

Model SR9000G

OWNER'S MANUAL

STEREO RECEIVER



marantz®

MODEL SR9000G TECHNICAL SPECIFICATIONS

AUDIO SECTION

POWER OUTPUT PER CHANNEL

4 OHMS DIN	180 W
4 OHMS RMS	165 W
8 OHMS DIN	145 W
8 OHMS RMS	130 W
TOTAL HARMONIC DISTORTION AT RMS 8 OHMS	0.03%
DAMPLING FACTOR 8 OHMS (1 kHz)	70

Frequency Response

Phono: (RIAA)	±0.5 dB (20 Hz ~ 20 kHz)
Aux: (±2 dB)	8 Hz ~ 65 kHz

Signal-to-Noise Ratio

Phono: (7.75 mV, 20 V output)	85 dB
Aux: (Vol. Max., 20 V output)	98 dB

Input Terminals

Phono: Input Sensitivity/Impedance	2.7 mV/47 kohms
Aux: Input Sensitivity/Impedance	160 mV/20 kohms

FM TUNER SECTION

Frequency Range	87.5 ~ 108 MHz
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Usable Sensitivity

DIN Mono (S/N 26 dB, 75 ohms)	0.85 μ V
DIN Stereo (S/N 46 dB, 75 ohms)	19 μ V
Alternate Channel Selectivity, 98 MHz	70 dB

Signal-to-Noise Ratio, 98 MHz

Unweighted: Mono	75 dB
Stereo	67 dB
Weighted: Mono	77 dB
Stereo	72 dB

MW TUNER SECTION

Frequency Range	515 ~ 1650 kHz
Usable Sensitivity (20 dB S/N 30% Mod., 1 MHz)	10 μ V
Selectivity	20 dB

GENERAL

Power Requirements	220 V AC, 50 Hz
(E and N versions are featuring an external voltage selector for use on other voltages. Other versions can be converted by a qualified technician to operate on 110/120/240 V.)	
Power Consumption at Rated Output, Both Channels Operating	560 W
Dimensions	
Panel Width	466 mm
Panel Height	146 mm
Depth	380 mm
Weight	
Unit alone	13 kg

SECTION AMPLIFICATION

PUISSANCE DE SORTIE PAR CHANAL

4 OHMS DIN	180 W
4 OHMS RMS	165 W
8 OHMS DIN	145 W
8 OHMS RMS	130 W
DISTORTION HARMONIQUE TOTALE A RMS 8 OHMS	0,03%
FACTEUR D'AMORTISSEMENT 8 OHMS (1 kHz)	70

Réponse en fréquence

Phono: (RIAA)	±0,5 dB (20 Hz ~ 20 kHz)
Aux: (±2 dB)	8 Hz ~ 65 kHz

Rapport signal/bruit

Phono: (7,75 mV, sortie 20 V)	85 dB
Aux: (Vol. Max., sortie 20 V)	98 dB

Bornes d'entrée

Phono: Sensibilité d'entrée/Impédance d'entrée	2,7 mV/47 kohms
Aux: Sensibilité d'entrée/Impédance d'entrée	160 mV/20 kohms

SECTION TUNER FM

Bande passante	87,5 ~ 108 MHz
Sensibilité d'usage	
DIN Mono (S/N 26 dB, 75 ohms)	0,85 µV
DIN Stéréo (S/N 46 dB, 75 ohms)	19 µV
Sélection du canal adjacent, 98 MHz	70 dB
Rapport signal/bruit, 98 MHz	
Non pondéré: Mono	75 dB
Stéréo	67 dB
Pondéré: Mono	77 dB
Stéréo	72 dB

SECTION TUNER MW

Bande passante	515 ~ 1650 kHz
Sensibilité d'usage (20 dB S/N 30% Mod., 1 MHz)	10 µV
Sélection	20 dB

GENERALITES

Source d'alimentation	220 V AC, 50 Hz
(Les versions E et N possèdent un sélecteur de voltage permettant l'utilisation sur différents voltages. Les autres versions peuvent être converties par un technicien qualifié en 240 V.)	
Consommation avec les 2 canaux à pleine charge	560 W
Dimensions	
Largeur de la face	466 mm
Hauteur de la face	146 mm
Profondeur	380 mm
Poids	
Poids net	13 kg

VERSTÄRKERTEIL

AUSGANGSLEISTUNG PER KANAL

4 OHMS DIN	180 W
4 OHMS RMS	165 W
8 OHMS DIN	145 W
8 OHMS RMS	130 W
KLIRRRAD BEI RMS 8 OHMS	0,03%
DÄMPFUNGSFAKTOR, 8 OHMS (1 kHz)	70

Frequenzgang

Phono: (RIAA)	±0,5 dB (20 Hz - 20 kHz)
Aux: (±2 dB)	8 Hz - 65 kHz

Fremdspannungsabstand

Phono: (7,75 mV, Ausgang 20 V)	85 dB
Aux: (Vol. Max., Ausgang 20 V)	98 dB

Eingangsklemmen

Phono: Eingangsempfindlichkeit/Eingangsimpedanz	2,7 mV/47 kohms
Aux: Eingangsempfindlichkeit/Eingangsimpedanz	160 mV/20 kohms

FM/UKW TUNERTEIL

Frequenzbereich	87,5 - 108 MHz
Eingangsempfindlichkeit	
DIN Mono (S/R 26 dB, 75 ohms)	0,85 µV
DIN Stereo (S/R 46 dB, 75 ohms)	19 µV
Selektivität, 98 MHz	70 dB
Signal/Rauschabstand, 98 MHz	
Nicht bewertet: Mono	75 dB
Stereo	67 dB
Bewertet: Mono	77 dB
Stereo	72 dB

MW TUNERTEIL

Frequenzbereich	515 - 1650 kHz
Eingangsempfindlichkeit (20 dB S/R 30% Mod., 1 MHz)	10 µV
Selektivität	20 dB

ALLGEMEINES

Netzanschluß	220 V AC, 50 Hz
(Die E und N Geräteausführungen besitzen einen Spannungswähler, der eine Umschaltung auf einen andere Spannung gestattet. Die anderen Geräte können von einem Fachmann für 240 V, 50 Hz Betrieb umgeändert werden.)	
Stromaufnahme bei Nennleistung und Zweikanalbetrieb	560 W
Abmessungen	
Breite der Frontplatte	466 mm
Höhe der Frontplatte	146 mm
Gerätetiefe	380 mm
Gewicht	
Gerätengewicht	13 kg

