

[illegible]

Model 4000
Quadraxial 4
Adapter Pre Amplifier

Handbook of Instructions

marantz[®]

Model 4000
Quadradiat 4
Adapter Pre Amplifier

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

PURCHASER'S RECORD ►

AC Line Operation

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

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.

TABLE OF CONTENTS

Connecting the 4000	2
Speaker Phasing	3
Speaker Placement	5
Balancing Front/Rear	5
Source Devices	5
Tape Recording	6
Front Panel Features	7
Meters	7
Low Filter Switch for Rear Channels	7
Hi Filter Switch for Rear Channels	7
Balance Controls	7
Main and Remote Speaker Switches	8
Input Switch	8
Rear Phones Jack	8
Tape Monitor	8
Mode Switch	8
Mono	8
2 Channel	8
Discrete	9
Vari-Matrix	9
SQ Decoder	9
Dimension Control	9
Master Volume	9
Loudness Switch	9
Power Switch	9
Rear Panel Features	9
Level Switch	9
System Connect Main in Jacks	9
System Connect Front and Rear	9
Output Jack	9
Rear Channel Output Level Controls	10
CD-4/Aux in Jack	10
Scope Out Jack	10
Tape Monitor 2-Ch and 4-Ch Inputs	10
Meter Range Switch	10
Speaker Terminals	10
Power Connection	10
AC Convenience Outlets	10
AC Protector Fuse	11
Remote Control	11
Chassis Ground Binding Post	11
Optional SQ Decoder Connection	11
Technical Description	12
General	12
Input Switch	12
Level (Hi/Low) Switch	12
Monitor (Tape/Source) Switch	12
Mode Switch	13
Buffer Amplifiers	13
Rear Channel Output Level Controls	13

Tone Control Circuit	13
Front Pre-Amp	13
Power Supply	13
Level Meters	13
General Requirements	14
Service Notes	14

LIST OF ILLUSTRATIONS

1. Rear Panel Connection Facilities	2
2. Connection Diagram	4
3. Recommended Speaker Placements	6
4. Mono Mode Sound Dispersion	7
5. 2-CH Mode Sound Dispersion	7
6. Discrete Mode Sound Dispersion	7
7. Vari-Matrix Mode Sound Dispersion	7
8. Front Panel Controls and Jacks	8
9. Quick-Connect Speaker Terminal	10
10. Functional Block Diagram	11
11. Packing Instructions	14

FOREWORD

To obtain optimum performance and enjoyment from the Model 4000, please study these instructions carefully. Installation and operation are not complicated if the step-by-step instructions are followed.

This manual is divided into two parts. The first covers installation and operation in simple, non-technical language. The second describes the Model 4000 in more detail with technical explanations.

For quick identification of the controls and connections, references to them are printed in **BOLD** face type, exactly as they appear on the front and rear panels of the Model 4000. These instructions assume your system includes the Model 4000, a stereo preamplifier, front stereo amplifier, and a rear stereo amplifier.

If your system includes a stereo integrated amplifier and a stereo amplifier for rear channels, or a stereo receiver with separate stereo amplifier for rear channels, procedures are the same. **REFERENCES TO PRE-AMPLIFIER IN THESE CASES ALSO APPLIES TO THE PREAMPLIFIER SECTION OF AN INTEGRATED AMPLIFIER OR RECEIVER.**

GENERAL DESCRIPTION

The Marantz Model 4000 Quadraxial Adaptor converts any stereo system with a tape-source monitor feature to a full-featured 4-channel system. It is specifically designed to complement any existing high quality Marantz component system. The 4000 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 4000 will also reproduce any discrete 4-channel program as well as regular stereo and monaural programs. An optional plug-in decoder adapts the 4000 for specific matrix systems such as Columbia's SQ.

Optional Accessories are:

- SQA-1 Plug-in SQ Decoder with Front-Rear Logic
- SQA-2 Plug-in SQ Decoder with Full Logic
- CD-400 CD-4 Disc Demodulator
- RC-4 Remote Balance and Volume Control
- WC-2 Walnut Cabinet

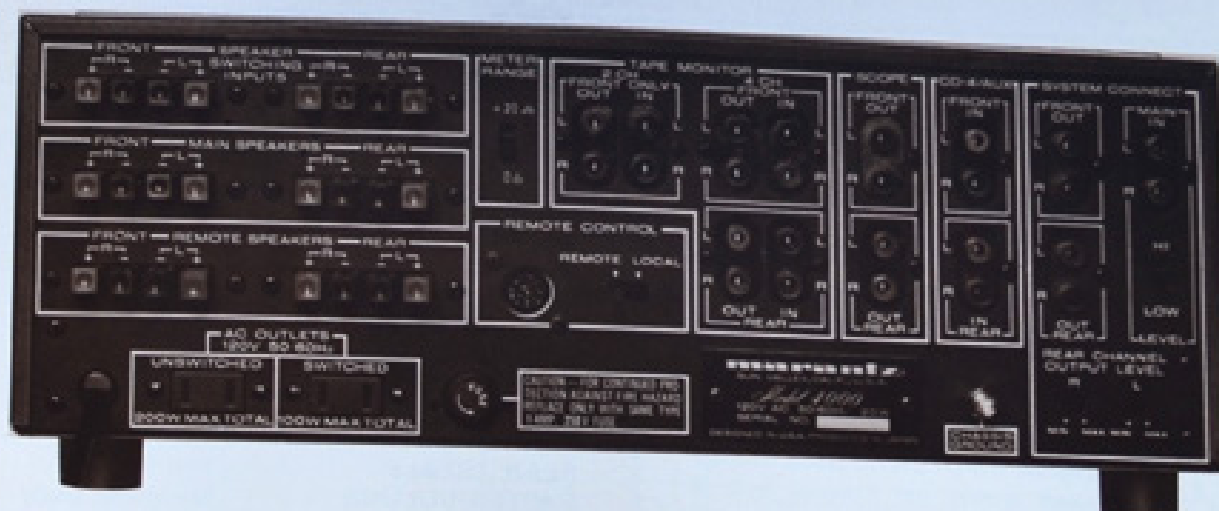


Figure 1. Rear panel Connection Facilities

CONNECTING THE 4000

Refer to Figure 1 for the following connections.

1. Turn the pre-amplifier off and unplug it from the A.C. wall outlet.
2. Remove all cables from the pre-amplifier's tape monitor (tape in and tape out) jacks. If you have a tuner or turntable connected to your pre-amplifier, do not disconnect their cables.

