The remainder of this manual explains how to use your system most effectively.

SOURCE DEVICES

2-channel

A stereo record player may be connected to the **PHONO** jacks.
High level 2-channel playback devices (tuner, tape player, record player with equalized high level output, etc.) may be connected to the **FRONT TAPE MONITOR** and **CD-4/AUX INPUTS.**

4-channel

Discrete 4-channel playback devices (Q-8 cartridge player, 4-channel reel-to-reel player, CD-4 discrete disc demodulator, etc.) may be connected to the **CD-4/AUX, TAPE MONITOR 1** or **TAPE MONITOR 2** input jacks.

REMOTE SPEAKERS

The 4270 can accommodate both main and remote speaker systems. A second group of four speakers may be set up in another room. Connect these four remote speakers to the **REMOTE SPEAKERS** terminals as you did the main speakers.
The **MAIN** and **REMOTE SPKR** Switches on the front panel now permit activation of MAIN and/or REMOTE groups of loudspeakers.

NOTE: Do not use 4-Ohm speakers if main and remote speakers are to be used simultaneously. Use 8- or 16-Ohm speakers only.

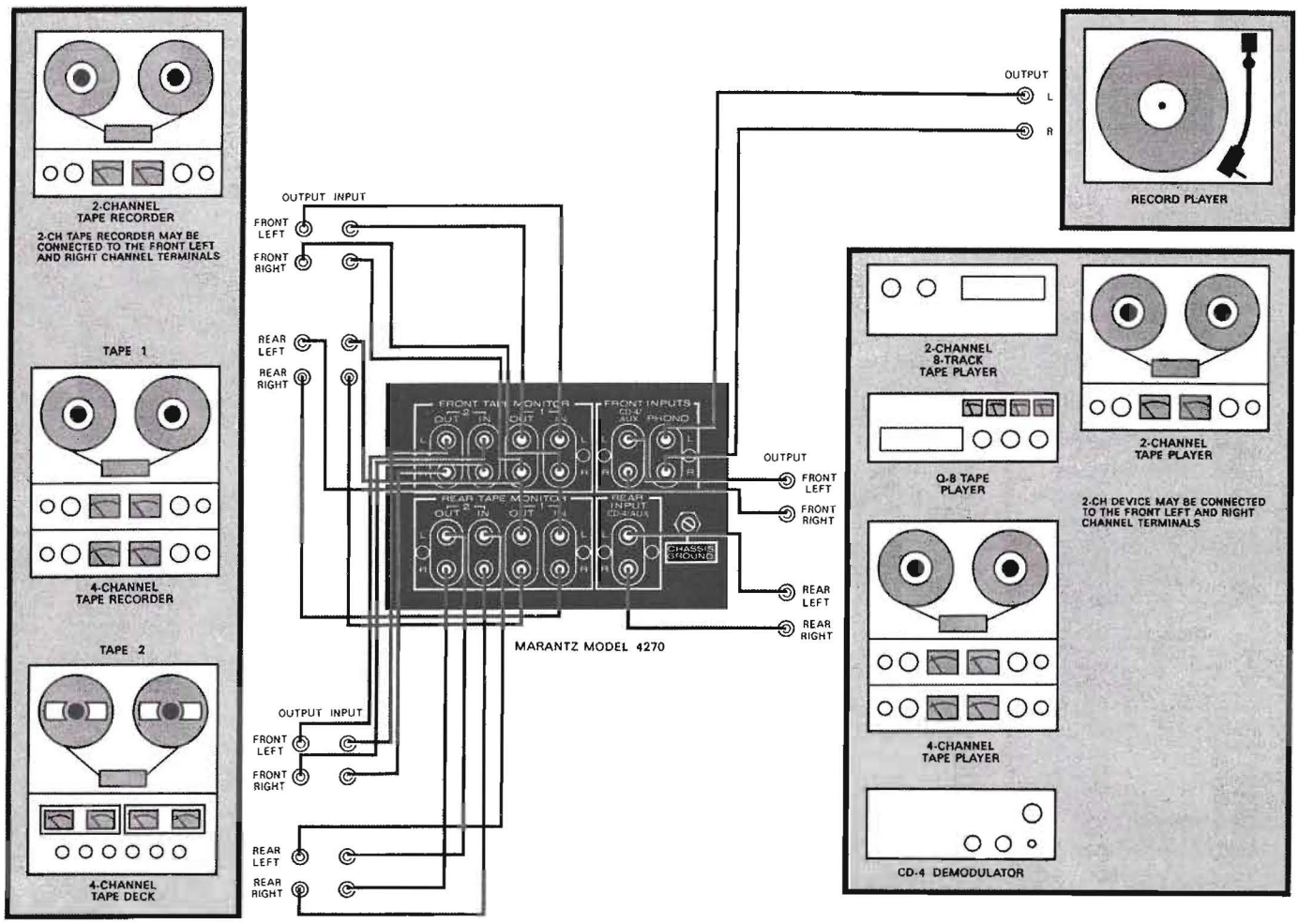

Figure 3. Connection Diagram

SPEAKER PHASING

To assure the best 4-channel or Stereo separation and frequency response, the following tests will verify that all four speakers are correctly phased.

1. After the speakers are connected to the 4270, place all four speakers in the center of the room.

2. Set **MODE** Switch at **MONO**. Play a record (or radio or tape) with strong bass tones, at a low volume level. Center the **FRONT L-R** and **REAR L-R BALANCE** controls. Set **FRONT-REAR BALANCE** control at extreme **FRONT** position.

3. Position the front (left and right) speakers about six inches apart, face-to-face. Listen, particularly to the apparent loudness of the bass tones.

4. Next, turn off all power, but do not disturb the volume, tone or balance settings. Reverse connections on the right-front speaker only. Turn on the power, and listen again. If the bass tones now seem louder than in (3), you have corrected the phasing between the front (left and right) speakers. If the bass tones now sound softer, then turn off all power and re-connect the right-front speaker as you first had it connected.

5. Now check phasing between the two left (front and rear) speakers. Set both **FRONT L-R** and **REAR L-R BALANCE** controls at extreme **L** position, and set **FRONT-REAR BALANCE** for equal loudness from the two speakers. Position the two speakers face-to-face, about six inches apart, and listen for bass as in (3).

6. Turn off power. Experimentally reverse connections only on the left-rear speaker. Use the connection which gives the "best" bass, as in (4).

7. Last, check phasing between the two rear (left and right) speakers. Center both **FRONT** and **REAR BALANCE** controls. Set **FRONT-REAR BALANCE** control at extreme **REAR** position. Position the two rear speakers face-to-face as before. Listen for bass.

8. Turn off power. Experimentally reverse connections only on the right-rear speaker. Listen again to determine the "best" bass method of connecting the right-rear speaker. All speakers will then be in phase, and you may use all controls normally.