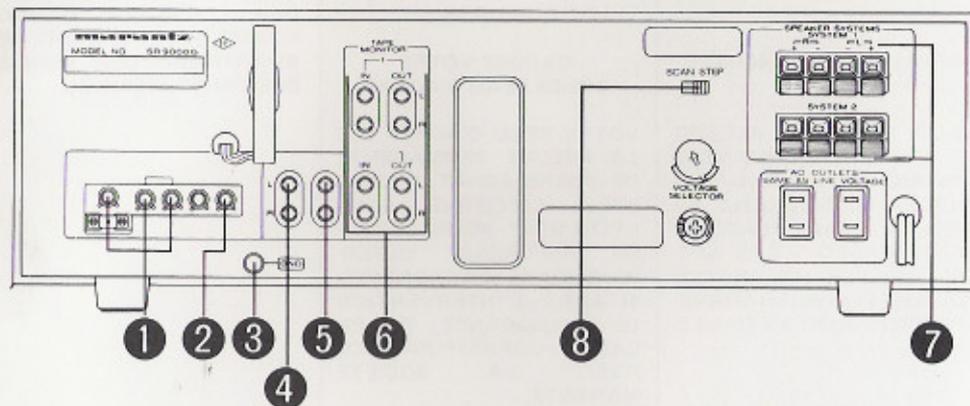


Figure 1. Rear Panel
Figure 1: Panneau arrière
Abbildung 1. Geräterückseite

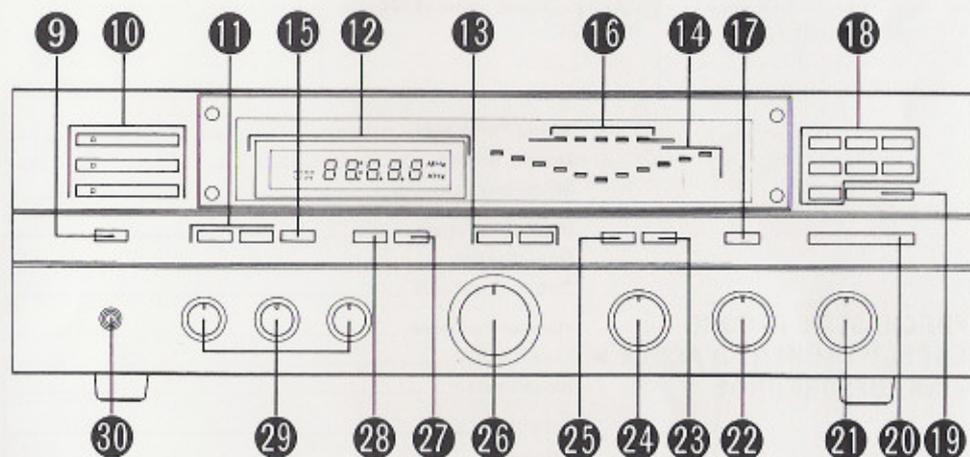


Figure 2. Front Panel
Figure 2. Face avant
Abbildung 2. Gerätevorderseite

FOREWORD

To obtain maximum performance and enjoyment from this Stereophonic Receiver, please study these instructions carefully. Do not plug in or connect this receiver until you have read and complied with this handbook of instructions.

This is a multilingual handbook designed to provide instructions in English, French, and German for the different versions of this model sold worldwide.

For quick identification of the many controls and connections, references to them are printed in **BOLDFACE TYPE**, exactly as they appear on the front and rear panels of your Receiver.

Your Marantz product has been specially prepared to comply with the household power and safety requirements that exist in your local. Please check the alphabetical suffix following the serial number of your Marantz product. Refer to the following table to note the differences that exist between your unit and the unit pictured and described in this manual.

- A — Operating Voltage: 240 V AC.
- C — Operating Voltage: 120 V AC.
- E, N — Operating Voltage: 220 V AC. Has a voltage selector.
- P — Operating voltage: 120 V AC. Has a voltage selector.

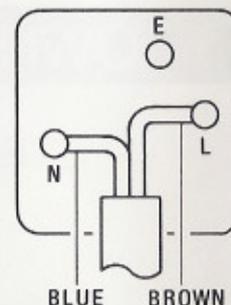
Should it become necessary to convert this unit to a different operating voltage, please note that a proper fuse must be substituted for the one currently in the unit.

FOR UNITS SOLD IN THE UNITED KINGDOM:

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

- Blue — Neutral
- Brown — Live



As the colours of the wires may not correspond with the terminal identification in your plug, proceed as follows:

- Connect brown wire to the terminal marked "L" or coloured brown or red.
- Connect blue wire to the terminal marked "N" or coloured blue or black.
- For 13 A plugs, conforming to BS 1363, use a 3 A fuse.
- For other plugs, use a 5 A or lower fuse in the plug or adaptor or at the distribution board.

ENGLISH: This unit meets the requirements of EEC Recommendation 76/889.

FRENCH: Cet appareil est conforme à la recommandation CEE 76/889.

SPANISH: Este aparato está conforme a los requerimientos de la norma 76/889 de la CEE.

GERMAN: Dieses Gerät entspricht den Anforderungen der EWG Richtlinien 76/889.

ITALIAN: Questi apparecchi rispondono alla direttiva CEE 76/889.

WARRANTY

FOR WARRANTY INFORMATION, CONTACT YOUR LOCAL MARANTZ DISTRIBUTOR.

RETAIN YOUR PURCHASE RECEIPT

YOUR PURCHASE RECEIPT IS YOUR PERMANENT RECORD OF A VALUABLE PURCHASE. IT SHOULD BE KEPT IN A SAFE PLACE TO BE REFERRED TO AS NECESSARY FOR INSURANCE PURPOSES OR WHEN CORRESPONDING WITH MARANTZ.

IMPORTANT

WHEN SEEKING WARRANTY SERVICE, IT IS THE RESPONSIBILITY OF THE CONSUMER TO ESTABLISH PROOF AND DATE OF PURCHASE. (YOUR PURCHASE RECEIPT OR INVOICE IS ADEQUATE FOR SUCH PROOF.)

GARANTIE

POUR LES CONDITIONS DE GARANTIE, VEUILLEZ VOUS ADRESSER A VOTRE DISTRIBUTEUR LOCAL.

GARDEZ VOTRE BORDEREAU D'ACHAT

VOTRE RECU D'ACHAT EST LA PREUVE PERMANENTE DE VOTRE ACHAT. IL DOIT ETRE CONSERVE SOIGNEUSEMENT POUR SERVIR DE REFERENCE ULTERIEURE DANS LES CAS NECESSITANT L'INTERVENTION DE L'ASSURANCE, OU EN CAS DE CORRESPONDANCE AVEC LA SOCIETE MARANTZ.