3. Using shielded audio cables with phono plugs, make the following connections:

PRE-AMPLIFIER	4000
TAPE OUT (LEFT) to	SYSTEM CONNECT MAIN IN L
TAPE OUT (RIGHT) to	SYSTEM CONNECT MAIN IN R
TAPE IN (LEFT) to	SYSTEM CONNECT FRONT OUT L
TAPE IN (RIGHT) to	SYSTEM CONNECT FRONT OUT R

4. **STEREO REAR CHANNEL AMPLIFIER**

Using shielded audio cables with phono plugs, make the following connections:

REAR AMPLIFIER input (LEFT) to	SYSTEM CONNECT REAR OUTPUT L
REAR AMPLIFIER input (RIGHT) to	SYSTEM CONNECT REAR OUTPUT R

5. When connecting speakers, it is important to observe correct relative phasing (polarity).

Standard lamp cord (zip cord) and most other types have some form of coding on the insulated wire (e.g., a ridge or groove on one edge, or one of the wires may be tin-coated while the other is copper). Coded wires will help to insure identical connections and the proper polarity of each channel. Using No. 18 gauge or heavier lamp cord (zip cord), make the following speaker output connections:

FRONT STEREO AMPLIFIER

4000 SPEAKER SWITCHING INPUTS

FRONT L OUTPUT

NEG (or— or GND or COMM or 0) to	FRONT L—
POS (or + or HOT or 1) to	FRONT L+

FRONT R OUTPUT

NEG (or— or GND or COMM or 0) to	FRONT R—
POS (or + or HOT or 2) to	FRONT R+

REAR STEREO AMPLIFIER

4000 SPEAKER SWITCHING INPUTS

REAR L OUTPUT

NEG (or— or GND or COMM or 0) to	REAR L—
POS (or + or HOT or 1) to	REAR L+

REAR R OUTPUT

NEG (or— or GND or COMM or 0) to	REAR R—
POS (or + or HOT or 2) to	REAR R+

6. Next, connect your loudspeakers as follows:
Main front and rear speakers to the 4000's

MAIN SPEAKER outputs. Remote (if any) front and rear speakers to the Model 4000's **REMOTE SPEAKER** outputs.

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

CAUTION:

Because the speaker switching system employs a "common ground" between L and R Channels, the use of any amplifier which cannot be common grounded **MUST** be avoided.

NOTE: The power rating of the **SPEAKER SWITCHING INPUTS** is 60 Watts average continuous power per channel into 8 Ohms. Due to the high "peak to average" ratio of most music programs, this rating is satisfactory for music program operation with power amplifiers rated up to 250 Watts per channel into 8 Ohms.

USE OF AMPLIFIERS DELIVERING MORE THAN 250 WATTS PER CHANNEL INTO 8 OHMS

When extremely high powered amplifiers are used, it is necessary to bypass the Model 4000's **MAIN** and **REMOTE** switching systems by connecting the speakers directly to the speaker output terminals of the front and rear stereo amplifiers. When the speakers are connected directly to the power amplifier, the meters on the Model 4000 will not operate.

To operate the meters, it is necessary to connect another lead from each of the amplifier speaker outputs to the appropriate **SPEAKER SWITCHING INPUT** terminals on the Model 4000, as shown in Figure 2. The speakers will now be directly driven by the amplifiers and the meters on the Model 4000 will function.

7. Set the controls as follows:

PRE-AMPLIFIER'S CONTROLS	POSITION
VOLUME	Mid (12 o'clock)
BALANCE	Mid
SOURCE SELECTOR	Phono or FM
TONE CONTROL	Mid

Put the pre-amplifier's tape source monitor switch in the **TAPE** position.

CAUTION:

DO NOT SET THE PRE-AMPLIFIER'S TAPE MONITOR SWITCH TO THE SOURCE POSITION WHEN USING THE MODEL 4000. EXTREMELY HIGH VOLUME LEVELS FROM

THE FRONT SPEAKERS MAY RESULT BECAUSE THE PRE-AMPLIFIER'S VOLUME CONTROL IS SET APPROXIMATELY TO THE MID POSITION.

4000 CONTROLS	POSITION
FRONT L-R BALANCE	Mid
REAR L-R BALANCE	Mid
FRONT-REAR BALANCE	Mid
MONITOR	SOURCE
INPUT (MAIN-CD-4/AUX)	Main (out)
MODE	2 CH
DIMENSION	Mid
REMOTE CONTROL (rear panel)	LOCAL
REAR BASS	Mid
REAR TREBLE	Mid
MASTER VOLUME	Minimum (fully counterclockwise)
MAIN SPEAKER	ON (in)
REMOTE SPEAKER	OFF (out)
REAR LEVEL CONTROLS (rear panel)	Maximum (fully clockwise)
MAIN IN LEVEL SWITCH (rear panel)	LOW

8. Plug all the units into AC outlets.

NOTE: The AC convenience outlets on the Model 4000's rear panel should only be used to power an associated tape recorder and/or turntable.

For conveniently switching the AC power simultaneously to all components: connect the Model 4000, tuner (if used), and power amplifiers to the **PRE-AMPLIFIER'S** switched outlets. This may only be done if the total power consumption of the components does not exceed the maximum rating of the pre-amplifier's AC switched outlets.

9. Turn on the power switches on all units.

10. The Volume level of all speakers is controlled by the Model 4000's **MASTER VOLUME** control. Increase the **MASTER VOLUME** control to a comfortable listening level.

Your complete 4-channel 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.

SPEAKER PHASING

If you have used coded speaker wire in connecting the speaker systems, the complete system should be in phase. However, amplifiers and pre-

