

# REL Set-Up Made Simple

RELS are not traditional subwoofers, but true sub-bass systems. A REL is designed to augment the performance of “full range” speaker systems, to provide linear response down to below 12 Hz (Studio III, -6 dB down at 9 Hz). Therefore, for the moment, set aside everything you’ve been taught about subwoofers and how they are integrated into a stereo or theater system. RELs set-up and position differently than other subwoofers. A REL will take advantage of physics and room acoustics to provide deep pressurization as no other sub-woofer can. It’s important that you bring to the set-up process a willingness to do things a little differently in order to obtain these superior results. The end result of your labors will be an utterly seamless integration of true deep bass to a sound system, regardless of the main speaker’s low bass capability.

## Two Things Before You Begin

- A. It is helpful to know that you will almost always connect the REL to the input on the rear panel labeled “Hi Level.” This connection is made using the supplied 34’ 10” (10 meters) cable, the bare leads of which connect to the speaker output terminals of the power amplifier. The easy and foolproof connection at the REL is done with a Neutrik Speakon connector. The purpose of connecting to the speaker output terminals is one of the unique secrets of REL’s success. By connecting to the high level input on the REL from the amplifier, you build forward the sonic signature of your main system, including the tonal balance and timing cues of the entire electronics chain. In this way, the REL is fed the exact signal that is fed to the main speakers.
- B. When possible, the REL should be placed in one of the corners behind the speakers. Remember, we are dealing with true LOW bass pressurization with RELs, not the mid-bass that most competitors settle for. Low bass pressurization below 40Hz is best derived from corner placement, where the most linear and efficient low bass can be produced.

Basic set-up should take no more than ten to fifteen minutes to accomplish once connected.

## Connecting

High-level connection, using the enclosed cable with the Neutrik Speakon connector, is always the first choice. By connecting to the amplifier’s speaker outputs the sonic signature of the entire amplification chain is folded into the signal for the sub, thereby keeping timing and timbre cues consistent. In other words, the signal sent to the REL is exactly the same signal sent to the speakers, allowing for seamless integration. This connection can be made without affecting the performance of the amplifier because the sub’s amplifier input impedance is 100,000 ohms. This scheme also avoids adding any detrimental effects by not interposing any additional electronics into the amplification chain.

- The standard high level hook up procedure is: attach the red wire to the amplifier’s right positive speaker output terminal; attach the yellow wire to the amplifier’s left positive speaker output terminal; attach the black wire to which ever of the amplifier’s ground output terminals is convenient; plug the Speakon connector into the sub’s high level input.

- For differential amplifiers using one sub, simply use the standard connecting scheme with the exception of connecting ground to chassis ground, not to speaker output ground, and then connecting into the high level input (Hi Input or Unbal Hi Input on Stentor III and Studio III).
- For differential amplifiers using two subs for each channel: connect red to positive; yellow to negative; and black to chassis ground; plug the Speakon into the balanced high level input (Bal Hi Input).

Low-level connection, RCA inputs (or XLR on some models), is always an option, should high-level connection not be possible, or in a theater system where both high-level and low-level connection should be used. When connecting to the low level inputs, connect a single RCA cable to the 0dB RCA jack. Additional gain can be achieved by connecting to the +12dB input. If you are connecting two channels of stereo output from a pre-amplifier, simply use a high-quality y-adaptor to sum the two signals together.

### **Positioning**

The optimal position for a REL is in one of the corners behind the main speakers. This position provides 9 dB of mechanical amplification and allows for the most linear true low bass wave launch, owing to the ability to tune the sub to the axial node of the room, or longest throw distance.

### **The Process**

To begin the set-up process, choose a piece of music that has a repetitive bass line that is very low in frequency. We recommend cut 4 from the soundtrack to Sneakers (Columbia CK 53146). This has a repetitive bass drum throughout that gives you plenty of time to move the woofer around, but more importantly, the recording venue was quite large for this recording, and therefore it has a very deep and large-scale bass signature. This type of cut is perfect for the set-up process, and should be played at the highest reasonable level expected for system play back.

Working with a partner, one in the listening position and one at the woofer manipulating the controls, is the most effective and efficient ways to set up the woofer. If working alone, the initial steps in the set-up can very effectively be carried out from the location of the woofer. Trying to ignore all other music in the cut, listen for the bass drum and its effect on the listening room.

