
BOSE® SPATIAL CONTROL™ RECEIVER
Owner's Manual
BOSE

FRONT PANEL FEATURES

(1) BOSE POWER SWITCH
Touching any two letters of the BOSE logo turns the receiver on or off

(2) SOURCE
Selects an AM, FM, PHONO, OR AUX input signal for listening or tape recording

(3) TAPE 1 AND 2
Connects two tape recorders to the Receiver for playback or recording

(4) MODE
Adjusts the operating (MONO or STEREO) characteristics of the Power Amplifiers

SOURCE AND ROOM COMPENSATION CONTROLS

(5) COMPENSATION
Activates all Source and Room controls

(6) LOW FILTER
Reduces the lowest octave of bass energy

(7) LOW FREQUENCY RANGE
WIDE — Activates the Low Frequency Control in the 20-400 Hz range
NARROW — Activates the Low Frequency Control in the 100-250 Hz range.

(8) LOW FREQUENCY
Permits adjustment of program material for both channels under 400 Hz. Normal setting is determined by a procedure outlined in the Owner's Manual

(9) HIGH FREQUENCY
Permits the adjustment of the program material for both channels above 2.2 kHz. Normal setting is determined by a procedure in the Owner's Manual

(10) BALANCE
Adjusts the relative volume of both channels

(11) SPATIAL CONTROL
Pushbutton activates the Spatial circuitry in the Receiver
Slide control adjusts the Spatial characteristics of the system and acts as a balance control between two pairs of speakers

(12) FM MUTING
Controls the "FM quieting" circuitry eliminating FM interstation noise

(13) LOUDNESS
Activates a volume compensation circuit adding low and high frequencies to the program material as a function of the volume control setting

(14) SPKRS A
Connects or disconnects the speakers wired to Speakers A terminals

(15) SPKRS B
Connects or disconnects the speakers wired to Speakers B terminals

(16) HEADPHONES
Connects any low or high impedance headphone to the receiver

(17) VOLUME
Adjusts the sound level for the speakers and headphone jack

(18) TUNING
Selects the AM or FM Station

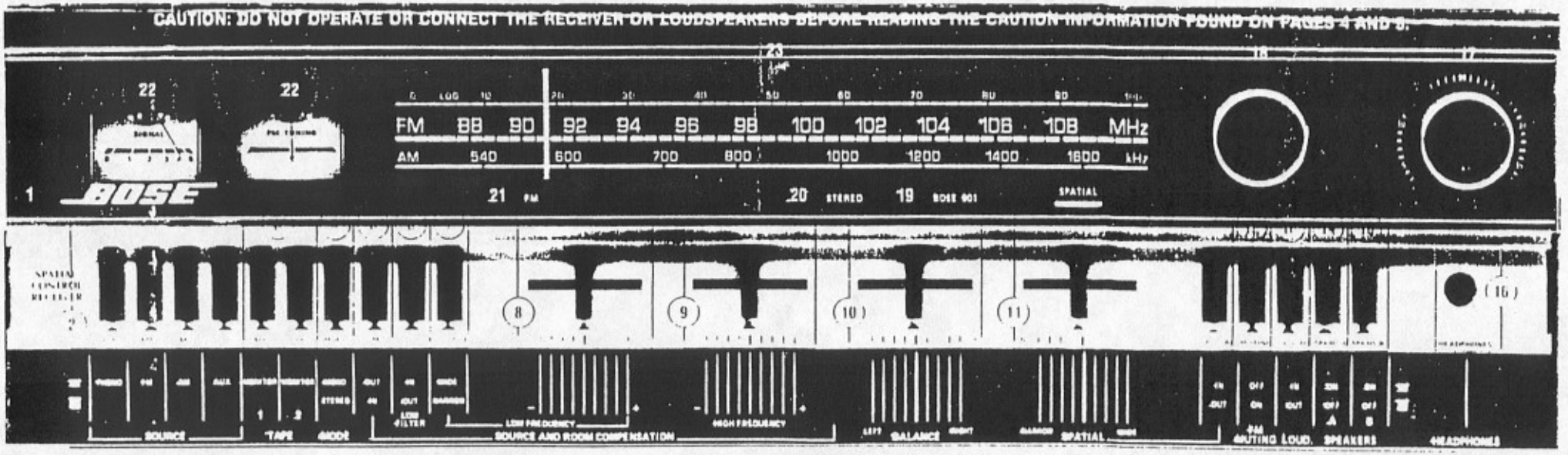
(19) BOSE 901
Indicates the operation of the internal BOSE 901 Series IV Equalizer

(20) STEREO
Indicates the reception of a stereo signal from an FM station. Also indicates mono or stereo operation as selected by the MODE switch

(21) SOURCE INDICATORS
Indicates the SOURCE selected

(22) SIGNAL AND TUNING METERS
Signal Meter indicates the relative strength of the station being received; adjust for maximum. Adjust the FM Tuning Meter to the center (0) for best reception

(23) TUNING DIAL AND POINTER
Indicates the frequency of the AM or FM station being received. Includes a logging scale as a tuning aid



CAUTION INFORMATION

CAUTION: Read this section before connecting or operating the unit or loudspeakers

1. Please retain all safety and operating information provided with the Spatial Control Receiver for future reference.
2. For your safety, follow all cautions and warnings in the operating instructions and on the unit. This includes all cautions and warnings regarding the loudspeakers as well.
3. As the Spatial Control Receiver is a complex electronic instrument, do not assume the unit is faulty until you have completed Section V.G., "In Case of Difficulty", of the instruction manual.
4. Do not connect to the outlets on the rear of the receiver any accessory that requires more power than the outlets are rated to provide.
5. Do not use your receiver near water; for example, near a bath tub, washbowl, kitchen sink, in a wet basement, or near a swimming pool.
6. Place the unit so its location and position does not interfere with proper ventilation. Do not place it on a bed, sofa, rug, or similar surface that might block ventilation holes. If you are enclosing the receiver in a bookshelf or cabinet, follow the instructions in Section II.A. of the instruction manual to insure proper air flow through ventilation openings.
7. Do not place any objects (for example, papers, magazines, record jackets) on top of the cabinet that impedes air flow as this may cause failure of the unit.
8. Locate the unit away from direct sunlight or any excessive heat sources such as radiators, heat registers, stoves or other appliances.
9. Connect the receiver to an AC Line (power mains) of the same type marked on the rear of the unit, such as 120 VAC, 60 Hz.
10. Route the power line cord and speaker cables where they will not be walked on, pinched, or cut by heavy or sharp objects. Pay particular attention to cords, plugs, convenience receptables, or at places where cords exit from or plug into the unit.
11. The power line cord of the unit should be unplugged from the AC line outlet (power mains) when left unused for long periods of time, such as a long vacation.
12. If you install an outdoor antenna, locate it away from power lines or high tension lines. Ground the antenna system to protect against voltage surges and built-up static charges. (This is especially important in protecting your house and receiver during electrical storms.)

    An example of antenna grounding, as per National Electrical Code Instructions, is shown below. Follow the grounding instructions provided with the external antenna. If the instructions provided with your antenna are inadequate, Section 810 of the National Code, ANSI/NFPA Number 70-1978, provides detailed information regarding the proper antenna grounding procedure. This document can usually be purchased from your local wholesale electric supply outlet or by mail from:

    National Fire Protection Association
    Publications Department
    470 Atlantic Avenue
    Boston, Mass. 02210.
13. Do not drop objects or spill liquids into the cabinet openings.
14. The unit should be serviced by qualified personnel when:

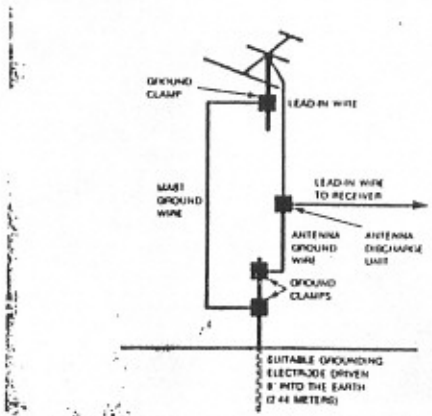
    The power line cord or plug has been damaged.

    Objects or liquids have fallen or been spilled into the unit.

    The unit has been exposed to rain or excessive moisture.

    The unit does not appear to operate normally or exhibits a marked change in performance.

    The unit is dropped or the enclosure damaged.
15. Clean the unit as recommended in Section V.D. of the instruction manual.



A. USE NO. 10 AWG COPPER, NO. 8 AWG ALUMINUM, NO. 17 AWG COPPER-CLAD STEEL, FOR GROUND WIRES FOR BOTH MAST AND LEAD-IN.

B. SECURE LEAD IN WIRE FROM ANTENNA TO ANTENNA DISCHARGE UNIT AND MAST GROUND WIRE TO HOUSE WITH STAND-OFF INSULATORS SPACED FROM 4 FEET (1.22 meters) TO 6 FEET (1.83 METERS) APART.

C. MOUNT ANTENNA DISCHARGE UNIT AS CLOSE AS POSSIBLE TO WHERE LEAD-IN ENTERS HOUSE.

TABLE OF CONTENTS

I. FORWARD

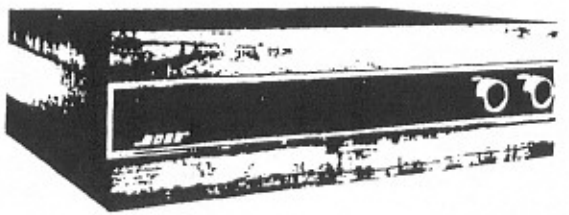
Congratulations on your choice of the BOSE® Spatial Control™ Receiver. As part of your High Fidelity system the BOSE Receiver offers a new level of performance, flexibility and versatility. It incorporates three important features which open new dimensions of audible performance and ease of operation:

The BOSE Receiver, when used with BOSE 901 Series III or IV Loudspeakers, has the ability to control the spatial properties of sound. Spatial properties create the sense of room size and convey the apparent location of the performers; they also create the ambience that makes music sound life-like. This Receiver incorporates four power amplifiers, a 901 Series IV Equalizer, Spatial Control™ Circuitry, and CMOS switching Logic to control the spatial performance of the system.