IMPORTANT

SI LE RECOURS A LA GARANTIE EST NECESSAIRE, LE CONSOMMATEUR DOIT FOURNIR LA PREUVE DE L'ACHAT ET LA DATE. DANS CE CAS, LE BORDEREAU OU LA FACTURE SERVENT DE PREUVE.

GARANTIE

BEWAHREN SIE IHREN KASSENZETTEL STETS GUT AUF. BEI INANSRUCHNAHME DER GEWAHRLEISTUNG KOMMT IHM EINE WICHTIGE BEDEUTUNG, DER BEWEIS DES KAUFDATUMS ZU.

GENERAL DESCRIPTION

Your Receiver is an all solid state receiver incorporating the innovative design and unparalleled technology that have made Marantz famous in the audio component industry.

Your Receiver is a superb FM/AM synthesized receiver that was designed by our engineering team using state-of-the-art microcomputer and digital synthesizer technology.

Your Receiver features a sensitive stereo FM tuner, a highly selective AM tuner, and a low distortion preamplifier and amplifier on a single chassis. The microcomputer controlled synthesizer tuner enables three types of tuning operations, i.e. preset tuning of 7 stations for each of the AM and FM bands, automatic tuning, and manual tuning.

The FM tuner utilizes a dual gate MOSFET front end, ceramic IF filters, and a phase locked loop multiplex decoder with pilot signal canceller. The AM tuner features an advanced integrated circuit with ceramic and L-C filters for high selectivity and low interference. The amplifier sections permit the connection of two stereo pairs of loudspeakers, a turntable or record changer, two tape recorders, stereo headphones, and an auxiliary source such as an additional tuner or a TV sound source.

AFTER UNPACKING

It is advisable to retain all original packing material to prevent damage should you wish to transport or ship your Receiver (refer to page 14 for repacking and shipping instructions). Be careful that you do not inadvertently throw away or lose the parts packed with the unit.

Please inspect your Stereophonic Receiver carefully for any signs of shipping damage. Our very strict quality control and professional pride ensure that each unit left the factory in perfect condition. If the unit is damaged or fails to operate, immediately notify your dealer. If the unit was shipped to you directly, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for shipping damage. Save the carton and all packing material as evidence of damage for their inspection. If necessary, contact your dealer or, as a last resort, your Marantz importing agent, who will fully cooperate under such circumstances.

PURCHASER'S RECORD ENREGISTREMENT D'ACHAT ► EINKAUFSURKUNDE

Model Purchased _____
Modèle acheté _____
Modellbezeichnung _____
Date of Purchase _____
Date d'achat _____
Datum des Kaufs _____
Place of Purchase _____
Lieu d'achat _____
Wo gekauft _____
Address _____
Adresse _____
Adresse _____
City _____ State _____
Ville _____ Province _____
Stadt _____ Land _____
Serial Number _____
Numéro de série _____
Seriennummer _____

REAR PANEL CONNECTIONS

Figure 1 shows the location of input and output jacks on the rear panel. These jacks are for "permanent" connections. Front panel controls and their use will be discussed later.

All connections to the rear panel should be made with the power to the entire system turned off. The rear panel signal connections are arranged in stereo pairs. All signal connections to your Receiver, with the exception of the FM antenna, remote control and loudspeakers, should be made with shielded audio cables.

To avoid confusion, connect one cable at a time between your Receiver and the other components of your system. This is the safest way to avoid cross-connecting channels or confusing signal inputs with outputs.

FM ANTENNA

Included in the accessory kit is a ribbon type "folded dipole" FM antenna. This type of antenna is simple and practical and will give adequate results in primary signal areas. To use it, unfold it into a "T" shape and connect its leads to the terminals marked "300Ω" on the back of the receiver. The antenna is designed to operate in a horizontal position. Temporarily (for the purpose of getting started) attach it to a nearby wall.

AM LOOP ANTENNA

Your receiver is equipped with a high performance noise-free **AM LOOP ANTENNA**. The **AM LOOP ANTENNA** is held on the rear panel with a snap-in hinge. Swivel it out for best AM reception as shown in Fig. 3. For improved AM reception, remove the antenna from the hinge in the direction of the arrow as shown in Fig. 3 and hang it on a nearby wall. The length of the antenna cord is 1 meter and it should not be pulled tight.

Compared with a ferrite-rod antenna, the **AM LOOP ANTENNA** enables better AM reception, free from noise or the influence of nearby metallic objects.

1 OUTDOOR FM ANTENNAS

As stated before, the supplied folded dipole antenna will give satisfactory results in primary signal areas. It should be obvious, however, that if you are located in a fringe area where signals are weak, then an outdoor antenna will

be necessary. Even if you live in a strong signal location, an outdoor directional antenna may be needed to eliminate "multipath" reflections.

Multipath reflections are responsible for much of the distortion and hiss associated with poor FM reception. They occur when radio waves from the transmitter bounce off of nearby mountains and tall buildings. The reflected waves follow different, more round-about paths to your receiver and arrive slightly delayed and out of phase with the direct signal (hence, the term multi-path"). This causes distortion in the same manner that "ghost" images are generated on television.

The way to minimize multipath is to use a "beam type" antenna that can be aimed toward the FM transmitter and away from the multipath reflections. The best types of antennas to use are either a "yagi" or "Log-Periodic" configuration with six or more elements designed expressly for FM reception.

If you want to receive stations from more than one general direction, then you will need a good quality antenna rotor system. This will enable you to point the antenna in the direction giving the least multipath interference, by means of a control box located near the receiver.

Another important factor is the type of lead-in wire to use. Unshielded lead-in wires, such as 300-ohm twin lead, can act as an omnidirectional antenna, and can cancel the directional benefits of your antenna. Therefore, we recommend using a balanced, shielded 300-ohm cable or a coaxial 75-ohm cable with a 300 to 75-ohm matching transformer at the antenna.

Shielded antenna cable will be available at the same store where you buy your antenna.

It is considered good practice to connect the antenna mast to an earth ground, both for reasons of safety and noise reduction. If 300-ohm shielded cable is used, connect the shield to ground (GND) at the receiver end only. When using 75 ohm coaxial antenna cable, connect its shield through the ground strap and the center conductor to the screw terminal as shown in Figure 4.

For rural areas, it is recommended to consult a local dealer about installation and lightning arrestor protection.

We do not recommend using master antenna systems, such as those found in apartment buildings. Such systems are usually designed

expressly for television reception and frequently suppress or reduce the quality of the FM signals before distribution.