9. Once having phased your four speakers, you need not repeat the procedure in the future if you now code the speaker connections and/or the speaker cables. Any method of coding is satisfactory, provided it enables you, in the future, to duplicate your now-correct hookup between speakers and amplifiers.

SPEAKER PLACEMENT

Experimentation will reveal the best speaker locations in your room. The placements are shown in Figure 4.

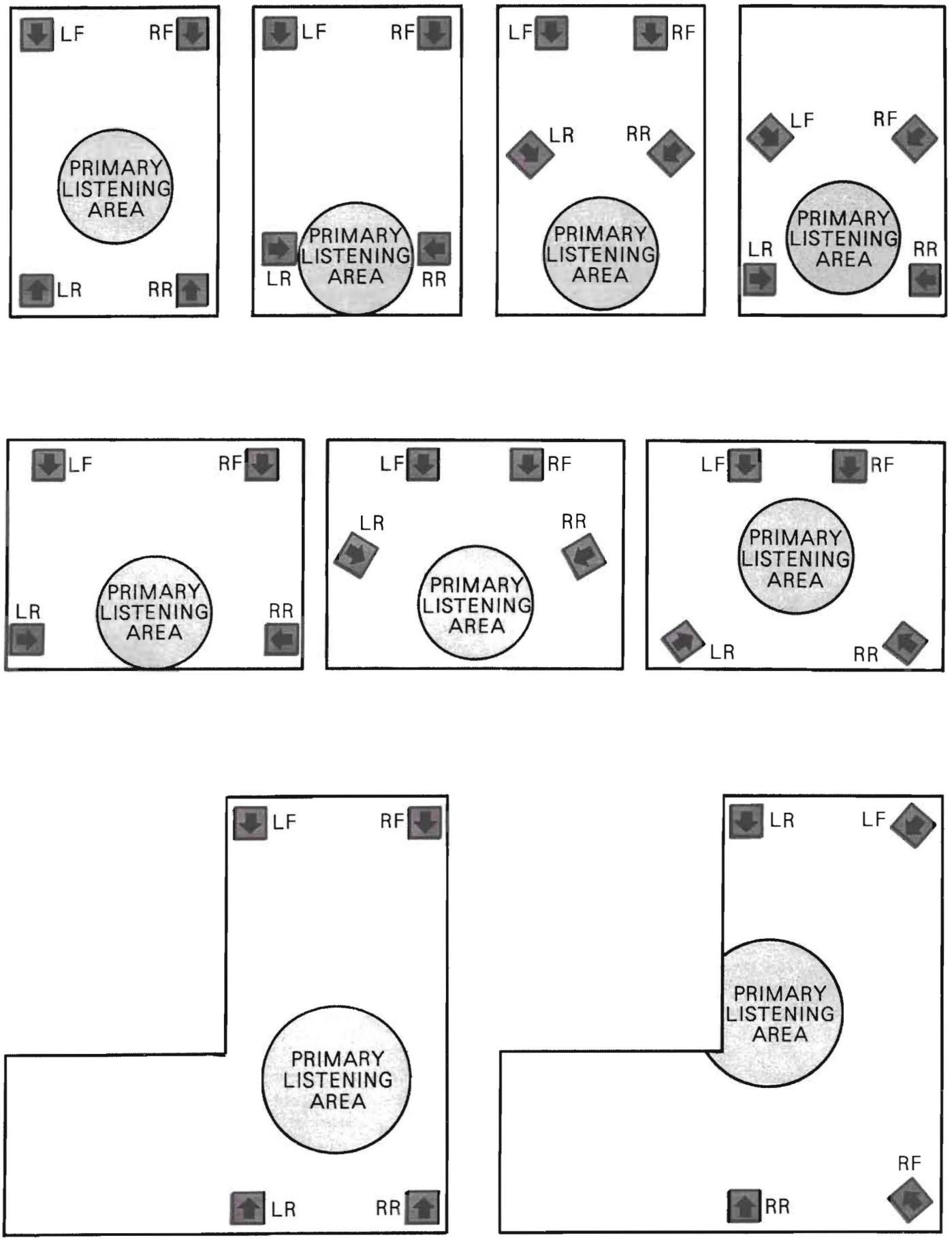

Figure 4. Speaker Placement

FRONT PANEL FEATURES

MODE SWITCH

MONO

When the **MODE** Switch is in the **MONO** position, all input signals are summed. Speakers are driven as shown in Figure 5.

Use the **MONO** position for A) phasing speakers and B) playing a monaural source such as TV audio, AM radio or monaural records through all four channels.

2 CH

When the **MODE** Switch is in the **2 CH** position, left-front and left-rear inputs are summed. Right-front and right-rear inputs are summed. Speakers are driven as shown in Figure 6.

Use the **2 CH** position for playing regular stereo records without synthesizing rear channels.

DISCRETE

When the **MODE** Switch is in the **DISCRETE** position, each input signal goes to its respective output channel. Speakers are driven as shown in Figure 7.

Use the **DISCRETE** position for A) playing discrete 4-channel sources such as Q-8 cartridges or CD-4 records, and B) playing 2-channel stereo programs through front speakers only.

VARI-MATRIX

When the **MODE** Switch is in the **VARI-MATRIX** position, rear input signals are internally disconnected. Left-front and right-front inputs feed left-front and right-front speakers, as in the DISCRETE MODE. Rear channel signals are "synthesized" or derived from the left-front and right-front input signals. The characteristics of the rear channel signals are varied by the **DIMENSION** control. Speakers are driven as shown in Figure 8.

