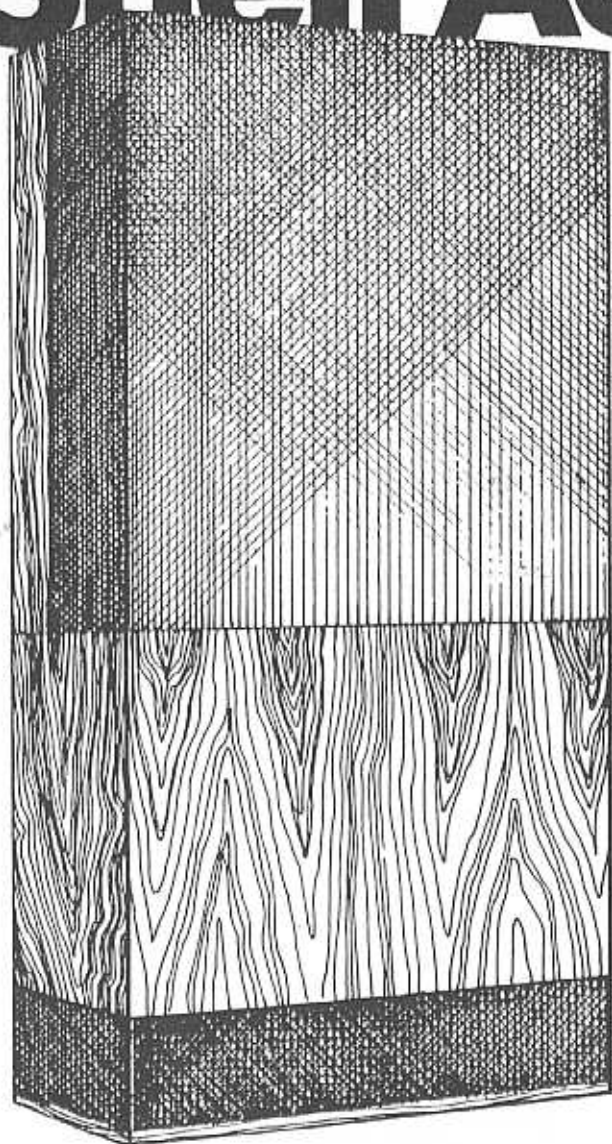


■ Snell Acoustics



**Type A
loudspeaker
system
instruction
manual**

Setting Up Your Type A's

W. J. S. S.

The Type A has been carefully optimized to give best performance when placed on the floor and close to one wall. The position of the speakers along the wall, the exact distance from the wall, and the angle of the speaker with respect to the listener should be the result of considerable experimentation. Generally, the speakers should form the base vertices of an isosceles triangle with the listener at the apex. In most circumstances the sides should be slightly longer than the base (distance between speakers). See figure 1. This may not be possible in some rooms due to the presence of fireplaces, hallways, stairwells or furniture. The distance of the speakers from the corners of the room will have a pronounced effect on the smoothness of the bass response, with the most natural tonal balance normally occurring when the speakers are at least several feet from the corners. Placing the speakers closer to the corners will usually produce excessive bass output, but if your listening room is lacking in bass, this location may work successfully. If the speakers are used near corners, aim them somewhat into the listening area to minimize the possibility of strong high frequency reflections from the side walls of the rooms. In this location, bass response will be considerably smoother if the rear woofer ports are partially covered. A heavy block of wood set directly behind the rear ports is adequate.

TYPICAL ROOM PLACEMENT

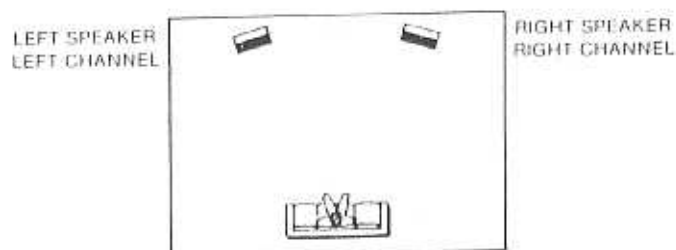


FIG. 1

The distance of the speaker's lower section from the rear wall strongly influences the response through the upper bass and lower mid-range. Moving the speakers closer to the wall increases the output in this frequency range. If positioned carefully, normally seven to nine inches from the wall, the woofer interacts with the reflected energy off the wall in a manner which produces exceptionally smooth response. Once again, experimentation is called for.

Imaging and high frequency balance are somewhat affected by the amount of the "toe-in". Both suffer if the listening position is more than 35° off-axis. The ideal amount of toe-in is also room dependent, since rooms vary in liveness and brightness. Ten to twenty degrees off-axis works optimally in many rooms. Alternatively, placing the speakers parallel to the rear wall is sometimes effective.

The listening "window" of the Type A is extremely wide, and although best listening will be attained at the apex of the imaginary isosceles triangle, there is a *much* larger listening area where the imaging and tonal balance remain excellent.

One situation which should always be avoided is the placement of tall objects in front of or to the sides of the Type A's. This will result in reflections which will affect imaging and detail. Several feet of free space will amply reward the listener with smoother, more accurate reproduction of complex musical passages.

