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Test Bench

BY Michael Fremer

REL T5 Subwoofer

PRICE: \$599 **AT A GLANCE:** Compact cube houses 8-inch long-throw woofer • 125-watt class A/B amplifier • Simultaneous high-level and LFE inputs with independent level controls

Small Acorn, Big Tree



REL T5 SUBWOOFER
PERFORMANCE ★★★★★
VALUE ★★★★★
BUILD QUALITY ★★★★★

In a 1970s television commercial, storm clouds brewed and thunder rolled ominously after an embarrassed Mother Nature tasted Chiffon margarine and pronounced it butter. “It’s not *nice* to fool Mother Nature,” admonished the announcer, Mason (“with a name like Smucker’s”) Adams.

When it comes to reproducing massive explosions, close-up whirring helicopter rotors, the lowest organ stops, and large-space room rumble, there’s no fooling Mother Nature. Producing deep, gut-socking *musically convincing* low frequencies that you can feel as well as hear typically requires compressing large volumes of air. That usually calls for a big woofer in an even bigger cabinet capable of compressing and rarefying the large amounts of air required to pressurize a room.

That does not mean—as one audio writer mistakenly wrote—that you can’t reproduce 20 hertz in a room less than 55 feet long, which is the approximate length of a 20-Hz sine wave. “20 Hz won’t fit!” he wrote. “The wave will crash into the wall and break up,” he figured. Nonetheless, producing deep, linear bass in smaller rooms is problematic.

Nor is there any reason that a small box can’t produce very low frequencies (though often at only modest volumes before distortion runs rampant). Many long-throw, small-driver, small-box subwoofers can produce reasonably low frequencies down to where sound is felt as much as it’s heard. More than a decade ago, the development of compact, powerful, long-throw drivers with unusually large, foamy surrounds ushered in

a spate of such products. Unfortunately, few of these small fart boxes can truly pressurize a room or be musically satisfying and blend seamlessly with the speakers being called upon to generate the higher frequencies. Most produce low-frequency boom, with musicality going bust.

REL claims that its diminutive T5, when properly set up, can pressurize a room, produce very low frequencies, integrate well with the main speakers, and produce musically satisfying results. In other words, REL says its entry into the tiny subwoofer category can fool Mother Nature.

Thinking Inside the Box

REL’s T5 measures less than a cubic foot and houses an 8-inch downward-firing, long-throw, steel-chassis woofer driven by a gutsy 125-watt RMS Class A/B amplifier. The well-braced little cabinet sits on four aluminum cubes that load the driver to the floor at a specified distance. Claimed in-room response is –6 decibels at 32 Hz, with nominally flat response from 35 Hz to 90 Hz. Other than the lowest organ pedals, the T5 should be able to grab the deepest frequencies produced by most musical instruments and convey the room rumble of all but the largest spaces to a reasonable volume. But what about pressurizing the room and producing a seamless blend with the main speakers?

One of the keys to REL’s claim is its versatile input structure. It includes two separately adjustable sets, one of which includes a variable low-pass filter and both high-level speaker and low-level RCA inputs. However, only one of these may be used at a time. There’s also an RCA jack labeled “.1/LFE,” which provides no low-pass filter but does have its own level control and may be used simultaneously with one of the other inputs if desired.

In addition, there’s a stereo speaker-level Neutrik speakON jack input. REL supplies a 10-meter (34-foot, 10-inch) cable with a Neutrik plug on one end and three stripped wires on the other that connect to the amplifier’s left and right hot speaker terminals and one of the two negative terminals. If you’re running a dual-differential

balanced (or bridged) amplifier, REL recommends that you connect the ground wire to a chassis ground, not the negative speaker terminal (although REL wisely admonishes you to contact your dealer first).

Because of the T5’s speaker-level input capability, REL recommends that you not set the processor’s front speaker setting to Small even if your main speakers are low-frequency limited. The potential advantage of this arrangement is twofold. First, only the LFE information reaches the subwoofer via the low-level RCA input, and you can independently adjust that level.



Simultaneously, when you set the speaker type to Large, the same low-frequency information and bass character reaches both the main speakers and the subwoofer through the speaker-level input, and it too can be independently adjusted. REL believes this produces a more seamless and musical blend. That may or may not prove to be ideal or even workable, depending upon the robustness of your small satellites, but to REL's way of thinking, it's worth a try. A variable crossover frequency control adjusts the T5's high-frequency response limit between 32 Hz and 180 Hz.

While REL claims that fooling Mother Nature is within the T5's capabilities, accomplishing it requires setup skills acquired over time and that most novices don't possess. That said, REL's instruction manual does a good job of walking you through the steps necessary to achieve both prodigious and musically convincing deep bass and a satisfactory subwoofer/stereo speaker blend using both the LFE low-level and stereo high-level inputs.

T5 Setup

REL importer Sumiko sent along a Sonus Faber Toy speaker system, consisting of four small two-way satellites and a Toy Center, to use with the T5. (See Mark Fleischmann's review of the Toy system, *Home Theater*, May 2009.) Despite their name, these handsome leather-clad speakers are anything but. They feature

1-inch ring-radiator neodymium-magnet tweeters and 4-inch coated cellulose cone drivers that are designed to run full range. Still, their low-frequency response is extremely limited in both extension and output capability, as you'd expect for such compact speakers.