The Source and Room Compensation Controls replace the standard tone controls normally found on receivers but offer much greater flexibility. These Controls help eliminate the tonal imbalances caused by room construction and furnishings, and by variations in program material.

A BOSE 901 Series IV equalizer, used with the BOSE 901 Series III or IV Loudspeaker System, is built into the Receiver making it easy and economical to use 901 speakers with your music system. (The Receiver's internal BOSE 901 Series IV Equalizer is fully compatible with the BOSE 901 Series III loudspeakers and offers improved performance in midrange accuracy and versatility of operation.) Once the rear panel programming switches are set, the equalizer is switched in and out of the signal path automatically, preventing accidental equalization of conventional loudspeakers.

Take the time to get acquainted with your new Spatial Control™ Receiver. Read the Owner's Manual and review the sections concerning speaker connection and auxiliary equipment. The better you understand the features of your new Receiver, the more it can serve your present and future high fidelity needs.



II. INSTALLATION

A. UNPACKING, INSTALLATION, AND INITIAL CONNECTION

After opening the carton, grasp the receiver by the sides and lift it out of the carton. Place the receiver on a table and remove the plastic wrap.

Unpack your receiver carefully and inspect it for signs of possible damage. If you find the receiver is damaged, contact your BOSE dealer immediately.

CAUTION: DO NOT LIFT THE RECEIVER BY GRASPING THE PLASTIC WRAP, THE HINGED FRONT PANEL, OR THE AM LOOPSTICK ANTENNA (FOUND ON THE REAR OF THE RECEIVER).

Unwrap the FM DIPOLE antenna (the T-shaped wire antenna) in the receiver carton. Connect it to the terminals labeled "300" on the Receiver's rear panel. (See Figure 1). Stretch the dipole antenna to its full length and "T" shape, and position it horizontally. For further information on positioning the dipole antenna or installing an outdoor antenna, see Section IV.A., Improving FM Reception.

Uncoil the AC line cord and connect to any convenient AC outlet.

Before you turn on the receiver, make certain the Volume is turned down.

When positioning the receiver, please observe the following precautions:

1. Although the BOSE Spatial Control™ Receiver generates little heat, it does need a certain amount of ventilation. If you place your receiver in a cabinet, make certain that it has adequate ventilation. See Figure 2.
2. Do not connect equipment requiring more than the maximum wattage indicated on the switched and unswitched accessory outlets.
3. For best AM reception, leave adequate space behind the receiver to adjust the external AM antenna.

When you have finished installing the receiver, save the carton and fillers for possible later use.

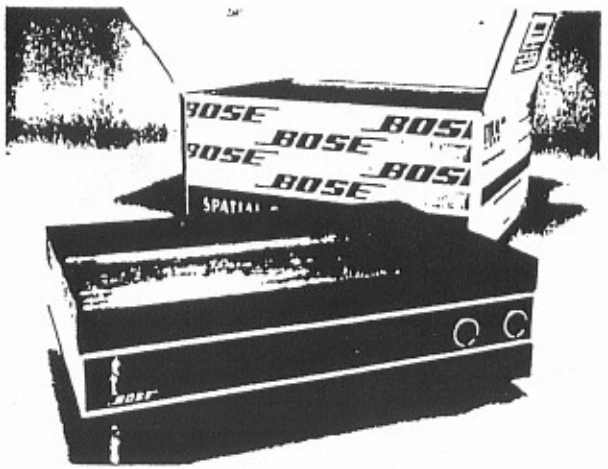
B. CONNECTING THE LOUDSPEAKERS AND ADJUSTING THE REAR PANEL SWITCHES

1. BOSE 901 SERIES III OR IV SPEAKERS

Operation of the Spatial Control™ feature requires special connections between the Receiver and 901 Series III or IV loudspeakers. Fifty feet of three-conductor 16-gauge connection wire is included with your receiver for this purpose.

Should you need more wire, contact the dealer from whom you purchased your receiver. Alternatively, you can contact Bose directly for additional 50 foot lengths of wire. You can also use Type SJ three-conductor 16-gauge cable which is available at most hardware stores. Sixteen gauge wire is suitable for lengths up to 50 feet per speaker. For longer runs, use 14-gauge cable, available at most electrical supply stores.

Measure and cut the wire to length. Strip ½ inch (1.3 cm) of insulation from each conductor, and twist the wire strands together. **Be careful not to place the wire where furniture or sharp, heavy objects might pinch or cut the insulation or conductors.**



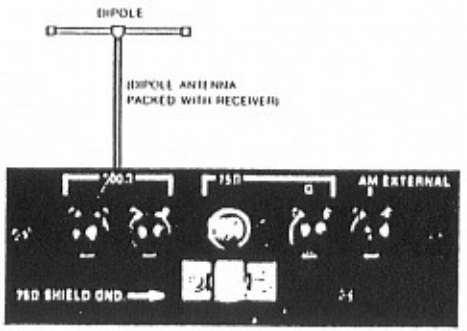


Figure 1
DIPOLE CONNECTIONS

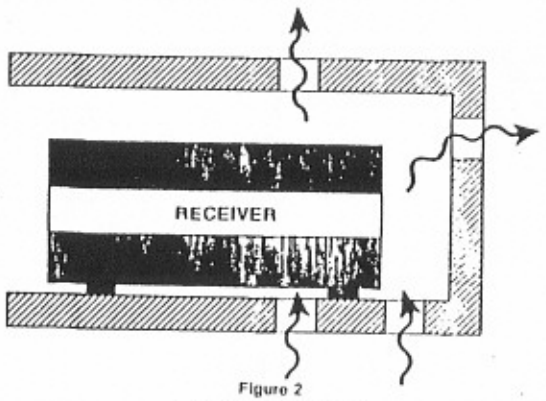


Figure 2
VENTILATION DIAGRAM

For operation of the SPATIAL feature, your 901 Series III or IV loudspeakers must be connected to the SPEAKERS A output as follows[1].

a. Place the Part I speaker on the left side of the room and locate the connection terminals.[1]

b. Locate the Receiver rear panel Speakers A connection terminals; to make a connection to the Receiver, insert the wire in the hole in the center of the terminal while depressing it.

c. Connect the (+) terminal of the speaker to the terminal marked (+) on the left channel of the Speakers A amplifier output.

d. Connect the (-) terminal of the speaker to the (-) terminal of the Speakers A output of the Receiver[2]. Remove the plastic sleeve over the center speaker terminal and use the appropriate metric or English knurled speaker nuts and washers provided in the accessory pack. See Figure 3.

e. Using the color coded speaker wire, connect the left speaker terminal marked (-) to the terminal marked (-) on the left channel of the Speakers A amplifier output.[2]

f. Place the (Part 2) speaker on the right side of the room and connect the (+), (-), and (-) terminals to the corresponding terminals on the receiver, as outlined above.[2]

Should you wish to connect 901 Series IV Speakers to the SPEAKERS B Terminal, disregard Section d. above. Wire the 901 IV speakers using the (+) and (-) terminals only.

CAUTION:
DUE TO THE AMPLIFIER SWITCHING CHARACTERISTICS, THE SPATIAL CONTROL™ RECEIVER HAS NO COMMON GROUND. DO NOT ATTEMPT TO TEST THIS RECEIVER OR CONNECT ANY DEVICE THAT CONNECTS THE NEGATIVE (-) SPEAKER TERMINALS OF THE RECEIVER TOGETHER.

[1] The directions above apply to speakers installed right-side up. If your speakers are hung upside down, modify the wiring and placement procedure:

Reverse the placement of the Part I with the Part II speaker in the listening room.

Reverse the (+) and (-) wiring connections at BOTH speakers. DO NOT CHANGE THE WIRING AT THE RECEIVER. DO NOT CHANGE THE WIRE CONNECTED TO THE (-) TERMINAL.

If additional speakers (connected to Speakers B) are used in the same room, reverse BOTH rear speaker (+) and (-) connections.

[2] When making both the amplifier and speaker connections, make certain that no loose wire strands from either conductor touch each other, causing a possible short circuit.

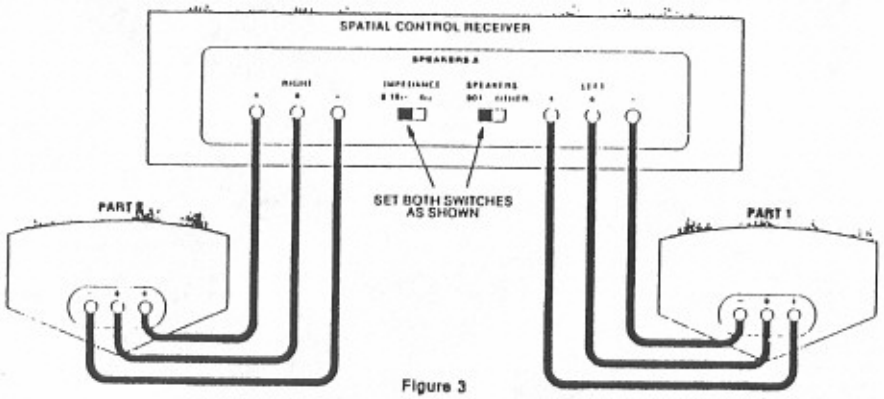


Figure 3
CONNECTING 901 SERIES III or IV TO SPEAKERS A

2. ALL SPEAKERS OTHER THAN BOSE 901 SERIES III OR IV LOUDSPEAKERS.

Fifty feet of speaker connection wire is included with your Receiver for loudspeaker connection. This special three-conductor 16-gauge connection wire is used to connect the three terminals found on the BOSE 901 Series III and IV loudspeakers; for conventional speakers, use the outside two conductors and clip or tape the unused center wire.