Where outdoor antennas are prohibited or inconvenient, the simplest form of "rabbit-ear" TV antenna is the most practical and will give satisfactory results. This type is preferred over the folded dipole because it can be more readily rotated for the best reception.

2 OUTDOOR AM ANTENNA

Two single wires are required to make an AM outdoor antenna. First, connect one end of a single wire to the **AM ANTENNA** terminal on the rear panel, and the other end to a very high horizontal antenna wire of 8 to 25 meters in length suspended between insulators in an outdoor location (the higher the better). Next, connect the second single wire between the **GND** terminal of your receiver and an authenticated earth ground.

3 GND BINDING POST

The **GND** post is used when connecting an external AM antenna or when attaching a ground wire from a turntable to the receiver when hum is apparent.

4 PHONO INPUTS

The **PHONO** jacks are intended for use with magnetic phono cartridges and have a 47,000 ohm input impedance.

If a hum is heard when playing records, this is an indication that the record player or its connections are incorrectly grounded. Connect a separate ground wire from the turntable or record changer frame to the **GND** binding post of the unit. If this is ineffective, try reversing the polarity of the turntable's power plug.

If hum persists, consult the instruction booklets for the turntable and/or phono cartridge.

5 TAPE 3/AUX INPUTS

The **TAPE 3/AUX** jacks are for miscellaneous high level signal sources such as additional tuners and/or receivers, tape players, phonographs that provide RIAA equalized high level output, TV sound outputs and other external components.

6 TAPE JACKS

The rear panel of your Receiver can accommodate two tape recorders. The terms **IN** and **OUT**

refer to the input and output of the unit. Therefore, the **IN** jacks on your Receiver accept signals from the line outputs of each tape recorder; the **OUT** jacks feed signal to the tape recorder's line inputs.

7 SPEAKER SYSTEMS

The **SPEAKER SYSTEMS** terminals on the rear panel can accommodate two stereo pairs of loudspeakers. Connect the main pair to the **SYSTEM 1** terminals. The **SYSTEM 2** terminals are for a second stereo pair of loudspeakers. Selection of loudspeaker systems is made with the **SPEAKERS** switches on the front panel.

To connect the speakers to your receiver, use a minimum of 3A capacity cable (heavy duty two conductor lamp cord). If the desired cord length for either speaker exceeds 5 meters, use a minimum of 6A capacity cable.

SPEAKER PHASING

To assure the best stereo separation and frequency response, the speakers must be properly phased. The positive terminal on each speaker should be connected to its respective (+) terminal on your Receiver, and the negative or "common" terminal should be connected to its respective (-) terminal. To verify that a pair of speakers are correctly phased, perform the following test:

1. Complete the necessary signal connections so that program material may be played through the speakers.
2. Place the speakers in the center of the room.
3. Depress the **MODE/TUNING** pushswitch and play a record (or radio or tape) with strong bass tones at a low volume level. Center the **BALANCE** control.
4. Position the speakers about six inches apart, face-to-face. Listen, particularly to the apparent loudness of the bass tones.
5. Next, turn off all power, but do not disturb the **VOLUME** or **BALANCE** settings. Reverse the connections on the right speaker only. Turn on the power and listen again. If the bass tones now seem louder than in (4), you have corrected the phasing between the speakers. If the bass notes now sound softer, turn off the power and reconnect the speakers as they had been originally.
6. If an additional pair of speakers is used along with the system 1 speaker system, check phasing between the system 2 speakers and the system 1 speakers. Use the **BALANCE** control to play only two speakers at once, and invert the wiring on the system 2 speakers as necessary. Do not

change the connections on the system 1 speaker system.

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

Use caution when connecting your Receiver to a loudspeaker with built-in power supply, such as an electrostatic loudspeaker.

The "common" connection terminal of such a speaker may be capacitively coupled to ground through its own power supply. To protect your Receiver from distortion and possible overload, make sure the (-) terminals of your Receiver are connected to the "common" terminals of such a loudspeaker system.

CAUTION:

Never directly connect the loudspeaker terminals of one channel in parallel with those of any other. Any resulting damage is not covered under warranty.

NOTE:

Do not use 4 ohm speakers if system 1 and system 2 speakers are to be used simultaneously. Use 8 or 16 ohm speakers only.

8 SCAN STEP SELECTOR SWITCH

This selector changes the steps when the tuner searches for the next station up and down the scale. The switch must be set to the 9KHz step in AM and to the 50KHz step in FM when used outside of the United States.

CONVENIENCE OUTLETS

One **UNSWITCHED** and one **SWITCHED AC OUTLET** is provided on the rear panel for powering associated components of your system (tape recorder, record player, etc.).

The **SWITCHED** outlet provides power only when the **POWER** pushswitch is depressed while the **UNSWITCHED** outlet provides power even while the **POWER** pushswitch is in its **OFF (out)** position.

AC POWER CONNECTIONS

The correct voltage for operating your equipment is printed on the rear panel. Be sure the **POWER** pushswitch is "OUT" before plugging the **AC LINE** cord into an electrical outlet.

CAUTION:

Do not plug your Receiver into a DC outlet as serious damage will occur.

SIMPLIFIED OPERATING PROCEDURES

When operating the Stereo Receiver for the first time, follow these simple directions. Later, full advantage can be taken of its versatility with the remaining controls and pushswitches.

- Connect the FM antenna to the appropriate terminals on the rear panel.
- Connect the speakers to the **SYSTEM 1** speaker terminals.
- Place all pushswitches in the "out" position.
- Turn the **VOLUME** control all the way to the left (counterclockwise) and set the **BALANCE** control in **CENTER** position.
- Rotate **TREBLE**, **MID**, and **BASS** controls to the 12 o'clock position.
- Push the **SPEAKER SYSTEM 1** pushswitch.
- Apply AC line power by depressing the **POWER** switch.
- Select the desired program source by setting the **SELECTOR** switch to the appropriate position. If **FM** or **AM** is selected, press the **UP** or **DOWN** side of the **TUNING/SCAN** bar until the desired station is tuned. Adjust the **VOLUME** control to a comfortable listening level.

MAIN CONTROLS AND SWITCHES

9 POWER SWITCH

The **POWER** switch, when depressed, supplies AC power to your Receiver and to the **SWITCHED** outlet on its rear panel.

10 FUNCTION INDICATOR

The **FUNCTION INDICATOR** indicates the position selected by the **SELECTOR** switch. When the **SELECTOR** switch is placed in the **FM** or **AM** position, the **FUNCTION INDICATOR** indicates "TUNER", "FM" or "AM" is indicated on the **FREQUENCY/TUNER MODE DISPLAY**.