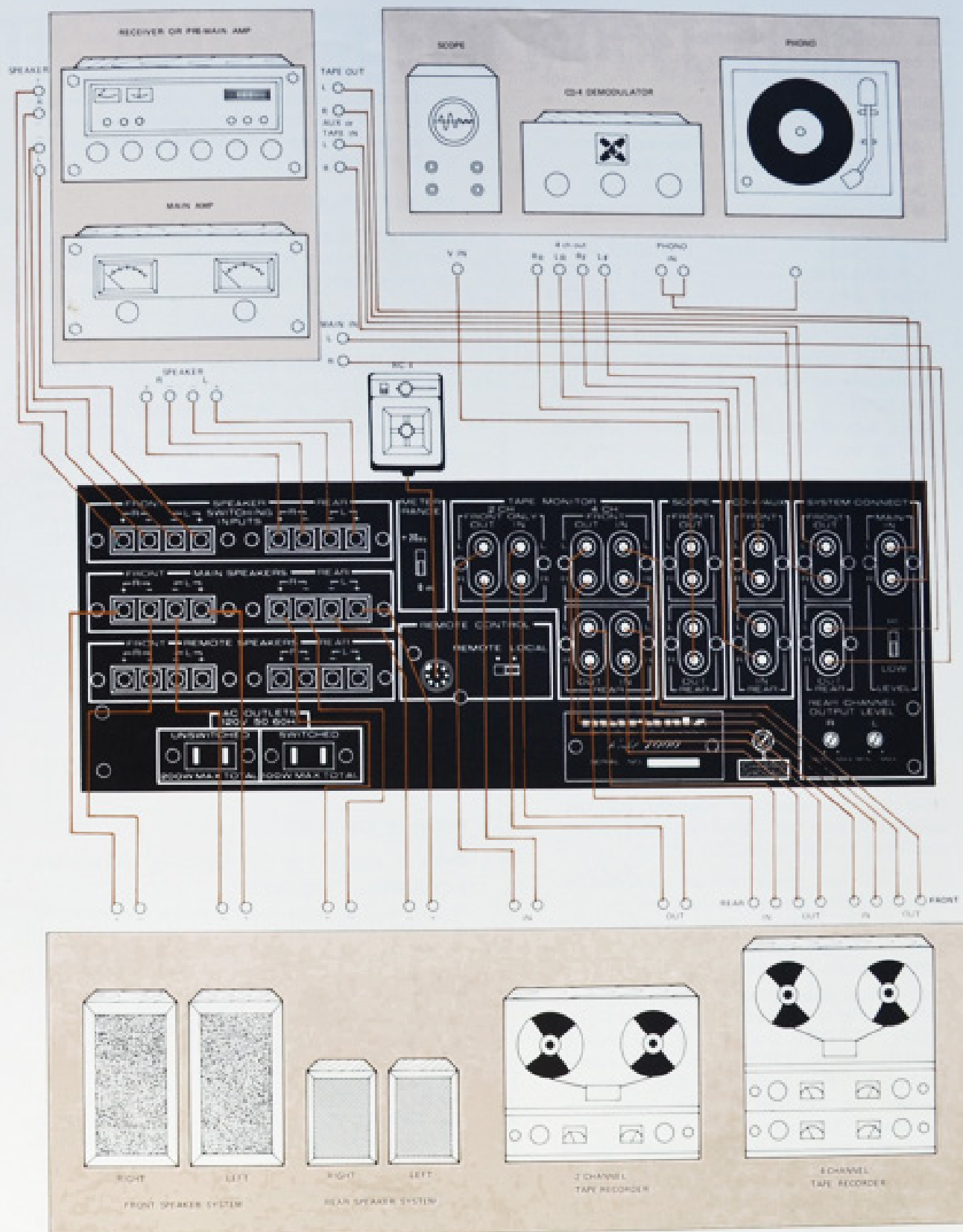


Figure 2. Connection Diagram

amplifiers of different make and/or model may have internal phase differences between them. To ensure that the complete system is in phase for the best 4-channel separation and image localization the following procedure must be performed.

1. After the speakers are connected, place all four speakers in the center of the room.
2. Set the Model 4000's **MODE** switch to the **MONO** position. 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 the **FRONT-REAR BALANCE** control to the 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 the power to all components, but do not disturb their volume tone, or balance settings. Reverse connections on the right-front speaker only. Turn on the power and listen again. If the bass tone now seems 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 the power on all units, and reconnect the right-front speaker as you first had it connected.
5. Now check phasing between the two left (front and rear) speakers. Set the Model 4000's **FRONT L-R** and **REAR L-R BALANCE** controls to the extreme **L** position, and set the **FRONT-REAR BALANCE** to **Mid** position to attain 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 the power to all components. Experimentally reverse connections only on the left rear speaker. Turn on power and listen. Retain the left-rear speaker connections which give the "best bass" as in (4).
7. Last, check phasing between the two rear (left and right) speakers. Center the Model 4000's **FRONT** and **REAR BALANCE** controls. Set the **FRONT-REAR BALANCE** control to the 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 codify the speaker connections and/or the speaker cables. Any method of codifying is satisfactory, provided it enables you in the future to duplicate your now-correct hookup between the speakers and the Model 4000.

SPEAKER PLACEMENT

Experimentation is suggested to reveal the best speaker locations for your room. See Figure 3 for recommended placements.

BALANCING FRONT/REAR

With Model 4000's **BALANCE** controls in their mid positions, and the **MODE** switch set to the **MONO** position, adjust the volume of the system to a comfortable listening level. Adjust the preamplifier's volume control until a proper front-rear balance is achieved. If the preamplifier's volume control is now set higher than the mid "12 o'clock" position, reduce it to the mid position. Then adjust the **REAR CHANNEL OUTPUT LEVEL CONTROLS** counterclockwise, to reduce the rear channels' level until proper front to rear balance is achieved.

NOTE: If the system tends to operate at loud levels at very low settings of the **MASTER VOLUME** control—set the **MAIN IN** level switch to the **HI** position. This may be necessary for some preamplifiers that have a high output level at the tape out jacks.

SOURCE DEVICES

Refer to Figure 1 for the following connections.

2-CHANNEL TAPE DECK

A two-channel tape deck may be connected to the 4000 as follows:

TAPE DECK		4000 TAPE MONITOR 2-CHANNEL JACKS
Left input	to	FRONT OUT L
Right input	to	FRONT OUT R
Left output	to	FRONT IN L
Right output	to	FRONT IN R

When the 4000's **MONITOR** switch is set to the **TAPE 2 CH** position, the tape deck signal applied to the **TAPE MONITOR 2 CH IN** jacks will be heard.

4-CHANNEL TAPE DECK

A discrete 4-channel tape deck may be connected to the 4000's **TAPE MONITOR 4 CH** jacks as follows:

TAPE DECK JACKS

Left front input to
Right front input to
Left rear input to
Right rear input to
Left front output to
Right front output to
Left rear output to
Right rear output to

4000 TAPE MONITOR 4-CHANNEL JACKS

FRONT OUT L
FRONT OUT R
REAR OUT L
REAR OUT R
FRONT IN L
FRONT IN R
REAR IN L
REAR IN R

When the Model 4000's **MONITOR** switch is set to the **TAPE 4 CH** position, the tape deck signal applied to the **TAPE MONITOR 4 CH IN** jacks will be heard.

A 4-channel disc demodulator, 8-track player, etc., may be connected to the Model 4000's

CD-4/AUX jacks. When the **INPUT** switch is set to the **CD-4/AUX (in)** position, signals applied to the **CD-4/AUX** jacks will be heard. These signals will also appear at the **TAPE MONITOR 4 CH OUT** jacks.

TAPE RECORDING

To record, select the desired program source using the pre-amplifier's selector switch or by switching the Model 4000's **INPUT** switch to the **CD-4/AUX** position. The selected source signal will be fed to all of the **TAPE OUT** jacks for recording. To monitor the tape on a three-head recorder during recording, set the **MONITOR** switch to the desired **TAPE** position (either 2 CH or 4 CH).