If you need additional wire, two-conductor copper zipcord is available at most electrical and hardware stores. This wire is usually color-coded or has one or more ribbed lines along one side of the insulation so that each conductor can be individually identified for proper phasing of your speaker system.

It is important that the wire used to connect your speaker system is large enough. If the wire has too much resistance, audible coloration of the sound and loss of power can result.

Use the table below to choose the correct gauge of stranded copper wire for different wire lengths.

RECOMMENDED CONNECTION WIRE†

Wire Gauge	Maximum Wire Length For 8-Ohm Speakers	Maximum Wire Length For 4-Ohm Speakers
18-gauge zipcord (or two-conductor wire)	40 ft.	20 ft.
16-gauge two conductor wire	60 ft.	30 ft.
14-gauge two-conductor wire	100 ft.	50 ft.

†The wire lengths shown in Table 1 introduce no perceptable audible coloration. Most listeners will not notice any effect even if wire lengths are increased by as much as 50%.

Measure and cut the wire to length. Strip ½ inch (1.3 cm) of insulation from each conductor, and twist the wire strands together. **Speaker wiring must be placed in your room where furniture or sharp, heavy objects cannot pinch or cut the insulation or conductors.**

It is important that the amplifier connections for both speaker systems be identical (See Figure 4) so that both speakers work together (in phase).

a. Place the left speaker on the left side of the room and locate the connection terminals on the speaker.

b. Locate the Receiver Speaker A connection terminals, to make a connection to the Receiver, insert the wire in the hole in the center of the terminal while depressing it.

c. Using the color coded speaker wire, connect the left speaker terminal marked (–) to the terminal marked (–) on the left channel of the Speakers A amplifier output.

d. Connect the (+) or positive terminal on the left speaker to the terminal marked (+) on the left channel of the Speakers A amplifier output.

e. Use only the Receiver connection terminals marked (+) and (–). The terminal marked (•) is intended for use with the 901 Series IV speaker ONLY and should not be used with conventional speakers.

f. Place the other speaker on the right side of the room and repeat the connection procedure.

Wire connections for Speakers B the same as Speakers A.

Follow your speaker manufacturer's recommendations regarding fusing your speakers.

†When making both the amplifier and speaker connections, make certain that no loose wire strands from either conductor touch each other, causing a possible short circuit.

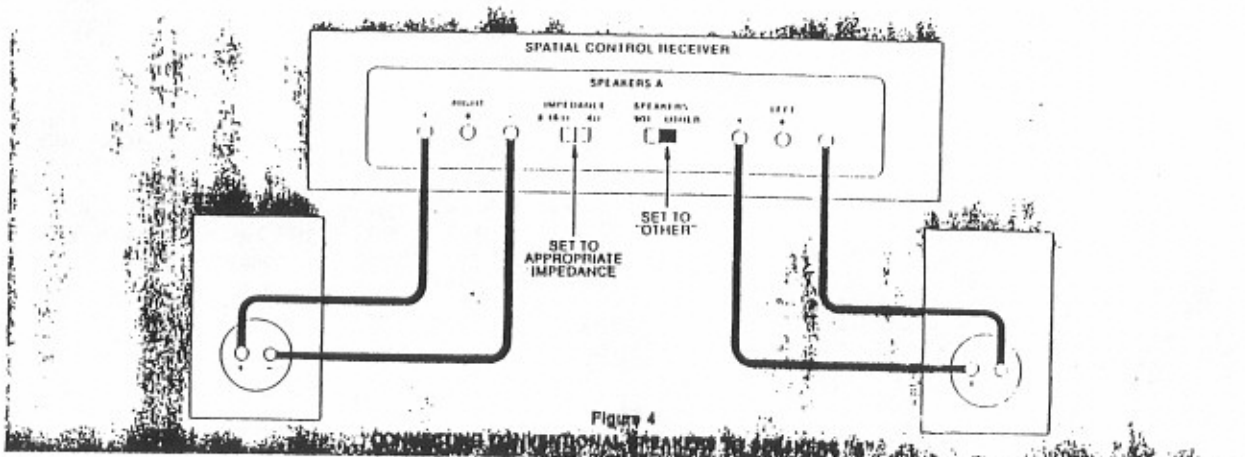
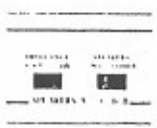


Figure 4

3. SETTING THE REAR PANEL SWITCHES

The Spatial Control™ Receiver has unique programming switches for each set of speaker outputs. These switches control the equalization and amplification of each loudspeaker.



The 8-16 OHM/4-OHM switch configures the four power amplifiers according to the impedance of your speakers. If operating one pair of 8 ohm speakers, two amplifiers work together to power each speaker. When two pairs of speakers or one pair of 4 ohm speakers are operating, each speaker is powered by one amplifier.

The 901/OTHER switch controls the operation of the 901 IV active equalizer. This insures that the 901 loudspeakers always receive an equalized signal and prevents conventional speakers from being accidentally equalized.

Follow the instructions below to set the switches for each pair of speakers you are using. **Under special circumstances, it is necessary to set the impedance switches to 4 ohms regardless of the actual impedance of your loudspeakers.**

Set the Balance control in the center position with only Speakers A (the front speakers) playing. With the speakers positioned next to each other, the sound should seem to be coming from between the speakers, and the music should sound full and natural. Always connect the speakers so that the most bass results.

If the sound is not localized between the speakers and is lacking in bass, it is possible that one of the speaker connections is reversed. Check your connections and reverse the connections to one speaker only and repeat the test.

Now select Speakers B only (the rear speakers), and repeat the above test.

After checking the performance of both front and rear pairs of speakers, again play the same material and play both Speakers A and B (using the front/back balance) such that all four speakers are playing at equal volume. The sound should be localized in the center of the four speakers and should be rich and full. If it is not, reverse the connections to both speakers on the Speaker B terminals. Again, repeat the test.

8-16 OHM/4 OHM SWITCHES

Set the impedance switches to 8-16 ohms for all 901 loudspeakers. For other loudspeakers, set the switches for the impedance of the speaker system. Both Speakers A and B have individual 8-16 OHM/4 OHM Switches. See Figure 3.

901/OTHER SWITCHES

This switch activates the internal 901 Series IV active equalizer. Set the switch to the "901" position for BOSE 901 Series III and IV loudspeakers. (See Figure 3.) If you now own 901 Series III or IV speakers, the equalizer originally provided with your speakers is no longer required.

For all other loudspeakers, set the appropriate switch to the "Other" position. See Figure 4.

Both Speakers A and B have individual 901/OTHER Switches. If you are using two pairs of speakers be certain to set both switches to their appropriate position.

[1]If you are using speakers which require a separate active equalizer (such as the original 901 or 901 Series II loudspeakers), consult Section II.E., Connecting Other Equipment.

CAUTION:

DO NOT, UNDER ANY CIRCUMSTANCES, LEAVE THE 901/OTHER SWITCH IN THE "901" POSITION WHEN USING CONVENTIONAL LOUDSPEAKERS AS POSSIBLE DAMAGE TO CONVENTIONAL LOUDSPEAKERS CAN OCCUR.

4. PHASING TWO PAIRS OF SPEAKERS OPERATING IN THE SAME ROOM

DO NOT ATTEMPT THIS TEST UNTIL ALL EQUIPMENT AND CONNECTIONS FOR YOUR SYSTEM HAVE BEEN MADE! ALL ACCESSORY EQUIPMENT THAT WOULD NORMALLY BE USED WITH YOUR SYSTEM (SUCH AS NOISE-REDUCTION DEVICES OR EQUALIZERS) MUST BE CONNECTED AND OPERATING DURING THE PHASING TEST.

If you are operating two pairs of loudspeakers in the same room, this test will help you ensure that they are operating in phase. Adjust your receiver for mono operation and play music containing deep bass through the speakers connected to the Speaker A terminals.

C. CONNECTING A TURNTABLE OR RECORD CHANGER

The BOSE® Receiver has connections for a turntable or record changer. These two connections are found on the rear panel of the receiver and are marked Left and Right; additionally, a separate ground terminal is provided for certain types of record playing equipment. See Figure 5.

Most turntables have color-coded cables or plugs that identify the left and right channels. Connect these cables to the Phono jacks on the Receiver.

If your turntable has a separate ground wire, connect it to the ground (GND.) connection found to the left of the phono connections. See Figure 5.

If you are using a belt drive, direct drive, or electronic drive turntable, connect the power cord to the SWITCHED AC outlet found on the rear of the receiver. This permits the on/off switch found on the receiver to control the turntable.

Older record changers or turntables using "idler wheel" drive systems should be connected to the UNSWITCHED AC outlet allowing the unit to cycle off at the end of the record.

D. CONNECTING A TAPE RECORDER

The BOSE® Receiver tape connection facilities allow two tape recorders to be connected for both recording, dubbing, and playback.

Connect a pair of cables from the "line out" jacks on the tape recorder to the "TAPE IN" jacks on the Receiver. (If you are uncertain, consult your tape recorder's instruction manual to identify the input and output jacks).

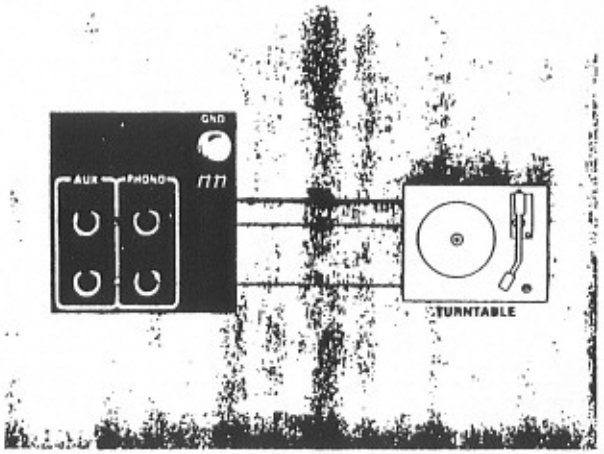
Connect a pair of cables from the "TAPE OUT" jacks of the receiver to the "line input" jacks on the tape recorder.