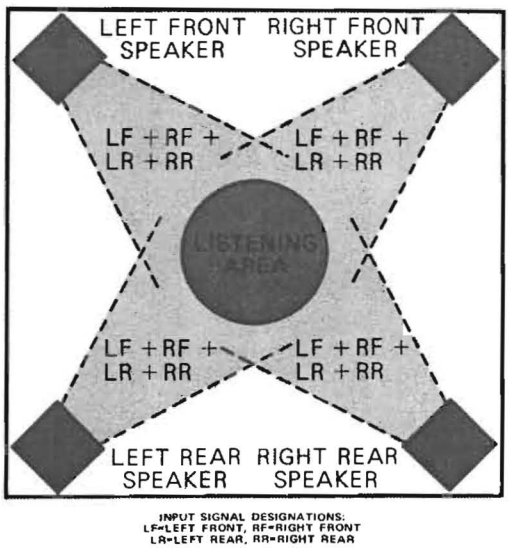

Figure 5. Mono Mode Sound Dispersion

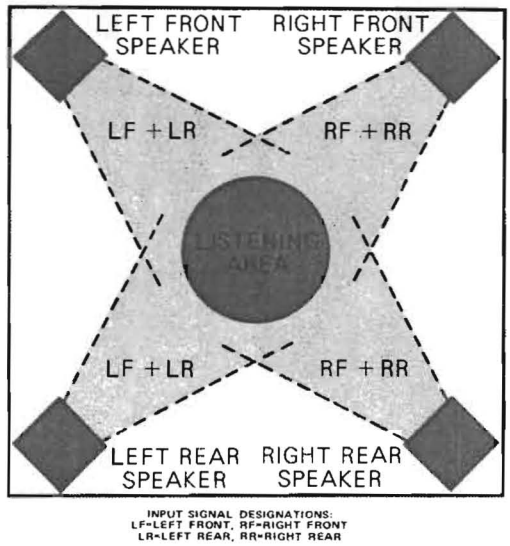

Figure 6. 2-channel Mode Sound Dispersion

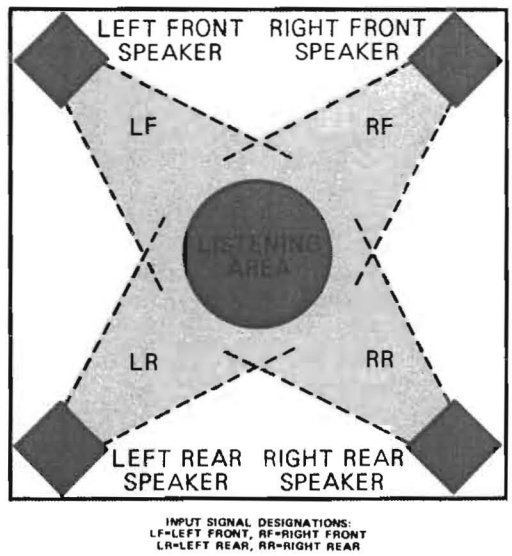

Figure 7. Discrete Mode Sound Dispersion

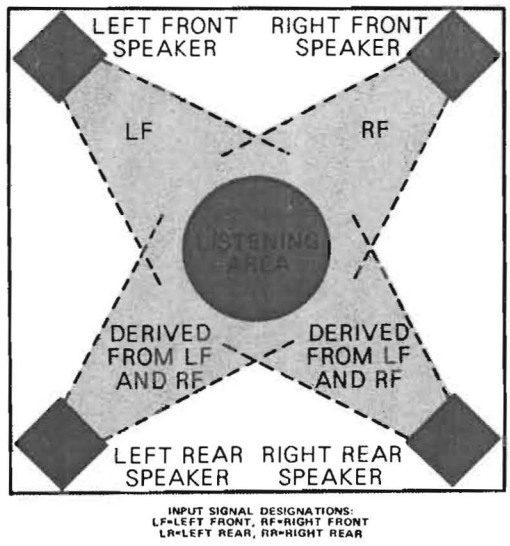

Figure 8. Vari-Matrix Mode Sound Dispersion

Figure 9. Front Panel Controls and Jacks

DIMENSION

The **DIMENSION** control is operative only when the **MODE** Switch is set to the **VARI-MATRIX** position. This control optimizes the 4-channel VARI-MATRIX effect.

SQ DECODER

With the **MODE** Switch on **SQ DECODER**, any rear input signals to the 4270 are internally disconnected. The rear channel outputs are, instead, derived from front channel signals which have been processed by the plug-in decoder. The characteristics of these derived rear channel outputs are determined by the type of plug-in decoder.
Use **SQ DECODER** position only with an optional plug-in decoder installed. Without this optional decoder, there will be no output when the **MODE** Switch is set to the **SQ DECODER** position.

BALANCE CONTROLS

The Model 4270 has three **BALANCE** controls: **FRONT L-R, REAR L-R** and **FRONT-REAR**. The **FRONT L-R** slide knob adjusts the balance between the front channels. The **REAR L-R** slide knob adjusts the balance between the rear channels. The **FRONT-REAR** slide knob adjusts the balance between the rear and front pairs of channels. Balance adjustments must be carried out in the MONO mode. To balance the front channels, first set the **FRONT-REAR** control all the way to the **FRONT** to silence the rear speakers while you adjust the **FRONT L-R BALANCE** control. To balance the rear channels, move the **FRONT-REAR** control all the way to **REAR**, and then adjust **REAR L-R BALANCE**. Now you are ready to adjust the **FRONT-REAR** control for the most pleasing overall balance.

SELECTOR SWITCH

The **SELECTOR** Switch selects the program source for listening or recording. The switch can select any of six sources: **AM, FM, PHONO, CD-4/AUX**, TAPE **1** and TAPE **2.**

BASS, MID AND TREBLE CONTROLS

These controls are used to adjust the tonal balance of program material to suit your individual listening preference. The bass, midrange and treble responses are adjusted by dual-concentric, friction-coupled controls. With **BASS, MID** and **TREBLE** controls set at the center position, frequency response of the amplifier becomes flat.

The smaller (outer) knob adjusts the response of the front audio channels, while the larger (inner) knob adjusts the rear audio channels.

Turn the knobs clockwise to boost, or counterclockwise to attenuate its respective frequency range.

MONITOR SWITCH FOR TAPE 1/TAPE 2

This switch assigns the **TAPE/SOURCE MONITOR** Switch to either **TAPE 1** or **TAPE 2.**

MONITOR SWITCH FOR TAPE/SOURCE

When the **MONITOR (TAPE/SOURCE)** Switch is placed in **"TAPE"** (in) position, the signals connected to the tape input jacks (as selected by the **MONITOR TAPE 1, 2** Switch) will be played back.

To play the tape recorder connected to the **TAPE MONITOR 1** or **TAPE MONITOR 2** jacks,

or to monitor the tape on a three-head recorder during recording, place the **MONITOR (TAPE/SOURCE)** pushswitch in the **"TAPE"** (in) position.
During recording, the **MODE** Switch should be in the **DISCRETE, VARI-MATRIX** or **SQ DECODER** positions. This applies the source signal, unchanged, directly to the tape outputs.

To record a discrete 4-channel source on a 2-channel recorder, put the **MODE** Switch in the **2 CH** position. Leave the **TAPE/SOURCE** button in the **SOURCE** (out) position while recording. This will feed the sum of the left-front and left-rear inputs to the left-front **TAPE MONITOR OUT** jack, and the sum of the right-front and right-rear inputs to the right-front **TAPE MONITOR OUT** jack.

To record any type of source on a monaural recorder, put the **MODE** Switch in the **MONO** position. Leave the **TAPE/SOURCE** button in the **SOURCE** (out) position while recording.