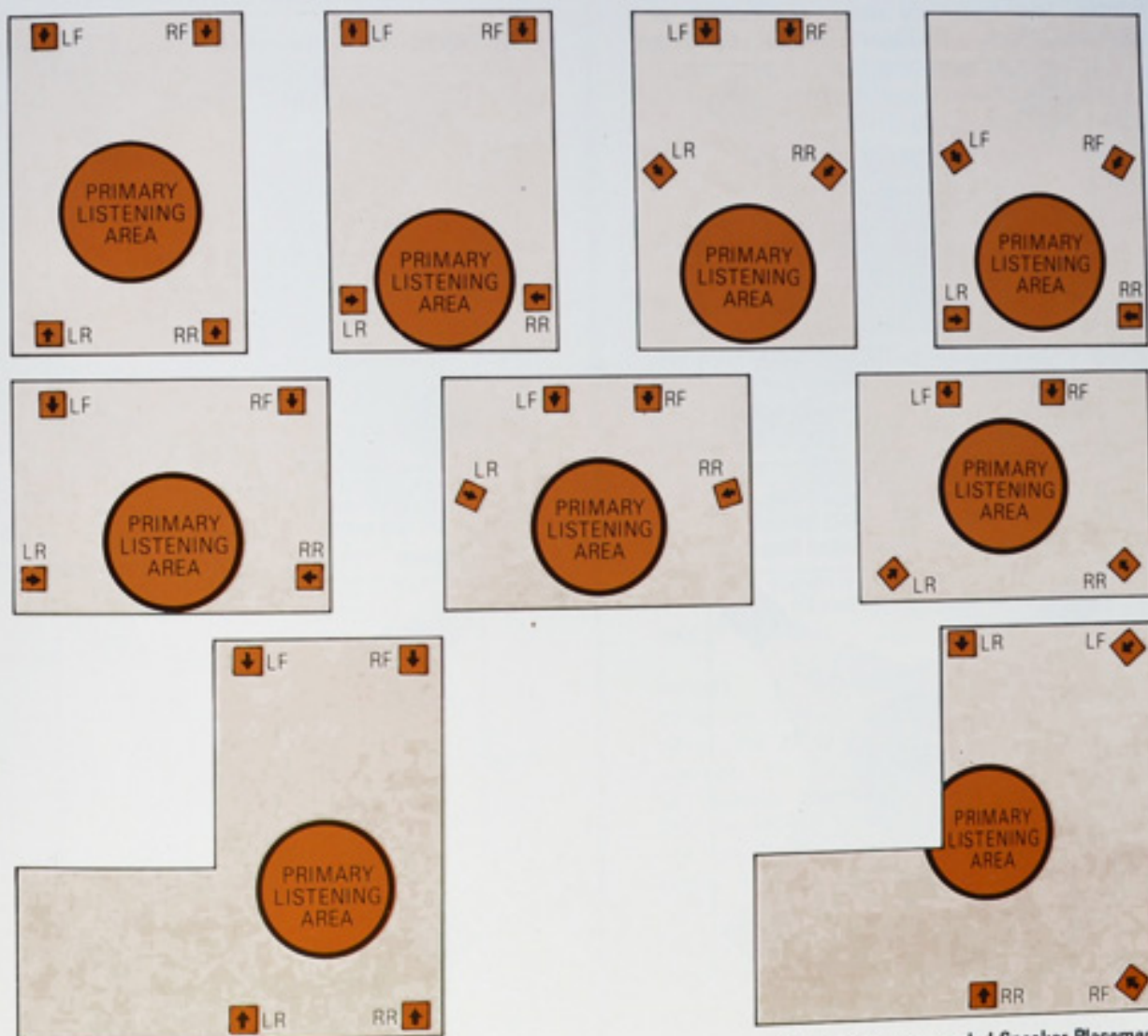


Figure 3. Recommended Speaker Placements

FRONT PANEL FEATURES

Refer to Figure 8 Front Panel Features.

METERS

The meters on the front panel respond to the audio signals in each of the four channels. They indicate the signal levels that are being applied to the **SPEAKER SWITCHING INPUTS** terminals. These meters will monitor both high and low signal levels depending on the position of the rear panel **METER RANGE** switch.

LOW FILTER SWITCH FOR REAR CHANNELS

Depress this pushswitch to reduce turntable rumble, low frequency noise, or "boomy exaggerated" bass. Obviously, use of the filter

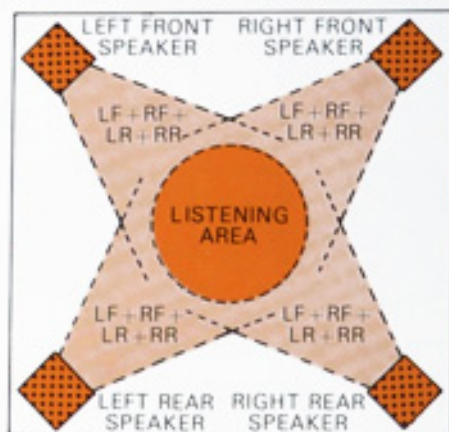
will reduce desired low frequency sounds as well as unwanted noises. Therefore, it should be used judiciously. The "out" position switches the filters out of the circuit. Use the stereo preamplifier's **LOW FILTER** switch for the Front channels.

HI FILTER SWITCH FOR REAR CHANNELS

Depress this pushswitch to reduce high frequency noise such as "scratch" from worn phonograph records, and tape "hiss." The filter slightly reduces high frequencies in the program material. When the program does not have high frequency noise, the **HI FILTER** pushswitch should be "out." Use the stereo preamplifier's **HI FILTER** switch for the Front channels.

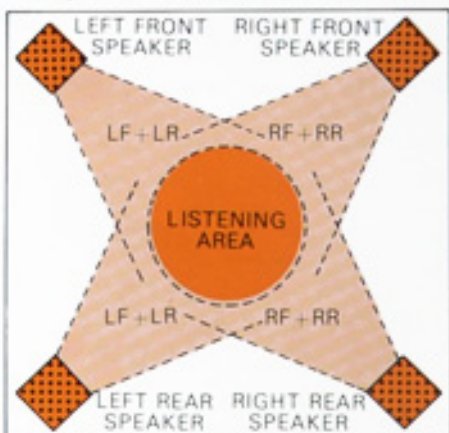
BALANCE CONTROLS

The Model 4000 has three balance controls:



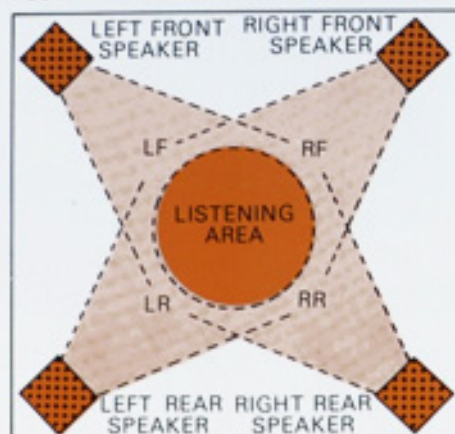
INPUT SIGNAL DESIGNATIONS:
LF = LEFT FRONT, RF = RIGHT FRONT
LR = LEFT REAR, RR = RIGHT REAR

Figure 4. Mono Mode Sound Dispersion



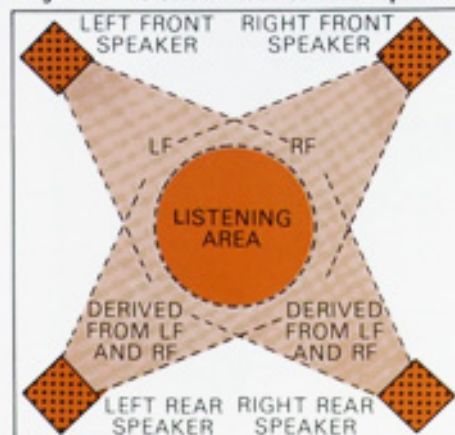
INPUT SIGNAL DESIGNATIONS:
LF = LEFT FRONT, RF = RIGHT FRONT
LR = LEFT REAR, RR = RIGHT REAR

Figure 5. 2-channel Mode Sound Dispersion



INPUT SIGNAL DESIGNATIONS:
LF = LEFT FRONT, RF = RIGHT FRONT
LR = LEFT REAR, RR = RIGHT REAR

Figure 6. Discrete Mode Sound Dispersion



INPUT SIGNAL DESIGNATIONS:
LF = LEFT FRONT, RF = RIGHT FRONT
LR = LEFT REAR, RR = RIGHT REAR

Figure 7. Vari-Matrix Mode Sound Dispersion



Figure 8. Front Panel Features

FRONT L-R, REAR L-R and FRONT-REAR. The **FRONT L-R** slide control adjusts the balance between the front-left and right speakers. The **REAR L-R** control adjusts the balance between the rear left and right speakers. The **FRONT-REAR** slide knob adjusts the balance between front and rear speakers.