Note that the speakers are labeled "left" and "right". They are produced in mirror image pairs, with the left speakers having slightly better dispersion towards the right (when facing the loudspeaker) and vice versa. When positioning the speakers along the same wall with their fronts facing the listener, the "left" speaker should be to the left of the "right" speaker.

The speaker should stand vertically. If the floor tilts away from the wall, prop up the front edge of the woofer cabinet until the speaker is vertical.

The dispersion of the loudspeaker allows for a placement which would be impossible for most loudspeakers but works well with the Type A in certain rooms. The speakers may be placed on opposite walls, slightly toed-in so that the listener is not much more than 25° off axis. See figure 2. The normal orientation of the left and right loudspeakers should be reversed (so that the left speaker is on the right and vice versa). The usual cautions about corner placement should be kept in mind. Imaging may often be improved in difficult rooms, but bass performance may sometimes suffer.

ALTERNATIVE ROOM PLACEMENT

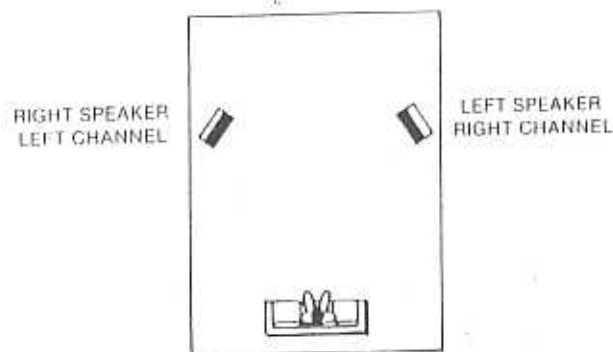


FIG. 2

How?

The Type A consists of a bottom section, containing the woofer, an upper section, containing the midrange and tweeter, and a jumper cable connecting the two halves.

If the speaker is to be placed on a hard floor, apply the enclosed felt disks to the underside of each bottom section.

Place a lower section in the first position that you have decided to try. Fit the upper section on the lower, lining up the pegs with the holes. If you are not bi-amplifying, connect the jumper cable between the jacks marked "to woofer" on the upper section to the jacks marked "woofer input" on the lower section, checking that the red striped pin of the plugs are inserted in the red jacks. See figure 3. Make sure that a shorting plug is inserted in the jack in the bottom section labeled "Short for normal mode". If the speaker is to be bi-amplified, refer to the section on bi-amplification below.

Repeat the process with the other speaker.

The connectors at the rear of the top sections marked "input 4 ohms" will accept bare wire, spade lugs or various "double" banana connectors such as the Pomona MDP, the banana connectors having the advantage of easiest connection and removal.

The length and type of speaker cable used in your system will have an audible effect. Under no circumstances should wire of gauge higher (thinner) than #18 be used. In general, the longer the length used, the greater the necessity of a lower gauge, and the lower the gauge, the better the sound, with diminishing returns setting in around #10 or #12.

A variety of speaker cables are now available whose manufacturers claim better performance than with standard heavy gauge wire. We have verified this in some cases, and the improvements available are often more noticeable than the differences between wires of different gauge. The differences vary with the amplifier and speakers used, and it should be noted that some can damage some amplifiers.

We would also recommend, if possible, that short runs of speaker cable connect the power amplifier(s) and speakers and that long interconnect cables of high quality be used to connect the preamplifier and power amplifier. This of course results in the power amplifiers being close to the speakers, which may be practically or cosmetically difficult, but if the length of the speaker cables can be reduced to a few meters, sonic advantages may be obtained. The effects of cables may sometimes be masked if the equipment is not of the highest quality.

Your Type A's should be wired in phase with each other. All speaker cables are marked so that it is possible to distinguish between strands by color of wire or insulation or by a white stripe or raised ridge along one strand. If you are using one stereo power amplifier (or two mono amplifiers) as opposed to bi-amplifying, connect one strand to the left channel of your amplifier's black (or ground) terminal and the other end of that strand to the black terminal on the rear of your left Type A marked "input 4 ohms". Connect

the other strand of that cable to the other terminal (usually red) on the left channel of your amplifier and to the red terminal on your left speaker. Connect the other cable between the right channel on your amplifier and the right loudspeaker in exactly the same fashion. Should you be interested in the absolute phase of your system, a positive voltage at the red terminal on the Type A will cause all drivers to move outward.

Very tight and positive connections are necessary. If you are using a heavy gauge wire be careful that as much as possible comes in contact with the amplifier and speaker terminals.

Save the boxes and all packing, including the plastic bags. If the speaker should ever require repair, they will need to be shipped to the factory in their original cartons, using all the packing, or serious damage will be likely.

Associated Equipment: Proper Selection and Use

The extraordinary accuracy and transparency of the Type A allows it to fully reveal the strengths and weaknesses of the associated audio equipment and source material. While the Type A will bring to life the sonic delights of state-of-the-art components, it will with equal clarity bring out any system flaws. This does not mean that expensive equipment is a prerequisite to good sound from the Type A, but rather that the equipment must be wisely selected, and setup with care. The rewards will be well worth the effort.