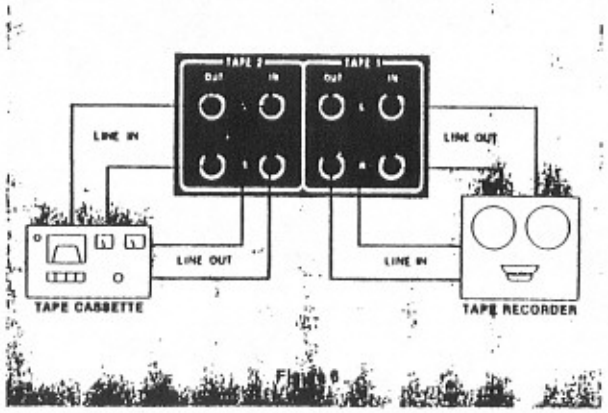
Connections for both Tape 1 and 2 are identical. When making all connections, be careful to make all connections maintaining the correct left and right orientation. See Figure 6.

E. CONNECTING OTHER EQUIPMENT

1. EQUALIZERS AND SIGNAL PROCESSING DEVICES

Most equalizers and signal processing equipment should be connected to the receiver using the Tape Monitor 1 or 2 connection facilities. Such equipment includes graphic and parametric equalizers and noise reduction equipment. See Figure 7.





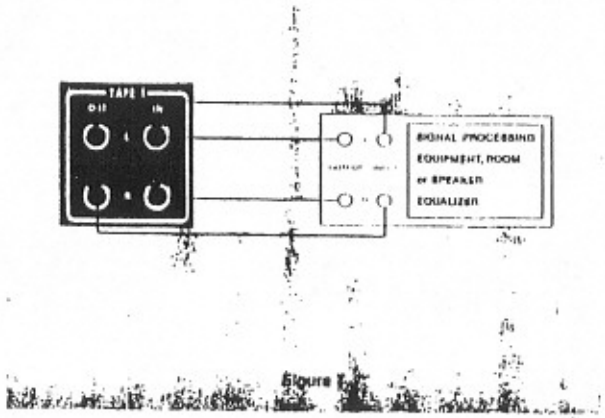


Figure 7

Should you own speakers which require their own electronic equalization, such as the Bose 901 Series I or II, you can connect them through the Tape Monitor jacks if you do not plan to use another pair of speakers at the same time.

To use such speakers in conjunction with conventional unequalized speakers, connect the equalizer through the pre-out/main-in jacks on the rear of the receiver after removing the U-shaped connecting bars. To equalize the SPEAKERS A channels only, connect the external equalizer through amplifier channels 1 (Left) and 4 (Right). To equalize the SPEAKERS B channels, connect the equalizer through amplifier channels 2 (Left) and 3 (Right). SET BOTH IMPEDANCE SWITCHES TO THE 4 OHM POSITION. See Figure 8.

NOTE TO BOSE 901 IV OWNERS:

The 901 IV internal equalizer is electrically before the preamplifier outputs. If your signal processing device is not compatible with an equalized signal, the Bose 901s can be equalized after the processing unit using the standard BOSE 901 IV equalizer.

2. TIME DELAY DEVICES

To connect a time delay device, use the Preamp Out-Amp In jacks found on the rear of the unit. Preamplifier outputs for Channels 1 and 4 (Speakers A) and should be connected directly to the input of the delay device. If your delay device provides outputs for both front and rear channels, connect to 1 and 4 (front channels or Speakers A) and 2 and 3 (ambient channels or Speakers B), left and right respectively. The controls for the delay circuitry will then operate each of the independent amplifier channels. See Figure 9.[1] [2]
SET BOTH IMPEDANCE SWITCHES TO THE 4-OHM POSITION.

[1]If you are using 901 Series IV speakers, do not use the (*) terminal when instructed to set the impedance switch to 4 ohm.

[2]Perform additional phasing test found in Section II B.

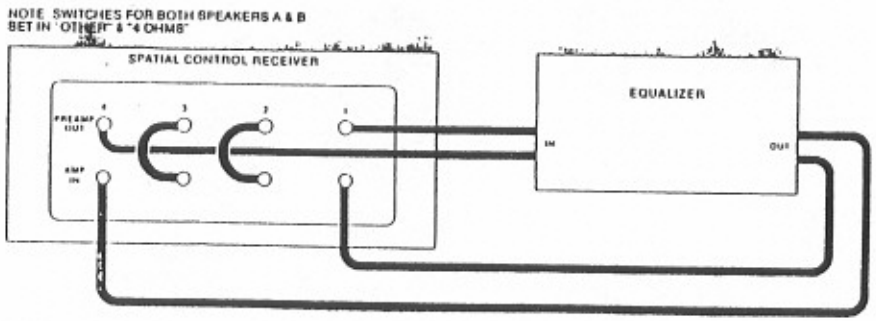


Figure 8
CONNECTING OTHER EQUIPMENT

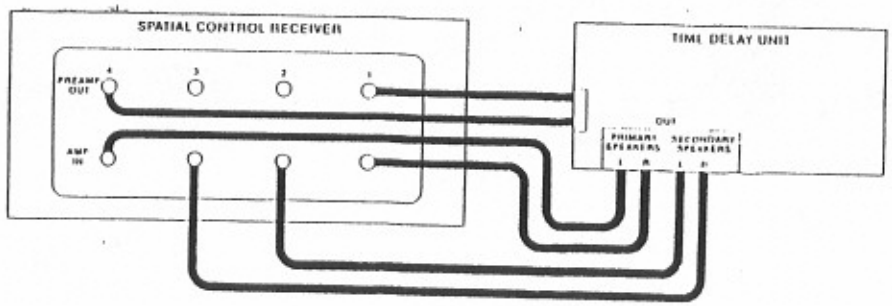


Figure 9
CONNECTING A TIME DELAY DEVICE

III. OPERATING CONTROLS

To fully utilize the features and flexibility provided by this receiver, please take a few minutes to become familiar with the push button and slide controls. While reading this section, experiment with the controls to determine their function and purpose; the amount of time spent learning about the controls should help you get the most out of its features. See pages 2 & 3.

A. POWER

Touching any two adjacent letters of the BOSE nameplate (located on the front of the receiver) turns the Receiver on. Touching it again turns it off. Two of the AC outlets (SWITCHED AC) on the rear of the receiver are controlled by this on/off switch, while two AC outlets are not affected (UNSWITCHED AC). (An electronic muting circuit disconnects the loudspeakers for a few seconds after turn-on to eliminate any noises that might occur.)

An additional on/off switch is located on the rear of the receiver beneath the unswitched outlets. In the event that you are away for extended periods of time or are concerned that the receiver may be accidentally turned on, turn the receiver off using the rear power on/off switch. WHEN THIS SWITCH IS OFF, IT IS NOT POSSIBLE TO ACTIVATE THE RECEIVER USING THE FRONT PANEL TOUCH CONTROL.

NOTE: IF THE RECEIVER REFUSES TO TURN ON OR IF IT TURNS ON AND OFF, CHECK FOR POSSIBLE CONNECTION ERRORS. (SEE SECTION V.G. "IN CASE OF DIFFICULTY".)

B. SOURCE (Phono, FM, AM, AUX)

1. PHONO

The PHONO push button selects the turntable or record changer connected to the rear of the receiver. The phono preamplifiers are designed with substantial dynamic headroom and can accomodate most high quality magnetic cartridges.

2. FM

To receive an FM radio program, depress the FM push button on the front panel. Rotate the tuning knob to select an FM radio broadcast. For best reception, adjust the tuning knob for maximum deflection of the Signal Strength Meter and a centered or "0" reading on the FM tuning meter.

When the receiver is accurately tuned to an FM Stereo station, the "STEREO" indicator lettering on the front panel will glow and the program will be heard in Stereo. When the receiver is tuned to a Mono (non-stereo) FM broadcast, the stereo indicator lettering on the front panel will not light and the stereo decoding circuits of the tuner will not operate.

When in the FM mode, the receiver also switches automatically between Mono and Stereo operation depending on the strength of the signal received. If the tuner circuitry attempts to switch intermittently from Stereo to Mono, or if the signal received is excessively noisy, depress the MODE button to operate the tuner in Mono. This will reduce noise considerably. For further suggestions, see Section IV.A., Improving FM Reception.

The muting circuit automatically suppresses background noise. To receive extremely weak stations which might be suppressed by the muting circuit, depress the MUTING push button.

Your BOSE Receiver incorporates a log scale facilitating easy location of FM stations. (This is particularly useful when living in a large metropolitan area where many stations may be crowded together on the dial.)

The BOSE Receiver incorporates an FM detector output (located immediately above the rear panel phono connections) for use with possible future FM quadraphonic decoders.

3. AM

To receive AM radio broadcasts, depress the AM push button on the front panel of the Receiver. Adjust the tuning knob (with the volume set at low level) to an AM station. Adjust for maximum deflection (towards the right) of the Signal Strength meter.

In comparing the sounds of AM broadcasts versus FM broadcasts, you may notice that AM programs lack the brilliance and clarity of FM stations. Also, depending upon your location, AM signals may be affected by static or other forms of interference. These differences are normal and are why FM is preferable for music listening while AM is valued more for news, sports, and programs of conversation.

The BOSE receiver contains an external rear panel loopstick antenna designed to combine high sensitivity with good interference rejection. To improve AM reception, pull the loopstick from its clip and move it to increase the signal as shown by the meter. For further information to improve AM reception, see Section IV.B., "Improving AM Reception".

4. AUX

The BOSE Spatial Control™ Receiver is equipped with a stereo auxiliary input for connecting other program sources to your high-fidelity system. Almost any stereo or mono high-level source may be plugged into the AUX jacks: examples include an additional tape recorder, a tape player, the sound track of a film projector, or the audio output of a television set. After connecting the appropriate cables to the AUX jacks, adjust the volume control of the program source (if possible) so that the sound level remains approximately the same as FM or PHONO. Depress the Mode push button when using a mono source, for example, a television set.