11 SPEAKERS SYSTEM SWITCHES

These switches select the loudspeaker terminals to which audio power is fed. Either the **SYSTEM 1** or **SYSTEM 2** stereo pair of loudspeakers may be operated individually, or simultaneously if both switches are depressed. When the two **SPEAKERS SYSTEM** switches are in the normal "out" position, all loudspeaker terminals are internally disconnected from the power amplifier section.

The signal at the headphones jack is not affected by the **SPEAKERS SYSTEM** switches. The "out" position allows "private listening" when stereo headphones are used.

NOTE:

Volume level should be reduced to minimum when switching speakers.

12 FREQUENCY/TUNER MODE DISPLAY

Receiving frequency is indicated on the **FREQUENCY/TUNER MODE DISPLAY**. The tuner mode is also indicated on this display as follows:

FM STEREO: This is displayed when a stereo broadcast is received.

ME: MEMORY WRITE ENABLE indication. When the **MEMORY** switch on the front panel is pressed, this is displayed and a station can be memorized onto one of the seven **PRESET** switches. The **MEMORY WRITE ENABLE** function will reset itself in 5 seconds if one of the **PRESET** switches are not programmed. Refer to "TUNING PROCEDURES" on page 11.

- FM or AM:** Indicates the band being received.
- MHz or KHz:** Indicates the unit of receiving frequency. **MHz** will illuminate when the FM band is selected and **KHz** will illuminate when the AM band is selected.

13 TAPE MONITOR SWITCHES

When the **TAPE MONITOR 1** or **2** switches are depressed individually, the tape recorder connected to the corresponding **TAPE MONITOR IN** jacks can be monitored. The **TAPE MONITOR** switches interlock electronically, so that only one tape recorder will be heard at a time. If both **TAPE MONITOR** switches are depressed simultaneously, only Tape Recorder 1 will be heard. For more information on tape monitoring see "Tape Recording" on page 12.

14 LED POWER INDICATORS

These LED's (Light Emitting Diodes) allow a direct read-out of the amount of power being supplied to the speakers. The upper scale is calibrated for an 8 ohm speaker system and the lower scale is calibrated for a 4 ohm speaker system (such as when using 4 ohm speakers or two 8 ohm speaker systems simultaneously).

15 LED POWER INDICATORS RANGE SWITCH

This switch selects indication ranges of the **LED POWER INDICATORS**.

Set it to "OUT" position and "ON" position in listening at high and low volume, respectively.

16 SIGNAL STRENGTH/MULTIPATH INDICATOR

The **SIGNAL STRENGTH/MULTIPATH** indicator of your Receiver has two different functions.

1. It indicates the relative signal strength of any AM or FM broadcast unless the **MULTIPATH** switch on the front panel is pressed.
2. In the FM mode, it indicates the multipath level of the received FM broadcast when the **MULTIPATH** switch is pressed. In the AM mode, the **MULTIPATH** switch does not function.

17 MULTIPATH SWITCH

When the **MULTIPATH** switch is in its normal OFF (OUT) position the **SIGNAL STRENGTH/MULTIPATH** display will indicate the signal strength of the incoming AM or FM station. When this switch is pressed in, the amount of multipath distortion in the FM signal will be displayed.

If your FM antenna can be rotated, then it should be turned so that the least amount of multipath is displayed (fewest number of LED's lit when the **MULTIPATH** button is depressed).

18 PRESET BUTTONS 1 - 7

When one of these buttons is pressed, the frequency stored in the corresponding memory is recalled. If the **SELECTOR** switch is in the FM position, the receiver will immediately tune in the pre-programmed FM station. If the **SELECTOR** switch is in the AM position, the receiver will immediately tune in the pre-programmed AM station. Refer to "TUNING PROCEDURES".

19 MEMORY SWITCH

This switch is depressed when it is desired to program one of the seven **PRESET** switches. If no **PRESET** is programmed within 5 seconds of activating the **MEMORY** switch, this function will automatically turn itself off.

To program one of the **PRESET** switches, first use the **TUNING/SCAN** bar to tune in the desired station. Then momentarily press the **MEMORY** switch and, while the **ME** light is still on, depress the desired **PRESET** switch. Refer to **TUNING PROCEDURE** on page 11.

20 TUNING/SCAN BAR

This switch is used to tune in a station in the **AUTO** or **MANUAL** mode. When the left side is pressed, the frequency being received is shifted downward. When the right side is pressed, the frequency being received is shifted upwards. When the frequency reaches the high (or low) end of the band, the display will skip to the low (or high) end and continue with the tuning operation.

When in the **AUTO** mode (**MODE/TUNING** switch **OUT**), the circuitry will search out the next station and automatically tune it in. In the **MANUAL** mode (**MODE/TUNING** switch **IN**), the circuitry will continue tuning until the **TUNING/SCAN** bar is released. In **MANU-**

AL, exact station tuning is accomplished by tapping the **DOWN** or **UP** side until the station is precisely tuned in.

21 SELECTOR SWITCH

The **SELECTOR** switch selects the program source for listening or recording when the **REC MODE** switch is in the **DIRECT** position. If a tape recorder's playback output has been connected to the **TAPE MONITOR 1 IN** jacks or **TAPE MONITOR 2 IN** jacks on the rear panel, you can select it by depressing the **TAPE MONITOR 1** or **TAPE MONITOR 2** pushswitch.

22 REC MODE SWITCH

This switch controls the input signals that are fed to the tape recorders connected to the **TAPE MONITOR 1** and **TAPE MONITOR 2** jacks.

For detailed information on the operation of this control, see the section on using tape recorders.

23 MODE/TUNING SWITCH

This switch controls FM muting mode and **AUTO/MANUAL** tuning mode at the same time. When this switch is set to the **OUT** position, the **FM MUTING** function is turned **ON**, **MODE** is put into **STEREO** and tuning mode is in **AUTO** mode. Setting this switch to the **IN** position turns **FM MUTING** off, puts **FM MODE** into **MONO** and sets tuning mode in **MANUAL**. For details of **AUTO/MANUAL** tuning mode, refer to "TUNING PROCEDURES" described on page 11.

When tuning to FM broadcasts with the **MODE/TUNING** switch in its "out" position, the muting circuit will eliminate interstation noise. To prevent muting very weak stations along with the noise, the muting function may be switched out of the FM circuits by depressing the **MODE/TUNING** pushswitch.