The phono cartridge is second only to the speaker in the extent of its effect on the sound of the system. The alignment of the cartridge is *extremely* critical. Many of the protractors and guides supplied by turntable and arm manufacturers are inadequate or incorrect. Consult your dealer for a chart relating proper overhang, offset angle and the pivot to stylus distance of your arm. Experiment with vertical tracking angle and tone arm damping. Tone arm-cartridge compatibility will also affect the results you obtain.

The low frequency response of the Type A allows turntable rumble to be mercilessly revealed. Audible rumble in your turntable (not recorded in the source) should not be tolerated.

Record warps are reproduced in an audio system as extreme low frequency vibrations which will occasionally overtax a power amplifier or damage a woofer. If you must play a severely warped record, the use of a subsonic filter is recommended, although they are not usually sufficiently steep so as to eliminate the problem. Under other circumstances the audible effects of almost all subsonic filters make their use inadvisable in a good system.

A turntable should not be placed so near to the Type A that vibrations are passed back through

WIRING HOOKUP FOR NORMAL OPERATION

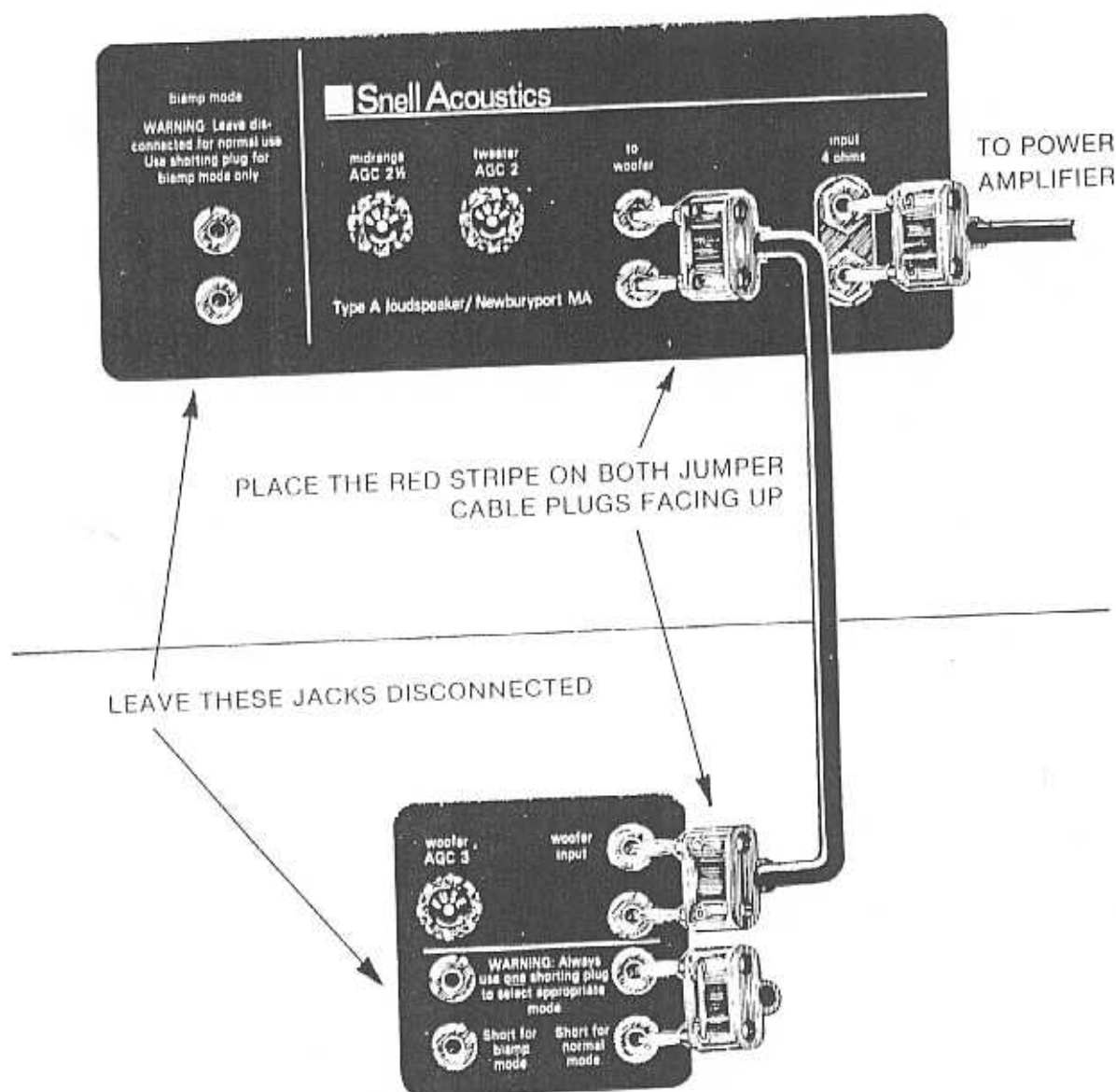


FIG. 3

air or floor to the turntable, causing feedback. Feedback can result in deterioration of the sound long before the familiar "howling" is evidenced. A good test to find the susceptibility of your system to feedback follows: Place the stylus on a record as if to play it but leave the turntable off. Turn the volume control up to a position appropriate to loud listening. Lightly tap shelf on which your turntable is resting. If no sound is heard through the speakers, all is well. If a dull tapping is heard through your speakers, your suspension is not perfect. If the sound reverberates after the tap for a fraction of a second or longer, you are on the threshold of feedback. Consult with your dealer as to the best way of eliminating feedback in your system. The best solution is more typically mov-

ing the turntable, using a sub-base, and/or suspending the turntable from a wall or from the ceiling.

