

Owner's Guide

The Bose® 901® Series V Direct/Reflecting® Loudspeaker System



BOSE®

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Warning

To reduce the risk of fire or electric shock, do not expose the Active Equalizer to rain or moisture.

Caution

To reduce the risk of electric shock, do not remove the Active Equalizer cover. No user-serviceable parts inside. Refer servicing to qualified service personnel.



The lightning flash, with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the Active Equalizer enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle as marked on the Active Equalizer is intended to alert the user to the presence of important operating and maintenance instructions in this owner's manual.

CAUTION

RISK OF ELECTRICAL SHOCK – DO NOT OPEN

TO PREVENT ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

AVIS

RISQUE DE CHOC ELECTRIQUE – NE PAS OUVRIR

AFIN DE PREVENIR UN CHOC ELECTRIQUE NE PAS ENLEVER LE COUVERCLE ARRIERE. IL NE SE TROUVE A L'INTERIEUR AUCUNE PIECE POUVANT ETRE REPARÉE PAR L'USAGER. S'ADRESSER A UN REPARATEUR COMPÉTENT.

The CAUTION marks shown on this page are located on the bottom of your Active Equalizer.

The Bose® 901® Series V Direct/Reflecting® Loudspeaker System

Safety Instructions

Read this section before connecting the loudspeakers or equalizer.

1. Retain all operating instructions provided with the Bose® 901® Direct/Reflecting® Loudspeakers and 901 Active Equalizer for future reference.
2. For your safety, follow all cautions and warnings in the operating instructions and on the speakers and equalizer.
3. The Bose 901 Active Equalizer is a complex electronic instrument. Do not assume the unit is faulty until you have read Section 10, **In Case Of Difficulty**.
4. Do not use the equalizer or speakers near water; e.g., near a bath tub, washbowl, kitchen sink, swimming pool or in a wet basement.
5. Locate the speakers and equalizer away from direct sunlight or excessive heat sources such as radiators, heat registers, stoves or other appliances.
6. Connect the equalizer to an AC line (power mains) of the type specified on the back of the unit; e.g., 120 Vac, 60 Hz.
7. Route the AC 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 receptacles, and places where cables exit from or plug into the units.
8. Nonuse Periods—The power line cord of the equalizer should be unplugged from the AC power mains when left unused for long periods of time, such as during vacations. (To disconnect the cord, pull it out by grasping the plug. Never pull the plug out by the cord.) The equalizer does not have any power (mains) switch and is always connected to the mains, unless the mains plug has been removed from the AC mains outlet.

9. The equalizer should be serviced by qualified personnel when:
 - a. The AC power line cord or plug has been damaged;
 - b. Objects or liquids have fallen or been spilled into the unit;
 - c. The unit has been exposed to rain or excessive moisture;
 - d. The unit does not appear to be operating normally or exhibits a marked change in performance;
 - e. The unit is dropped or the enclosure damaged.
10. Clean the units only according to the recommendations outlined under Section 9, **Maintenance**.
11. Do not attempt to service the equalizer beyond the instructions listed under Section 10, **In Case of Difficulty**. All other servicing should be referred to qualified personnel.

1. Introduction

Thank you for purchasing the Bose 901 Series V Direct/Reflecting® Loudspeaker System. Its advanced design and quality construction will give you many years of listening pleasure.

The installation and operating principles of your Bose 901 system are significantly different from those of conventional speaker systems. To avoid problems and obtain the best possible performance, **please take the time to read this manual.**

2. System Description

A complete Bose 901-V system consists of **three** matched components: two 901-V Direct/Reflecting® speakers and a separate 901-V Active Equalizer.

Each speaker contains nine (9) full-range Helical Voice Coil drivers mounted in a proprietary multi-directional array. Sound energy is focused and reflected off the walls of the listening room in an optimized pattern that virtually eliminates the stereo imaging restrictions imposed by conventional speaker designs. An advanced 14-element Acoustic Matrix™ enclosure improves the efficiency of the system while reducing low-frequency distortion.

The 901 Active Equalizer precisely controls the acoustic power response of the 901 speakers. Its fixed equalization curve takes into account the effects of driver sensitivity, enclosure characteristics, speaker placement, room reflections and the absorption of the grille assembly. Mid-Bass and Mid-Treble sliders let you adjust the tonal balance to match almost any type of room or music.

Important

You MUST use a Bose 901-V Active Equalizer when playing your 901-V Loudspeakers. Do not attempt to replace the 901 Equalizer with any graphic or parametric equalizer. Although these devices may be used in conjunction with a 901 Equalizer, they cannot duplicate its function. The performance of Bose 901-V Direct/Reflecting® Loudspeakers is not guaranteed unless they are used with a factory-supplied Bose 901-V Active Equalizer.