MAIN AND REMOTE SPKR SWITCHES

These switches select the loudspeaker terminals to which audio power is fed. The MAIN and REMOTE groups of loudspeakers may be operated separately or simultaneously. With both speaker switches in the "out" position, all loudspeakers are disconnected. The signal at the **FRONT** and **REAR PHONES** jacks is not affected by the **MAIN** and **REMOTE SPKR** Switches.

NOTE: When using both MAIN and REMOTE speakers simultaneously, the combined impedance of all the speakers should not be less than 4 Ohms.

POWER SWITCH

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

FRONT AND REAR PHONES JACKS

These jacks accept a standard 3-conductor phone plug employed with standard stereo or 4-channel headphones. When using 2-channel headphones, insert the plug into the **FRONT PHONES** jack. When using 4-channel headphones, insert the front plug into the **FRONT PHONES** jack and the rear plug into the **REAR PHONES** jack. Either high- or low-impedance headphones may be used.

LOUDNESS

When listening at low levels, set this switch "in". The **LOUDNESS** Switch boosts bass and treble tones to compensate for the human ear's lack of response to those frequencies at low volume levels.

HI FILTER SWITCH

With this pushswitch set "in", the High Frequency Filter suppresses high frequency noise, such as "scratch" from worn phonograph records and tape "hiss". The filter will also slightly reduce high frequencies in the program material. When the program does not have high frequency noise, the **HI FILTER** pushswitch should be "out".

TUNING METER

The Model 4270 is equipped with two meters, a **SIGNAL-STRENGTH** Meter and an **FM TUNING** Meter. The **SIGNAL-STRENGTH** Meter indicates the signal-strength of any AM or FM broadcast. The **FM TUNING** Meter operates on FM only and indicates correct station tuning. The **SIGNAL-STRENGTH** Meter acts as a Dolby Calibration Meter when the **DOLBY** Switch is in any position other than **"OFF"**.

TUNING

AM: For optimum AM reception, tune to the desired station. Then, rock the **TUNING** knob slightly back and forth until the maximum reading is obtained on the **SIGNAL-STRENGTH** Meter. The **FM TUNING** Meter is not used for AM.
FM: Set the **SELECTOR** Switch to **"FM"** and tune to the desired station. Then, slowly rock the **TUNING** knob back and forth until the **FM TUNING** Meter points to the center scale position.

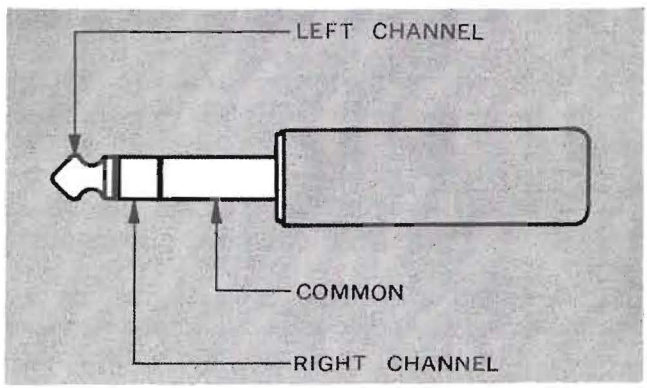

Figure 10. Stereophone Plug

FM MUTING SWITCH

When tuning to FM broadcasts with the **FM MUTING** Switch in its "in" position, the muting circuit will eliminate inter-station noise. To prevent muting of very weak stations along with the noise, the muting function may be turned off by releasing the **FM MUTING** pushswitch to the "out" position.

VOLUME

This control regulates volume of all four channels simultaneously.

DOLBY SWITCH

This switch sets the Dolby noise-reduction circuit for record or playback and also switches the Meter Mode from AM or FM SIGNAL-STRENGTH to DOLBY CAL LEVEL, or vice-versa. With the **DOLBY** Switch placed in **"OFF"** position, the Meter will be used as a **SIGNAL-STRENGTH** Meter; in all other positions, as a **DOLBY CAL LEVEL METER.**

DOLBY FM: This position is used for listening to Dolbyized FM broadcasts. The Dolby FM level has been pre-adjusted at the factory.

PLAY: This position is used to play back a Dolbyized source (except FM).

OFF: With this position, the Dolby circuit is by-passed and the input signals are directly applied to both **TAPE MONITOR OUT** jacks and amplifiers.

RECORD I: For making a Dolbyized recording from an in-coming "flat" (non-Dolbyized) signal. When the **MONITOR** Switch is in the **SOURCE** (out) position, the "flat" signal will be heard. When the **MONITOR** Switch is in the **TAPE** (in) position, the Dolbyized signal from the tape will be heard.

RECORD II: For making a "flat" (non-Dolbyized) recording from an in-coming Dolbyized signal. Regardless of the position of the **MONITOR** Switch, a "flat" signal will be heard.
Refer to the Dolby Mode Chart on page 16.

RECORD LEVEL (L) (R)

These knobs control the record level of the signals to be recorded through the Dolby unit. Adjust the knobs so that the Level Meter pointers of the tape recorder do not exceed the 0VU level.

PLAY CAL. (L) (R)

These knobs adjust the playback outputs from a tape deck to the proper Dolby level.

400Hz TONE SWITCH

This is used for calibration of the record input level of the tape deck. When the switch is depressed, the built-in oscillator operates and a sine wave signal output of 580mV will be applied to the four **TAPE MONITOR OUT** jacks.

REAR PANEL FEATURES

PHONO JACKS

These two jacks are intended for use with magnetic cartridges requiring a standard 47,000 Ohm resistive load. If a hum is heard when playing a record, try reversing the polarity of the turntable power plug. If this is ineffective, connect a separate ground wire from the turntable or record changer to the **CHASSIS GROUND** binding post of the 4270.

CD-4/AUX JACKS

These jacks are for connection of any 4-channel high level equipment source. Manufacturers may use different terminology for the four channels, and care should be exercised to avoid confusing the signal channel terminations. The following are examples of 4-channel nomenclature equivalents:

LEFT FRONT	LF–LF–CHANNEL – 1	TRACK 1
LEFT REAR	LR–LB–CHANNEL – 2	TRACK 2
RIGHT FRONT	RF–RF–CHANNEL – 3	TRACK 3
RIGHT REAR	RR–RB–CHANNEL – 4	TRACK 4

TAPE MONITOR IN AND TAPE MONITOR OUT JACKS

These jacks are for the connection of a 2-channel or 4-channel tape recorder.
(Refer to "SOURCE DEVICES", page 4.)

