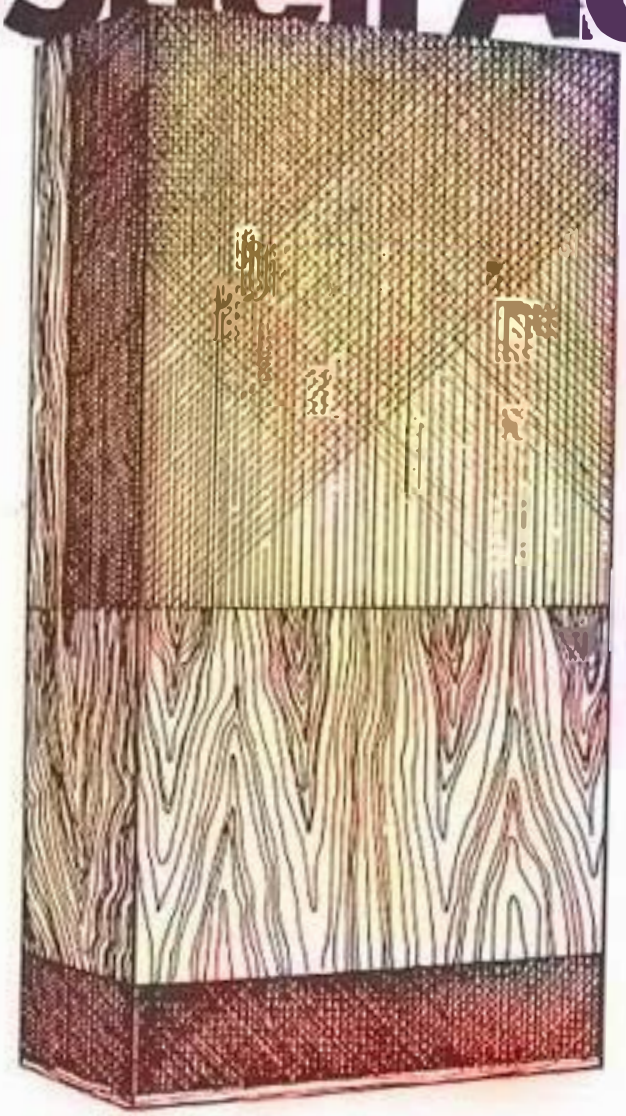
# Snell Acoustics



# Type A loudspeaker system instruction manual

# Setting Up Your Type A's

The Type A has been carefully optimized to give best performance when placed on the floor and close to one wall. The posilion of Ihe speakers along the wall, the exael distance from the wall, and the angle of the speaker with respect to the listener should be the result of considerable experimental ion. Generally, Ihe speakers should form the base vertices of an Isosceles triangle with the listener at the apex. In most circumstances Ihe sides should be slightly longer Ilian the base (distance between speakers). See figure 1. This may not be possible in some rooms due to the presence of fire-places. hallways, stairwells or furniture. The distance of the speakers from the corners of the room will have a pronounced el feet on the smoothness of the bass response, with the most natural tonal balance normally occurring when the speakers are at least several leet from the corners. Placing Ihe 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 il the *rear* woofer ports are partially covered. A heavy block ol wood set directly behind ihe rear ports is adequate.

TYPICAL ROOM PLACEMENT

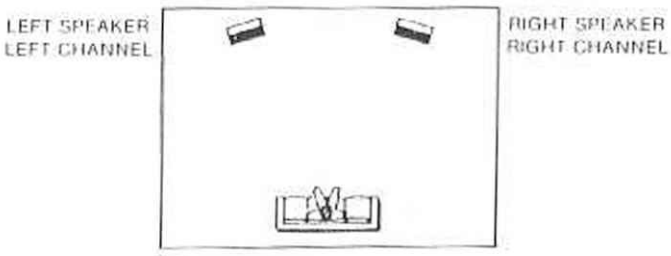



FIG. 1

The distance of Ihe speaker's lower section from the rear wall strongly influences the response through the upper bass and lower mid-range. Moving Ihe speakers closer to the wall increases Ihe 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 affooted by the amount of the "toe-inVBoth 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 Ihe rear wall is sometimes effective.