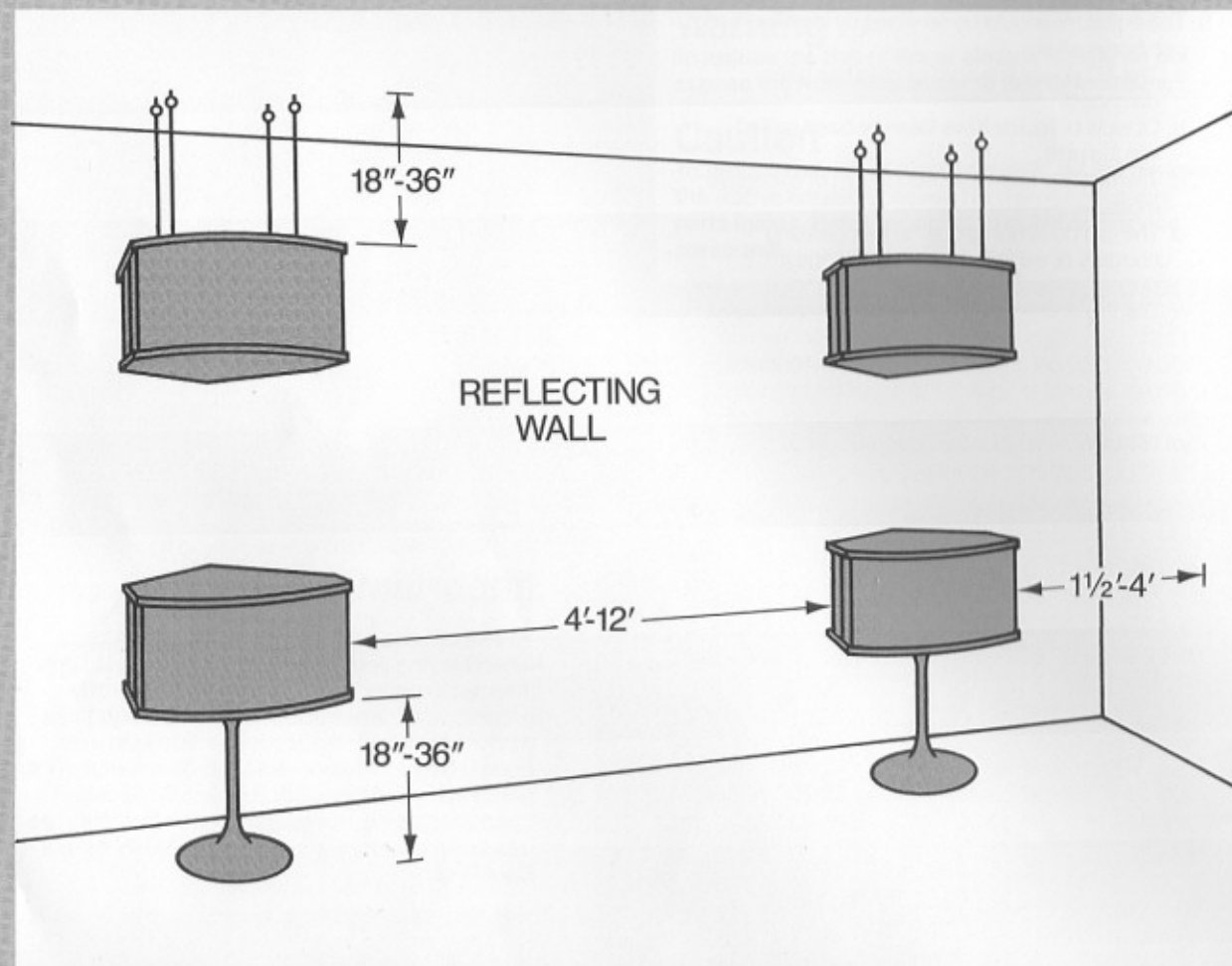


Figure 1. Recommended speaker placement in average-sized rooms.

3. Unpacking

Your Bose 901 system is packed in **three** separate cartons: two large speaker cartons and a separate, small carton containing the 901 Active Equalizer.

Unpack each unit carefully, saving the cartons and all packaging materials for possible later use. If any component appears to be damaged when unpacking, **do not proceed with the installation**. Repack the damaged unit(s) in its original carton and notify your authorized Bose High Fidelity dealer immediately.

4. Installation

Installation of your Bose® 901® system should be performed in the following order:

- Placing the 901 Loudspeakers in your listening room.
- Connecting the speakers to your amplifier or receiver.
- Connecting the 901 Active Equalizer to your control unit (preamplifier or receiver).
- Testing the complete system for proper operation.

Familiarize yourself with the following installation guidelines before attempting to install the speakers and equalizer.

a. Speaker Placement

Bose® 901® Loudspeakers adapt readily to almost any type of listening environment. They may be placed directly on a deep shelf, table or pedestal, mounted on wall brackets or suspended from the ceiling of your listening room. The placement option you select will depend on room design and acoustics, decor requirements and other practical considerations such as the presence of children, pets or special fixtures.

The placement guidelines below will help you obtain the optimum performance of your 901 system. Refer to FIGURE 1.

- Place the 901 speakers on the left and right sides of the listening area, spaced 4 to 12 feet (1.2–3.6 m) apart.

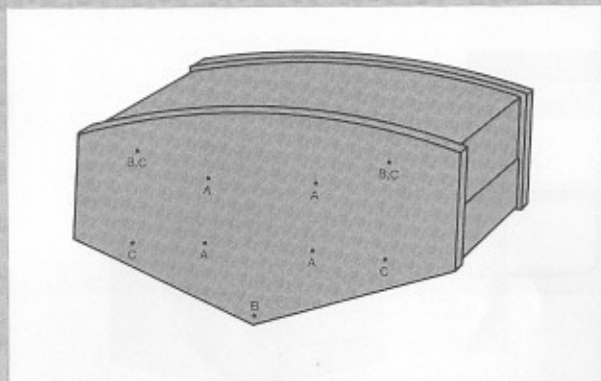


Figure 2. Pilot holes for mounting hardware.

- **The V-shaped grille panel is the rear of the 901 enclosure.** Aim this part of each speaker **away** from the listening area, towards the wall behind the speakers. The point of each "V" should be located between 8 and 16 inches (20–40 cm) away from the back wall.
- Always maintain **at least 18 inches** (45 cm) of clear space around the sides, top and bottom of the speaker enclosures. Recommended distances are 2 to 4 feet (60–120 cm) from the side walls, and 18 to 36 inches (45–90 cm) from the floor or ceiling. Do not place the speakers exactly halfway between the floor and ceiling.
- Sound-absorbent furnishings (heavy drapes, stuffed chairs, etc.) should be kept **at least 2 feet** (60 cm) away from the speakers.

The bottom panel of each 901 enclosure includes a pattern of seven pilot holes (FIGURE 2). These holes are provided to simplify the installation of mounting hardware or suspending the speakers from the ceiling.