The use of tone controls and equalizers should be tempered with moderation. In general, the less signal processors in the signal path the better, but it is a sad fact that nearly all modern recordings are mixed down and equalized using "monitors" less accurate than your Type A's. With flawed recordings it may be useful to employ an equalizer or tone controls. *Excessive* boost of any frequency may damage your system.

Preamplifiers and moving coil step-up devices vary widely in sound quality and should be auditioned and compared if possible.

The question of amplifier power is not easily answered without reference to a particular listening environment. Less than fifty watts per channel into 4 ohms will rarely provide sufficient power to provide optimum performance in an average room, and two hundred watts may sometimes be inadequate in a large room at very high levels. The Type A can comfortably handle many hundreds of watts of clean power on good source material with no signs of strain. For the widest possible dynamic range, bi-amplification is recommended. On the other hand, an improperly used 50 watts per channel amplifier can possibly be overdriven into damaging your Type A's. Turn-on transients, the disconnection of audio cables during the use of the system and acoustic feedback can cause damage. Volume controls should be set close to the minimum when tone arms are cued or radio stations are tuned, as these may produce dangerous transients as well.

Fuses

Every driver on the Type A is individually fused. These fuses will protect the Type A from most forms of abuse but are not infallible. If a fuse blows, the driver which it protects will cease to operate and the speaker will evidence a severe lack of bass, midrange or treble.

Fuses should be replaced with the exact value and type supplied. Use of slow blow fuses or values higher than those recommended will invalidate the warranty.

Woofer	3 ampere	(Buss AGC 3 or Littelfuse 3AG 3A)
Midrange	2½ ampere	(Buss AGC 2½ or Littelfuse 3AG 2½A)
Tweeter	2 ampere	(Buss AGC 2 or Littelfuse 3AG 2A)

If a fuse blows, the speaker has been subjected to excessively high power levels, and the volume should be reduced somewhat. If a fuse continues to blow at lower volume settings, check the condition of your electronics.

Problems

If your audio system is malfunctioning, check the speaker's fuses, the jumper cable, and the connections at the speaker's input. If one of the three fuses is blown, it will produce a very noticeable lack of bass, midrange, or treble. See the section on fuses.

If only one channel is malfunctioning, you can determine if it is the speaker or if it is elsewhere in the audio system by switching the input wire from the back of speaker A to speaker B and vice versa. If the same speaker still sounds faulty, it is most likely the source of the trouble. Alternatively, if it is hard to switch the wires between speakers, you can make the exchange between channels at the back of the amplifier. If the same speaker sounds faulty, then it is likely that either the cable connecting your speaker and amplifier

or your speaker itself is at fault.

If your system sounds faulty but you are unable to pin down the source of the difficulty, go to your dealer for advice. Do not assume that it is necessarily your speakers which are at fault. For example, your stylus may be worn or defective.

Do not return your speakers to the factory for repairs without prior consultation with your dealer or with the factory. All repairs are done at the factory to insure that the speakers are performing to specifications. If a speaker must be returned for repairs, pack it carefully, referring to the packing diagram at the back of the manual and using *all* packing material, including the plastic bag.

The speaker grilles are not user-removable. Repairs of the Type A by the owner or dealer may invalidate the warranty.

Caring For The Finish

The Type A is handcrafted from the finest materials. An occasional (perhaps once a year) thin coat of *dark* paste wax (clear paste wax for the oak cabinets) will preserve the beauty of the finish. Using a paper towel, apply a very liberal coat of the wax, then wipe off *immediately* and buff thoroughly. Do this to one surface at a time. Be careful that wax does not get onto the grille material. In this regard, it may be helpful to place a long strip of stiff paper edgewise into the space between the cabinet and grille. Rubbing alcohol will remove wax from the cloth.

Bi-Amplification

Why?

Bi-amplifying the Type A can result in a substantial improvement in sound quality. To understand why this is possible, consider the normal versus bi-amplified setup.

In the normal, unbi-amplified mode the right and left signals pass from preamplifier to loudspeakers unchanged except for amplitude. Inside each speaker the internal crossover divides the signal into the midrange and high frequencies reproduced by the upper sections and the low frequencies handled by the bottoms. In the bi-amplified mode, shown in figure 4, the right and left signals are divided after the preamplifier by the electronic crossover into high and low frequency signals. One stereo power amplifier then amplifies the highs (both channels) and the other stereo power amplifies the lows. The highs are sent into the upper sections of the Type A's, where they pass through the midrange and tweeter crossovers, though bypassing the midrange's low frequency roll off, and on to the midrange and tweeter drivers. Similarly, the lows go to the woofers, by passing the internal crossovers.