C. TAPE 1, TAPE 2

The TAPE 1 and 2 push buttons connect the output of two tape recorders to the Receiver. If your tape recorder has three heads and separate playback electronics, an instantaneous comparison of the tape recording with the program material can be made.

1. **TAPE PLAYBACK**

To play a previously recorded tape, activate the "play" mode of the tape machine and press the appropriate TAPE monitor button on the receiver. The output of the tape machine is now connected to the amplifying circuitry of the receiver regardless of the input selected by the four SOURCE push buttons. The VOLUME, SOURCE and ROOM COMPENSATION controls, and MODE switch can now be used to adjust the reproduced sound quality.

2. **TAPE RECORDING**

The output of the program selected by the SOURCE push buttons is sent to the tape recorder via the tape output jacks. Only the SOURCE selector, the MODE switch (when used to deactivate the FM stereo circuitry), and the TUNING knob affect the signal reaching the TAPE OUT jacks. The other controls on the receiver can be used to adjust the sound coming from the loudspeakers but have no effect on the signal reaching the tape recorder. (Check your Tape Recorder Owner's Manual for further instructions about recording.)

3. **TAPE MONITORING** (To listen to a tape while it is being recorded)

If your tape recorder has a tape "monitoring" feature, you can listen to a tape while it is being recorded. Depress the TAPE push button to hear the recorded tape, release it to compare it to the source selected for recording. If the TAPE MONITOR switch is depressed with no tape recorder connected or with the tape recorder connected but not operating, all sound will stop regardless of the volume control setting or the input selected.

4. **TAPE COPYING**

To copy or "dub" a tape from Tape 1 to 2, depress the TAPE 1 button. The output of the tape recorder will automatically be supplied to the second tape recorder. Do not push the Tape Monitor 1 button while dubbing to a machine connected to Tape 2 because the recording will be interrupted.

To copy from Tape 2 to Tape 1, use a 'Y' connector to feed the output of tape recorder 2 to both the Auxiliary input and Tape 2 input. To make a copy on the first tape recorder, set the second recorder for playback, depress the AUXiliary push button, and set the first machine to record. When using this procedure, do not attempt to monitor the source material; depressing the Tape 1 pushbutton can cause feedback which will be heard as a loud tone or whistle.

If you wish to make a mono recording from the BOSE receiver, use a 'Y' connector to join the Left and Right Tape 1 outputs. Do not leave the 'Y' connector connected to the Tape output jacks of the BOSE receiver. This will electrically connect both channels of the electronics of the receiver so that stereo performance will not be possible.

D. **MODE (Mono/Stereo)**

The MODE switch should normally be left in the "out" position for STEREO operation. In mono, it connects both amplifier channels so the same signal is heard from both speakers.

The FM tuner section of the Receiver automatically switches from stereo to mono when the MODE switch is depressed. This reduces noise or distortion on poor quality FM broadcasts.

The MODE switch can also be used to connect both channels together in order to hear sound from both channels when playing a monaural source, such as a television set or single channel tape recorder.

Additionally, the MODE control can be used to reduce unwanted surface noise and distortion when playing mono records or noisy stereo records.

E. **LOW AND HIGH FREQUENCY SOURCE AND ROOM COMPENSATION CONTROLS**

As part of its ongoing research in sound reproduction, BOSE corporation has examined the acoustic properties of a wide range of listening rooms. We found that rooms vary in systematic and predictable ways. Moreover, we found that standard bass and treble controls do not affect the frequency ranges where rooms differ most significantly.

Additional research suggests that recordings, as well as rooms, differ in predictable ways. The Source and Room Compensation controls have been specifically designed to compensate for problems created by variations in listening room acoustics and recording characteristics in order to reproduce music as accurately and realistically as possible.

1. **DESCRIPTION**

a. COMPENSATION CONTROLS

This pushbutton affects all functions of the Source and Room Compensation circuitry. Depressing the push button bypasses the Source and Room Compensation Controls. Releasing it returns the Controls to their normally active state.

b. LOW FILTER

The LOW FILTER decreases the extreme low bass frequencies in the music. Normally left in the "out" position, this control can be used to reduce rumble and acoustic feedback or excessive deep bass. The effect of the low filter is subtle as the sound energy affected is primarily below 60 Hz.

c. LOW FREQUENCY CONTROL

The LOW FREQUENCY CONTROL provides up to 16 db of change in the bass energy range. This unique frequency contour allows you to compensate for problems which occur in listening rooms and recorded source material. Sliding the control to the right increases energy in the low frequencies while pushing it to the left lessens these frequencies.

The effect of the LOW FREQUENCY CONTROL is determined by the setting of the LOW FREQUENCY RANGE push button, as follows:

(1) WIDE Setting

With the LOW FREQUENCY RANGE SELECTOR set to WIDE, the LOW FREQUENCY SLIDE CONTROL provides a "shelf type" response that increases or decreases a broad frequency range from 20 Hz. to 250 Hz. This control is particularly useful when program material requires a gradual increase or decrease in overall bass content

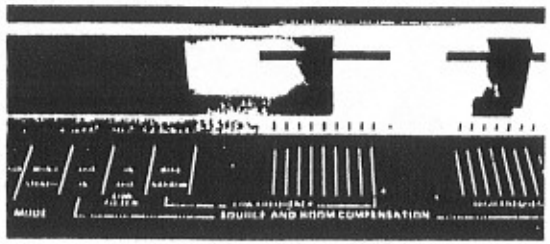
(2) NARROW Setting

With the LOW FREQUENCY RANGE SELECTOR set to NARROW, the LOW FREQUENCY SLIDE CONTROL affects a "narrow band" of frequencies centering on 140 Hz. This control is particularly useful in two instances. First, it can compensate for boominess or thinness which results when sound is absorbed or reflected by the walls or ceiling of your room. Second, it can eliminate unwanted boominess in poorly made records, without reducing fundamental bass energy.

d. HIGH FREQUENCY CONTROL

The High Frequency Control helps correct high frequency imbalances caused by room absorption or recording equalization. This control acts on a broad range of high frequencies, beginning at 2.2 kHz. Sliding the control to the right boosts the amount of high frequencies. Sliding it to the left reduces the amount of high frequencies.

2. ADJUSTING THE SOURCE AND ROOM COMPENSATION CONTROLS.



a. Select a familiar well-recorded record with a full orchestral passage or a record with a large number of diverse musical instruments that span the entire frequency range. Choose a recorded passage with music sustained over several seconds to allow you to observe the effects of the controls.

b. Set the HIGH FREQUENCY control to the center and adjust the Low Frequency range pushbutton to the NARROW or "out" position.

c. Move the LOW FREQUENCY control back and forth several times over the extremes of its range and listen to its effect. You will notice a dramatic change in the basic fullness or body of the sound without changing the deep bass or midrange. Starting with the control at the extreme left, slowly move the slider until the sound is rich and full.

NOTE THE POSITION OF THE LOW FREQUENCY SLIDE CONTROL.

d. Next, set the LOW FREQUENCY pushbutton to the WIDE position. Move the LOW FREQUENCY control back and forth several times over its entire range and listen carefully. You will notice a dramatic change in the entire deep bass range but not the midrange.

AGAIN, NOTE THE POSITION OF THE LOW FREQUENCY SLIDE CONTROL.

e. Next, AUDIBLY compare the WIDE setting of the LOW FREQUENCY control with the NARROW setting. Select the control setting which provides the most pleasing balance of sound, without excessive heaviness.

In many rooms, the difference in the two settings is subtle because the frequencies affected are below 60 Hz, where most speakers are relatively inefficient. However, if your listening room has a deep bass resonance or boom, the Low Frequency Range control will permit you to adjust for this mid-bass inaccuracy without affecting the overall response of the system.

f. Next, move the HIGH FREQUENCY control over the extremes of its operating range several times, listening to its overall effect. Starting with the control at the extreme left, slowly move the control until the sound contains instrumental detail, clarity, and presence.

NOTE THAT SINCE NO ROOM IS TYPICAL, DIFFERENT CONTROL SETTINGS WILL BE APPROPRIATE IN DIFFERENT LISTENING ENVIRONMENTS. YOUR CAREFUL ADJUSTMENT OF THESE CONTROLS CAN RESULT IN A SIGNIFICANT IMPROVEMENT IN THE PERFORMANCE OF YOUR HIGH FIDELITY SYSTEM.

F. BALANCE

The BALANCE control regulates the relative strength of the left channel and right channels. With the control centered, both channels are heard with equal volume. If required, adjust the BALANCE control so that the sound appears to be centered between the two speakers.

G. SPATIAL CONTROLS

1. DESCRIPTION

When used with the Bose 901 Series III or IV loudspeaker system, the Bose Spatial Control™ Receiver gives you the ability to adjust the spatial properties of your music system. These properties create the sense of the size and shape of the performing environment. They also reveal the apparent location of the performers within the environment and create the ambience that makes music sound life-like.

The Spatial Control™ Receiver can be adjusted to recreate the close, intimate sound of a soloist or the grandeur of an orchestra and choir. To an extent, the receiver can also compensate for unusually shaped rooms, making the sound more open in narrow rooms and better focused in large rooms.

To achieve these different functions, the Spatial Control™ Receiver incorporates several specialized electronic circuits. Bose-designed switching logic — using CMOS components — controls the many interconnections possible between the four amplifiers, Spatial circuitry, and built-in 901 equalizers. The design of the Spatial Control™ Receiver makes it an extremely versatile unit, capable of operating in a number of different modes. It can, for example, operate two pairs of speakers, one equalized and the other unequalized, with the Spatial slide control operating as a balance control between the speakers.

2. USING THE SPATIAL SLIDE CONTROL WITH 901 SERIES III OR IV LOUDSPEAKERS

With the receiver operating, depress the SPATIAL and SPKRS A push buttons and release SPKRS B if depressed. The Spatial Control™ circuit is now active and the SPATIAL indicator lighted. (Activating the push button control for the Spatial Control™ circuit has no effect when using conventional speakers or playing Speakers B.)