If you are suspending the speakers from the ceiling, certain guidelines should be followed to insure a safe and proper installation. Due to a variety of building constructions worldwide, we cannot specify ceiling attachments for each

situation. However, it is recommended that a system of three support chains and hardware be used. All the chains and hardware should be steel. You must anchor at least two supports to a rigid structural beam or joist. Pilot holes labeled B in FIGURE 2 should be used. In addition, the following guidelines should be followed in selecting your mounting hardware:

- Screw eyes can be used on the speakers and screw hooks in the ceiling; both should have at least a #10 wood thread whose outside diameter is approximately $\frac{3}{16}$ inch (4.5 mm).
- Ceiling screw hooks must be long enough to go through the plasterboard (from $\frac{3}{8}$ inch (9.5 mm) to $\frac{3}{4}$ inch (19 mm) thick) and still have a full inch (25 mm) of thread engagement into the structural support, or masonry anchor described below.
- All hardware, which includes chain, chain "S" hooks, screw eyes and hooks, must have a manufacturer's safe-load rating of 40 lbs (18 Kg) or more. For this strength, generally the screw eyes and hooks will have a shank diameter of $\frac{5}{32}$ inch (4 mm) or larger and generally the chain will have a link diameter of about $\frac{9}{64}$ inch (0.135 inch or 3.4 mm exact) or larger.
- If you are suspending the speakers from a masonry surface, only good metal expansion masonry anchors which properly accept the thread of the ceiling screw hooks should be used.
- Do not use "cup hooks" or hollow wall fasteners as these parts will not provide the necessary support.

If the speakers are to be suspended relatively high in your listening area, angle the back of the enclosures downward by slightly increasing the length of the rear support and chain.

If more detailed instructions on suspending speakers from the ceiling are desired, ask for Bose Service Bulletin No. 901-83-02 available from the Bose Customer Service Department, The Mountain, Framingham, MA, USA 01701.

If you are placing the speakers directly on a table or shelf, check to be sure that the support structure can support the full weight of a 901 speaker, which is approximately 35 lbs (16 kg). For proper safety margin the support structure should be capable of supporting 140 lbs (65 kg) or more (or four times the total weight of *all* items being supported). Avoid placing a speaker on the same shelf as your other stereo components (especially the turntable), as acoustic feedback may result.

If you are using Bose® 901® Speaker Pedestals (available at your authorized Bose High Fidelity dealer), follow the supplied instructions for mounting the speakers. In this case, the pilot holes labeled A (FIGURE 2) should be used. Note that all connection wires must be installed on the speaker **before** attaching the speakers to the pedestals. Make sure you use Bose Model PS-5 Pedestals. They will properly support the speaker.

b. Room Acoustics

The acoustics of your listening room will have a significant effect on the sound reproduced by your Bose® 901® system.

Most room effects can be controlled by using the Mid-Bass and Mid-Treble controls provided on the 901 Active Equalizer (see Section 6, **System Operation**).

The following may also help you obtain better performance from your 901 system:

- 901 speakers work best when sound energy is given room to develop "around" the enclosures, reflecting off nearby walls, floor and ceiling. Hard materials such as wood, brick, glass, sheetrock and/or sturdy paneling generally provide the most effective sound-reflecting surfaces.
- If your listening room contains few furnishings with bare walls and floors, your music may sound unnaturally shrill or bright. The addition of carpeting, wall hangings and drapes usually helps to alleviate this problem. Distribute these furnishings evenly around the listening area for best results.
- Rooms filled with stuffed furniture, unusually heavy carpeting or drapes can absorb much of the high frequency

energy radiated by your 901 speakers. Such rooms often make reproduced music sound dull and lifeless. By rearranging or removing some of the absorbent furnishings, the tonal balance can be improved.

c. Speaker Connection

The performance of all speakers can be audibly affected if the wire connecting the speakers to your amplifier is not heavy enough. The table below specifies the **minimum** size of 2-conductor wire recommended for various speaker-to-amplifier distances.

RECOMMENDED WIRE SIZES*

Maximum Length	Wire Gauge
30 feet (9 m)	AWG #18 (0.75 mm ²)
45 feet (14 m)	AWG #16 (1.5 mm ²)
70 feet (21 m)	AWG #14 (2.0 mm ²)

*Based on a maximum frequency response deviation of ± 0.5 dB.

Standard 2-conductor zipcord (available at electrical and hardware stores) can be used for speaker connection. This wire is often color-coded, or else has a ribbed line(s) running along one conductor for easy identification of the positive and negative leads.

Follow the next procedure carefully to assure that both 901 speakers are properly connected to your music system. Refer to FIGURE 3.

- Turn off your amplifier or receiver and unplug it from the AC power mains before attempting to connect the loudspeakers.
- Slightly separate the conductors at the ends of each length of wire. Strip approximately $\frac{3}{4}$ inch (18 mm) of insulation off each conductor.
- Locate the **left** speaker input terminals located on the bottom panel recess of the cabinet. Note: If you are using pedestals, be sure to thread the wire through the pedestal shaft before proceeding. Note that there are two terminals

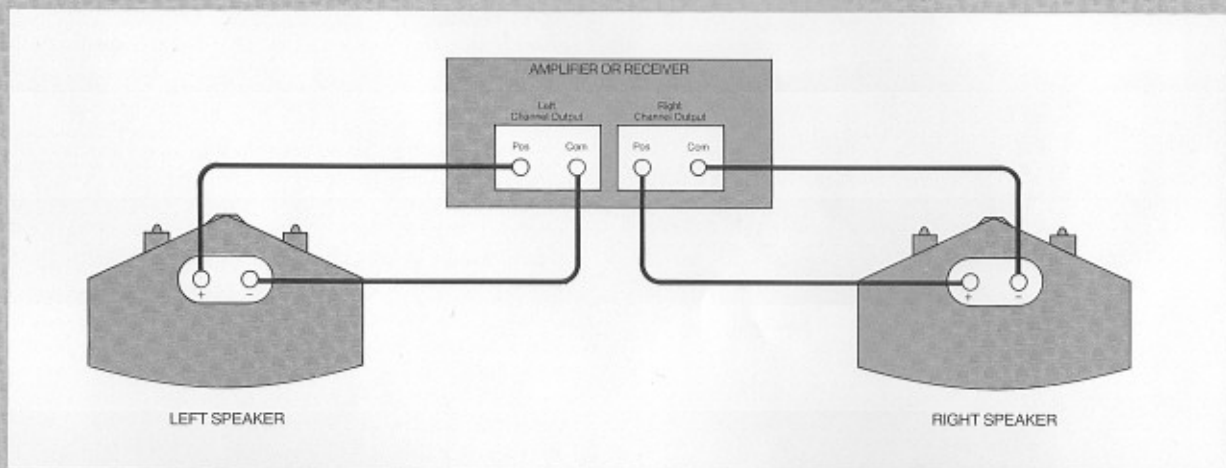


Figure 3. Speaker connection.