The listening "window" of the Type A is extremely wide, and although best listening will be attained at the apox 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 Ihe Type A's. This will result in reflections which will affect imaging and detail Several feel of free space will amply reward the listener with smoother, more accurate reproduction of complex musical passages.

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

The speaker should stand vertically. If Ihe lloor lilts away from the wall, prop up Ihe fron! edge of the woofer cabinet until the speaker is vertical.

The dispersion of Ihe loudspeaker allows for a placement which would be impossible for most loudspeakers but works well with the 1'ype A in certain rooms. The speakers may be placed on opposite walls, slightly toed-in so I hat Ihe listener is not much more than 25° off axis. See figure 2. The normal orientation of the left and right loudspeakers should bo reversed (so that the left speakci is on the right and vice versa). The usual cautions about corner placement should be kepi in mind. Imaging may often be improved in difficult rooms, but bass performance may sometimes suffer.

ALTERNATIVE ROOM PLACEMENT

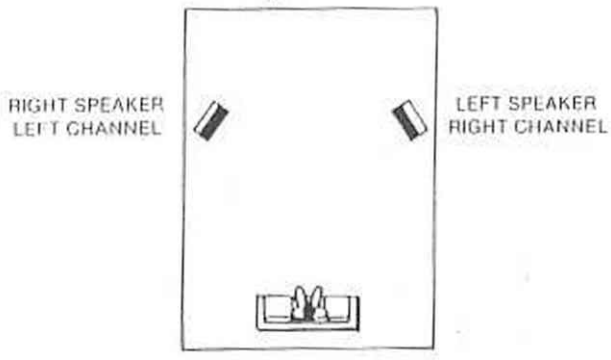



FIG. 2

How?

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

If the speaker is lo be placed on a hard floor, apply the enclosed fell 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 yon 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 o( 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“. II Ihe speaker is to be bi-amplified, refer to Ihe section on bi-amplification below.

Repeal Ihe process with the oilier 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, Ihe banana connectors having the advantage of easiest connection arid 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 /Mb be used. In general, the longer the lenglh used, the greater the necessity of a lower gauge, and the lower Ihe gauge, the better Ihe 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 ollen more noticeable than the differences between wires of different gauge. The differences vary with Ihe amplifier and speakers used, and il 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 lenglh of Ihe speaker cables can be reduced to a few meters, sonic advantages may be obtained. The effects of cables may somelimes be masked il the equipment is not of the highest quality

Your Typo 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. H vou are using one stereo power amplifier (or two mono ampli tiers) as opposed lo bi-amplifying, conned one strand to the left channel of your amplifier's black (or ground) terminal and Ihe other end of that strand to the black terminal on Ihe rear of your lull Type A marked “input 4 ohms". Connect the other strand of that cable lo 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 Ihe red terminal on the Type A will cause all drivers tu 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 evei require repair, they will need to he shipped lo the factory in 1 heir original cartons, using all the packing, or serious damage will he likely.

## Associated Equipment: Proper Selection and Use

The extraordinary accuracy and transparency of the Type A allows il to fully reveal Ihe strengths and weaknesses of the associated audio equipment and source material. While the Typo 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 Hie equipment must be wisely selected, and setup with care. The rewards will be well worth Ihe effort

The phono cartridge is second only to tho speaker in the extent of its effect on the sound of Ihe system. The alignment of the cartridge is ex*tremcly* 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, of (set angle and the pivot to stylus distance of your arm. Experiment with vertical tracking angle and lone arm damping. Tone arm-cartridge compatibility will also affect the results you obtain.