MAIN AND REMOTE SPEAKER SWITCHES

These pushswitches 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 pushswitches in the off (out) position, all loudspeakers are disconnected. The signal at the **REAR HEADPHONES** jack on the Model 4000 and the front headphone jack on the stereo preamplifier is not affected by the **MAIN** and **REMOTE SPEAKER** switches.

INPUT SWITCH

When this switch is set to the **CD-4/AUX** (in) position and the **MONITOR SWITCH** is set to **SOURCE**, the signal applied to the **CD-4/AUX** jacks on the Model 4000's rear panel will be heard. When this switch is in the **MAIN** (out) position, the source selected by the stereo pre-amplifier's selector switch will be heard.

REAR PHONES JACK

This jack accepts a standard 3-conductor phone plug employed with standard stereo or 4-channel headphones. When using 2-channel headphones, insert the plug into the phones jack on the

stereo pre-amplifier. When using 4-channel headphones, insert the front plug into the phones jack on the stereo pre-amplifier and the rear plug into the **REAR PHONES** jack on the Model 4000. Either high or low impedance headphones may be used.

TAPE MONITOR

When the Model 4000's **MONITOR** switch is set to the **4 CH** tape position, the signal applied to the **TAPE MONITOR 4 CH IN** jacks will be heard. When the **MONITOR** switch is set to the **2 CH** tape position, the signal applied to the **TAPE MONITOR 2 CH IN** jacks will be heard. When the **MONITOR** switch is set to the **SOURCE** position, the source selected by the **INPUT** (**MAIN-CD-4/AUX**) pushswitch will be heard.

MODE SWITCH

MONO

Refer to Figure 4, **MONO** Sound Dispersion. When the **MODE** switch is set to the **MONO** position, all channels are paralleled. Therefore, an identical signal will appear at each speaker. 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 and (c) setting up balance controls.

2 CHANNEL

Refer to Figure 5, **2-CH** Mode Sound Dispersion. When the **MODE** switch is set to the **2 CH** position, left-front and left-rear inputs are paralleled. Right-front and right-rear inputs are

paralleled. Use the **2 CH** position for playing regular stereo records through all four speakers, when synthesizing of rear channels is not desired.

DISCRETE

Refer to Figure 6, **DISCRETE** Mode Sound Dispersion.

Use the **DISCRETE** position for (a) Playing discrete 4-channel sources such as Q-8 cartridges, or CD-4 4-channel records with a 4-channel demodulator and (b) Playing 2-channel stereo programs through front speakers only.

VARI-MATRIX

Refer to Figure 7, **VARI-MATRIX** Mode Sound Dispersion.

When the **MODE** switch is set to 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.

SQ DECODER

With the **MODE** switch set to the **SQ DECODER** position, all 2-channel input signals applied to the Model 4000 are internally connected to the optional Marantz plug-in decoder. The four channel outputs are derived from 2-channel signal which have been processed by the decoder. The characteristics of these derived 4-channel outputs are determined by the type of plug-in decoder. Use the **SQ DECODER** position only, when an optional plug-in decoder has been installed. Without this optional decoder, there will be no output to the speakers, when the **MODE** switch is set to the **SQ DECODER** position.

DIMENSION CONTROL

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

REAR BASS AND REAR TREBLE CONTROLS

These control the low and high frequency response of the rear channels. Your pre-amplifier

controls the tone of the front channels. With both **REAR BASS** and **REAR TREBLE** controls set at the center position, frequency response of the rear channels is flat. Turn either tone control knob clockwise to boost, or counter-clockwise to attenuate its respective frequency range.

MASTER VOLUME

The **MASTER VOLUME** controls the signal levels to all four channels simultaneously.

LOUDNESS SWITCH

When listening at low levels, depress this push-switch "ON." The **LOUDNESS** circuit boosts bass and treble tones to compensate for the human ear's lack of response to those frequencies at low volume levels. The loudness circuit affects both the **FRONT** and **REAR** speakers. If the stereo pre-amplifier has a loudness switch, leave it set to the off position.

POWER SWITCH

This pushswitch turns the power on and off. When the **POWER** switch is depressed, the meter lamps will illuminate. Be sure the **POWER** pushswitch is off (out) before plugging or unplugging the power cord.

REAR PANEL FEATURES

Refer to Figure 1, Rear Panel Connection Facilities.

LEVEL SWITCH

Normally, this switch should be in the **LOW** position, providing an input sensitivity of 180mV. If the system tends to operate at loud levels for very low settings of the **MASTER VOLUME** control, the tape output level of the front amplifier may be too great. In this case, place the **INPUT LEVEL** switch to the **HIGH** position. This results in a sensitivity of 1.0 Volt.

SYSTEM CONNECT MAIN IN JACKS

These two jacks connect to the **TAPE OUT** jacks of the stereo preamplifier.

SYSTEM CONNECT FRONT and REAR OUTPUT JACKS

The **FRONT LEFT/RIGHT OUTPUT** jacks

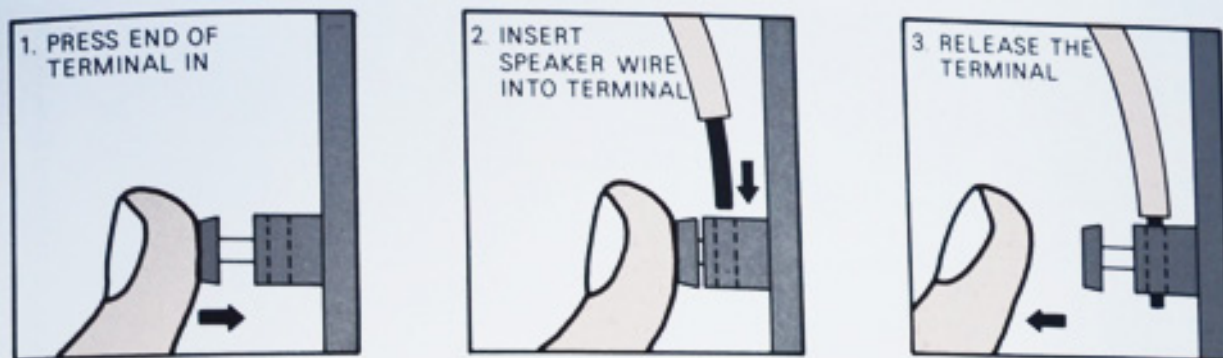


Figure 9. Quick-Connect Speaker Terminal

should be connected to the front pre-amplifier's tape in jacks. The **REAR LEFT/RIGHT OUTPUT** jacks should be connected to the rear amplifier's input jacks.