This configuration has several advantages. Each amplifier is dealing with frequencies in a restricted range, thus it cannot combine high and low frequency signals and produce sum and difference by-products (intermodulation distortion, or IM). If very high power is needed to reproduce the sound of a kickdrum, the demand for low frequency power will not affect the ability of the high frequency amplifier to perform normally, whereas if all frequencies were reproduced by the same amplifier its power supply might be temporarily depleted, causing dynamic compression or clipping of the high frequency material. The advantage is similar to that of the "dual monaural" amplifier design with totally separate channels and the elimination of so-called "dynamic crosstalk".

If one is not fortunate enough to choose an amplifier without regard for cost, bi-amplification allows the owner of Type A's the ability to match an amplifier to the frequency range (high or low) it is most comfortable with.

The power requirements of the upper section are slightly less than that of the lower section so a higher quality smaller power amplifier may often be used.

Note, however, that bi-amplification will not mask the audible effects of a substandard am-

plifier; it may even exacerbate the problem. Do not use amplifiers of widely varying sound quality. Do not use an amplifier having significantly less power than would be used if not bi-amplifying.

Since only low frequencies are being sent to the lower sections in the bi-amp mode, the Type A is designed so that the internal woofer crossover is bypassed, resulting in closer coupling of the amplifier and woofer and increased damping.

Overall, the improvements from bi-amplification can be described as greatly improved bass impact, a more "relaxed" and dynamic high end, and increased openness throughout the audible frequency range.

How?

In figure 4 one sees that a Snell Acoustics Electronic Crossover*, an extra stereo power amplifier, and additional speaker cables and "phono" cables are needed for bi-amplification. If at all possible, we would suggest that the dealer from whom you purchased the loudspeakers should do the initial set-up. If not, a signal generator, also known as an audio oscillator, and a VOM may be needed for set-up.

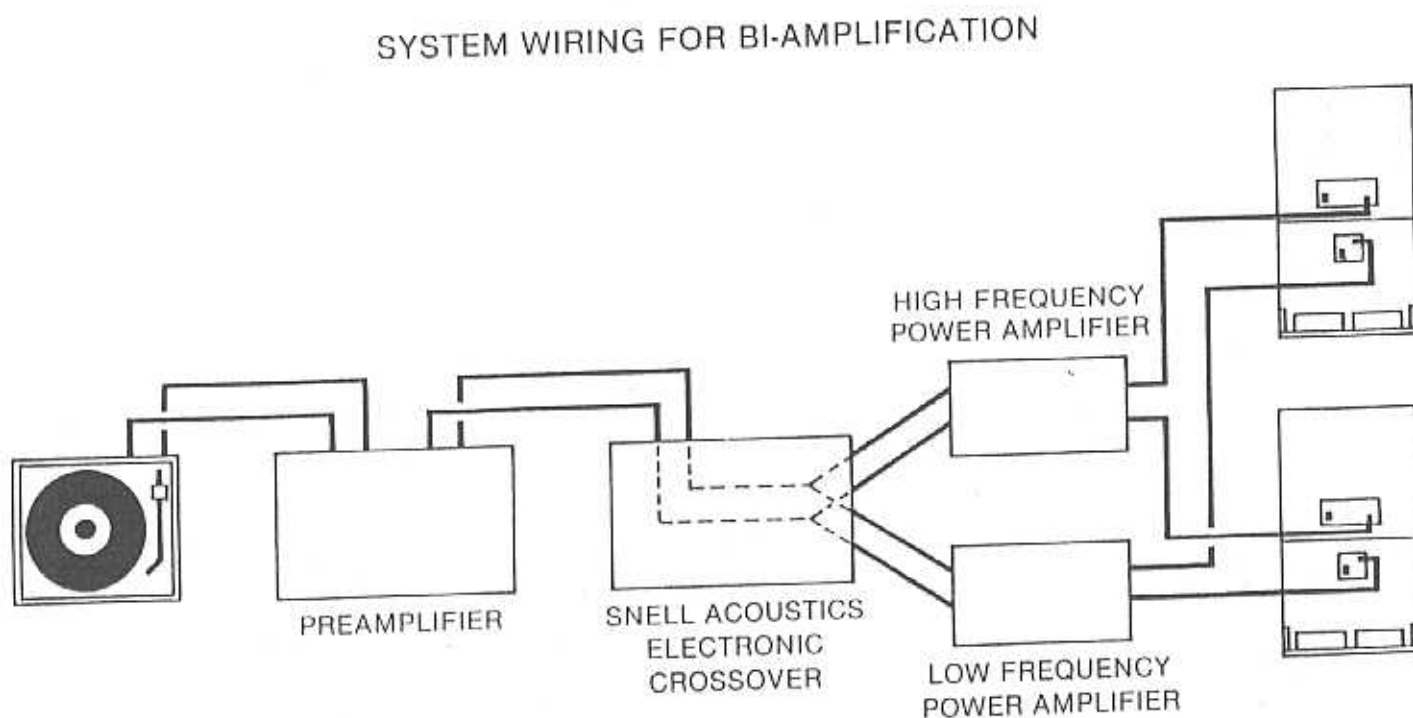


FIG. 4

*The electronic crossover *must* have the appropriate crossover characteristics, otherwise the sound will not be optimum and damage to the speaker may occur.