Tfie low frequency response of tfie 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, Ihe use of a subsonic filler is recommended. although I hey are not usually sw Iliciently sleep 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

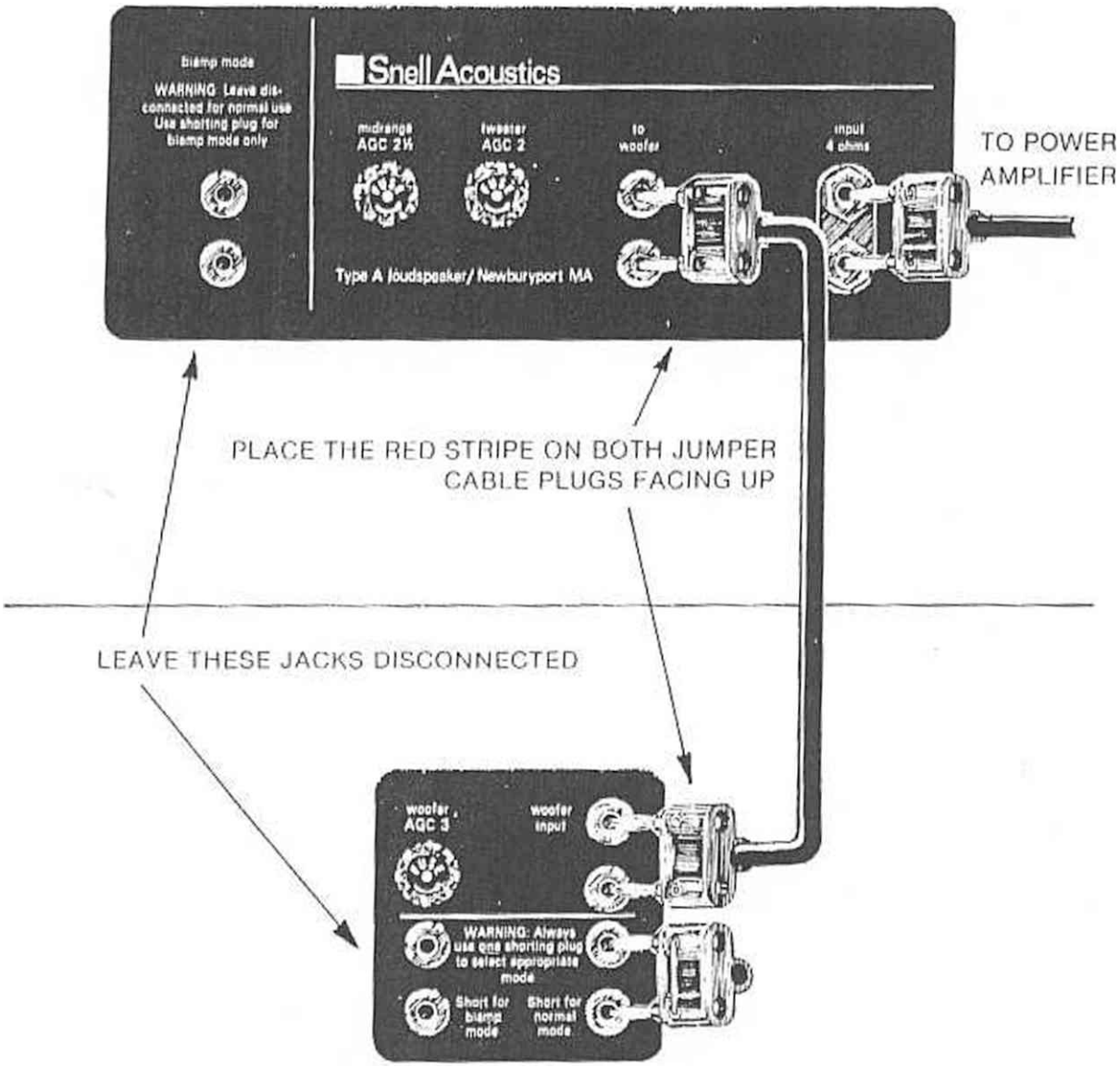



FIG. 3

air or floor lo Ihe turntable, causing feedback. Feedback can result in deterioration of the sound long before the familiar "howling" is evidenced. A good lest 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 appropi iate 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 Ihe 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 moving the turntable, using a sub-base, and/or suspending the turntable from a wall or from the celling.