REAR CHANNEL OUTPUT LEVEL CONTROLS

These controls are used to match the output level of the rear channels to that of the front channels. When correctly adjusted, the pre-amplifier's volume control should be set approximately to the Mid position. See "Balancing the System" section.

CD-4/AUX IN JACKS

These four jacks are for connecting a **CD-4** Demodulator or any discrete 4-channel source (such as a tape player) to the 4000.

SCOPE OUT JACKS

An external oscilloscope can be connected to these jacks to observe the program information from each of the four channels.

TAPE MONITOR 2 CH AND 4 CH INPUTS

These six jacks are for connecting a 2-channel or a 4-channel tape recorder.

METER RANGE SWITCH

Normally, this switch should be in the +20dB position. The meters will then read 0dB at 60 Watts per channel. If it is desired to obtain signal level indication at lower power output

levels, set this switch to the 0dB position. The meters will now read 0dB at 0.6 Watts per channel. Be careful not to overdrive the meters, when the **METER RANGE** switch is in this position.

SPEAKER TERMINALS

Twenty-four quick-connect type terminals are provided: Eight for **FRONT** and **REAR SPEAKER SWITCHING INPUTS**, eight for **FRONT** and **REAR MAIN SPEAKERS**, and eight for **FRONT** and **REAR REMOTE SPEAKERS**.

Terminals operate as follows: (see Fig. 9)

- 1) Press Terminal in
- 2) Insert speaker wire
- 3) Release Terminal

POWER CONNECTION

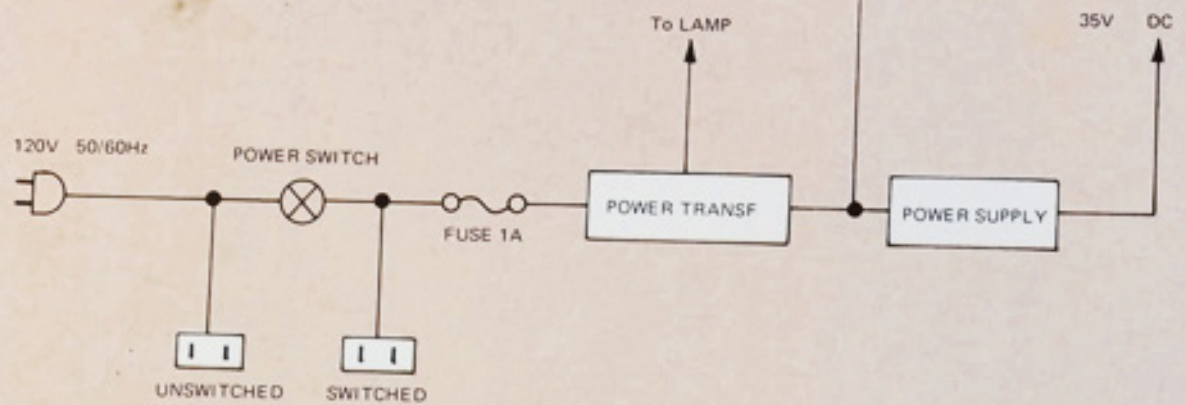
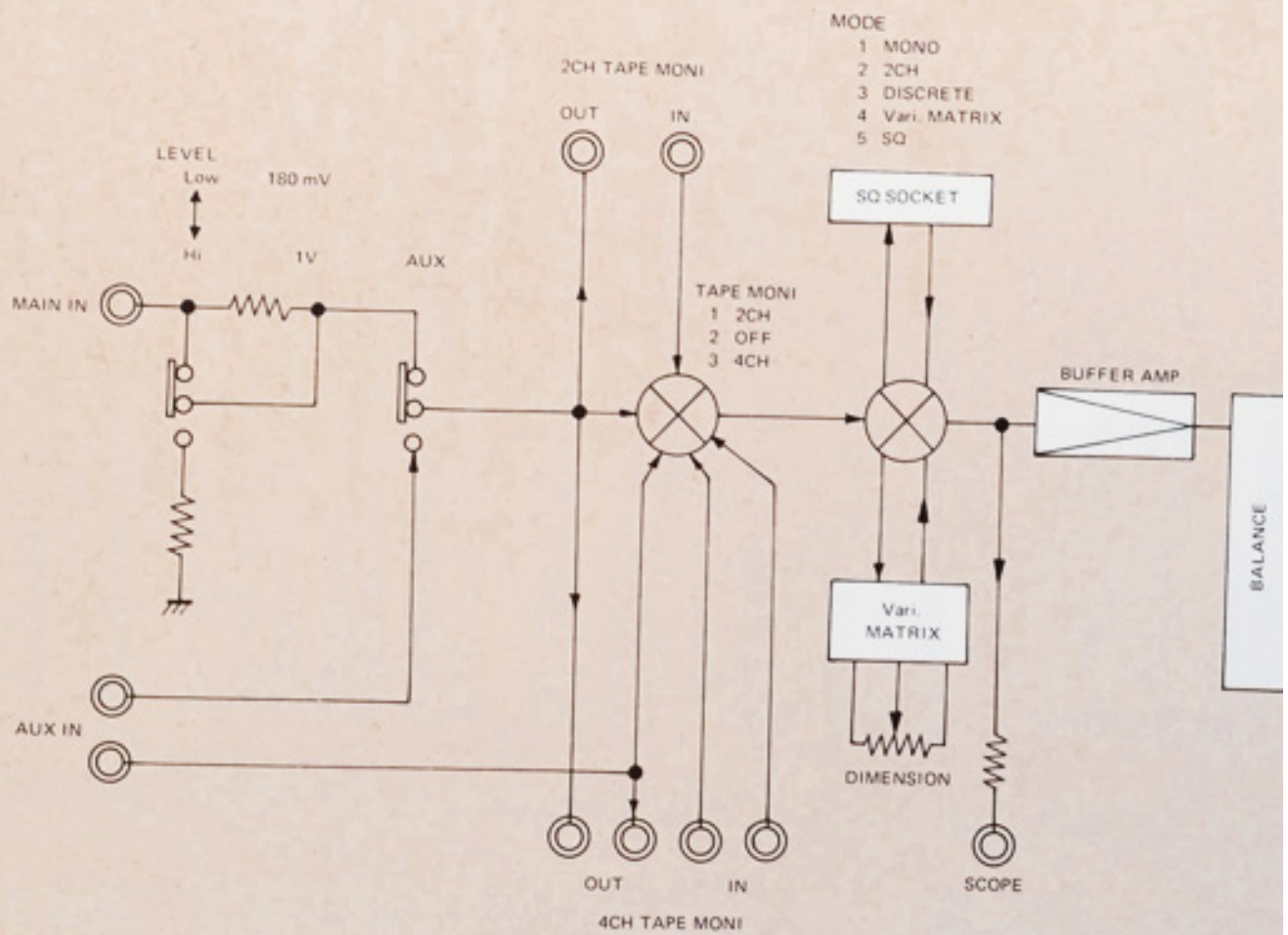
Plug into 117 volt A.C. outlet.