marked + (positive) and - (negative). Connect one wire conductor to the terminal marked -. Connect the other end of the **same** conductor to the output terminal marked COM, GND, NEG or - on the **left** channel of your amplifier or receiver. Use the color-coding or ribbed line(s) on the wire to be sure you are using the same conductor.

- In a similar manner, connect the + terminal on the **left** speaker to the output terminal marked POS or + on the **left** channel of your amplifier or receiver. (If your amplifier offers a choice of output impedances, use the terminal marked 8 or 8 OHMS.)
- Repeat steps c and d above, connecting the **right** speaker to the **right** output channel of your amplifier or receiver. Tighten all terminal connections firmly.
- Check **very carefully** to be certain that both speakers are connected to your amplifier the same way (positive to positive, negative to negative), and that there are no loose strands of wire "bridged" across the terminals on either the speakers or the amplifier. Correct all wiring errors **before** setting the speakers into their final positions in your listening room.

d. Speaker Fusing

Any loudspeaker can be damaged if the amplifier driving it should fail. Damage may also occur by playing the music so loudly that it sounds distorted. **This can happen even with a low-powered amplifier or receiver.**

Your 901 loudspeakers employ rugged full-range drivers which are highly resistant to electrical stress. Fusing will provide additional protection, and is recommended for use with amplifiers that do not have built-in speaker fuses and are rated at more than 25 watts per channel.

The fuse holders should be inserted into the positive (+) wire connecting each speaker to your amplifier or receiver (see FIGURE 3). Use **3-ampere, quick-acting Buss AGC-3, Littelfuse 312-003, or equivalent fuses.**

A complete fuse kit containing fuses and holders is available from the Bose Customer Service Department, The Mountain, Framingham, Massachusetts USA 01701 for \$5.00. Ask for 901 Fuse Kit, Part Number 108939-3.

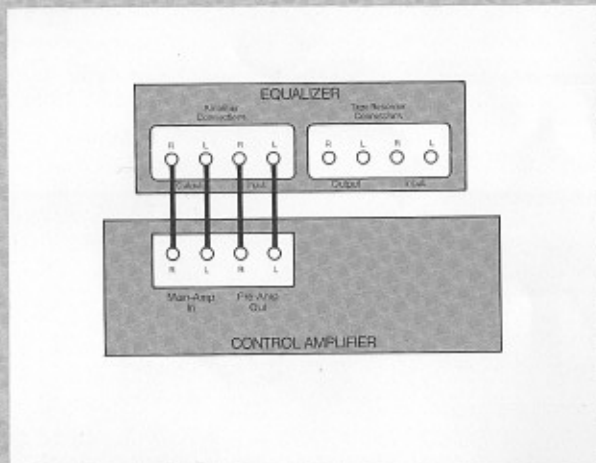


Figure 4. Connecting the Active Equalizer into a tape monitor circuit.

e. Equalizer Connection

The Bose® 901™ Active Equalizer does not connect directly to the 901 Loudspeakers. It is inserted into your music system **before** the final power amplifier which drives the speakers. The method you use to connect the equalizer will depend on the type of stereo components you are using.

Most modern control units (including receivers, preamplifiers and integrated amplifiers) incorporate at least one **tape monitor circuit**. This feature allows you to interrupt the normal signal path before the main volume control, and add extra audio components (a tape deck) into your music system. The circuit is usually controlled by a switch on your control unit marked TAPE or TAPE MONITOR.

The tape monitor circuit is the best place to connect your 901 Active Equalizer. This method of installation has two important advantages:

- It lets you switch the equalizer in and out of the signal path by operating the tape monitor switch on your control unit.

This is necessary when playing conventional non-equalized speakers and headphones (see Section 6, System Operation).

- Because the equalizer is connected before the main volume control, its active circuitry will not significantly contribute to the noise level of your music system.

Use the following procedure to connect the 901 Active Equalizer into the tape monitor circuit of your control unit. Refer to FIGURE 4.

- Turn off your control unit and unplug it from the power mains before attempting to connect the 901 Active Equalizer.
- If your control unit already has an external tape deck or signal processor connected to its tape monitor circuit, disconnect the cables leading to and from the external unit. Later instructions will explain how to reconnect the unit after the 901 Equalizer has been installed and tested.
- Locate the **tape input and output jacks** on the back of your control unit. Depending on the manufacturer, these four jacks will be labeled TAPE IN and OUT, TAPE RECORD and PLAY or some similar combination. If you are in doubt about which jacks to use, consult your control unit's instructions regarding the connection of a tape deck.
- Locate the array of four jacks marked **AMPLIFIER CONNECTIONS** on the back of the 901 Equalizer. These are the jacks you will use to connect the equalizer to your control unit.
- Using one of the twin cable assemblies supplied in the equalizer carton, connect the left and right Amplifier Output jacks of the 901 Equalizer to the jacks marked TAPE IN or TAPE PLAY on your control unit. Check the color-coding of the cables to be sure you are connecting the left and right channels together properly.
- Use the remaining cable assembly to connect the left and right Amplifier Input jacks of the 901 Equalizer to the jacks marked TAPE OUT or TAPE RECORD on your control unit.

