

## REL R-328 Subwoofer

Created on Wednesday, 01 May 2013 00:00

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In 2008, when I reviewed Thiel Audio's SCS4 two-way minimonitor, they also sent along their SS1 subwoofer. While I'd heard 2.1-channel speaker systems before, that was the first time I'd integrated a subwoofer into my own two-channel system. Thanks to an external crossover dedicated to work with the SCS4 main speakers, and adjustment knobs on the sub calibrated in meters, to correspond with the sub's distance from room boundaries, setup was a breeze.



The sonic results were entirely positive, and I decided that I would further experiment with adding a sub to my usual stereo setup sometime in the future. That has taken me longer than anticipated, but I finally got the opportunity.

Many companies produce subwoofers, most of them designed to be part of home-theater systems. REL is different. From the firm's beginning, in 1990, their subs have been intended, first and foremost, for music. An important part of REL's philosophy is that the subwoofer should receive exactly the same signal as the main speakers. To that end, they strongly recommend using the sub's high-level input, which connects to your amplifier's speaker-level outputs. (Many other manufacturers now omit a high-level input, making their subs impossible to use in some stereo setups.) REL also stays away from digital room correction, relying instead on careful placement of the sub in the room. This, too, runs counter to the practice of most of their high-end competitors, and might be thought unsophisticated by some buyers. On the other hand, if you assume that the purpose of a subwoofer is to fill in the frequencies below those reproduced by the main speakers,

instead of compensating for their interactions with the room, it will be playing below the frequency of the strongest room modes, unless the room is very large or the main speakers are very small.

The R-328 (\$1799 USD) is the middle offering in REL's recently updated Serie R line. It's nearly cubical, at 15.1"H x 13.5"W x 15.2"D (including grille and feet), and has a frontfiring, hand-thrown, 10" paper cone with a long-excursion surround on a die-cast steel frame and driven by a four-layer voice coil, as well as a downfiring 12" passive radiator of lightweight carbon fiber. The 10" active driver can respond quickly to transients, while the combined areas of the active and passive cones is equivalent to that of a single 15" driver, to move a lot of air when needed. Drive is provided by a REL-designed and -built class-D amplifier delivering up to 350W. The cabinet walls are made of MDF, with carefully designed internal bracing.

On the rear panel -- a solid piece of aluminum -- are a Neutrik speakON connector for the high-level input and two RCA jacks. One of the latter is for an optional low-level connection, the other for the low-frequency effects (LFE) channel of a home-theater system. The LFE input operates in parallel with the feed from the main audio channels, and has an independent level control for perfect matching of the two sources. Power is supplied via a standard IEC socket with a rocker On/Off switch. Because the amplifier uses only 5W at idle and is always ready to instantly respond, you can leave it powered up unless you plan to be away for a while.



Also on the rear panel are a smoothly rotating output-level knob, a knob for setting the crossover frequency that operates from 30 to 120Hz in small clicks, and a phase switch: 0° or 180°. Two last things to note: It's a shame that the R-328 will be tucked into a corner; its hand-rubbed, gloss-black finish is impeccable.

## Setup

Following REL's recommendation, I set about attaching the provided Neutrik speakON connector to its terminal on the R-328, but was at first confused by its having only three wires. The "Connections" section in the owner's manual says to connect the red wire to the positive terminal of one channel, the yellow wire to the positive terminal of the other, and the black wire to the negative terminal of either. That's fine if you have an amplifier whose negative speaker terminals are tied to ground, but it won't work for a fully balanced design such as my GRAAF GM-50. The setup portion of the manual also contains connection instructions, and includes the alternate scheme for balanced amplifiers: black wire connected to chassis ground. That information should really be included in the "Connections" section, to prevent mistakes that could lead to subpar performance or, worse, amplifier instability.

Once the wiring was sorted, the next step was to find the proper position for the R-328. The manual clearly walks the user through this procedure, step by step. You begin by placing the sub at a 45° angle in a corner of the room, behind and to one side of the main speakers. While playing a track with repeated low-frequency sounds, you move the sub diagonally out into the room until it produces a maximum volume and depth of bass. After you've found that position, rotate the sub increasingly parallel to the room's long wall until the bass is, again, noticeably deeper and louder.

The manual suggests that it will be audibly obvious when the proper placement has been achieved -- and it was. REL suggests using "Cosmo . . . Old Friend," from the album of James Horner's original score for the film *Sneakers* (CD, Columbia CK 53146), which has a very low bass drum recorded in a cavernous acoustic, played repeatedly with a consistent stroke that always produces the same volume. I asked around in order to borrow this album, and did find it ideally suited to the task, but I don't understand why, after more than 20 years in business -- and 21 years after this album was released -- REL couldn't have made their own equivalent recording for inclusion with the R-328.