CAUTION: DO NOT PLUG THE MODEL 4000 INTO A D.C. OUTLET, AS DAMAGE WILL OCCUR.

AC CONVENIENCE OUTLETS

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

NOTE: CAUTION SHOULD BE EXERCISED TO SEE THAT THE MAXIMUM POWER RATINGS OF THESE OUTLETS ARE NOT EXCEEDED.



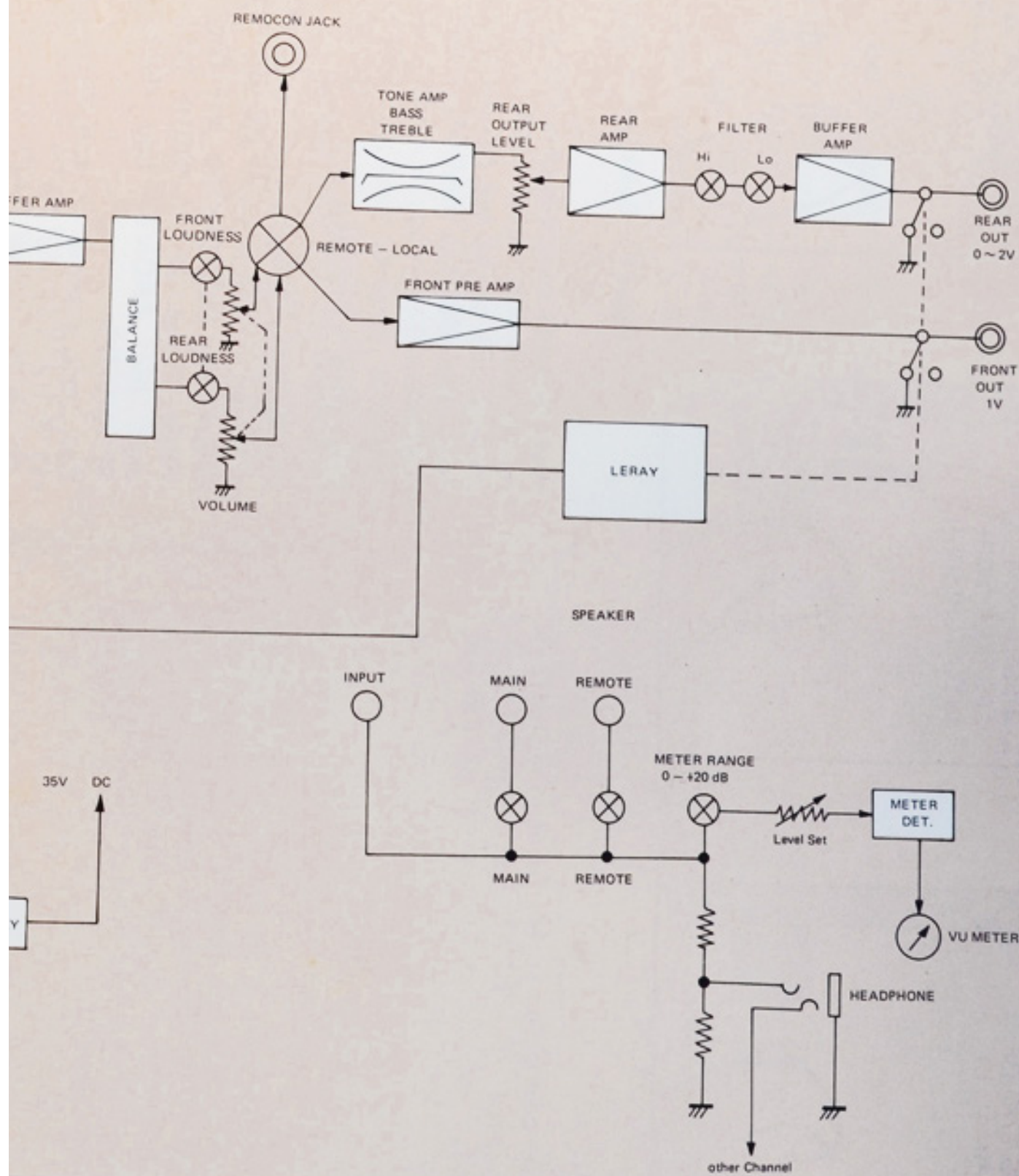


Figure 10. Functional Block Diagram

AC PROTECTOR FUSE

This feature automatically disconnects AC power in the event of a power surge or circuit overload. If the **POWER** pushswitch is activated and the front panel fails to illuminate and no sound is heard through the speakers, release the **POWER** pushswitch to the off (out) position, unscrew the fuse holder on the rear panel and visually inspect the fuse to see if the internal filament has opened. If so, replace the fuse with one having the same type and rating.

REMOTE CONTROL

This rear panel **REMOTE CONTROL** receptacle and switch are intended for use only with the optional **MODEL RC-4** Remote Control. For use, follow the instructions supplied with the Model RC-4. **WHEN THE RC-4 IS NOT USED, THE REMOTE CONTROL SWITCH MUST BE IN LOCAL POSITION.**

CHASSIS GROUND BINDING POST

Permits a convenient connection for the turntable's ground wire.

OPTIONAL SQ DECODER CONNECTION

A pocket on the bottom of the chassis will accommodate Marantz 4-channel decoders such as the Model **SQA-1** or **SQA-2**. For use, follow the instructions supplied with the optional decoder.

TECHNICAL DESCRIPTION

GENERAL

The block diagram of the Model 4000 is shown in Figure 10. To simplify the description, only the left-front (LF) and left-rear (LR) channels are shown.

The Model 4000 primarily consists of: a) Input, monitor, mode, power and speaker switching, b) A Vari-Matrix circuit for conversion of 2-channel program sources into synthesized 4-channel, c) Balance, volume, and tone control circuits, d) SQ decoder connector and pocket, e) Remote control socket, f) Front and rear channels pre-amplifiers, g) Meter circuits, and h) Power supply circuit.

INPUT SWITCH

The **INPUT SWITCH** selects program sources for listening or recording. In the **MAIN** (out) position, signals are selected from the "MAIN-IN" jacks on rear panel. All sources are then available from the pre-amplifier's inputs to which the Model 4000 is connected. In the **CD-4/AUX** position, signals are selected from the **CD-4/AUX** jacks.

LEVEL (HI/LOW) SWITCH

Signals applied to the **MAIN IN JACKS** are fed to the **LEVEL (HI/LOW)** switch. When the **LEVEL** switch is in the **LOW** position, the signal is passed directly to the **INPUT** switch. When the **LEVEL** switch is in the **HI** position, the input signal is attenuated 15 dB.