Notice that the two positions of the Spatial slide control are labeled WIDE and NARROW.

In the Narrow position, the middle and high frequencies which contain most directional information are diverted to the inside rear drivers of your 901 loudspeakers; you hear the intimate sound normally associated with small instrumental groups or solo performances. See Figure 10.

In the centered position, the Spatial slide control provides equal energy to all drivers in the 901 speaker. You hear the spatial performance normally associated with a pair of 901 Series III or IV speakers. See Figure 11.

In the Wide position, most frequencies containing directional information are diverted to the single front driver and to the outside rear drivers of the 901. The reproduced sound has the spacious sound quality associated with large orchestral performances or some studio-produced rock or disco. See Figure 12.

Intermediate positions provide varying degrees of spaciousness and intimacy.

For the most life-like music reproduction possible, adjust the Spatial slide control for each music selection. With practice, you can quickly find the setting of the control most appropriate to your music, your listening room, and your personal tastes.

The Spatial Control™ circuitry operates only with the Spatial push button "in", with 901 Series III or IV speakers only, with Speakers A only, and with all rear panel switches set correctly. Should you experience difficulty, please recheck all connections and switch settings. Also, depending on the reflective characteristics of your listening room, you may notice a change in the high frequency balance of the music as you move the control from Wide to Narrow. This is normal and can be compensated for by using the High Frequency Control.

3. USING THE SPATIAL SLIDE CONTROL WITH TWO PAIRS OF LOUDSPEAKERS

When two pairs of speakers are used, the SPATIAL slide control becomes an electronic balance control between the two pairs of speakers connected to the Receiver.

As the control is pushed toward WIDE, the output of Speakers A is reduced while the output of Speakers B is increased. As the control is pushed toward NARROW, the output of Speakers A is increased while the output of Speakers B is decreased. If only one pair of speakers is connected but both Speakers A and B are switched on, the Spatial slide control functions as a volume control. This performance change is normal and is part of its function as a balance control between Speakers A and B.

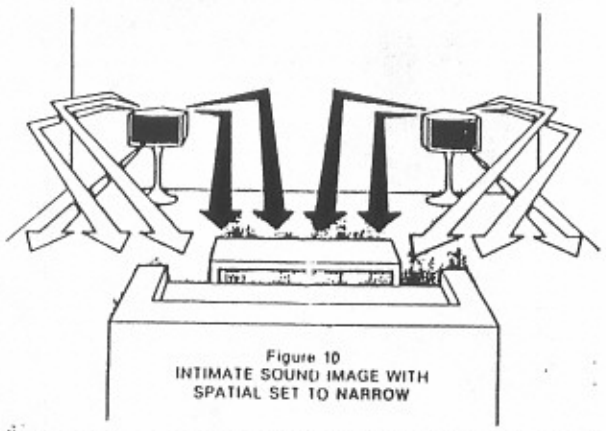


Figure 10
INTIMATE SOUND IMAGE WITH
SPATIAL SET TO NARROW

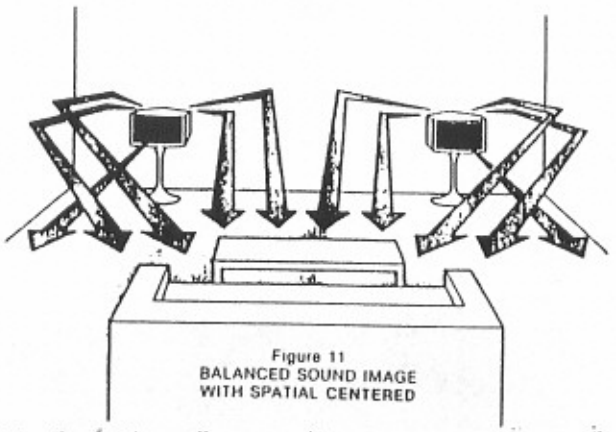


Figure 11
BALANCED SOUND IMAGE
WITH SPATIAL CENTERED

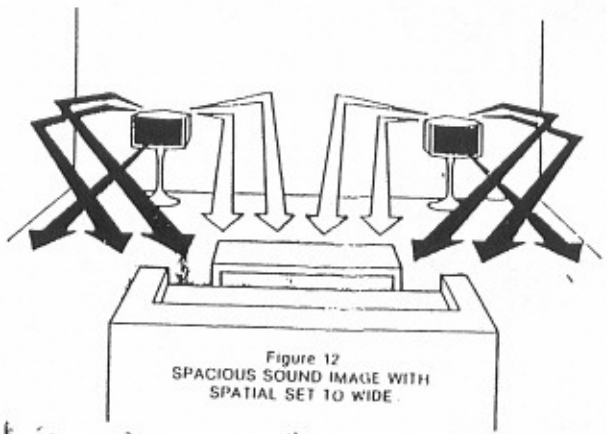


Figure 12
SPACIOUS SOUND IMAGE WITH
SPATIAL SET TO WIDE

When two pair of speakers are used in the same room without any additional signal processing equipment, BOSE recommends reversing the connections to the rear pair of speakers, in order to create a better stereo image. The balance between both pairs of speakers can be adjusted using the Spatial slide control.

H. FM MUTING

With the MUTING switch released, the static and sound heard between FM stations is suppressed so that only stations are heard. With the switch depressed, noise appears between each station over the entire FM band.

When the MUTING is operating, FM stations too weak to override the muting circuitry may not be heard. To override the circuitry, depress the MUTING push button.

I. LOUDNESS

This control, although not affecting the overall volume of the sound, activates a "loudness compensation" circuit in the Receiver. At low sound levels, our hearing becomes relatively insensitive to sound energy at very low and very high frequencies. The loudness circuitry within the receiver automatically compensates for this effect and restores to music a more natural tonal balance. As the volume control is set to progressively lower settings, it boosts low and high frequencies by a precise amount. This compensation is gradually and automatically removed as the volume control is moved above the 12 o'clock position.

J. SPKRS A

The Speakers A switch activates the speakers wired to the terminals marked Speakers A on the rear panel. This switch can be used to shut off the main speakers when listening to headphones or when sound is desired only in another room.)

K. SPKRS B

SPKRS (Speakers) B turns on or off a second set of speakers wired to the on the rear panel terminals marked Speakers B.

NOTE: WHEN SPEAKERS B IS PUSHED, THE SPATIAL CONTROL™ CIRCUITRY OF THE RECEIVER AUTOMATICALLY BECOMES A BALANCE CONTROL BETWEEN THE TWO SETS OF SPEAKERS. CONSEQUENTLY, ONLY SPEAKERS A CAN BE ACTIVATED WHEN YOU WISH TO USE THE SPATIAL CONTROL™ FEATURE.

L. HEADPHONES

Any high-quality low or high impedance headphone may be used with the front panel jack found on the BOSE Receiver. Special internal headphone amplifiers provide a volume-controlled output for the headphone jack. (Regardless of the switch settings on the rear panel or the speakers selected, the headphones always receive an unequalized signal.)

Connect electrostatic headphones to the Speakers B terminal of the Spatial Control™ Receiver. Set the 901/OTHER switch to the "Other" position and 8-16 OHM/4 OHM switch to the "4 ohm" position.

IV. FOR BEST RESULTS

A. IMPROVING FM RECEPTION

Excellent FM reception requires a well-designed antenna installation. Because of the technological similarities between FM and Television, you can probably use the quality of your TV picture as a guide. If you find that in your location you must connect a TV set to a cable system or roof antenna in order to get clear, ghost-free reception, it is likely that an external FM antenna will be needed for consistently satisfying reception of FM stereo broadcasts as well.

If you have difficulty, try the following procedures to improve your FM reception. They are listed in order of increasing cost and complexity:

1. Try altering the height and orientation of the folded dipole antenna, remembering that the strongest reception usually occurs when the crossbar of the "T" is perpendicular to the direction of the FM signal.
2. Replace the folded dipole antenna with a "rabbit ears" TV antenna. For FM reception, the simplest and least expensive "rabbit ears" antenna with the fewest switches, knobs, and coils, is usually the best. Extend each arm horizontally (or at an angle not greater than 45 degrees from the horizontal) to a length of approximately 30 inches. Mount the antenna away from the wall so that it is free to rotate, and orient the antenna for optimum reception.
3. If your TV set is connected to an outside antenna, try connecting the FM receiver to the same antenna, using a signal-splitting device designed for this purpose. (Before connecting to an apartment master antenna or community cable system, determine if FM reception is included with the cable signal) See Figure 13.
4. Erect your own FM antenna outside, either on the roof or on a porch or balcony. Excellent FM outdoor antennas are made by several manufacturers. Such antennas have several advantages:
   a. Since FM signals are weakened close to the ground, a roof top antenna pulls in stronger signals. Furthermore, since FM transmission is largely along "line of sight," a roof top antenna can receive stations located further away.
   b. Much interference and distortion in stereo FM reception is caused by the FM signal reflecting from metal objects, (i.e., airplanes, trucks, and steel frame buildings) A roof top antenna may be located above most of these reflected signals, furthermore, since it is designed to be highly directional and to be used with a rotor, it can be aimed to reject most reflected signals while receiving more of the signal direct from the station.

For best results, connections for external antennas should be made via shielded cable. Shielded 300-ohm cable is available and connects to the 300-ohm terminals at the rear of the receiver. (Disconnect the dipole antenna from those terminals before connecting any external antenna.) In some cases, it will be more convenient to use shielded 75-ohm "coaxial" cable, the type of antenna cable commonly used for master antenna and community cable systems. See Figure 13 for cable connection instructions.