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, *I-xcessivu* 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 largo/oom 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 överdriver» 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 thp 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, Ihe 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 exaqt value and type supplied. Use of slow blow fuses or values higher than those recommended will Invalidate the warranty.

| | | |
|---|---|---|
| Woof or | 3 arnpcro | (Buss AGC 3 of Utlolfyse 3AG 3A) |
| MidrnnQG | 2V> ompore | (Buss AGC 2V> of lltlnliuae 3AG 2'/»A) |
| Twenler | 2 ampere | (Buss AGC 2 or Littnltiise 3AG 2A> |

If a fuse blows, the speaker has been subjected to excessively higtj 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 diffuclty, 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 mu9t 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-removabla. 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 grill,e 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-AmpllflcatIon

Why?

Bl-ampllfylng the Type A can result In a substantial Improvement In sound quality. To understand why this Is possible, consider the normal versus bl-ampllfled setup.

In the normal, unbl-ampllfled 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 bl-ampllfled 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 twoeter 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 il 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) il 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 amplifier; 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 hi-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 bo 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.

## SYSTEM WIRING FOR BI-AMPLIFICATION

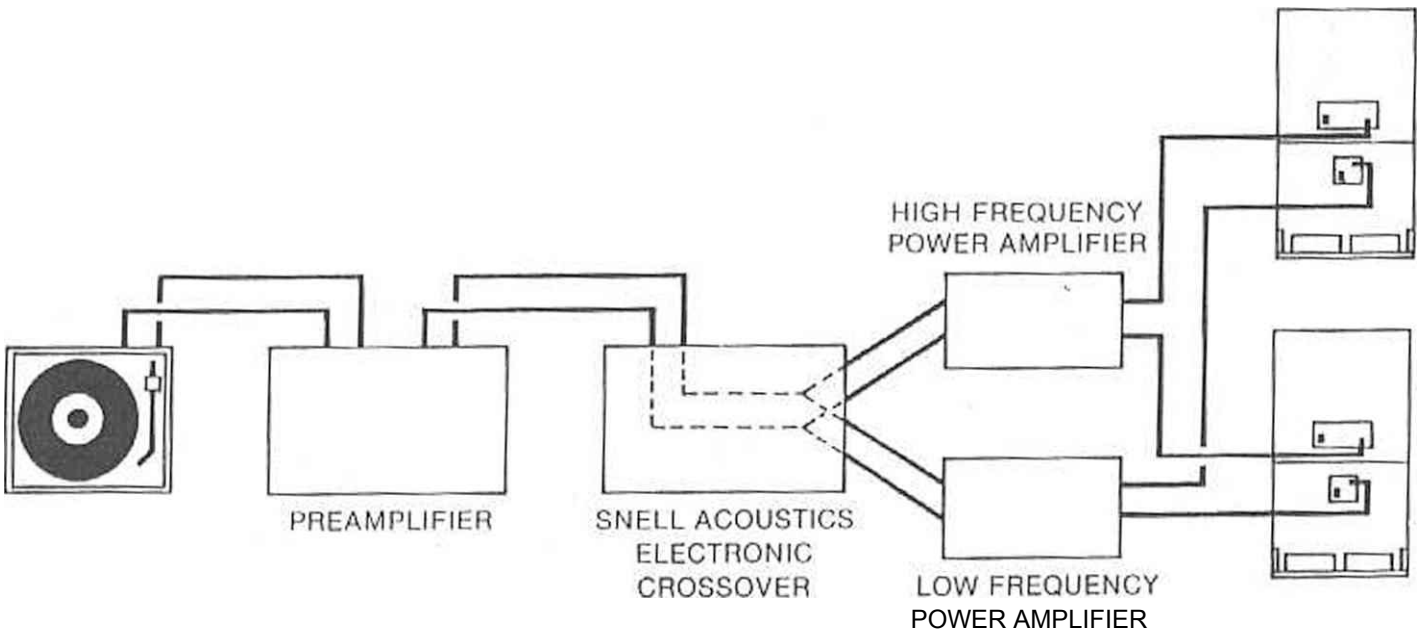



FIG. 4

*Thn electronic crossover *must* have the appropriate crossover characteristics, otherwise the sound will nut be optimum and damage tu tiro speaker may occur.