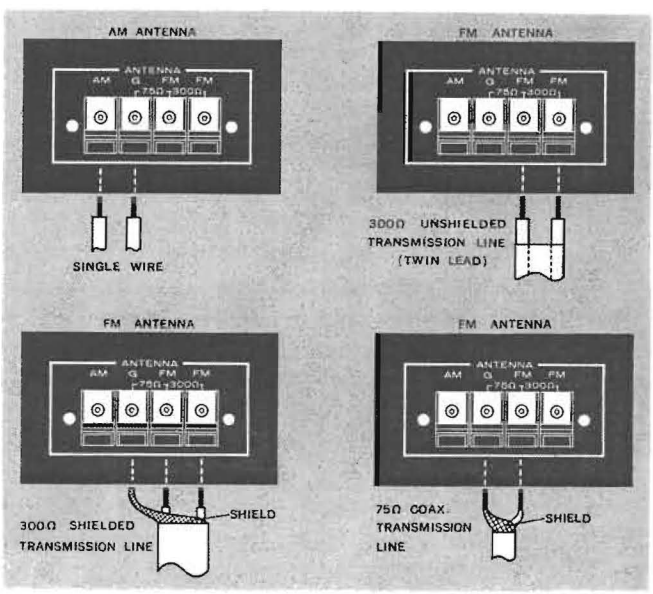

Figure 11. FM/AM Antenna Connections

FM ANTENNA TERMINALS

These terminals connect to an FM antenna. For best FM reception, Marantz recommends a Log-Periodic antenna mounted on a good quality rotor system. For rural areas, it is recommended that a local dealer be consulted about antenna installation and lightning arrestor protection. A master antenna system is not recommended for use with your Model 4270; such systems are usually designed expressly for television reception and frequently suppress FM signals before distribution. In addition, master antenna systems often severely limit quality FM reception. 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 4270. Both are practical and will give satisfactory results in primary signal areas.

Your Model 4270 will accept either a 75 Ohm or 300 Ohm antenna. (See Figure 11.)
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**" terminal, and its inner or center conductor to either of the **FM** terminals.

AM ANTENNA TERMINAL

This terminal connects to an AM antenna. The 4270 is equipped with a ferrite-rod antenna for AM reception and it will give satisfactory results in primary signal areas. However, an outdoor

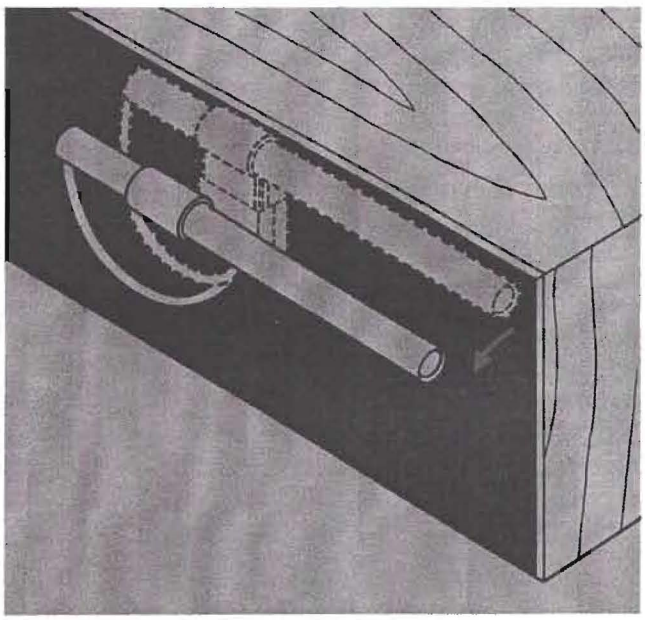

Figure 12. AM Ferrite-rod Antenna

antenna will provide better reception. 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 at a very high position outdoors. Next, connect the other single wire between the "**G**" terminal and an earth ground (such as a water pipe).
(Refer to Figure 11.)

FM QUADRADIAL OUTPUT JACK

In anticipation of discrete 4-channel stereo broadcasts, your Model 4270 is equipped with an **FM QUADRADIAL OUTPUT** jack. The signal available at this jack is the unequalized output of the FM discriminator. It's frequency response characteristics and signal level are ideal to drive any 4-channel adaptor. This jack can also be used as a simple white-noise generator for frequency response check of loudspeakers or amplifiers. For this application, release **FM MUTING** Switch of the Model 4270 in FM mode and tune off from any FM signal.

FM DE-EMPHASIS SWITCH

Selects **75μS** or **25μS FM DE-EMPHASIS** for accurate reception of Dolbyized FM signals.

DOLBY FM PRESET LEVEL CONTROLS

These factory-adjusted controls govern FM output level to the DOLBY circuit. These controls are for the use of a qualified technician only.

MUTING LEVEL CONTROL

Adjusts the threshold of the inter-station muting circuit. Turning this control counter-clockwise will lower the threshold to permit reception of weak signals.

POWER MODE SWITCH

Switches from 25 watts x 4 operation to 70 watts x 2. In the 2-channel mode, only the front speaker terminals are used.

BE CERTAIN THAT THE UNIT'S POWER SWITCH IS OFF BEFORE OPERATING THE POWER MODE SWITCH.

NOTE: When operating the unit in the **70W x 2** mode, all speaker terminals are "above ground". Consequently, the use of any switching or testing system which employs a common ground will activate the limiting circuits and should therefore be avoided.

PRE OUT, MAIN IN JACKS

For normal operation, these jacks are interconnected with the supplied jumpers. When connecting an external unit (equalizer, reverberation unit, etc.), remove the jumpers and connect the **PRE OUT** jacks to the external unit's inputs. In turn, connect the external unit's outputs to the **MAIN IN** jacks.

It is possible to create a higher powered 4-channel system by adding an external amplifier. If the external amplifier has less than 70 watts x 2, it should be used to drive the rear speakers. If the external amplifier has more than 70 watts x 2, it should be used to drive the front speakers. In each case, the rear panel **POWER MODE** Switch should be set to the **70Wx2** position.

CONNECTING AN EXTERNAL AMPLIFIER FOR REAR CHANNELS

To use an external amplifier for the rear channels, connect the **REAR PRE OUT** jacks to the inputs of the external amplifier. In turn, connect the rear speakers to the output terminals on the external amplifier. The 4270 will then supply the power for the front speakers and the external amplifier will supply the power for the rear speakers.

CONNECTING AN EXTERNAL AMPLIFIER FOR FRONT CHANNELS

To use an external amplifier for the front channels, connect the **REAR PRE OUT** jacks to the **FRONT MAIN IN** jacks. Connect the rear speakers to the **FRONT** speaker terminals on the 4270.

Then, connect the **FRONT PRE OUT** jacks to the inputs of the external amplifier. In turn, connect the front speakers to the output terminals on the external amplifier. The 4270 will then supply the power for the rear speakers and the external amplifier will supply the power for the front speakers.

CHASSIS GROUND BINDING POST

Permits connection of the ground wire from a turntable or other component to reduce hum.

