

**The Speakerlab Super Seven
OWNER'S MANUAL**

The Speakerlab Super Seven

The Speakerlab Super Seven has been designed to incorporate several new and effective technical features.

First off, the Super Seven uses a Samarium Cobalt leaf tweeter.

This driver is not only extremely reliable as well as affordable, but it also out-performs any other type of high frequency driver we know of.

The 10-inch woofer uses a cone made of polypropylene. This non-

resonant, neutral material provides a truly startling improvement in upper bass clarity and openness.

The use of the polypropylene cone in the 6½-inch midrange driver offers the same advantages. This unit is one of the most advanced mid-range speakers we know of, similar to the driver used in our no-compromise S50. The usually low crossover point (350 Hz) of this driver

provides full coverage of the critical midrange frequencies.

The enclosure is tall and slim in shape and is built so that the front board and grille frame assembly provide a smooth baffle surface, free of any obstruction that would otherwise blur the stereo imagery due to diffraction and reflection of the sound source.

Specifications

Speakerlab SS7

Type	3-way
Woofer Section	10" and 12" acoustic suspension
Midrange	6½"
Tweeter	leaf
Crossover	3-way LC
Crossover Frequencies	350 Hz & 3.8 kHz
Enclosure Dimensions	(H,W,D) 38½"x16"x13"
Rated Impedance	4 ohms
Max. Power Rating	200 watts RMS/chan.
Min. Power Rating	10 watts RMS/chan.
Shipping Weight	105 lbs.

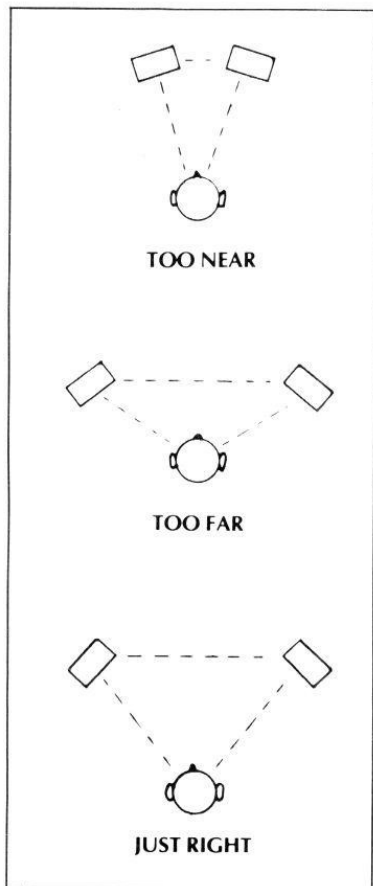
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How to place your speakers

Speaker placement affects both the stereo imaging of your system and the frequency response.

Best stereo is obtained when the two speakers and listener form a triangle with the distance between the speakers approximately equal to their distance from the listener. Best four-channel operation is obtained when the speakers are placed at the corners of an imaginary square with the listener in the center.



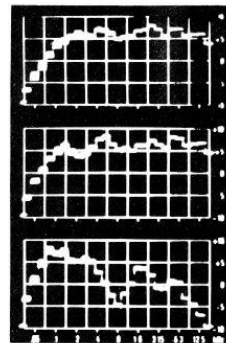
Not many homes, however, allow an ideal setup. You end up having to experiment. In a reasonable compromise, both stereo speakers will be within earshot and not so close together that the stereo channels are indistinguishable. Four-channel speakers will be placed somewhere to your left and right, before and behind you.

In a properly arranged system you need not be able to say "that sound is coming out of that speaker." The idea is to reproduce a sense of depth and spaciousness in the music which makes it much more realistic and pleasant to listen to.

The frequency response of the speakers will be affected by how closely they are placed to the walls and floor and also by the materials which cover the walls and floor. Most writers treat these effects as some kind of mystery with the magical name "room acoustics," but they are more properly called "wall acoustics" and are quite predictable.

Nearby surfaces reflect low frequencies, so placing a speaker in a corner which gives three adjacent surfaces will boost the bass. You can make a little speaker sound like a big one if you place it right. Soft surfaces such as rugs, drapes, upholstery and people absorb high frequencies and cut the treble, while hard surfaces such as closed windows, painted walls, and wood or tile floors reflect high frequencies and boost the treble.