- Plug the AC power cord of the 901 Equalizer into a "switched" AC outlet on your control unit. The equalizer will now turn on and off whenever you use your control unit.

If your control unit has more than one tape monitor circuit, connect the 901 Active Equalizer so that **all** program sources will pass through the equalizer before reaching your power amplifier and speakers. The exact way you accomplish this will depend on the design of your control unit. Some units incorporate one or more "tape dubbing" switches in addition to the normal tape monitor switch. If present, set the dubbing switches so that the equalizer is driving your power amplifier whenever the 901 speakers are being played. Consult your control unit's instructions for more information.

If your control unit has special connections for an external processing device, use them to connect your 901 Active Equalizer. This will provide maximum flexibility when using extra tape decks or accessories with your music system.

If your control unit has a Preamp-Out/Power Amp-In jacks, you can use them to connect the 901 Active Equalizer into your music system. Although this method of connection frees all tape monitor circuits for normal use, it has four disadvantages:

If your control unit has a Preamp-Out/Power Amp-In jacks, you can use them to connect the 901 Active Equalizer into your music system. Although this method of connection frees all tape monitor circuits for normal use, it has four disadvantages:

- The 901 Equalizer cannot easily be switched in and out of the system. This may prove inconvenient if you wish to use conventional non-equalized speakers or headphones with your power amplifier;
- The noise performance of your music system will not be as good as it would be if the equalizer were connected before the volume control;
- The input/output characteristics of the 901 Active Equalizer are designed to match the signal levels and impedances found in standard tape monitor circuits, and may not be optimum for use between your preamplifier and power amplifier.
- If you connect the Active Equalizer in this configuration, you cannot connect a tape deck or a signal processing unit to the Active Equalizer.

FIGURE 5 shows the proper method of connecting the 901 Active Equalizer to a Preamp-Out/Main-Amp-In circuit. Your control unit's instructions will indicate how to separate the preamplifier and power amplifier sections of your equipment (usually by removing buss wires or operating a rear-panel switch).

If you are using separate preamplifier and power amplifier components, the 901 Active Equalizer can be connected between them by referring to FIGURE 6. This installation method shares all of the disadvantages noted above. If your power amplifier has separate gain controls, reducing them slightly from maximum will help to reduce system noise. Consult your amplifier's instructions for further recommendations.

Further information on connecting multi-tape decks and signal processing devices such as noise reduction units, and time delays can be obtained from your dealer or directly from Bose Corporation.

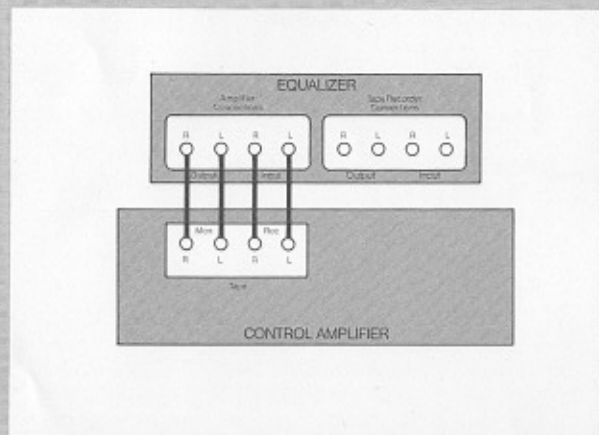


Figure 5. Connecting the Active Equalizer into a Preamp-Out/Power Amp-In circuit.

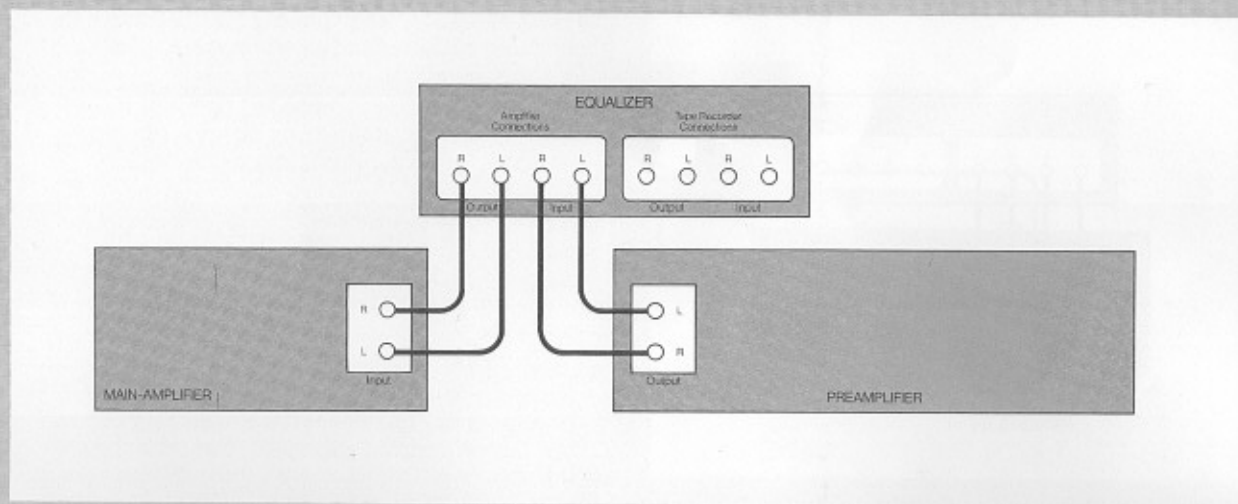


Figure 6. Connecting the Active Equalizer between separate preamplifier and power amplifier components.

Send \$1.00 to Bose Corporation, Customer Service Department and ask for Document 901-83-03, 901 Systems Application Manual.

f. System Testing

The installation of your Bose® 901® system is now complete. Test the 901 speakers and equalizer for proper operation **before** connecting any other equipment to your music system. The test procedure depends upon how you have connected the active equalizer.