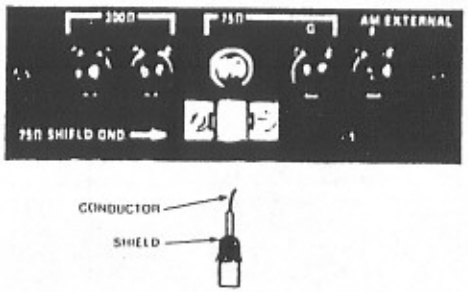


Figure 13

B. IMPROVING AM RECEPTION

If AM reception is poor, this is usually due to interference or insufficient signal strength. You can improve reception by eliminating nearby sources of interference. Switch off fluorescent lights, dimmer controls for lights, and household appliances such as blenders or power tools that contain small electric motors.

If you are located in a rural area with no major sources of electrical interference, you may wish to connect an external AM antenna to improve reception of distant AM stations. A suitable antenna can be made using a piece of insulated single conductor wire anywhere from 15 to 150 feet in length. Connect one end of the wire to the AM terminal on the rear panel of the receiver. The remaining length of wire should be mounted parallel to the ground, as high as is practical, and extended in a straight line as long as is practical. For best results, the antenna should not be mounted close to any metal objects and should be neither close to nor parallel to power lines which might introduce static into the signal. If using a metal mast, refer to the grounding information found in the Caution Section of this manual when installing the antenna. See Figure 14.

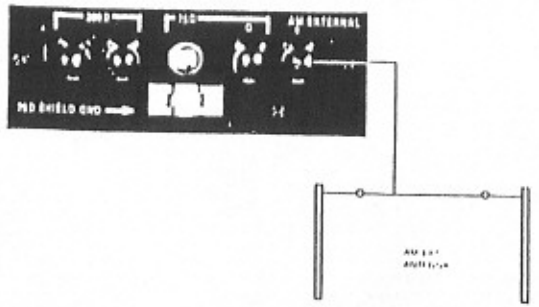


Figure 14

V. TECHNICAL INFORMATION

A. Specifications

Amplifier

Power Output:	**100 Watts per channel minimum RMS continuous power, with both channels driven into 8 Ohms, THD < .09% from 20 Hz to 20 kHz, power amps in bridged (non-spatial) mode.**
IHF Power Bandwidth:	20 Hz to 20 kHz, both channels driven, THD < .09%
Intermodulation Distortion:	.09% IHF (60 Hz/7 kHz mixed 4:1 at rated output)
Frequency Response:	20 Hz - 20 kHz +0.1 −0.5 dB Phono RIAA ± 0.3 dB
Input Sensitivity/Impedance/ Capacitance:	Aux and Tape: 200 mV/50 K Ohms Phono: 2.0 mV/47 K Ohms/150 pF
Signal to Noise Ratio:	Amplifier: 90 dB A weighted, below rated output, inputs shorted
Signal to Noise Ratio:	97 dB A weighted, below rated output, min. volume. Phono: 83 dB A weighted, below rated output, inputs shorted.
Channel Separation:	Aux and Tape: 65 dB @ 1 kHz (to pre-out) Phono: 60 dB @ 1 kHz.
Phono Overload:	145 mV
Loudness Contour:	+8 dB @ 100 Hz (± 2 dB) +3.5 dB @ 10 kHz (± 1 dB)
Output Impedance:	Tape out: 3 K Ohms Preamp out: 1.6 K Ohms
Protection Circuitry:	DC voltage detection to protect speakers Current limiting to protect against short circuits Thermal protection on heat sink and transformer case

FM Tuner

IHF Usable Sensitivity:	1.9 µV/10.8 dBf (Mono), 3.3 µV/15.6 dBf (Stereo)
50 dB Quieting Sensitivity:	3.5 µV/16.11 dBf (Mono), 35 µV/36.11 dBf (Stereo)
Frequency Response:	30 Hz - 15 kHz, +0.2 - 1.0 dB
Signal to Noise Ratio (65 dBf)	70 dB (Mono); 65 dB (Stereo)
THD at 65 dBf	.10% (Mono), .25% (Stereo)
Capture Ratio	1.8 dB
Alternate Channel Sensitivity	70 dB
Spurious Response Rejection	100 dB
Image Rejection	80 dB
AM Rejection	53 dB
Stereo Separation, 1 kHz	45 dB

AM Tuner

20 dB Usable Sensitivity	250 μV (ferrite loopstick)
Adjacent Channel Selectivity	40 dB
Total Distortion	.5% (400 Hz @ 50% Modulation)
Image Rejection	70 dB
IF Rejection	80 dB
Signal to Noise Ratio	45 dB

General

Power Requirements	120 Volts AC 60 Hz
Power Consumption	1150 Watts at rated power
AC Outlets	2 switched, 2 unswitched 400 watts max. total
Dimensions	20-1/2 x 6-5/8 x 16-3/8 in.
Weight	36-1/2 lbs.

Source and Room Compensation Controls

Low Filter:
- 3 dB at 100 Hz.
- 7 dB max. at 20 Hz.

Low Frequency Control, Narrow Position
± 8 dB at 140 Hz. (center frequency)
± 1 dB at 20 Hz and 1 kHz.

Low Frequency Control, Wide Position
± 3 dB at 350 Hz.
± 8 dB at 50 Hz.

High Frequency Control
± 8 dB at 15 kHz.
± 3 dB at 2.2 kHz.

B. Table of Amplifier Equalization

Front Panel Speaker Switches A	Front Panel Speaker Switches B	901 Other Rear Panel Speaker Switches A	901 Other Rear Panel Speaker Switches B	Equalization of Receiver Amplifiers 1 and 4	Equalization of Receiver Amplifiers 2 and 3
out	out	any setting			
in	out	other	other		
in	out	901	other	E	E
in	out	other	901		
in	out	901	901	E	E
out	in	other	other		
out	in	901	other		
out	in	other	901	E	E
out	in	901	901	E	E
in	in	other	other		
in	in	901	other	E	
in	in	other	901		E
in	in	901	901	E	E

E indicates equalized channels

C. Voltage Conversion

The Bose® Spatial Control™ Receiver is manufactured in two voltage configurations:

120V AC, 60 Hz (USA model)
240V AC, 50-60 Hz (Export model)

If voltage conversion is required, contact an authorized serviced agency.

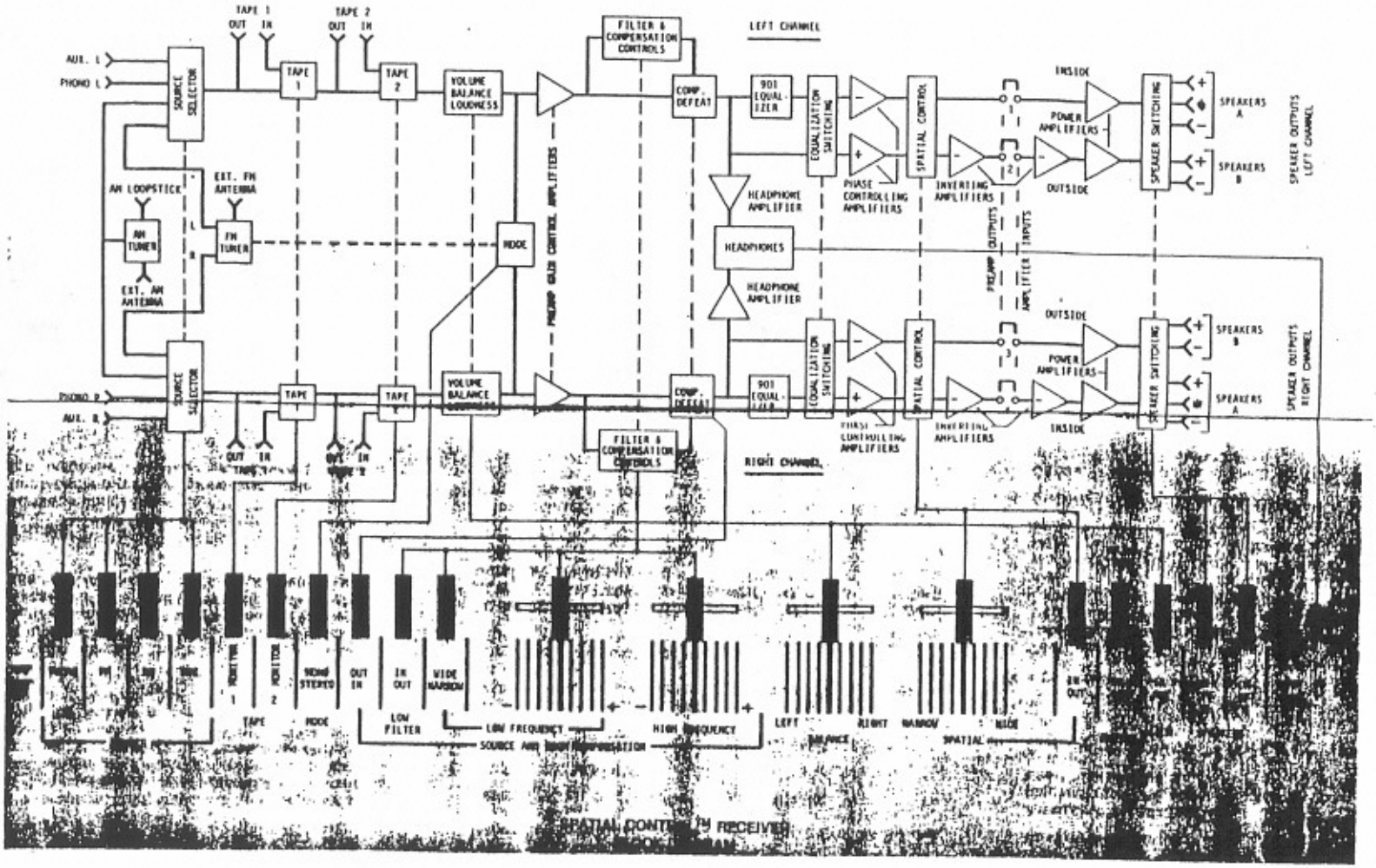
D. Care and Maintenance

The front panel of this receiver may be easily cleaned using a high-quality glass cleaner. The cabinet is made with an oil-rubbed walnut veneer finish. Use a high quality furniture polish. To maintain the lustrous appearance, occasionally rub the cabinet with linseed oil and polish with a dry cloth.