To start, one must establish whether the power amplifiers involved are inverting or non-inverting, that is, do they leave a sine wave unchanged except for amplitude or do they invert it (turn it 180° out of phase). If you are using two identical amplifiers in your system to power the upper and lower sections of the Type A's, it is likely that they are both either inverting or non-inverting. Some amplifier manufacturers have introduced changes in their amplifier's circuitry that reverse this, however, so that two seemingly identical amplifiers built at different times may differ. The amplifiers can be tested as below or the manufacturer can be contacted with serial numbers. Incidentally, there is no advantage attached to an amplifier being of an inverting or non-inverting nature, but if the two amplifiers used in bi-amping differ in this regard, the upper and lower sections of the Type A will be out of phase. The speaker wiring must then be changed to correct the phase, as will be discussed below.

The easiest way to ascertain whether both amplifiers fall into the same category is to hook one channel of one amplifier to the left loudspeaker and a channel of the second amplifier to the right loudspeaker (normal set-up, except for amplifiers). Place the speakers side by side, switch the preamp to monaural, and adjust the preamp balance control until the two speakers are of roughly equal loudness. While listening to music with substantial bass information, reverse the speaker leads at the input of one loudspeaker. The apparent bass output of the pair of loudspeakers will either increase or decrease. The speakers will be "seeing" the same signal when the bass is loudest. If this occurs with the leads unreversed, the amplifiers are alike with respect to inversion of the signal. If the bass is loudest with the leads reversed, the amplifiers are different. This information will be used in the next stage of the set-up.

We are now ready to connect the two power amplifiers to the loudspeakers as shown in figure 5. If you are converting from a single amplifier set-up, disconnect the jumper cables that normally interconnect the upper and lower sections. Next, transfer the shorting plug on the lower sections from the "Short for normal mode" jack to the "Short for biamp mode" jack. Add a shorting plug to the "biamp mode" jack on the upper sections.* If you do not have an additional shorting plug, one can be readily assembled from a standard double banana plug and a short length of heavy wire. Finally, connect the outputs of the high frequency amplifier to the jacks marked "input 4 ohms" on the upper sections, and the outputs of the low frequency amplifier to the jacks marked "woofer input" on the lower sections, using speaker cables of good quality. If the inverting test showed the amps to be dissimilar, reverse the hot and ground connections at the input of *both* upper sections.

We now proceed to the hook-up of the electronic crossover (figure 4). The main outputs of the preamplifier should be fed to the inputs of

the electronic crossover. The high frequency outputs of the crossover should be connected to the respective channels of the high frequency power amplifier and the low frequency outputs should be connected to the respective channels of the low frequency power amplifier.

At this point we must make level adjustments on the crossover to compensate for the differences in gain between different power amplifiers. One power amplifier may multiply the signal fed to it from the crossover by a factor of 30, another by a factor of 40. This is unrelated to the rated power of the amplifier, which is the *maximum* amount of power that the amplifier is capable of producing. An amplifier with higher gain would send a louder signal to the section of the Type A that it powers than an amplifier with lower gain; thus using amplifiers with different gains in a bi-amp setup would result in an imbalance between upper and lower sections of the Type A's. This is corrected by adjusting the high and low frequency level controls on the electronic crossover. These level controls must be set very precisely, following the procedure outlined below, using a signal generator and VOM of high quality. Refer to Figure 6.