The Super Seven is designed for placement 3 to 10 inches from the wall, on the floor or on a shelf. Placed out in the middle of the room, they will have less bass. Placing them in a corner will exaggerate the bass. Some rooms (and some listeners) need the bass boost furnished by corner placement, so try it if you desire.



Frequency response measurements of a small speaker in different locations.

UPPER—speaker up off floor away from walls. The free-space response is about ± 3 dB from 90 Hz-17 kHz.

MIDDLE—speaker on floor away from walls.

LOWER—speaker on floor in a corner. Corner placement extends the bass to about 50 Hz. The pronounced dip at 800 Hz in the third picture indicates that the bass-strengthening corner reflections are delayed about 2.5 milliseconds from the direct radiation. The delay makes no difference below 150 Hz, but disrupts the measurement about 150 Hz due to interference effects between the direct and reflected sound. These interference effects do not seem to injure the audible performance of a speaker in a corner; probably because the ear disregards the delayed sound—a psychoacoustic phenomenon little studied or understood.

Surfaces near your head have the same effect as do surfaces close to the speakers. The receiving transducers you were born with are subject to the same acoustic laws as the transmitting transducers you bought.

If you have a choice of several places to put your speakers, experiment.

The effects of hard or soft surfaces can be compensated for a some extent by bass and treble controls.

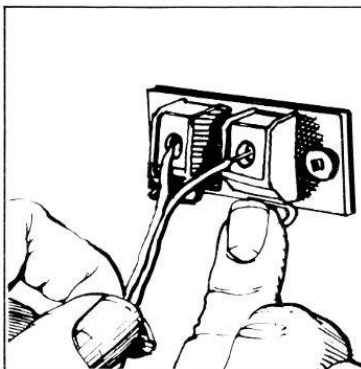
How to connect your speakers

How to connect your speakers to your amplifier with the proper phasing.

The Super Seven has its terminals located on the back. The black terminal is the ground, or common, terminal and the red is the positive, or hot, terminal. Connect the terminals for each speaker through 2-conductor wire to corresponding terminals on the back of your amplifier.

It is important for optimum sound that you connect up both speakers of the stereo pair **in-phase** with one another. To do this, follow the rule: **Use the marked conductor to connect the amplifier common (black, minus) terminal to the speaker common (black, minus) terminal.** Do this for both woofers and they will then move in-phase. What this means is that they will move outward together in response to a positive signal, augmenting each other. Improperly phased, or out-of-phase, speakers will oppose each other—one will be moving outward as the other is moving inward—and may diminish the bass and disturb the stereo imaging.

In zipcord one conductor is marked by printing or a ridge on the insulation, by tinning (silver color) on the conductor itself, or by a colored thread along the conductor. Make it a rule to use the marked conductor for ground (common) and



you will always get your speakers phased correctly.

The speaker terminals are the push-button type. Push in the button and insert the bare end of your connecting wire into the hole which is open in the front of the terminal. Release the button and the terminal will grip the wire. The red terminal connects to the red, plus, positive, or 4 or 8 ohm terminal on your amplifier or receiver. The black terminal connects to the black, minus, negative, ground or common amplifier terminal. A pair of speakers connected in this manner will be in-phase.

Out-of-phase operation may cause weak bass and a poorly defined stereo image but is not harmful to the equipment.

What kind of wire to use.

We recommend that you use two-conductor standard copper wire (zipcord) No. 16 gauge or No. 18 gauge. Don't be fooled—the larger the gauge number, the smaller the wire. Ordinary lamp cord is No. 18 zipcord. We do not recommend No. 22 gauge wire, which is commonly sold as speaker wire by mail order outfits and stereo stores that should know better. It cannot be used for very long runs without interposing excessive resistance between the amplifier and speaker.

The table below shows the allowable run lengths for different gauges of wire. The lengths shown are the distance measured one-way from amplifier to speaker. You may use different wire sizes for each speaker, as long as each speaker has large enough wire for itself.

Maximum length of wire from amplifier to speaker	Gauge of copper wire for 8 ohm speakers
Up to 18 feet	No. 18
Up to 30 feet	No. 16
Up to 48 feet	No. 14

The recommendations on wire size in this table are minimum figures, the larger the wire the better the operation will be, although the improvement in sound quality using large gauge wire is subtle.