If your 901 Active Equalizer is connected to a tape monitor circuit on your control unit, follow the test procedure outlined below:

a. Disconnect any conventional non-equalized speakers or headphones that may still be connected to your music system. If your equipment includes a speaker selector

switch, set it so that **only** the 901 speakers are connected to your power amplifier.

b. Set the controls on your 901 Active Equalizer as follows:

- **Monitor** switch to the "in" position.
- **Bass** switch to the "1" (out) position.
- **Mid-Bass** and **Mid-Treble** sliders to their center (detented) positions.

c. Set the TAPE or TAPE MONITOR switch on your control unit to its OUT or NORMAL position.

d. Play a disc or radio program through your music system. You should be able to hear the program on the 901 speakers. **NOTE:** The tonal balance of the speakers will be incorrect because the 901 Active Equalizer is not yet switched into the system.

- e. Move the BALANCE knob on your control unit to the extreme left and right to check for proper orientation of the stereo channels. If the channels are reversed, examine your amplifier and speaker connections.

You have now tested the 901 speakers and the speaker wiring. If your music system is not operating as indicated, review the instructions outlined under **Speaker Connection**. Any difficulties encountered up to this point must be corrected **before** testing the 901 Active Equalizer.

- f. With the speakers playing, set the TAPE or TAPE MONITOR switch on your control unit to its IN, PLAY or MONITOR position. **All sound should stop**. If the sound does not stop, recheck your equalizer wiring and be sure the controls on the 901 Active Equalizer are set according to Step B.
- g. Set the Monitor switch on the 901 Active Equalizer to its "out" position. The sound should return with full, natural-sounding response. If the sound does not return and the equalizer's power indicator is lit, the equalizer is probably wired incorrectly. Review **Equalizer Connection**.
- h. Use the Balance control on your control unit to re-check the orientation of the left and right stereo channels. If the channels are reversed when the 901 Active Equalizer is switched in, check your equalizer connections.

If your 901 Active Equalizer is connected between your preamplifier and power amplifier, use the following test procedure:

- Disconnect any conventional non-equalized speakers or headphones that may still be connected to your music system. If your equipment includes a speaker selector switch, set it so that **only** the 901 speakers are connected to your power amplifier.
- Set the controls on your 901 Active Equalizer as follows:
 - **Monitor** switch to the "out" position.
 - **Bass** switch to the "1" (out) position.
 - **Mid-Bass** and **Mid-Treble** sliders to their center (detented) positions.

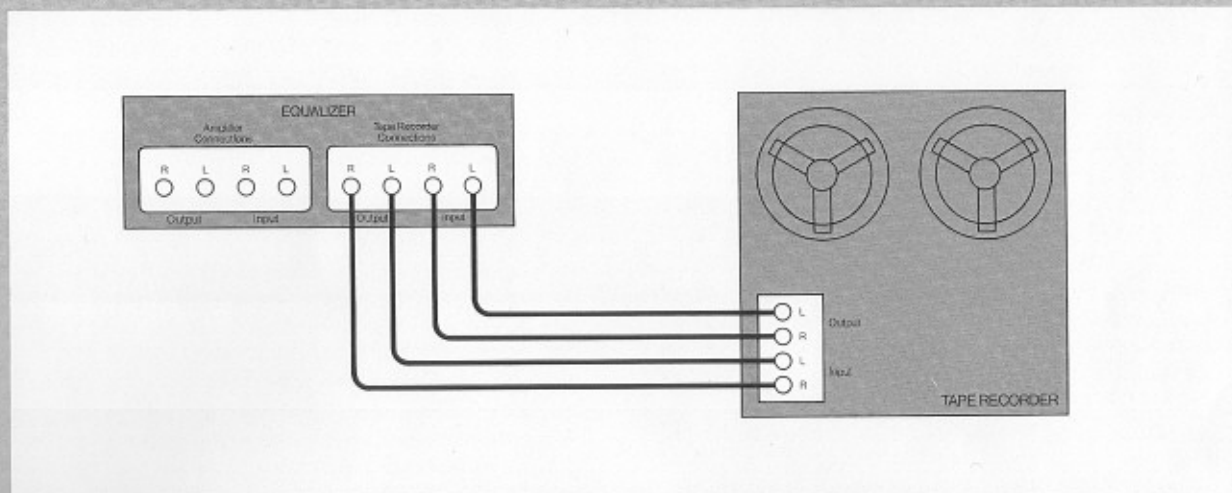


Figure 7. Connecting a tape deck or signal processor to the Active Equalizer's tape monitor circuit.

- Play a signal source through the music system. You should be able to hear the program on the 901 speakers. If you cannot hear the program and the equalizer's power indicator is lit, check the speaker and equalizer wiring according to the instructions outlined under **Speaker Connection** and **Equalizer Connection**.
- Move the BALANCE knob on your control unit to the extreme left and right to check for proper orientation of the stereo channels. Examine your speaker and equalizer wiring if the channels are reversed.
- Turn off your power amplifier and temporarily unplug the 901 Active Equalizer from its AC power outlet. Turn your power amplifier back on. **You should not be able to hear the program**. If you do hear the program, the equalizer is probably wired incorrectly. Review **Equalizer Connection**.
- Turn off your power amplifier **before** restoring AC power to the 901 Equalizer. The system is now ready for use.

5. Connecting Other Equipment

The Bose® 901® Active Equalizer includes an independent tape monitor circuit to replace the one lost when connecting the equalizer to your control unit. Audio components usually connected to a tape monitor circuit (including tape decks and/or signal processing devices) should be connected to the 901 Equalizer by following the next procedure. Refer to FIGURE 7.

- Turn off the control unit and any other components you are connecting. Be sure the power indicator light on the 901 Equalizer is off.
- Locate the **line input and output** jacks on your tape deck or signal processor. Depending on the manufacturer, these four jacks will be labeled LINE IN and OUT, MAIN IN and OUT or some similar combination. If you are in doubt about which jacks to use, consult the external unit's instructions.