Tu start, one? must establish whether the power ampliliers involved are inverting or non-inverting, that is, do they leave a sine wave unchanged except lor amplitude or do they invert it (turn it 180° out of phase). If you are using two identical amplilicrs 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 lwo seemingly Identical amplifiers built at different times may differ. The amplifiers can be tcsled as below or the manufacturer can be contacted with serial numbers. Incidentally, there is no advantage attached to an amplifier being of an inverting ur non-inverting nature, but d the two amplifiers used in bl-arnplng differ in this regard, the upper and lower sections of the Type A 'will be out of phase. The speaker wiring rnusl then be changed lo 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 lo the right loudspeaker (normal set-up. except for amplifiers). Place the speakers side by side, switch the preamp lo monaural, and adjust the preamp balance control until the two speakers are of roughly equal loudness. While listening lo music with substantial bass information, reverse the speaker leads at the input ol *one* loudspeaker. The apparent bass output ot the pair of loudspeakers will either incicase or decrease. The speakers will be "seeing" the same signal when the bass is loudest II this occurs with (lie leads unreversed, the amplifiers are alike with respect to inversion of the signal If the bass is loudest wilh the leads reversed, llte amplifiers are different. I'his information will be used in the next stage of the sel-up.

We are now ready lo 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 nor malty interconnect the upper and lower sections. Next, transfer the shorting plug on the lower sections from the "Short for normal mode" jack to Ihe "Short for biamp mode" jack. Add a shorting plug lo I he "hiamp 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 Iho outputs ol 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 "woofei input" un Ihn lower sections. using speaker cables ol good quality. If the inverting test showed the amps to he dissimilar, reverse the hoi and ground connections at the input of *both* upper sections.

We now proceed to Ihe liuok up of the electronic crossover (figure 4). The main outputs of the preamplifier should be fed to Ihe inputs of the electronic crossover. The high frequency outputs ol the crossover should be connected lo Ihe respective channels ol Ihe high frequency power amplifier and the low frequency outputs should be connected to the respective channels ol the low frequency power amplifier.

At this point we must make level adjustments on the crossover lo compensate lor Ihe 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 ol the amplifier, which is Hie *maximum* amount ol power Ural Ihe amplifier is capable of producing. An amplifier with higher gain would send a louder signal to the section of the Type A tfiat 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. Those level controls rnusl be set very precisely, following Ihe procedure outlined below, using a signal generator and VOM of high quality. Refer to Figuie 6.

Connect Ihe signal generator lo an auxiliary input of Ihe preamplifier, pul tire preamp into monaural mode, and set Ihe tone controls to flat. Turn all the level controls on the electronic crossover lo their maximum positions, but leave (tie preamplifier volume control fully down. Select a 4000 Hz tone on the signal generator and conned Ihe probes ol the VOM to the left channel high frequency power ampliliei 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 tell channel output terminals of the low frequency power amplifier and select a 40 Hz lone 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 lire preamplifier or signal generator volume controls. If the 40 Hz VOM reading was Initially less Ilian 1.5 volts the *preamp* volume control must be increased until 1.5 volts is reached. This will ol course increase the high frequency output as well, so you must once again select 4000 Hz arid *reduce* Ihe high frequency level on the *crossover* until the high frequency power amplifier VOM reading is back down lo 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 lo double check that both read 1.5 volts un Iho VOM Finally, repeal Ihe onlim procedure for the right channel.