Troubleshooting

Clipping Overload.

Many people don't realize that an amplifier rated at 20 watts can produce 20 to 40 watts of distortion. An amplifier's power is rated with a certain percentage of distortion (for example, 40 watts @ .05% distortion). The amplifier will put out power far in excess of its rating with vastly increased distortion. For example, a 45 watt amplifier is capable of a power output of over 100 watts. Worse yet, the distortion associated with overdriving and clipping throws huge amounts of power into the high-frequency region—for more than the normal power in music. This excessive energy can have devastating effects on sensitive high-definition tweeters.

Fortunately, you don't need test equipment to detect when an amplifier is distorting (clipping). It is easily audible as a strained, harsh quality to the music. We've found that the majority of amplifiers and receivers begin to clip from the "12 o'clock" to the "3 o'clock" setting on the volume control. At a certain point in this range, the overall volume will increase dramatically with only a slight advancement of the volume control. This is where clipping begins—so be careful. If you establish the point at which your amplifier begins to distort and never turn it up that loud, your speakers are safe.

Use our speakers for stereo reproduction at home. They are not designed for use with musical instruments. Instrument speakers are designed along wholly different principles than stereo speakers.

Amplifier Overload.

A common error speaker shoppers and new speaker owners make is to turn up the amplifier volume until the system distorts audibly. They call this distortion "cone break-up". What you hear in such a case is

amplifier clipping, not speaker distortion. The amplifier is running out of power on the music peaks.

Since the distorted sound is coming out of the speakers, you can easily attribute it to the speakers themselves. This is a simple mistake—no matter what goes wrong with a system, the result will be heard in the speakers since everything comes out of the speakers.

The remedy to this problem is easy—turn down the volume or get a more powerful amplifier.

Clipping will occur at lower settings of the volume control if the loudness switch is on or if the bass is turned up. Both these controls work by boosting the bass signal, which uses more amplifier power.

How do you avoid acoustic feedback?

A frequent problem with stereo systems where the speakers are located close to the turntable is acoustic feedback. It usually shows up as a large-amplitude "flutter" in the woofer cones (if they are visible) or as distorted sound. The problem is aggravated by high settings of the volume or bass control or by having the loudness switch on. The listener typically reports that he can turn up the volume control (or the bass control) only so far—then the oscillation starts.

The problem is most likely to occur with speakers with unusually good bass response. What occurs is this: the speakers vibrate the floor; the floor vibrates the turntable; and the turntable vibrates the record. The cartridge stylus cannot distinguish vibrations in the record groove from vibrations in the record itself—so the stylus moves and injects the signal into the system, where the signal is amplified and moves the woofer cone, continuing the cycle.

The cure is to prevent speaker vibration from shaking the turntable.

Place the turntable and speakers as far apart as possible. If you have an unusually shaky floor, mount the turntable on a shelf or on a wall or place a heavy (30 lbs.) stone slab on foam rubber, just beneath the turntable. Putting a soft pad under the speakers to isolate them from the floor often helps. Turntables are spring mounted to reduce acoustic feedback; in newer turntables, the isolation is more effective.

4 and 8 ohm speaker differences.

"Ohms" is the measure of a speaker's impedance—the amount that it impedes, or resists, the amplifier's current. The smaller the "ohms," the greater the current and power drawn by the speaker. Where the impedance becomes important is when you use more than one set of speakers. Most stereo receivers have terminals for two sets of speakers, A and B, and a switch to select A, or B, or A + B. However, most amplifiers will not drive more than one pair of 4 ohm speakers at a time without overheating. That means both pairs of speakers must be at least 6 ohms to play A + B.

The Super Seven is a 4 ohm speaker. If you have another pair of speakers that are 4 or 8 ohms, you can only play A or B, not A + B.

On the other hand, most amplifiers develop maximum power into 4 ohms. So if you are going to use a single set of speakers and are pushing for maximum power, 4 ohm speakers are best.

Two side effects of impedance differences take place when comparing speaker systems. 4 ohm speakers will draw more power at a given volume control setting than 8 ohm speakers of the same efficiency; so they will play louder and seem more efficient. On the other hand, the volume control setting can be turned higher before the amplifier begins to distort with 8 ohm speakers again, because they draw less power.