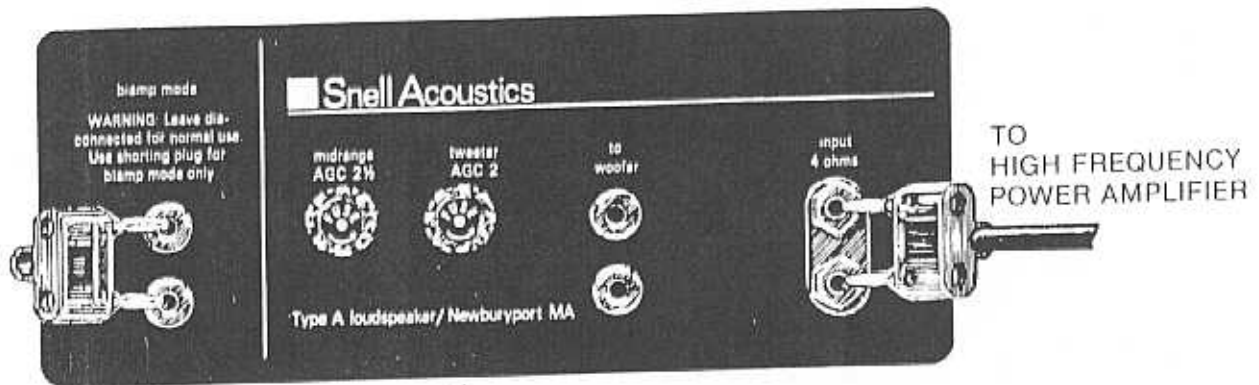
Connect the signal generator to an auxiliary input of the preamplifier, put the preamp into monaural mode, and set the tone controls to flat. Turn all the level controls on the electronic crossover to their maximum positions, but leave the preamplifier volume control fully down. Select a 4000 Hz tone on the signal generator and connect the probes of the VOM to the left channel high frequency power amplifier output terminals. Slowly turn up the preamplifier volume control (and the signal generator volume control if necessary) until the VOM reads exactly 1.5 volts. Now connect the VOM probes to the left channel output terminals of the low frequency power amplifier and select a 40 Hz tone on the signal generator. If the VOM reads greater than 1.5 volts, reduce the left low frequency level control on the crossover to give a 1.5 volt reading, being careful not to change the position of the preamplifier or signal generator volume controls. If the 40 Hz VOM reading was initially less than 1.5 volts the *preamp* volume control must be increased until 1.5 volts is reached. This will of course increase the high frequency output as well, so you must once again select 4000 Hz and *reduce* the high frequency level on the crossover until the high frequency power amplifier VOM reading is back down to 1.5 volts. Once again take a low frequency power amplifier reading at 40 Hz and a high frequency power amplifier reading at 4000 Hz to double check that both read 1.5 volts on the VOM. Finally, repeat the entire procedure for the right channel.

*WARNING: Never connect the shorting plug to the upper section "biamp mode" jack unless using an electronic crossover which has the correct crossover specifications and is approved by Snell Acoustics. Damage resulting from the above constitutes misuse and may void the warranty.

The system should now be operational. Listen to a record or tape that you are familiar with, using the balance control on the pre-amplifier to listen to each speaker separately.

and checking that each speaker is working independently and that upper and lower sections of both speakers are producing sound. The speakers are now correctly bi-amplified.