'WARNING: Never connect Hit* shorliny plug lo Ihr? upper section "bianip mode" lack unless using an clechomn ciosr, over which has Ihe correct crossover spocHiealions and is approved by Snell Acoustics. Damage rosulling Irani Ihe above conslilnles misuse mid may void ihe vmrumly

The system should now be operational I isten to a record or tape that you are familiar with, using the balance control on the pre-amplifier to listen lo 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

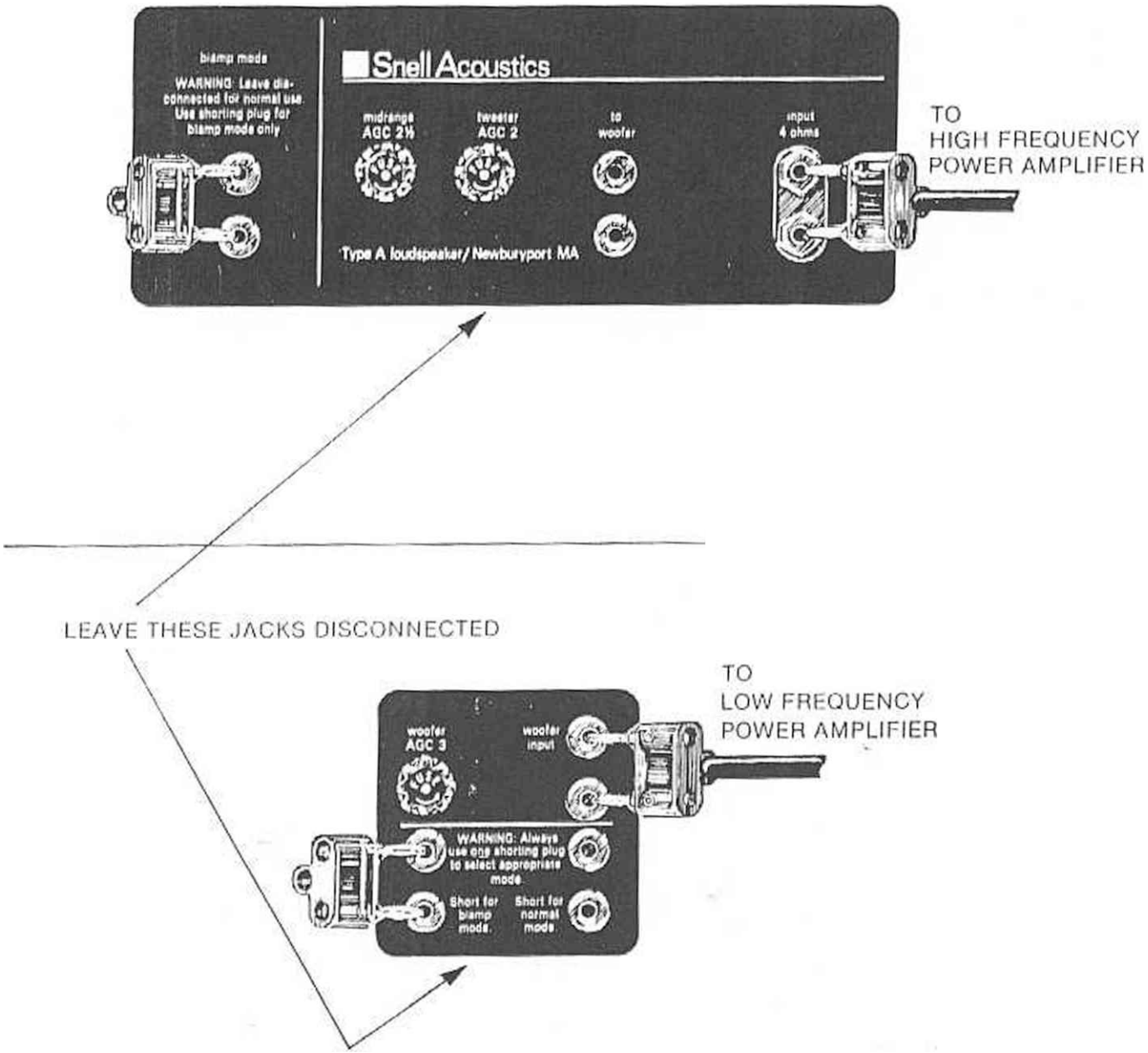
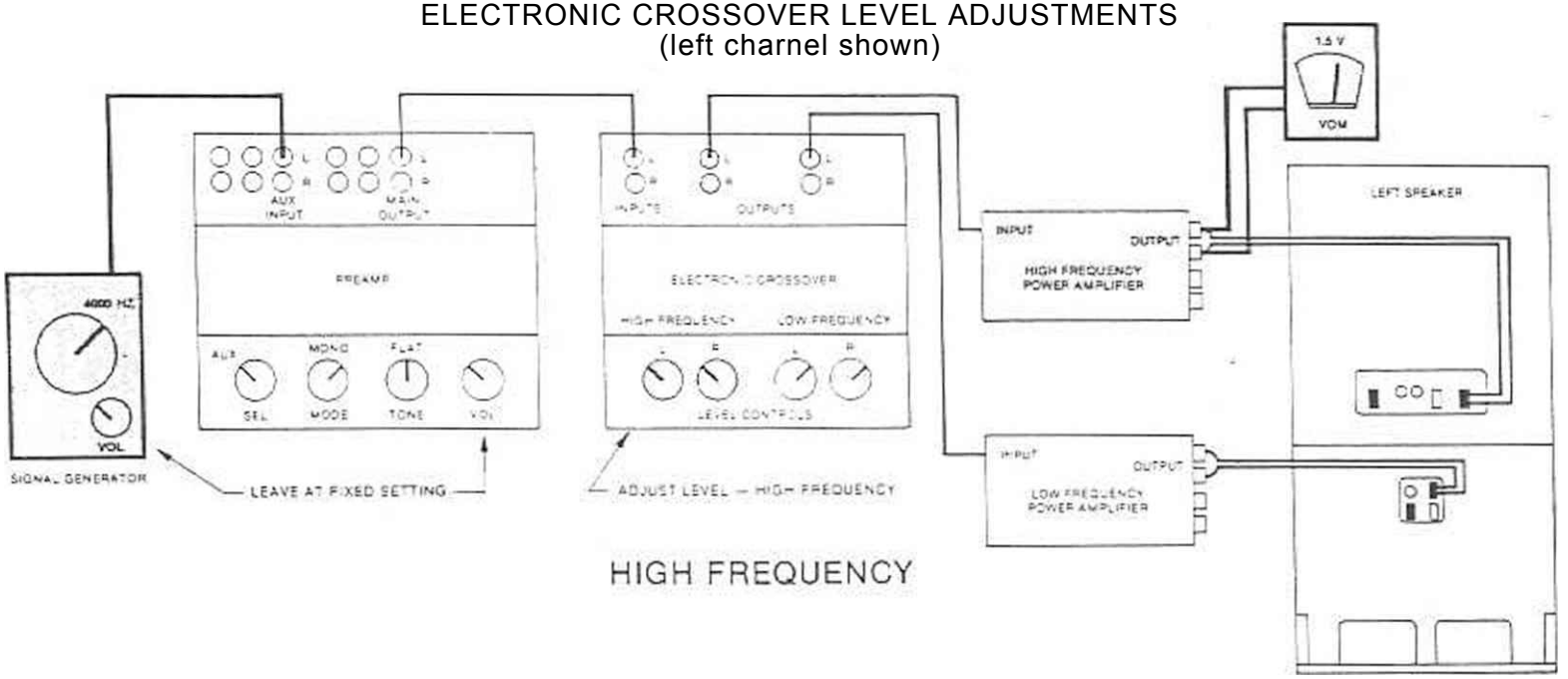
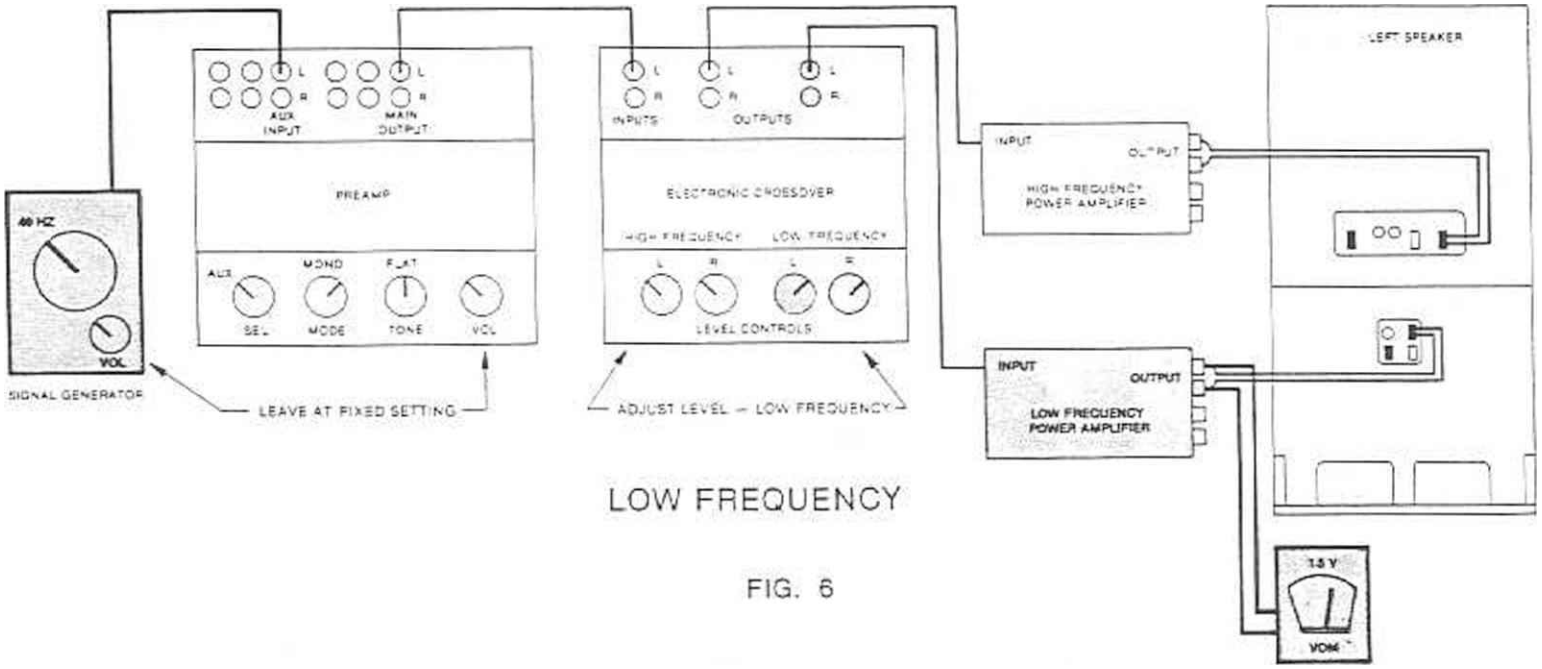



FIG. 5

ELECTRONIC CROSSOVER LEVEL ADJUSTMENTS
(left charnel shown)




HIGH FREQUENCY




LOW FREQUENCY

FIG. 6

# SPECIFICATIONS

| | |
|---|---|
| Frequency response on axis and up to 25 degrees off axis* | 36 Hz to 18 kHz ± t x db |
| Impedance (minimum) | 4 ohms |
| Power requirements (minimum) • | 80 watts RMS/channel |
| Driver complement | 10-inch (24.5-cm) woofer<br>4-inch (10.2-crn) midrange<br>1-inch (2.54-cm) tweeter |
| Crossover frequencies | 275 Hz and 2500 Hz |
| Fusing | |
| Woofer | AGC 3 or 3AG 3A |
| Midrange | AGC *2Vi* or 3AG 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.*