MAIN AND REMOTE SPEAKERS

Sixteen quick-connect terminals are provided — eight for main speakers and eight for remote speakers. (Refer to "CONNECTING THE 4270" and "REMOTE SPEAKERS".)

Terminals work as shown in Figure 13.
1) Press terminal in
2) Insert speaker wire
3) Release terminal

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 4270 INTO A DC OUTLET, AS SERIOUS DAMAGE WILL OCCUR.

AC CONVENIENCE OUTLETS

Two AC outlets, one switched and one unswitched, are provided on the rear panel to supply power to associated components of the system (tape recorder, record player, etc.). The maximum power available from the **SWITCHED** and **UNSWITCHED AC OUTLETS** is 100 Watts and 200 Watts, respectively.

REMOTE CONTROL

The **REMOTE CONTROL** connector and switch are intended for use only with the optional Model RC-4 Remote Control. The **REMOTE CONTROL** Switch assigns control of loudness, balance and volume to the optional RC-4 Remote Control. **WHEN THE RC-4 IS NOT USED, THE REMOTE CONTROL SWITCH MUST BE IN THE LOCAL POSITION.**

EXTERNAL DECODER CONNECTION

A pocket on the bottom of the chassis will accommodate Marantz 4-channel decoders, such as the Model SQA-1. For use, follow the instructions supplied with the optional decoder.

TAPE RECORDING

Instructions for connecting a recorder and playing back a tape are given in "SOURCE DEVICES", page 4.

To record, select the desired program source, using the **SELECTOR** Switch. Put the recorder connected to the **TAPE MONITOR OUT** jacks "**1** or **2**" in the record mode.

For additional information, refer to MODE SWITCH on page 7, and MONITOR SWITCH on page 8.

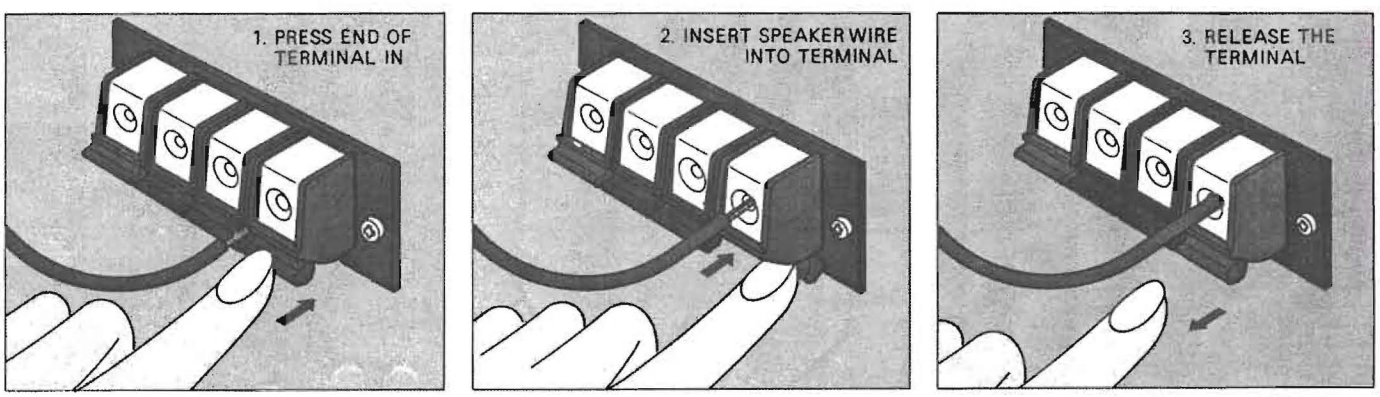

Figure 13. Quick-Connect Speaker Terminal

BASIC DOLBY PROCESS

The Dolby system increases the level of low-level, mid- and high-frequency signals during recording and reduces the level of these signals by an identical amount during playback. As a result, the playback signal is identical to the original source signal, but the level of background noise generated by the tape recorder is greatly reduced. A Dolbyized FM broadcast has already been subjected to the first phase of the noise reduction process before it is transmitted. When these signals pass through the Dolby playback circuitry, the mid- and high-frequency noise, is greatly reduced.

DOLBY CALIBRATION

The purpose of the following adjustments is to achieve the proper Dolby levels by calibrating the recording and playback signals being applied to the Dolby processors to a standardized level of 580mV.

The Model 4270 is capable of processing Dolby signals from sources other than a tape recorder (AUX, PHONO, FM, ETC.).

NOTE: It is possible to use the Dolby system for recording and playing back tapes through your system without using a standard alignment tape.

Procedures for making your own Dolby Alignment Tape are as follows:

1. Thread a blank tape onto your recorder (or insert a cassette).
2. Set the **400Hz TONE** Switch to the "ON" (in) position.
3. Set your recorder's monitor switch to the source position.
4. Set your recorder's record levels to 0 VU.
5. Commence recording. Record about 45 seconds of the tone. This tape you have just made is used to calibrate the Marantz Dolby circuit with the recorder.

However, a Dolby recording made on your recorder using the calibrated tape you have just made may not necessarily be compatible with the Dolby circuits in a different recorder or systems. Therefore, for universal compatibility, Marantz offers a Dolby standard alignment tape which will make all of your Dolby recordings universal with any other Dolby system. These tapes are available in the standard reel-to-reel, cassette and 8-Track formats. If you desire one of these tapes, enclose a check or money order for $4.95 for each tape desired (California residents add 5% sales tax). Be sure to specify which format is desired. Mail to:

MARANTZ NATIONAL PARTS
P. O. Box 99
Sun Valley, California 91352

NOTE: The Dolby system can be used with most types of tape recorders. However, it cannot be used with a recorder utilizing Automatic Recording Level system (ALC).

PROCEDURE FOR PLAYBACK CALIBRATION

1. Turn on the Model 4270 and your recorder.
2. Set the **DOLBY** function switch on the Model 4270 to the **PLAY** position.
3. If your recorder has a SOURCE/TAPE (MONITOR) Switch, set it to "TAPE".
4. Load the Dolby standard alignment tape.
5. Play the Tape.
6. If your recorder does not have output level controls, proceed to step 9.
7. When your recorder has output level controls and the meters on the recorder read playback level, adjust the controls until the meters read "0VU". Then proceed to step 9.
8. If neither 6 nor 7 apply to your recorder, set the output level controls to about 2/3 of full output.
9. Adjust the **PLAY CAL** controls (left and right) on the 4270 to the **DOLBY LEVEL** reference on the **SIGNAL-STRENGTH** Meter. To adjust the left **PLAY CAL** control, place the **METER** Switch to the "OUT" position. To adjust the right **PLAY CAL** control, place the **METER** Switch to the "IN" position.
10. You have now properly calibrated the Dolby Playback Level. From this point on, do not change your recorder's output level controls or the Model 4270's **PLAY CAL** controls.