How to use your amplifier

Your bass and treble controls.

A popular superstition holds that setting your bass and treble controls "straight up" will give flat frequency response. It would be so nice if that were true.

Unfortunately, small frequency response errors in the cartridge, preamp, recording equalization circuit, and other places add up so that rarely is a system perfectly flat. There are also the effects of reflections from far walls mentioned previously. In addition, nearly all records are equalized with a built-in gradual treble boost on the assumption that they will be played back on systems with a gradual rolloff in the high end, which most systems (constrained by the laws of economics—a good high end is too expensive for most speakers) indeed do have. If you have a careful ear, and if you have speakers with a flat, low-distortion high end, all these effects will be painfully evident.

The point here is this: you shouldn't be afraid to use your tone controls. Bass and treble controls enable you to make slight adjustments to correct for all these errors. Usually the high frequency end of the spectrum will require most attention. A small adjustment, no more than 10 o'clock cut or 2 o'clock boost, usually will suffice. Cut the treble to compensate for over-bright recordings and reduce noise on FM. Cut the bass if you must use your speakers in a corner and they sound boomy. Boost bass if they sound thin because you have a large room or lots

of open doors and windows that drain off low-frequency energy or have hard-surface walls that reinforce midrange and highs.

On most preamplifiers and receivers, the tone controls may be set anywhere from 10 o'clock to 2 o'clock without making the music sound unnatural. Do not let the excesses practiced by some extremists—such as turning the loudness, bass, and volume full up to rattle neighbor's china—discourage you from making **reasonable** use of the tone controls.

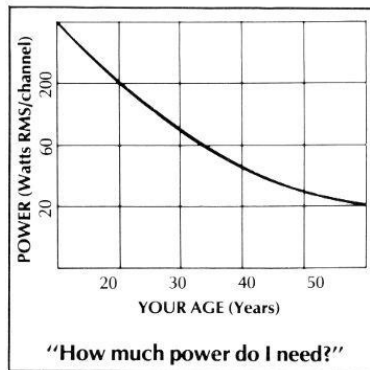
A word of warning—Speakerlab speakers usually require very little bass boost. They have very good low-end response and too much bass boost can cause excessive cone motion. This can result in suspension "thumping," distortion, and possible damage.

Seriously, the power you need really depends on how loud you like to listen to music. The actual power being put out by your amplifier depends on the setting of the volume control; amplifier power ratings correspond to **maximum** power before distortion begins. You can safely play a 50 watt speaker with a 100 watt amplifier if you don't turn up the volume too high.

We rate Speakerlab speakers for both minimum and maximum power. For example, the Speakerlab Super Seven is rated at 10 watts RMS minimum, 200 watts RMS maximum. The ratings correspond to the watts RMS per channel of amplifier power. The minimum rating is for moderate listening levels.

The maximum rating refers to the largest amplifier which is guaranteed safe to use for home music reproduction. Speakerlab's guarantee covers burnout so long as you use the speakers as recommended. You can use a larger-than-recommended amplifier at your own risk. The risk is minimal if you're careful. The time speakers get burned out is when you put them outside for a party and somebody decides to serenade the people on the other side of the lake.

We design Speakerlab speakers to cover as wide a power range as possible, and especially to handle the ultra-low distortion, moderate power amplifiers and receivers that are now available. Getting a new speaker system and finding out that your amp either won't drive it or burns it out can ruin your whole day.



Our Guarantee

We guarantee each speaker, to the original purchaser, to be free of manufacturing defects from the date of purchase for a period of five years.

If any parts (or the entire unit) fail, obtain a **Return Authorization** by calling the Mail Order Watts number, return them to us and we will remedy the defect as indicated under warranty coverage for parts and labor. Proof of purchase must be presented with any returned unit before warranty work can be performed. You pay shipping both ways.

This guarantee also covers failure due to burnout when the speaker is used with the maximum recommended amplifier power (in watts RMS per channel) or less and is used only for home stereo reproduction. Commercial or musical instrument applications void the guarantee. We will determine by examination whether the speaker ratings were exceeded.