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

While playing a single channel source such as TV, depress the **MODE/TUNING** pushswitch to hear the source through both speakers. When playing a monophonic phonograph record, use this pushswitch to suppress rumble, record surface noise, and pinch effect distortion.

24 BALANCE CONTROL

The **BALANCE** control may be positioned to the left or right of center for the desired speaker balance. Normally, this control should remain in the center (detented) position.

25 LOUDNESS SWITCH

The **LOUDNESS** switch compensates for human hearing characteristics by boosting the bass and treble response at low volume levels to achieve a more pleasing tonal level.

26 VOLUME CONTROL

This control is used to adjust the overall sound level from the speakers and headphones while maintaining proper stereo balance. The position of this control does not affect the signal at the **TAPE MONITOR OUT** jacks.

27 8KHz FILTER SWITCH

This switch can be used to reduce high frequency noise such as that associated with the playing of poorly recorded tapes or worn disc recordings. When the AM tuner is being used, this switch will help to suppress considerably the high pitched "whistle" caused by adjacent AM channel interference. This filter will also, along with high frequency noise, slightly attenuate high frequency program material, and should therefore be used judiciously. Neither of the filter switches affect the recording outputs.

28 SUBSONIC FILTER SWITCH

The **SUBSONIC FILTER** pushswitch activates a low frequency filter which has little or no effect on the system's overall frequency response, because frequencies of 20 Hz and lower are below the range of most program material.

The filter will, however, substantially improve system performance when you play phonograph records at high volume levels. A high quality phono cartridge will faithfully reproduce turntable rumble, record cutting lathe rumble, and even the slight warp of a new record. This low frequency noise, although inaudible to humans, can cause large excursions of the

woofer cones. An unnecessarily large amount of amplifier power is wasted reproducing these low frequency noise components. Activating the **SUBSONIC FILTER** switch prevents this from happening and allows more power to be made available for the important program frequency range.

29 BASS, MID AND TREBLE CONTROLS

The three tone controls, **BASS**, **MID** and **TREBLE**, adjust the normally "flat" frequency response of your receiver to suit individual listening preference.

The **BASS** control adjusts the low frequency tones, the **MID** control adjusts the middle frequency tones, and the **TREBLE** control adjusts the high frequency tones.

These controls may be adjusted to compensate for unbalanced room acoustics.

The tone controls have no effect on the signals present at the **TAPE MONITOR 1** or **TAPE MONITOR 2 OUT** jacks.

30 PHONES JACK

This jack accepts headphones utilizing a standard three conductor phone plug. 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 and recording outputs are not affected by the **SPEAKERS SYSTEM** switches.

TUNING PROCEDURES

Your Receiver does not have a conventional tuning dial or tuning knob. There are three tuning methods; preset tuning, automatic tuning and manual tuning.

PRESET TUNING

When one of the seven **PRESET** buttons are pressed, the receiver will immediately tune in the station that has been programmed in. A total of fourteen stations (7 AM and 7 FM) can be programmed into the seven **PRESET** buttons. The procedure for preset tuning is as follows:

1. Set up the **PRESET** buttons as described in "MEMORY SWITCH" on page 9. Once this is done, turning on and off the receiver will not cause the receiver to "forget" the stations programmed into the presets. If the unit is unplugged or there is a power failure, then it will be necessary to reprogram the presets.
2. Turn the **SELECTOR** to **AM** or **FM** and depress the desired **PRESET** button. The receiver will tune in the desired station.

AUTOMATIC TUNING

When the **MODE/TUNING** switch is in its **IN** position and the **DOWN** (or **UP**) side of the **TUNING/SCAN** bar is depressed, the receiver will scan down (or up) and stop when the next station is found and precisely tuned in.

MANUAL TUNING

When the **MODE/TUNING** switch is in its **OUT** position and the **DOWN** (or **UP**) side of the **TUNING/SCAN** bar is depressed, the receiver will scan down (or up) until the bar is released. Precise station tuning can be achieved by tapping the **DOWN** or **UP** sides until the highest signal strength reading is achieved.

The synthesized tuner is designed to operate for FM stations having a channel spacing of 50 kHz.

Under certain circumstances where FM transmitters are not centered on integer multiples of 50 kHz, optimum tuning cannot be achieved thus creating some degradations in quieting, stereo separation and distortions.

In this case, the tuner may be more sensitive to receiving interferences from adjacent channels. Such inconveniences will certainly be noticed when the tuner is connected to some radio cable distribution networks where the 50 kHz channel spacing is not always respected.

If you have a cable radio distribution it will be necessary to use a separate FM antenna in order for this unit to work properly.

USING TAPE RECORDERS WITH YOUR RECEIVER

TAPE RECORDING AND DUBBING

The **REC** (record) **MODE** switch selects the signal source to be sent to the two tape recorders. The **REC MODE** switch operates independently from the **SELECTOR** switch. The **REC MODE** switch has 5 positions:

FM: In this position, the output of the tuner section can be recorded directly onto the tape. If the **SELECTOR** switch is in the **AM** position, tape out jacks will be muted. To record AM, turn the **REC MODE** switch to the **DIRECT** position and the **SELECTOR** switch to the **AM** position.

PHONO: In this position, the output from a turntable or record changer can be recorded directly onto the tape.

DIRECT: In this position, the tape recorder's inputs are selected by the position of the **SELECTOR** switch. In other words, this is the "normal" position for routine recording and listening.

TAPE COPY: These are the switch positions used for making tape copies. **TAPE COPY 1 → 2** indicates that tape 1 is being copied onto tape 2. **TAPE COPY 2 → 1** indicates that tape 2 is being copied onto tape 1.

The **REC MODE** switch and the **SELECTOR** switch offer a great number of recording/listening combinations. For example, it is possible to make a tape copy while simultaneously listening to a record. Or, you may wish to record an album on one tape recorder and listen to an auxiliary source at the same time. Of course, you can check the progress of the tape recorders at any time by using the **TAPE MONITOR** switches without affecting the recording process.

TECHNICAL DESCRIPTION

SYNTHESIZER

The term "Synthesizer" is often used to describe an electronic music composer or a 4-channel (quadraphonic) acoustic field composer.

In the following description, however, it is used to describe the method by which many frequencies may be derived (synthesized) from an ultra-stable quartz crystal (the same kind used by commercial broadcasting stations to assure their staying "on frequency".)

PLL SYNTHESIZER

PLL is an abbreviation for Phase Locked Loop, a system developed for the space program that, by continuously monitoring the output signal, any slight deviation from the correct frequency can be quickly detected and corrected. The PLL synthesizer used in the Receiver is capable of staying precisely on the desired frequency with no drifting.