Since the calibration is extremely stable and should not have to be repeated (except to periodically check it), we suggest that you mark the settings of your recorder's output level controls with a felt-tipped pen. Doing so will enable you to easily reset the controls if they are inadvertantly moved.

PROCEDURE FOR RECORD CALIBRATION

Before proceeding with the record calibration, be certain that the playback adjustments have been performed. **DO NOT CHANGE THE POSITIONS OF THE RECORDER'S PLAYBACK LEVEL CONTROLS (if any) OR THE 4270's PLAY CAL CONTROLS.**

In the event a record calibration is performed by the use of **TAPE MONITOR 1 IN** and **OUT** Jacks of Model 4270, shift the **SELECTOR** switch to **TAPE 2** after turning on a **400Hz TONE** knob. On the other hand, when the record calibration is conducted by the use of **TAPE MONITOR 2 IN** and **OUT** Jacks, shift the **SELECTOR** switch to **TAPE 1.** Home-position the **SELECTOR** switch after the calibration.

For Recorders with Three Heads

1. Thread a blank tape onto your recorder (or insert a cassette).
2. Put the 4270's **DOLBY** Switch in the **"PLAY"** position.
3. Put both the 4270's and the recorder's monitor switches in the "Tape" position.
4. Put the **400Hz TONE** Switch in the "ON" (in) position.
5. Commence recording.
6. Adjust the recorder's record level controls so the tone will deflect the 4270's **SIGNAL-STRENGTH** Meter to the **"DOLBY LEVEL"** mark.

For Recorders with Two Heads

1. Thread a blank tape onto your recorder (or insert a cassette).
2. Put the 4270's **DOLBY** Switch in the **"OFF"** position.
3. Put the **400Hz TONE** Switch in the "ON" (in) position.
4. Commence recording.
5. Adjust the recorder's record level controls to deflect the recorder's meters to 0VU.
6. Record the tone for approximately 15 seconds.
7. Stop the recorder and rewind it to the beginning of the tone recording.
8. Put the 4270's **DOLBY** Switch in the **"PLAY"** position.
9. Put the recorder in the play mode and play back the tape.
10. Note the level reading on the 4270's **SIGNAL-STRENGTH** Meter. To check the left channel level, put the **METER** Switch in the "OUT" position. To check the right channel level, put the **METER** Switch in the "IN" position. The object is to adjust the recorder's record level controls so the playback level achieved indicates **"DOLBY-LEVEL"** on the 4270's **SIGNAL-STRENGTH** Meter.
11. If the Meter indicates **"DOLBY LEVEL"**, calibration is completed.
12. A) If the Meter indication is above the **"DOLBY LEVEL"**, repeat steps 2 – 11, but decrease the record level in step 5 to slightly below 0VU on the recorder's VU Meters.
    B) If the Meter indication is below the **"DOLBY LEVEL"**, repeat steps 2 – 11, but increase the record level in step 5 to slightly above 0VU on the recorder's VU Meters.

For all Recorders

After the **"DOLBY LEVEL"** has been achieved on the **SIGNAL-STRENGTH** Meter, DO NOT change the recorder's input or output level controls or the 4270's **PLAY CAL** controls.

Utilizing the recorder's VU Meters, proper Dolby recording levels are adjustable by using the **RECORD LEVEL** controls on the front panel of the 4270. This only applies when making a Dolby recording.

Setting the level slightly lower than 0VU will increase the Dolby effect.

CHANGING THE RECORDER'S RECORD OR PLAYBACK LEVELS OR THE 4270's PLAY CAL CONTROLS WILL AFFECT THE DOLBY CALIBRATION.

Mark the calibration positions on the recorder's record and playback level controls to avoid the necessity of re-calibrating after making a non-Dolby recording.

IMPORTANT:
It will be necessary to re-calibrate the Dolby levels when a change in tape speed has been made or when a different brand or type of tape is used.

When the Dolby process is not desired on a recording, record in the normal manner – adjusting the record levels with the recorder's record level controls. DO NOT change the 4270's **PLAY CAL** controls.

USE OF THE DOLBY SYSTEM ON FM BROADCASTS

Your Model 4270 is equipped to receive Dolbyized FM broadcasts.

Most FM broadcasts do not currently use the Dolby Noise-Reduction system. To receive these broadcasts, leave the **DOLBY** Switch in the **"OFF"** position. However, if a local station is broadcasting a Dolbyized FM signal, full advantage of the increase in signal-to-noise ratio may be obtained by putting the **DOLBY** Switch in the **"DOLBY FM"** position. The rear panel **DOLBY FM PRESET LEVEL** controls are factory-adjusted. Do not change the position of these controls.

FM DE-EMPHASIS SWITCH

This rear panel switch operates only when the front panel **DOLBY** Switch is in the **"DOLBY FM"** position. It alters the frequency response of the FM signal. Normally, this switch should be left in the **75μS** position. However, if the station is broadcasting the Dolbyized signal using a 25μS pre-emphasis, put this switch in the **"25μS"** position to obtain flat FM frequency response. If in doubt, call the station.

DOLBY MODE CHART

This chart indicates the correct **DOLBY** Switch positions for various types of input material. The input format is indicated in the left column and the appropriate **DOLBY** Switch position, together with **FM DE-EMPHASIS** Switch position, is shown under the appropriate mode of operation.

Operating Mode / Input	De-Emphasis Switch Position	Dolby Switch Position			Notes:
		Listening	Record		
			Without Dolby	With Dolby	
F.M. (Normal)	75μs	"Off"	"Off"	"Record I"	–
F.M. with Dolby 75μs Pre-emphasis	75μs	"Dolby FM"	"Record II"	"Dolby FM"	If there is a doubt regarding the pre-emphasis used on the transmission, the F.M. station should be contacted, where possible, to ensure correct position for de-emphasis switch.
F.M. with Dolby 25μs Pre-emphasis	25μs	"Dolby FM"	"Record II"	"Dolby FM"	
Non Dolbyized sources (Phono, Tape, Aux inputs, A.M.)	–	"Off" "Record I"	"Off"	"Record I"	Pre-recorded tape manufacturers indicate when the material has been recorded in a Dolbyized format. Home recorded tapes should also be clearly marked as to format, to ensure correct play back mode.
Dolbyized sources (derived from "Tape" or "Aux" inputs etc.)	–	"Play" "Record II"	"Record II"	"Play"	
For initial calibration, utilizing the Dolby standard alignment tape, see detailed instructions on Pages 14 thru 16 of this manual.					