1. Phase Orientation: Once in the corner we need to adjust for phase. This may be the single most critical step, and because it really is quite simple, it is often over thought, especially by the most experienced audiophiles. Keep in mind; the right phase is whichever position is the loudest or fullest. While playing music with true low bass, adjust the crossover to a point where the sub and the speaker are sure to share frequencies (B, 3 for big speakers; C, 4 for smaller speakers). At this point turn the gain so that both sub and speaker are roughly equal and then switch, using the “mode selector” switch, from “0” (position 1) to “180” (position 3) phase positions. Again, whichever position is loudest or fullest is the correct position, and, as often as not, may be 180-degree phase. That is, this position is working in harmony with your main speakers, reinforcing bass, and not canceling it.
2. Room Orientation: Next, if space allows, try two different orientations of the woofer relative to the wall. First, while playing the set-up cut, place the REL with the connection panel parallel with the rear wall. (See Figure 1) Second, place the REL with the connection panel parallel with the sidewall. As with phase, the orientation which yields the most output is the best position for that room. This process simply orients the driver, and port, to most efficiently vent into the room. In some instances there may be little difference, at which point aesthetic concerns may override performance concerns. For Q

series, if possible, point the driver directly out of the corner, equidistant from the sidewalls.

3. Placement: The next step is to determine precisely how far out from the corner the sub should be placed to achieve the most efficient output, as well as the lowest frequency extension. With the sub fully into the corner, continuing to play the music, slowly pull the sub from the corner on the diagonal, equidistant from both side and rear wall (See fig. 2). At a certain point (sometimes a matter of only a few inches, in rare cases a foot or more) the sub will audibly go lower, play louder, and, if it truly locks on to the room and is fully pressurizing it, the air around the sub will seem to be energized. Stop right there! This is the correct position for the sub.
4. Crossover and Gain Settings: To determine the crossover point, bring the gain down, put the crossover to A-1, bring the gain back up to the point where you have achieved a subtle balance (In some situations where there may not be sufficient output due to room and subwoofer interactions B-1 should be the position to use in setting initial gain). Working only with the coarse control (A-D), bring the crossover point up until it is obviously too high, at this point bring it down to the next lowest setting. Now, working with the fine control (1-6), bring up the crossover point until it sounds too high, at which point bring it back down to the next lowest setting. For all intents and purposes, this is the correct crossover point. Once this stage has been reached, subtle changes to gain and crossover can be accomplished to provide the last bit of complete and seamless integration. With that, set-up is complete.

Note: As the Q-series crossover adjustment uses a single variable control, use the closest correlating position to any of the crossover settings noted above for ST series models. Ultimately, as with the click stops of the ST range, simply bring gain and then crossover up until excess output is achieved, then back down a soft-click or two.

Hint: There is a tendency among audiophiles to set the crossover point too high and the gain too low when first learning how to integrate a REL with the system, the fear being one of overwhelming the main speakers with bass. But in doing so, the resulting set-up will be lacking in bass depth and dynamics. The proper crossover point and gain setting will increase overall dynamics, allow for extended bass frequencies, and improve soundstage properties. Note, gain must be adjusted in conjunction with crossover changes. In general, when selecting a lower crossover point, more gain may need to be applied.

Theater and Film Applications: For Dolby Digital AC-3® or other 5.1 theater systems, once the standard set-up for two-channel outlined above is complete, the LFE output from the processor or receiver should be connected to the low-level input and appropriate gain adjustments made. It may be necessary to take the crossover out of the low-level input using the “mode” switch if extra upper bass output is called for. Keep phase consistent with what was selected during high-level set-up by simply choosing the corresponding setting (1 = 2, 3 = 4). For this configuration, you must set the processor to the “large” or “full range” setting for the left and right speakers in order for the REL to receive the bass signal via the high-level cable. In this configuration, the REL provides support for both the left and right speakers for two-channel listening, and support for the LFE when movies are playing. Most processors will allow you to defeat the subwoofer output when listening in the two-channel mode. The effect of this set-up is one of greatly increased dynamics in the mid-bass range; no bass bloat; and a greater degree of space and timing from the Foley effects. For an even greater sense of space and impact, a second woofer connected in parallel to the center channel will prove to be a dramatic improvement as well. And if that is not enough fun, a rear sub, both to support the rear channel speakers as well as to evenly distribute LFE through the room, truly completes the full-range

sonic picture for state-of-the-art film reproduction. A comprehensive set-up paper for home theater will be coming very soon.

Other Tips: Generally speaking, do not use the supplied spikes. RELs work on the principle of the driver in a high-pressure zone relative to the floor. Spiking the REL will decouple the woofer from the floor, which will lean out the bass response. If the floor is an older, very “springy” floor, spikes can be useful in reducing the influence of the REL on the floor. But better yet, a heavy stone slab placed under the REL will work better. Even if you intend to use the spikes, do NOT insert them until completion of the set-up process. After which, subtle adjustments to crossover and gain may be necessary.