A block diagram of the PLL synthesizer is shown in Figure 6. The programmable divider (an electronic circuit whose dividing ratio can be easily changed) is connected between a VCO and a Phase Comparator. A VCO (Voltage Controlled Oscillator) is an oscillator whose frequency varies with a change in the input voltage. A Phase Comparator is a circuit which compares two frequencies and generates an error correction voltage if there is any difference between them.

In Figure 6, the VCO frequency (f_{VCO}) is divided into f_{VCO}/N by the programmable divider. Then, f_{VCO}/N is compared with the reference frequency (f_{ref}) so that the loop is locked (phase locked loop) and f_{VCO} is set exactly to N times f_{ref} . By using a crystal oscillator as the reference, the VCO frequency is very stable. As shown, any frequency needed by the tuner section can be generated just by changing the dividing ratio N (reprogramming the programmable divider.)

SYNTHESIZED TUNER

As described above, the tuner uses a PLL synthesizer as shown in Figure 6 for the local oscillator; the reference frequency is set to the spacing of the broadcast stations (50 kHz spacing) and the program input (N) is changed for tuning. This tuning system is extremely accurate and frequency error can be kept within 0.005%.

This kind of tuning accuracy is needed to allow the unit to achieve its high selectivity. All receivers have selectivity to allow them to separate between the station being received and stations located nearby in frequency. The more selective a receiver, the narrower the range of frequencies it will receive beyond the 50 kHz station bandwidth. In a very selective receiver, low distortion can be achieved only in a narrow range around the center tuning point. If the station is off tune, a part of the sideband is missed, and the result is a distorted signal. The synthesized tuner in your Receiver with its ultrastable crystal oscillator will precisely tune in a station for minimum distortion.

MAINTENANCE

CLEANING

The satin gold anodized finish of the knobs and heavy aluminum front panel will last indefinitely with proper care and cleaning. NEVER use scouring pads, steel wool, scouring powders, or harsh chemical agents, such as lye solution. These will mar the finish. Clean with a soft, lint-free cloth or cotton swab slightly dampened with a mild solution of detergent and water.

Your Receiver is provided with air filtering material in the slotted areas of the top and bottom cover. These filter areas should be cleaned periodically (at least once each year) to remove dust that may clog the filter and retard cooling. There is no need to remove the top or bottom cover to accomplish cleaning. Simply vacuum the slotted areas in the top, sides and bottom of the unit.

IN CASE OF DIFFICULTY

Should you experience difficulties when operating your system for the first time, and you have followed the procedure outlined in the "Simplified Operating Procedures", use of the following data will help you correct or isolate the problem. If these hints fail to remedy the situation, refer the problem to your nearest authorized service facility.

* Receiver does not operate, and function indicator does not light on.

1. Make sure power cord is properly connected.

* Receiver does not operate, but function indicator is on.

1. Check settings of controls such as **SELECTOR**, **TAPE MONITOR**, **SPEAKERS** switches, **VOLUME**, etc.
2. Turn off **POWER** and check connection of cables from turntables, tape decks, speakers, and other equipment. Make sure speaker wires are not shorted together.

* Receiver operates in one channel only.

1. Check setting of **BALANCE** control.
2. Turn off system power and transpose (left channel for right channel) the speaker cables at the **SPEAKER SYSTEMS** terminals. If the same speaker remains inoperative when turned back on, either the cable or speaker is at fault.

* No FM reception.

1. Depress **MODE/TUNING** switch.

2. Connect FM antenna.

* FM reception sounds scratchy or raspy.

1. Make sure FM antenna is connected properly.
2. Try re-orienting FM antenna.
3. Determine if you are in a poor reception area. If so, refer to "OUTDOOR FM ANTENNAS" section.

* AM reception poor.

1. Determine if other components in your system, appliances, or fluorescent lights are causing interference.
2. Try an outdoor AM antenna. See "OUTDOOR AM ANTENNA" section.

* Loud hum in phono.

1. Check to see that phono plugs and jacks are clean and properly connected.
2. Try connecting turntable ground wire (usually colored green) to **GND** post on rear panel of receiver.
3. If ground wire is already connected, try disconnecting it.
4. Make sure phono cartridge is wired properly and making good contact with terminals in tone arm.

REPAIRS

Only the most competent and qualified service technicians should be allowed to service your 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, refer to your dealer or write directly to one of the location listed on page 38 for the name and address of the Marantz Authorized Service Station nearest your home or business. Please include the Model and serial number of your unit together with a full description of what you feel is abnormal in its behavior.

REPACKING FOR SHIPMENT

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

- a. Pack the unit carefully, using the original material as shown in Figure 7.
- b. Ship via a reputable carrier (do not use Parcel Post) and obtain a shipping receipt from the carrier.
- c. Insure the unit for its full value.
- d. Be sure to include your return address on the shipping label.

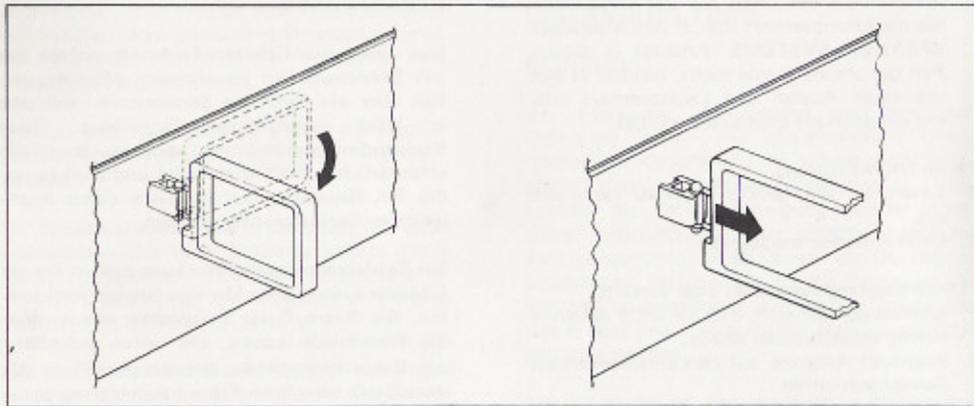


Figure 3. AM Loop Antenna
 Figure 3. Antenne cadre AM
 Abbildung 3. MW Schleifenantenne