E. Speaker Switching and Preamp Gain Table

Front Panel Speaker Switches A	Front Panel Speaker Switches B	Rear Panel Impedance Switches Speakers A	Rear Panel Impedance Switches Speakers B	Right A +	Right A -	Speaker Terminals Left A +	Speaker Terminals Left A -	Speaker Terminals Right B +	Speaker Terminals Right B -	Left B +	Left B -	Preamp Gain
out	out	4 Ohms	4 Ohms	G	G	X	X	G	G	X	G	high
out	out	4 Ohms	8 Ohms	G	G	X	X	G	G	X	X	high
out	out	8 Ohms	4 Ohms	X	G	X	X	G	G	X	G	high
out	out	8 Ohms	8 Ohms	X	G	X	X	G	X	X	X	high
in	out	4 Ohms	4 Ohms	G	G	4	1	G	G	X	G	high
in	out	4 Ohms	8 Ohms	G	G	4	1	G	G	X	G	high
in	out	8 Ohms	4 Ohms	3	G	4	1	G	2	X	G	low
in	out	8 Ohms	8 Ohms	3	G	4	1	G	2	X	G	low
out	in	4 Ohms	4 Ohms	G	X	X	X	X	G	3	G	high
out	in	4 Ohms	8 Ohms	G	X	X	X	X	G	3	4	low
out	in	8 Ohms	4 Ohms	G	X	X	X	X	G	3	G	high
out	in	8 Ohms	8 Ohms	G	X	X	X	X	G	3	4	low
in	in	any settings		G	X	4	1	X	G	3	G	high

X Speaker terminal not connected internally.
G Speaker terminal connected to ground
1-4 Speaker terminal connected to output of amplifiers 1-4
Preamp gain increased by a factor of X2 in high gain position


TAPE 1
OUT IN
TAPE 2
OUT IN
FILTER & COMPENSATION CONTROLS
LEFT CHANNEL
AUX. L
PHONO L
SOURCE SELECTOR
TAPE 1
TAPE 2
VOLUME BALANCE LOUDNESS
COMP. DEFEAT
901 EQUALIZER
EQUALIZATION SWITCHING
SPATIAL CONTROL
INSIDE
POWER AMPLIFIERS
OUTSIDE
SPEAKER SWITCHING
SPEAKERS A
SPEAKERS B
SPEAKER OUTPUTS LEFT CHANNEL
AM LOOPSTICK
EXT. FM ANTENNA
AM TUNER
FM TUNER
EXT. AM ANTENNA
MODE
PREAMP GAIN CONTROL AMPLIFIERS
HEADPHONE AMPLIFIER
HEADPHONES
PHASE CONTROLLING AMPLIFIERS
INVERTING AMPLIFIERS
PREAMP OUTPUTS
POWER AMPLIFIER INPUTS
PHONO R
AUX. R
RIGHT CHANNEL
SPEAKER OUTPUTS RIGHT CHANNEL
TAPE
MODE
LOW FILTER
LOW FREQUENCY
HIGH FREQUENCY
LEFT
RIGHT
NARROW
WIDE
SPATIAL
BALANCE

G. In Case of Difficulty

If you suspect a problem in operation of one or more components in your high-fidelity system, please take a few minutes to determine whether the defect is in the receiver or in another portion of the system. If you need assistance after performing these checks, please contact your BOSE dealer. He will arrange to service or check the unit for proper operation. The complete procedure for obtaining Warranty service is found in Section VI of this manual.

The following Trouble-Shooting Guide is provided to assist in determining the location and cause of the problem you are experiencing. Due to the complexity of the product, we suggest contacting your dealer if it appears the difficulty you are experiencing is due to a connection problem or auxiliary equipment.

1. **PHONO HUMS:**

   Check cartridge connections.
   Check turntable and receiver connection cables.
   Connect or disconnect turntable ground wire to receiver.
   Reposition turntable connection cables away from all AC line (mains) sources.
   Reverse AC plug, of receiver and/or turntable.

2. **NO SOUND, NO LIGHTS:**

   Be certain that the receiver is plugged into a working AC outlet.
   Be sure rear panel on/off switch is on.
   Activate front panel switch by touching two of the letters on the BOSE logo.
   Check the AC fuse on rear panel.

   TO AVOID THE HAZARD OF SEVERE ELECTRICAL SHOCK, ALWAYS DISCONNECT THE POWER LINE CORD FROM THE WALL WHEN REMOVING, REPLACING, OR CHECKING THE FUSE.

   If the receiver turns on and off intermittently, it is an indication of one of the following problems:

   Speaker wiring error.

   A speaker impedance of less than four ohms or eight ohms (depending on impedance switch settings) connected to any one speaker terminal.

   Overheating; be sure receiver is properly ventilated.

   A malfunction in the unit requiring authorized service.

3. **NO SOUND, BUT OPERATING LIGHTS:**

   Turn the VOLUME up.
   Select an operating program source.
   Depress SPEAKERS A or B.
   Check speaker wiring connections at receiver and speaker.
   Release TAPE MONITOR if depressed.
   Make certain Spatial Control is centered.
   Make certain all signal processing equipment is on and operating.

4. **SOUND ON ONE CHANNEL ONLY:**

   Center balance controls (both SPATIAL CONTROL and the normal BALANCE control).

   Check speaker wiring and connections. Try interchanging the left and right cables.
   Make certain signal processing equipment is properly connected.
   Check equipment connected to tape outputs.
   Reverse AC line cord to power supply for battery operated tape recorders connected to the receiver.

5. **HUM IN ALL MODES OF OPERATION:**

   Check equipment connected to tape outputs.
   Reverse AC line cord to power supply for battery operated tape recorders connected to the receiver.

6. **SPATIAL CONTROL™ WON'T ACTIVATE:**

   Switches must be set as follows:

   Speakers A rear panel switch set to "8-16" ohms
   Speakers A rear panel switch set to "901"
   Spkrs A (front panel pushbutton) ONLY depressed.
   Spatial pushbutton depressed.
   BOSE® 901 Series III or IV center (-) terminal must be connected.

7. **ONLY HALF THE BOSE 901 PLAYS:**

   For operation of the receiver in the Spatial Mode, the impedance switch corresponding to the Speaker A outputs must be set for "8 ohms". Check the setting of this switch. If for other reasons, you have set it to "4 ohms", disconnect the center (-) terminal.

   If the trouble still persists, contact your dealer. He will arrange for service or have the unit checked for proper operation. The complete procedure for obtaining service is outlined in the Warranty found below.

VI. WARRANTY

FULL 2-YEAR WARRANTY

BOSE warrants this unit to be free from defects in materials and workmanship for a period of two years from the original date of purchase. During that period, BOSE will remedy all such defects, without charge for parts or labor, upon return of the unit together with the original sales receipt or other proof of purchase to BOSE or to an authorized BOSE service agency. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse, or to exterior appearance.

IN NO EVENT SHALL BOSE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Should this unit fail within the warranty period, you should contact your nearest BOSE dealer for service instructions. The dealer may ask you to return the unit together with proof of purchase to the nearest authorized BOSE service agency. Alternatively, you may elect to send the unit directly to BOSE by carefully following this procedure:

1. Obtain a "Return Authorization" number from the BOSE Customer Service Department, 100 The Mountain Road, Framingham, Massachusetts 01701.
2. Return the unit together with proof of purchase to BOSE Corporation, 100 The Mountain Road, Framingham, Massachusetts 01701, *freight prepaid*, in its original shipping carton. If you need a new carton, your dealer or BOSE Corporation will provide a free replacement carton. Any damage in transit due to improper packing is not covered by the warranty and will not be recognized as an insurance claim by the transportation companies.

Your unit will be repaired and returned to you at BOSE's expense. If the defects cannot be repaired after a reasonable number of attempts by BOSE to do so, you may elect to receive a refund or replacement, but only if the unit is returned to BOSE free and clear of all liens and other encumbrances.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that the above limitation may not apply to you.

REAR PANEL FEATURES

(1) SERIAL NUMBER
Provides the serial number used for Warranty Registration.

(2) AC LINE FUSE
Protects the receiver from internal damage

(3) REAR PANEL ON/OFF SWITCH
Switches the unit completely off. Should only be used in special circumstances. See page 20

(4) TAPE 1, 2 INPUT AND OUTPUT
Connects two tape recorders providing both high level input and output signals.

(5) AUX INPUT
Connections for equipment such as a third tape recorder or television set

(6) PHONO INPUT
Connects record playing equipment using a high quality magnetic cartridge.

(7) FM DETECTOR OUTPUT
Connects device for decoding future FM four-channel broadcasts.

(8) GROUND TERMINAL
Connects separate ground wires for turntables or record players.

(9) POWER AMPLIFIERS
Input and output connections for the four amplifier channels

(10) EXTERNAL FM ANTENNA INPUT
Provides both a balanced 300 ohm input and unbalanced 75 ohm coaxial cable input for connection of the DIPOLE antenna (packed with the Receiver) or external antenna

(11) EXTERNAL AM ANTENNA INPUT
Provides an input for an indoor or outdoor single wire antenna.

(12) AM LOOP ANTENNA CLIP
Holds AM external antenna in place

(13) AC OUTLETS
Connects equipment requiring AC power. Both Switched and Unswitched outlets are provided.

(14) AM LOOP ANTENNA
External loop antenna used to improve AM reception

(15) SPEAKERS B OUTPUTS
Connects speakers wired to speakers B

(16) SPEAKERS A OUTPUT
Connects speakers wired to Speakers A. Includes three-wire terminals for 901 Series III and IV loudspeakers

(17) SPEAKERS: 901/OTHER SWITCHES
Internally connects the 901 IV Internal Equalizer to Speakers A or B

(18) IMPEDANCE: 8-16 OHM/4 OHM SWITCHES
Selects amplifier operating conditions for each type of speaker

(19) HEATSINKS
Provides convectional cooling for the output transistors