- c. Locate the four jacks marked **TAPE RECORDER CONNECTIONS** on the back of the 901 Equalizer. These are the jacks you will use to connect your external equipment. **Do not re-arrange the cables leading to and from your control unit.**
- d. Using standard audio cables, connect the left and right Tape Output jacks on the 901 Equalizer to the jacks marked LINE IN or MAIN IN on your tape deck or signal processor. Check the color-coding of the cables to be sure you are connecting the left and right channels together properly.
- e. Connect the left and right Tape Input jacks of the 901 Equalizer to the jacks marked LINE OUT or MAIN OUT on your tape deck or signal processor. This completes the installation.

If your control unit has more than one tape monitor circuit, you can connect a tape deck or signal processor to an unused monitor circuit as long as this does not prevent **all** signal sources from passing through the 901 Active Equalizer before reaching the power amplifier. This method of connection is recommended if you intend to use your deck or processor in conjunction with conventional non-equalized speakers or headphones, because it allows you to selectively bypass the 901 Equalizer by operating the associated tape monitor switch on your control unit.

Further information on connecting multiple tape decks and signal processing devices can be obtained from your dealer or directly from Bose Corporation. Ask for the 901 system applications manual.

Do not connect any tape decks or signal processors to the amplifier outputs of the 901 Active Equalizer. 901-type equalization may cause overload and/or instability in some types of external audio equipment. Always connect tape decks and signal processing devices **before** the inputs of the 901 Active Equalizer.

6. System Operation

If your 901 Active Equalizer is connected into a tape monitor circuit, operate your 901 system according to the following guidelines:

- a. **Always use the 901 Active Equalizer when playing your 901 Loudspeakers.** To switch the equalizer into the system, set the tape monitor switch on your **control unit** to its IN or MONITOR position. Check the switch periodically to be sure it is engaged.
- b. **To play a tape deck connected to the 901 Equalizer's tape monitor circuit,** set the Monitor switch on the 901 Equalizer to the "in" position. **You must disengage the 901 Equalizer's Monitor switch when listening to sources other than your tape deck** (disc, radio, etc.).
- c. **Do not play conventional non-equalized speakers or headphones with the 901 Active Equalizer engaged.** 901 equalization will make conventional speakers and headphones sound unnatural, and may actually **damage** some conventional speaker elements. Set the tape monitor switch on your control unit to its OUT or NORMAL position when using conventional speakers and headphones.
- d. **If your control unit has only one tape monitor circuit** and you wish to play a tape deck through conventional non-equalized speakers or headphones, reconnect the **outputs** of the tape deck to the AUX (auxiliary) input jacks on your control unit. Leave the **inputs** of the deck connected to the Tape Output jacks on the 901 Equalizer. Set the control unit's program selector switch to AUX and remove the 901 Equalizer from the circuit by setting the control unit's tape monitor switch to its OUT or NORMAL position. This method of connection allows you to record disc and radio sources in the normal manner,* or play any program source (including tape) with or without 901 equalization. Note that this arrangement works only with tape decks and cannot be used with any type of signal processing device.

***IMPORTANT:** When using the special connection procedure outlined above, do **not** place your tape deck into the "record" mode with the control unit's program selector switch set to AUX. This creates a feedback condition which can damage your equipment.

The following guidelines apply **only** to installations in which the 901 Active Equalizer has been connected between the preamplifier and power amplifier:

- a. You must leave the Monitor switch on the 901 Equalizer in its "out" position **at all times**. Otherwise the audio signal path will be interrupted.
- b. Do not connect tape decks or signal processing devices to the Active Equalizer when connected in this configuration.
- c. Remember that your power amplifier is always receiving a 901-equalized signal. This type of signal can damage conventional speakers and headphones. **Do not connect conventional speakers or headphones to your power amplifier unless you have first disconnected the 901 Equalizer.**

a. Mid-Bass And Mid-Treble Sliders

The Mid-Bass and Mid-Treble sliders on the Bose® 901® Active Equalizer are an important feature of your 901 system. These special controls let you accurately compensate for the effects of speaker placement, room acoustics and program quality in virtually any type of installation. Careful adjustment of these sliders is essential in obtaining maximum performance from your 901 system.

Once the 901 speakers are set into their final positions in your listening room, adjust the Mid-Bass and Mid-Treble sliders in the following manner:

- a. Select a familiar recording containing a sustained, wide-range musical passage.
- b. Set the tone controls on your control unit to their centered ("flat") positions. If your control unit has a loudness compensation switch (usually marked LOUD or LOUDNESS), set it to the OFF or OUT position.

- c. Engage the 901 Active Equalizer by setting the tape monitor switch on your control unit to its IN or MONITOR position. Temporarily set the **Mid-Treble** slider on the 901 Equalizer to its center (detented) position.
- d. Play the selected musical passage through the 901 speakers at a normal volume level. Move the **Mid-Bass** slider back and forth several times and listen to its effect. You will notice a significant change in the fullness or "body" of the sound.
- e. When you have familiarized yourself with the effect of the Mid-Bass slider, set it to the extreme **left** of its control range. Start the musical passage again and slowly advance the Mid-Bass slider to the right until the sound is rich and full, but without excessive "heaviness."
- f. Replay the musical passage and move the **Mid-Treble** slider back and forth until you are familiar with its effect. You will notice a significant change in the clarity and presence of the sound.
- g. Set the Mid-Treble slider to the extreme **left** of its control range. Start the musical passage again and slowly advance the Mid-Treble slider to the right until the sound is clear and detailed, but without excessive shrillness.

The optimum settings of the Mid-Bass and Mid-Treble sliders must be determined experimentally for your particular room. Only rarely will the center settings of both sliders produce the most natural-sounding response. This is due to normal variations in room acoustics, program quality and listeners' tastes.

Once you have found the best-sounding slider positions for your listening environment, use the tone controls on your control unit to alter the overall spectral character of the sound. Some program sources may also require a slight re-adjustment of one or both 901 Equalizer sliders for best results.

b. Bass Switch

The Bass switch on your 901 Active Equalizer provides an alternative bass equalization contour when playing programs containing unusually high amounts of low-frequency energy. It can also be used to reduce turntable rumble, acoustic feedback and other types of low-frequency noise and interference. Push the Bass switch to its "2" position to obtain the alternative equalization.