Table 1. Dolby Mode Chart

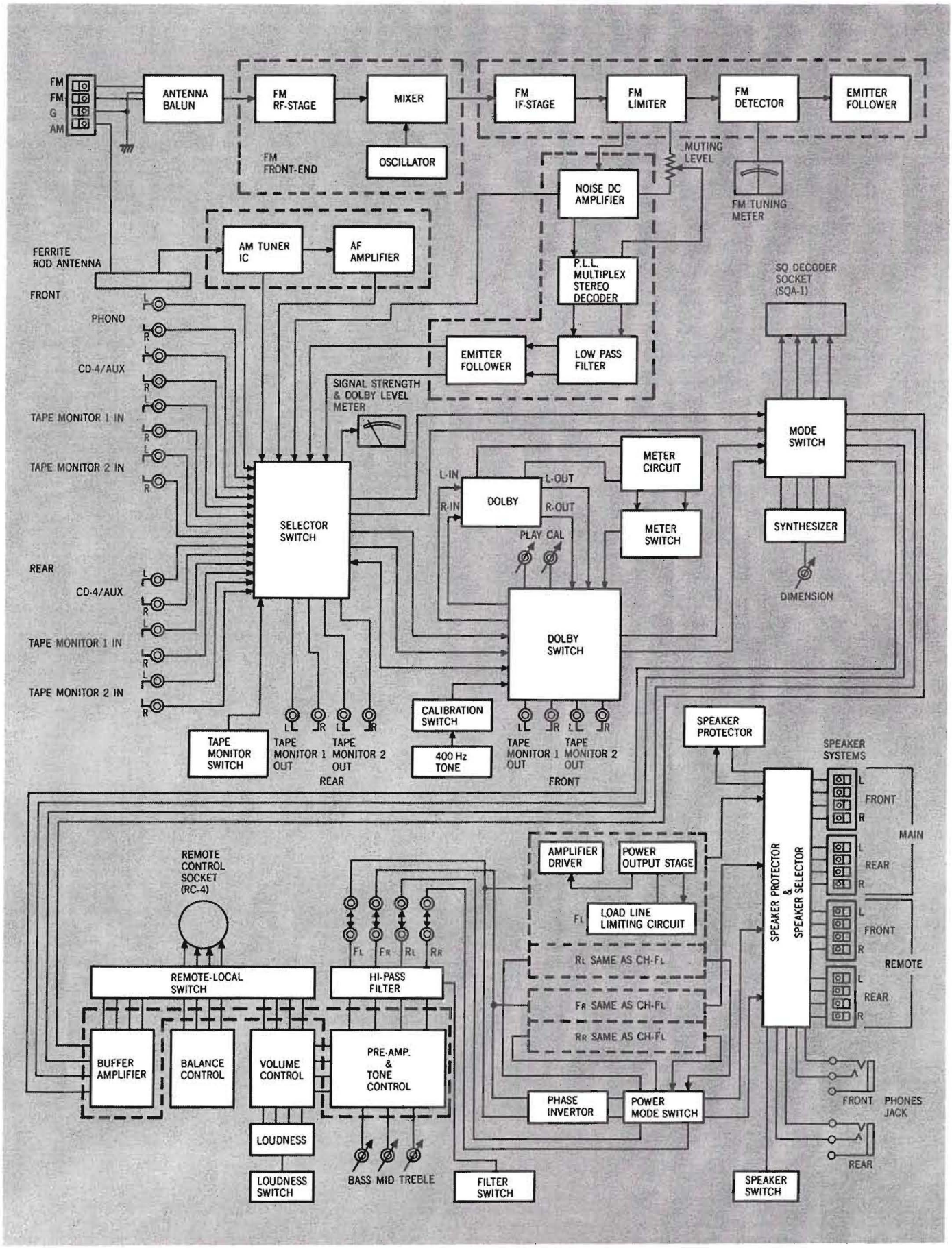

Figure 14. Block Diagram

TECHNICAL DESCRIPTION

GENERAL

Figure 14 is a block diagram of the model 4270 Stereo 2 + Quadradial 4 Receiver showing main functional elements and input and output signal routing.
PHONO INPUT jacks are provided for the front pair of channels.

FUNCTIONAL DESCRIPTION

FRONT END

FM antenna signals are applied through a balun transformer to the antenna coil which drives a field-effect transistor RF amplifier. The signals from the RF amplifier are fed through the double-tuned RF tank circuit to the FET Mixer stage, which is also fed by the signal generated by a local intermediate frequency. Careful attention to its thermal and electrical characteristics has minimized drift, thus obviating the necessity for AFC. The 10.7MHz converted signal is then fed to a phase-linear ceramic IF filter, followed by the limiter. It is then, in turn, processed through an FM discriminator. The output of the FM discriminator is fed to a buffer amplifier which then drives the multiplex demodulator.

IF STAGES

The IF section consists of six transistors and three stages of dual element ceramic filters. The characteristics of these filters are ideal in that the 200KHz passband is phase-linear, with sharp cutoff slopes. This exceptional phase linearity assures the elimination of a major source of high-frequency distortion and a loss of stereo separation. The sharp cutoff slopes provide improved selectivity, permitting reception of closely spaced channels.

LIMITER

The Model 4270 utilizes symmetrical diode limiter circuits consisting of high-performance Gold Bond Hot Carrier type diodes and IF limiter amplifier with a very small dynamic symmetrical aperture, eliminating the need for an AGC circuit which introduces low frequency distortion. Undesirable amplitude Modulation (AM signals, AM noise, AM distortion) are removed from the IF signal within the limiter.

FM STEREO DEMODULATOR

The stereo composite signal obtained from the buffer amplifier is first led to the FET muting circuit; then 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 16KHz 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 the audio amplifier consisting of NPN-PNP direct-coupled transistors and amplified to the required signal level, of about 755mV RMS. Finally, each amplified signal is led to the **SELECTOR** Switch.

The multiplex stereo demodulator circuit consists of a phase locked loop IC and is equipped with a separate automatic Stereo/Monaural switching circuit. The circuit checks 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 insure reception with a high quality signal-to-noise ratio.

MUTING CIRCUIT

In the absence of an FM carrier, all FM receivers produce inherent 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 FET) switching circuit, has been incorporated in the Model 4270. The muting circuit perfectly mutes out all the inter-station noise and also completely mutes out the side slope spurious response of the unit. The circuit has been designed to minimize annoying "pop" noise for velvet smooth tune-in and tune-out.

AM TUNER

The AM tuner portion of the 4270 is composed of one IC circuit (including RF amplifier, local oscillator, mixer, IF amplifier, detector and a signal strength indication amplifier) and one transistor amplifier to amplify the detected audio signals. A three-section variable capacitor improves spurious response ratio.

The ceramic filter utilized in the AM IF amplifier comes with higher selectivity and wide bandwidth for interference-free hi-fi reception.

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
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