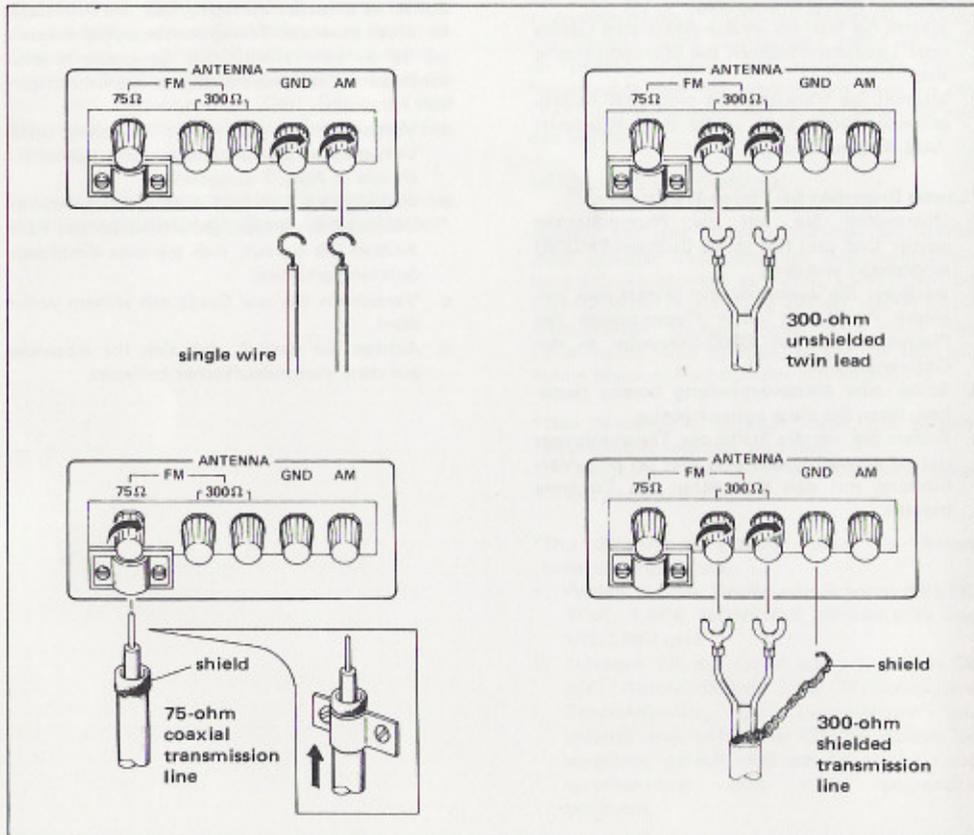


Figure 4. AM/FM Antenna Connection
 Figure 4. Branchement des antennes AM/FM
 Abbildung 4. MW/UKW Antennenanschlüsse

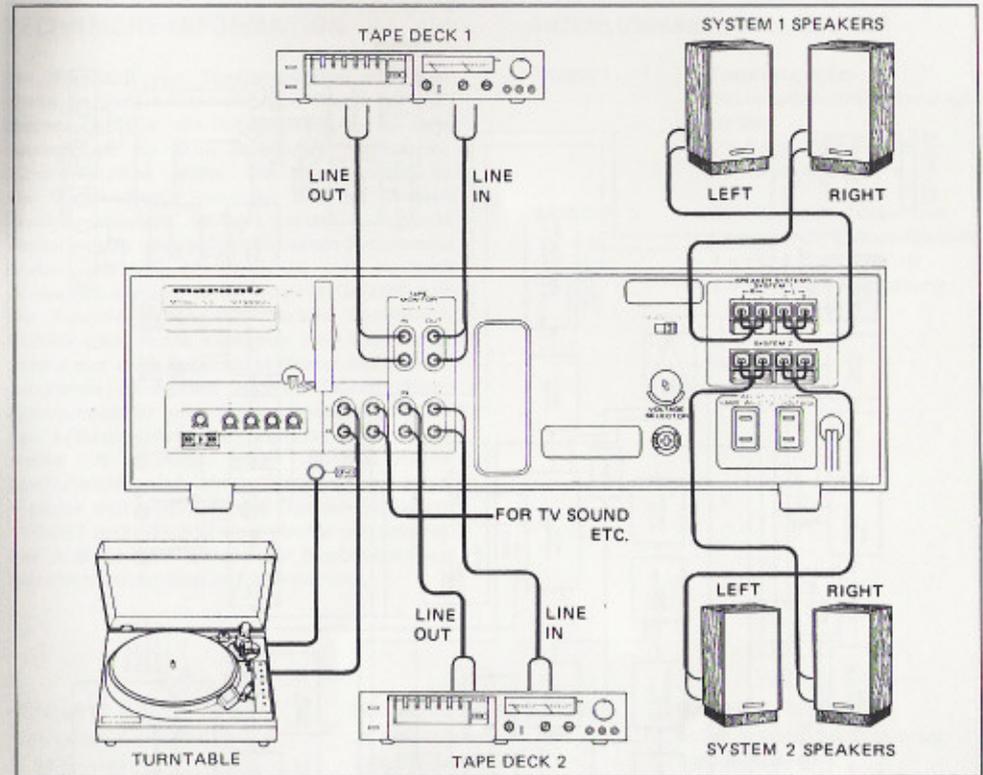


Figure 5. Connection Diagram
 Figure 5. Schéma des raccordements
 Abbildung 5. Kabelanschlüsse

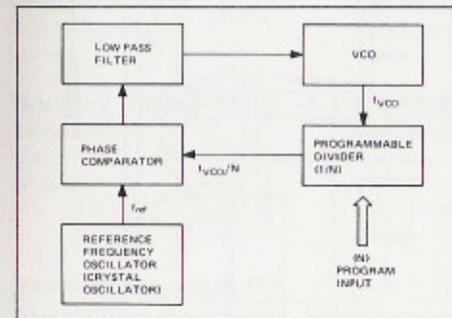


Figure 6. Block Diagram of the PLL Synthesizer
 Figure 6. Schéma du synthétiseur
 Abbildung 6. Blockschaltbild der Arbeitsweise des PLL-Synthesizers

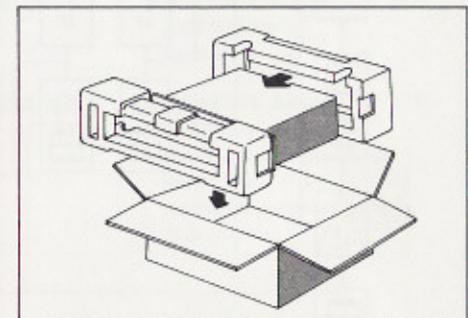


Figure 7. Repacking Illustration
 Figure 7. Instructions pour le remballage
 Abbildung 7. Wiederverpacken des Gerätes