Remember that Bose 901 Loudspeakers are capable of reproducing much lower bass frequencies than most conventional speakers. For this reason, your phono cartridge and tonearm must be carefully matched and isolated to avoid feedback at high volume levels. Consult your authorized Bose High Fidelity dealer or the Bose Customer Service Department for more information regarding turntable isolation and feedback control.

7. Equalizer Compatibility

Your Bose® 901® Series V Active Equalizer is designed for use **only** with Bose 901 Series V Direct/Reflecting® Loudspeakers. It is **not** compatible with Bose 901 Series I, II, III, or IV Loudspeakers. These earlier models require substantially different equalization and each should be used only with the equalizer series originally supplied with it.

8. Connecting Additional Speakers

If you wish to use more than one pair of Bose® 901® speakers with a single stereo power amplifier, only one 901 Active Equalizer is required. Connect the 901 speakers in parallel **only** if your amplifier can operate safely into a 4-ohm load. Otherwise, connect the 901 speakers in series. If your amplifier has a choice of output impedance, connect paralleled 901 speakers to the 4-ohm outputs, or series-connected 901 speakers to the 16-ohm outputs.

If you wish to play 901 speakers and conventional speakers simultaneously, you must use a separate stereo power amplifier for each pair of speakers. Connect a 901 Active Equalizer before the amplifier that will drive the 901 speakers. **Do not connect conventional loudspeakers in such a way that they will receive a 901-equalized signal.**

If you are using 901 speakers in a 4-channel or time-delay music system, a separate 901 equalizer will be required for each pair of 901 speakers. If you are mixing 901 speakers and conventional speakers in the same system, connect a 901 Active Equalizer before the power amplifier that will drive the 901 speakers. **NOTE:** The outputs of a Bose 901 Active Equalizer are out of phase with the inputs. For this reason, it may be necessary to reverse the polarity of one pair of speaker leads when using 901 speakers and conventional speakers in the same room.

9. Maintenance

The walnut veneer finish of your 901 speakers can be cleaned with any good grade of wood furniture polish. An occasional application of linseed oil will help to maintain the appearance of the 901 cabinets. After rubbing, polish off any excess oil with a clean, dry cloth.

The speaker grille panels require no special care, although they may be carefully vacuumed if necessary.

The extruded aluminum panels of the speaker and equalizer may be cleaned with fine furniture polish and soft cloth. Clean the electrical connections between your 901 Active Equalizer and other equipment at least once a year by removing and replacing all plugs with a firm twist. This will prevent normal contact oxidation from degrading the signal quality. **All other servicing should be referred to factory-authorized service personnel.**

10. In Case Of Difficulty

If you suspect a problem with your Bose® 901® system, use the following checklist to determine if the problem is in the speakers, equalizer, wiring or some other part of your music system.

If one speaker sounds defective, do not switch the speaker cables, as this could damage a speaker. Turn off the amplifier and disconnect the defective speaker's wire at the amplifier output and reconnect it to the amplifier channel that is working properly. If the speaker that sounded defective now plays correctly, the problem is not in the speaker or wiring.

If trouble appears in both speakers, connect the speakers to another amplifier or receiver that is operating properly. If the speakers now operate correctly, the problem is not in the speakers. (Remember that the tonal balance of the 901 speakers will be incorrect unless the 901 Active Equalizer is being used.)

If low and high frequencies seem weak, check to be sure the 901 Active Equalizer is in the circuit. Review Section 6. **System Operation** for instructions.

If you hear distortion when playing both speakers at high volume levels, try turning down the volume and/or selecting the "2" position of the **Bass** switch on the 901 Active Equalizer. If the distortion disappears, you may be using an insufficiently powered amplifier to drive the speakers.

If the trouble seems to be in the 901 Active Equalizer, temporarily bypass the equalizer to see if the system operates properly without it. Also check to see if all connections are correctly made and that none of the cables are defective.

If trouble persists in the speakers or equalizer, contact your authorized Bose High Fidelity dealer. He will verify any defects and arrange for service by a factory-authorized service agency or by the Bose factory. Bose Corporation will make every effort to remedy any problem within the terms of the warranty at minimum inconvenience to you.

11. Technical Information

901® Series V Direct/Reflecting™ Loudspeakers

Transducer Complement

Nine (9) 4½" (114 mm) full-range Helical Voice Coil drivers in each cabinet

Energy Dispersion

89% by reflection
11% by direct radiation

Enclosure

14-element Acoustic Matrix™ with three Reactive Air Columns

Nominal Impedance

8 ohms

Amplifier Power Requirements

10 watts/channel minimum
Maximum power unlimited in non-commercial applications

Recommended Fusing

Series-connected 3A quick-acting fuse

Cabinet

Oil-rubbed walnut veneer with bronze anodized aluminum trim

Dimensions

21" W x 12½" H x 13" D
(533 x 320 x 330 mm)

Weight

35 lbs (16 kg) per enclosure

901® Series V Active Equalizer

Input Impedance

47 k ohms

Output Impedance

1 k ohms

Usable Dynamic Range

106 dB @ 35 Hz

Noise (A-Weighted)

Greater than 90 dB below 1 volt

Distortion

Less than 0.09% THD at 1 kHz, 1 V input

Compensation Controls

Mid-Bass, ± 6 dB @ 225 Hz
Mid-Treble, ± 3 dB @ 3 kHz

Bass Switch

- 6 dB @ 35 Hz

Power Requirements

120 Vac, 60 Hz, 2.5 watts (North and Central America)
220 Vac, 50/60 Hz (not available in USA and Canada)
100 Vac, 50/60 Hz (Japan only)

Cabinet

Bronze anodized aluminum

Dimensions

2¾" H x 13" W x 4½" D
(70 x 330 x 125 mm)

Weight

3.4 lbs (1.5 kg)

BOSE®
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United States

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