Once the R-328's position is set, adjust its output level until the very low frequencies are in proper proportion to those higher. Next, raise the crossover frequency until the sub's output is obviously interfering with the output of the main speakers, then dial it back one notch. The *Sneakers* track is not the best choice here; you should use real music. I chose a piano recording I'd recently been listening to through my Stax headphones, and was convinced that the recording itself was properly balanced. When I set the crossover frequency too high, the piano took on a bit of what would have been chestiness, had it been a human voice. A little fiddling up and down with the knobs using a few other recordings and some **free test tones** (<http://www.soundstagehifi.com/index.php/feature-articles/sound-reasoning/162-sound-reasoning-assessing-bass-performance>) had me quickly satisfied that I'd achieved the appropriate blend of speakers and subwoofer.

I could have stopped there, but decided to repeat the entire setup procedure using TrueRTA and a Behringer ECM8000 measurement microphone. I was fascinated to watch

the low frequencies rise in level as I pulled the sub away from the corner, then decrease when I went too far, and the very bottom of the curve bump up as I modestly rotated the R-328 toward the long wall. My Esoteric MG-10 two-way minimonitors have a specified -6dB point of 41Hz, but the energy added by a room mode just above 50Hz makes the rolloff quite steep from there down. I adjusted the REL's level and crossover knobs until the low frequencies backed off that peak only slightly, and were essentially flat down to around 28Hz, at which frequency they began to roll off more quickly. Ultimately, the R-328 extended the bass response of my system by an octave, with strong output down into the mid-20Hz region, while leaving the rest of the system's frequency response unaffected. As far as measurements go, that's superb. While using these tools made setup a little faster, and me more confident in the final result, the R-328 ended up only about half an inch away from where I'd placed it by ear, with the level control in the same place, and the crossover one click down.

## Performance

The obvious -- and most fun -- thing to do after adding a subwoofer to a stereo system is to play music with lots of bass content. The day after I'd set up the REL R-328, a friend who's a pianist and organist was coming over, so I asked her to bring some of her favorite organ recordings. Pedal tones filled my 22' x 14' x 8' listening room and sent vibrations through the floor, but the sense of "being there" extended to more than just overt physical sensations of the low frequencies. As we moved from disc to disc, we heard much more of the distinct acoustic signature of each church than I'm used to hearing through my minimonitors alone -- or even through some of the larger, full-range speakers I've auditioned over the years. This sense of a more complete reproduction of ambience was to be repeated again and again during my time with the R-328.

I next pulled out percussionist Yim Hok-Man's *Poems of Thunder* (CD, Naxos World 76002-2). The first track, "Poem of Chinese Drum," features some highly synchronized percussion work, but I was most interested in it for the scale and impact of the very large drums played. Not only did they sound appropriately big, but the R-328 delivered a visceral thump with each blow of the mallet that I felt in my chest -- and that rattled a plate hung on the wall. The REL was also tight and responsive enough to individuate the strokes that make up the drum rolls, combining the pulsation of the drum skin with the underlying resonance.

Advocates of small, two-way minimonitors often argue that there's very little musical information below 50 or 60Hz. While that might be true on an intellectual level -- one can easily follow everything that's going on in a score -- it's not true on an experiential level, and most music is meant to be experienced rather than analyzed. I heard the large bass drums in the recent recording of Peter Breiner's orchestration of Mussorgsky's *Pictures at an Exhibition*, performed by the New Zealand Symphony Orchestra with Breiner conducting (24-bit/96kHz FLAC, Naxos/HDtracks), when I listened through my Esoteric bookshelf speakers alone, but adding the R-328 made the drums' depth and impact more akin to the effect they'd have in the concert hall. With the REL, I heard those same big drums played softly in a few passages where I'd completely missed them with my Esoteric speakers alone. Similarly, I've always heard the harp in "Ich bin der Welt abhanden gekommen," from Michael Tilson Thomas and the San Francisco Symphony's recording of Mahler's songs with orchestra (SACD/CD, San Francisco Symphony SFS821936-0036-2), but I'd

never appreciated that it was scored for the larger concert harp, which goes down to the lowest C on the piano, rather than the standard harp, whose range ends an octave higher. The gravity and majesty of those lower notes are part of the music and should not be ignored.