The warranty is void if the defect in the speaker is a result of abuse or clipping, or when operated contrary to instructions for use, or has been improperly serviced by unauthorized personnel.

Raw drivers (i.e. woofers, mid-ranges and tweeters) are warranted against material and manufacturing defects for a period of five (5) years from date of purchase to the original purchaser. No burnout guarantee is implied, unless they are used with our manufactured crossovers.

How to communicate with Speakerlab.

You deserve to get the outstanding performance you paid for when you bought our product so we'd like to help you solve any problem you have with our products.

If you can't solve the problem on your own, call:

Mail Order Dept. 1-800-426-7736
TOLL-FREE from within continental

U.S., for help. Washington State, Hawaii and Alaska residents call (206) 633-5020 and ask for our Mail Order Dept. The best times to call are weekdays 9 a.m. to 4 p.m. (Pacific Time).

If our Mail Order Dept. cannot handle your problem, they will refer you to our technical assistance line, open between 9:30 a.m. to 11:30 a.m. Pacific Time.

These numbers are for Speakerlab customers only. PLEASE DO NOT call us about problems with speakers made by other manufacturers, either for direct advice or to ask us the phone number of other companies. Most speaker manufacturers **are not** prepared for direct contact with their customers.

Remember, we like to hear from you, write to:

Speakerlab, Inc.
Correspondance Department
Box C-30325, Wallingford Station
Seattle, Washington 98103

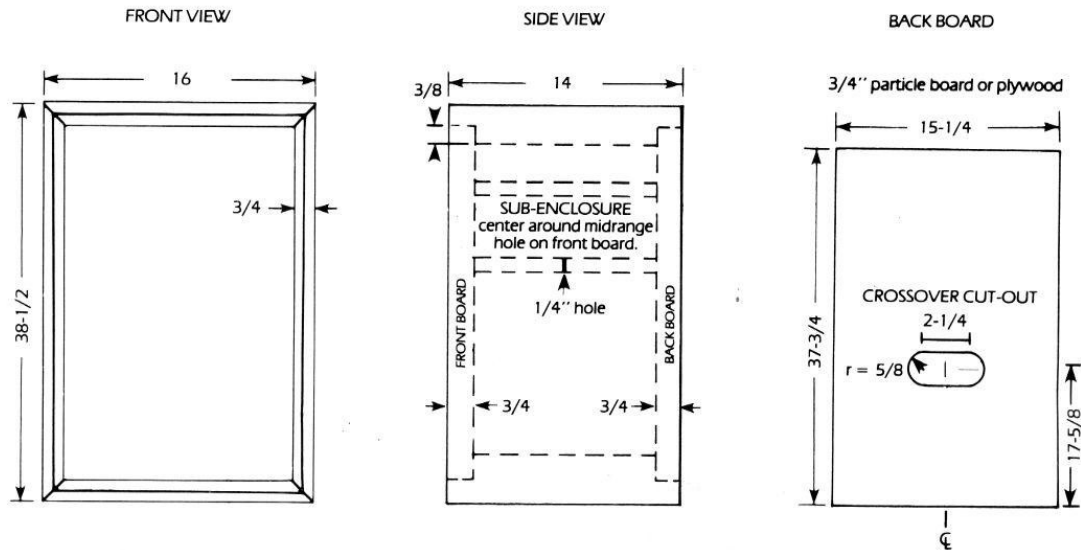


R8130

S7 enclosure dimensions.

1. All dimensions are in inches.
2. Use white wood glue or equivalent for assembly.
3. Use ample glue to prevent air leaks. Sealant optional—if needed.
4. Front and back boards fit in rabbets. Rabbet dimensions are $3/8'' \times 3/4''$.
5. Use $3/4''$ particle board or $3/4''$ grade AB plywood with suitable veneer or finish.

Note: Your discretion as a cabinet maker should be used at all times.



INTERNAL BRACES

1. Fit a $3/4'' \times 1-1/2''$ brace between the 10" and 12" woofers between the front and back board.
2. Nail and glue a vertical brace strip ($3/4'' \times 1-1/2'' \times$ approx. 36") on the inside of the sides, positioned 6" from the front of the enclosure. Fasten this strip on its edge ($3/4''$ side).

SUB-ENCLOSURE

$3/4''$ particle board or plywood