WIRING HOOKUP FOR BI-AMPLIFICATION



LEAVE THESE JACKS DISCONNECTED

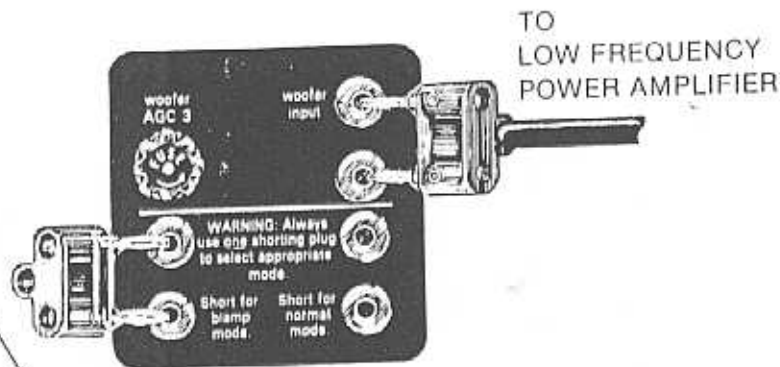
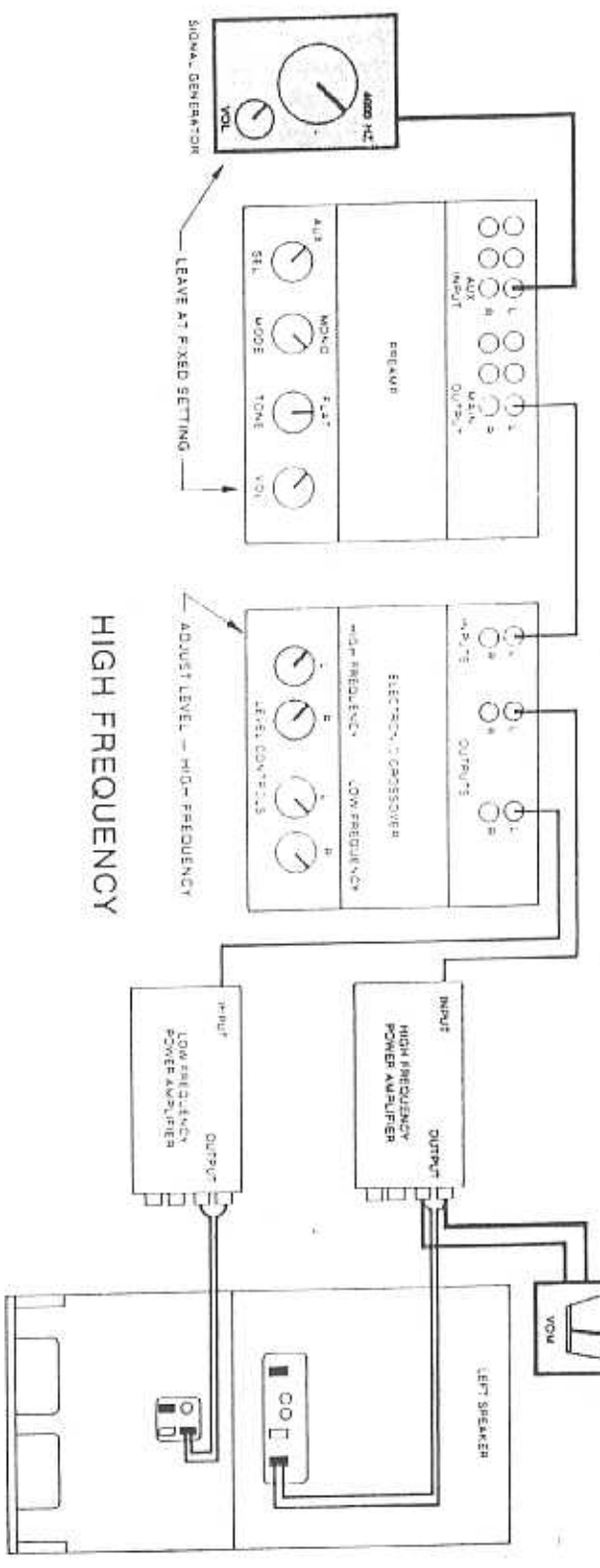
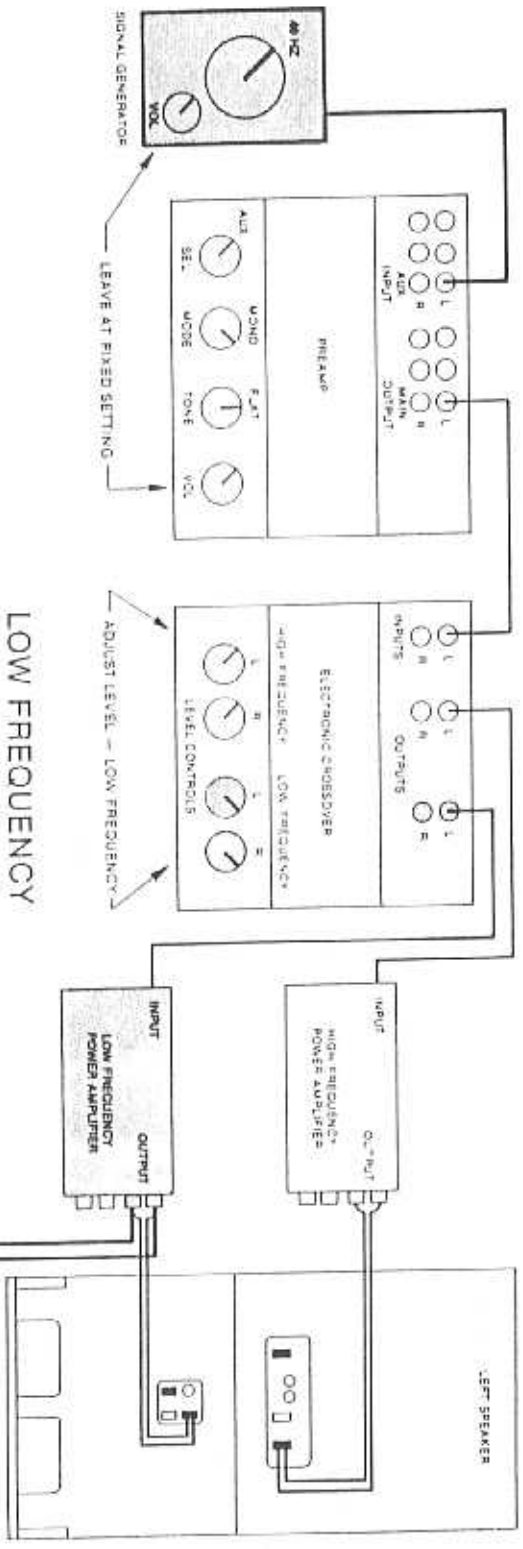


FIG. 5

ELECTRONIC CROSSOVER LEVEL ADJUSTMENTS (left channel shown)



HIGH FREQUENCY



LOW FREQUENCY

FIG. 6

SPECIFICATIONS

Frequency response on axis and up to 25 degrees off axis*	36 Hz to 18 kHz \pm 1 1/2 db
Impedance (minimum)	4 ohms
Power requirements (minimum)	80 watts RMS/channel
Driver complement	10-inch (24.5-cm) woofer 4-inch (10.2-cm) midrange 1-inch (2.54-cm) tweeter
Crossover frequencies	275 Hz and 2500 Hz
Fusing	
Woofer	AGC 3 or 3AG 3A
Midrange	AGC 2 1/2 or 3AG 2 1/2 A
Tweeter	AGC 2 or 3AG 2A
Dimensions	
Upper section	25.5" high x 23.75" wide x 13.0" deep (64.8 x 60.3 x 33.0 cm)
Lower section	21.0" high x 23.75" wide x 13.0" deep (53.3 x 60.3 x 33.0 cm)
Weight	
Upper section	43 pounds (19.5 kg)
Lower section	54 pounds (24.5 kg)

**This rating applies to the inner side. The speakers are mirror image pairs, having slightly better dispersion toward the inner side.*