Another album that took on a different character with the addition of the R-328 was Massive Attack's *Heligoland* (CD, Virgin 5099960946621). My listening room was throbbing with the deep-bass notes from the synthesizer, and the electronic bass drum had much more *oomph*. The whole thing just sounded more . . . well . . . massive. Jazz and rock albums don't typically have an abundance of truly low bass energy, but with the R-328, bass guitars had more grunt at the low end of their range, acoustic basses had more body, and kick drums had more heft.

The positive changes wrought by the addition of the R-328 didn't have to do only with bass per se. Pianist Jonathan Plowright's recent recording of works by Brahms (24/96

FLAC, BIS/eClassical) has a wide dynamic range, and the fortissimo passages thundered out with more vitality than I'm accustomed to hearing from my system. Indeed, when I switched off the sub, the piano diminished substantially in scale and presence. These differences weren't due to notes from the piano's bottom octave -- none were being played -- but rather, I think, to the way in which the subharmonics of the sounded notes energized the recording space, and were reproduced by the REL to energize my listening room.

I didn't expect a subwoofer to make any difference with violinist Rachel Podger and violist Jane Rogers' collection of duo sonatas by W. Mozart and M. Haydn (SACD/CD, Channel Classics CCS SA32411), but these two relatively small instruments had greater palpability with the REL powered on. Not only did the instruments seem larger and more lifelike, the acoustic envelope surrounding them was more complete. My MG-10 minimonitors open a pristine window on this recording, but adding the R-328 opened that entire end of my listening room onto the moderately reverberant acoustic of the church in which these performances were recorded.

Alexander M. Schweitzer and the Consortium Vocale Oslo's performance of *Crux Fidelis* (anon.; 24/176.4 FLAC, 2L/SoundStageRecordings.com) was also recorded in a church, but one much larger and more reverberant. The REL helped dissolve the space behind my speakers into that vastness, leading to the sense that I could step through the plane described by the speakers and walk among the members of the choir. The above-cited Mussorgsky album, too, was recorded naturally in a large hall -- you can't fit a symphony orchestra into a very small one. The dimensions of the venue were far more obvious with the R-328 in the system, and the little orchestra I heard through my minimonitors became a big one. The difference was like that between a painting hung on a wall and a mural covering the wall's entire surface.

### **Downsides?**

During my time with the R-328 I listened for any hint of bloat, overhang, or other muddying of the low end -- the problems commonly encountered with subwoofers. The only evidence I found of any of these issues was when I played Ray Brown, John Clayton, and Christian McBride's *SuperBass 2* (CD, Telarc 83483). Certain notes sounded a little too thick, and their tone suffered for it. The sub's enclosure didn't seem to be resonating any more on those notes than on others, which led me to believe that there was some interaction between those frequencies and the sub's corner placement. A double-bass player or three standing in that corner -- were that physically possible -- might have produced the same effect.

I played some test files consisting of quick tone bursts descending in half-step intervals, and did hear a little boominess in the lower 40Hz region -- the lowest notes of the double bass's range. Pulling the sub farther out into the room ameliorated this problem, but at the cost of some power and, even more, very-low-frequency extension. On balance, and with every other recording I played, I preferred the R-328 in the corner, as per REL's setup instructions.

## Conclusions

A REL subwoofer isn't for everyone. You or your dealer need to expend some time and effort in setting it up properly, and it won't compensate for any bass problems your room might have. Provided you're willing to do the former and you're not concerned about the latter, a REL sub will enhance what you already like about your system. The R-328 added significant low-bass extension, weight, and power that my two-way minimonitors simply couldn't reproduce, and did so while only rarely sacrificing any of the clarity that I love about my Esoteric MG-10s. In addition to those obvious benefits, the R-328 made my system sound more dynamic, and remarkably increased its ability to convey the ambient information contained on most naturally miked recordings. To sum up the REL R-328's performance in a single word: *excellent*.

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## Associated Equipment

- **Digital sources** -- Ayre Acoustics C-5xe<sup>MP</sup>, Music Culture Elegance 501A
- **Amplifier** -- GRAAF GM-50
- **Speakers** -- Esoteric MG-10
- **Headphones** -- Stax SR-507
- **Interconnects** -- Nordost Red Dawn LS, DH Labs Revelation, QED Silver Spiral
- **Speaker cables** -- DH Labs Q-10
- **Power conditioner** -- Equi=Tech Son of Q

### REL R-328 Subwoofer

Price: \$1799 USD.

Warranty: Three years parts and labor.

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