MONITOR (TAPE/SOURCE) SWITCH

This switch selects between source and the **2 CHANNEL** or the **4 CHANNEL TAPE INPUT** jacks on rear panel. The **2 CHANNEL** position is used with 2 channel tape recorders to record and playback 2 channel information from the **MAIN IN** jacks. The **4 CHANNEL** position is used with 4 channel tape recorders to record and playback 4 channel information from the **CD-4/AUX** jacks. The **SOURCE** position will select the input signal (either 2 or 4 channel) for listening and for comparison with the tape playback signal when recording with three head

MODE SWITCH

The **MONO** position is connected so that all 4 channels are paralleled, thus providing a mono signal to all outputs, irrespective of the source selected.

In the **2 CHANNEL** mode, front L and rear L are paralleled, as are right F and right R, providing front and rear stereo. The **DISCRETE** position results in the separate operation of all four channels. Only the front channels will function when 2 channel sources are applied. The **VARI-MATRIX** mode selects Marantz' built-in 2-4 synthesizer. The front channels are fed through unmodified. The rear channels are derived from the front, in a special phase shift circuit. This circuit, in conjunction with the **DIMENSION** control, allows a total variation from a full sum signal (Dimension fully counter-clockwise) to a full difference signal (Dimension control fully clockwise) in the rear channels. The **SQ** position selects the optional SQ decoder unit. In this position, left total and right total signals are fed into the decoder so that all four channels are controlled with phase and logic processing.

BUFFER AMPLIFIERS

The 2-4 channel signals are fed to the emitter follower buffer amplifiers which isolate the vari-matrix and SQ sections from the loading effects of the **BALANCE** and **MASTER VOLUME** controls.

REAR CHANNEL OUTPUT LEVEL CONTROLS

These controls vary the gain of the rear channel preamplifiers. They provide a means for compensation of gain variations resulting from different front and rear 2 channel stereo amplifiers and preamplifiers.

TONE CONTROL CIRCUIT

The signal of the rear two channels (LR and RR) after adjustment by the **MASTER VOLUME** control are fed to the tone control circuits. The network uses an **NPN-PNP** direct coupled feedback transistor pair at the input. These transistors provide a high-impedance termination of the **MASTER VOLUME** control and low driving impedance to the negative feedback (NFB) type tone control circuit. The tone controls are continuously variable and are in the feedback path of an **NPN-PNP** direct coupled feedback pair. Its output is delivered to the

HI and LO filter circuits. To prevent output loading on the filter circuits, an emitter follower is used to deliver the signal to the rear **SYSTEM CONNECT OUTPUT** jacks.

FRONT PRE-AMP

The front pre-amp provides a high impedance termination for the **MASTER VOLUME** control, and approximately 14dB of gain. The signal for the front channels is then presented to the front **SYSTEM CONNECT** output jacks.

POWER SUPPLY

The power supply incorporates a full wave bridge rectifier which feeds a series type voltage regulator circuit. It supplies a fully-regulated 35 volts to all the amplification and processing circuits of the Model 4000.

LEVEL METERS

These meters obtain their signal from the **SPEAKER SWITCHING INPUT** terminals of each channel, and thus show a relative indication of level in each channel. Each meter is calibrated so that when the **METER RANGE** switch is set to the 0 dB position and the dB meter is deflected to 0 dB, 6 Watts will appear at an 8 Ohm load. Similarly, when the **METER RANGE** switch is set to the +20dB position and the dB meter is deflected to 0 dB, 60 Watts will appear at an 8 Ohm load.

It should be noted that these meters respond to the average program level that is fed to the speaker terminals. For this reason, actual program peaks will exceed the indicated levels.

GENERAL REQUIREMENTS

Power Requirements120V AC, 60 Hz,
20 Watts

Dimensions

Panel Width.....15-3/8 Inches

Panel Height..... 5-3/4 Inches

Depth 9-1/16 Inches

Weight

Unit alone14.2 lbs.

Packed for Shipment 19.5 lbs.

These specifications and exterior designs may be changed for improvement without advance notice.

SERVICE NOTES

REPAIRS

Only the most competent and qualified service technicians should be allowed to service the Marantz Model 4000. 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 service 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 the Model 4000 is mounted in its accessory walnut cabinet, **ALWAYS REMOVE IT FROM THE CABINET BEFORE PACKING.**

DO NOT SHIP THE ACCESSORY WALNUT CABINET.

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 service department) for new packing material. Carton, fillers, and packing instructions will be shipped to you at a nominal charge. No unit should be returned to the factory without an authorized Return Label which the Marantz Company will supply if the description of the difficulties appears to warrant factory service.

Please pack the Model 4000 as illustrated in Figure 11.

CAUTION

Please **DO NOT** ship the Model 4000 mounted in its accessory walnut cabinet.

Insure the Model 4000 for full value.

Make sure that your correct return address is on shipping label.

Ship via a reputable carrier, and be sure to obtain receipt from carrier. **DO NOT USE PARCEL POST.**

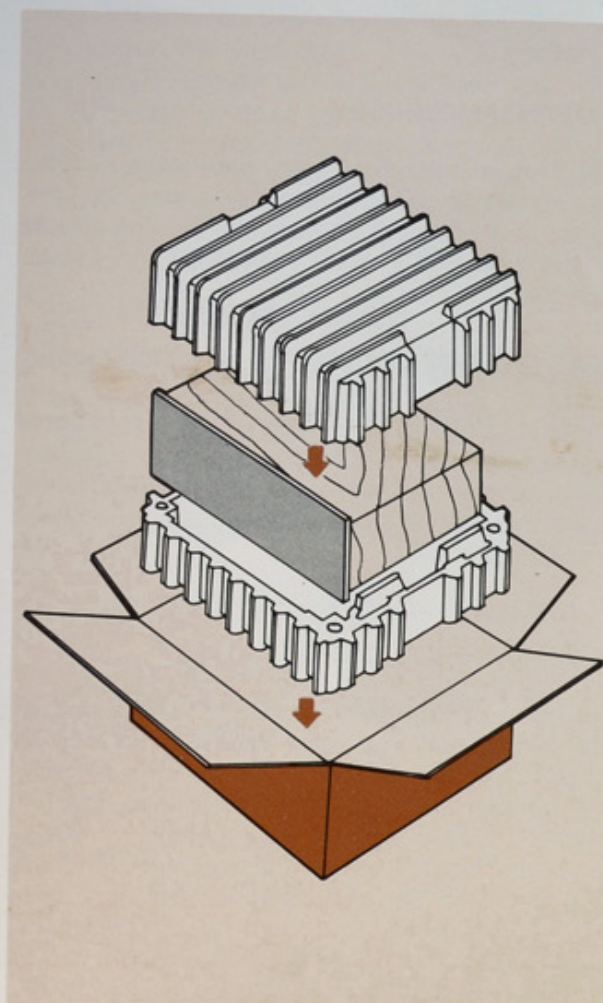


Figure 11. Packing Instructions

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.



marantz