While REL's instructions include a headline that says, "REL Setup Made Simple," and the claim that basic setup should take "no more than 10 to 15 minutes," don't count on it—with REL or any other brand of subwoofer. Properly integrating a subwoofer is one of the trickiest jobs in audio, particularly with satellite speakers with limited bass response.

I followed REL's instructions and ran my Marantz AV7005 surround processor's subwoofer output into the REL's LFE input. I also connected the Neutrik-terminated cable to my Parasound Halo A 51 amplifier's speaker terminals on one end and the REL's speaker-level input on the other.

REL recommends corner placement if possible. While that's a good general rule for maximum bass, results vary from room to room, and smoothness of response is often the trade-off. Moving the sub out of the corner and more toward the center of the room can improve blending and sometimes smoothness, but often at the expense of overall output. In the wacky world of room acoustics, there are rules of thumb but few hard-and-fast ones.

For instance, in my room, which measures 15 by 25 feet, corner placement produces uncontrollable bass bloat with any brand of subwoofer. The best sub location proves to be on the long wall about 7 feet from the corner, regardless of subwoofer brand or size. Corner placement made it impossible to get a tight kick drum or supple yet clean double bass.

Unfortunately, with any subwoofer, you'll find that movement of even a few inches can have a profound sonic effect. This is because the

room modes that cause bass peaks and null points are present in every space. You can even predictably map them out in idealized rectangular rooms. Bass will boom in one location and all but disappear in another, often a short distance away. Subwoofer and seating location are equally susceptible to the peak and null points.

In fact, when you're setting up a subwoofer, you might try this classic trick. Put the sub in your listening position, play a low-frequency test tone or music with reliable low-frequency information, and walk around the room. As you do, you'll easily hear the bass reinforcement and cancellation locations. Find the reinforcement point along the wall behind the speakers, in the corner, or elsewhere, and start with the subwoofer there.

There isn't sufficient space here to go into all of the intricacies involved in blending a sub's upper limit response with the main speakers' lower limit and finally setting the sub's output level. Generally speaking, though, you'd lower the output to minimum, lower the crossover to 25 Hz so the subwoofer outputs only the deepest signals, and then bring the volume up to where you can just hear the subwoofer. After that, raise the crossover point above the speaker's low-frequency limit to where it sounds truly obnoxious, and then lower it back down subtly until it tucks into place. As a final check, turn off the sub so it won't mask any untoward sounds coming from the mains; then slowly bring the system up to high volume to make sure your main speakers aren't being overworked and stressed by the bass load you're asking them to reproduce with your selected crossover and level adjustments.

All of this is more easily said than done. The setup pros from Sumiko fine-tune speaker placement and subwoofer adjustment using Jennifer Warnes' version of Leonard Cohen's "Ballad of the Runaway Horse," from the *Famous Blue Raincoat*



● The REL's 8-inch woofer is powered by 125 watts of Class A/B amplification.

CD, which has double bass and female voice. When everything's correct, the bass is tight yet supple, and the lower registers of Warnes' voice don't bloat.

The bottom line is that the smaller and more bass-restricted your main speakers are, the more difficult it is to integrate a subwoofer. And the greater the chance you'll be leaving a hole in the frequency response between the two or that the sub's output will be sonically intrusive. REL's speaker-level input greatly helped the integration process for me. The ultimate goal is to not hear the subwoofer thump—or hear the subwoofer at all. You just want to hear and feel the deep bass as part of the spacious, three-dimensional soundstage created by the subwoofer's participation.

Invariably, the less experience you have with this, the more likely you are to at first introduce too much low end. When it becomes annoying and relentless, as it surely will, you'll back off the level to where you've introduced a hole. Eventually, you'll hit the sweet spot (or the sweetest spot), and you'll stop fussing with the subwoofer controls. Ironically, that point will be where you don't hear the subwoofer, but you do hear its absence as a collapse of spatiality and physicality when it's turned off.

In my room, the T5 and the Sonus Faber Toys blended nearly seamlessly. The sub's upper frequency response subjectively overlapped the Toys' lower limits

HT Labs Measures

REL T5 SUBWOOFER

This graph shows the quasi-anechoic (employing close-miking of the woofer) frequency response of the T5

subwoofer (blue trace).

The T5's close-miked response, normalized to the level at 80 hertz, indicates that the lower -3-decibel point is at 43 Hz and the -6-dB point is at 34 Hz. The upper -3-dB point is at 101 Hz using the LFE input.—MJP

REL T5 SUBWOOFER



with the speaker-level input set to nearly off. When I set it any higher, the sound screamed, “Subwoofer here.” When I flipped the on/off switch, the sound screamed equally loudly, “Where’s the bass?” That’s where you want it—at least after the room-shaking novelty wears off.

T5 Performance

Properly dialed in, the T5 performs for the most part as

- REL supplies a 10-meter cable terminated with a Neutrik connector on one end and bare wire on the other.

advertised. It produced clean, visceral, room-shaking bass on the submarine epic *U-571*. It did the same on *The Hurt Locker*, where the explosions play a key role—almost as punctuation marks do on the page. These effects become cartoonish if the subwoofer is turned up too high, and they lose some impact if it’s turned down too low. Here is where a larger sub that can provide greater output with lower distortion has the edge. Larger, more expensive subs (woofers, not marines) have less of an on/off quality, with a more graceful but equally adroit attack and a longer sustain and decay.

Music provided the T5 with its real test. The stereo SACD of Peter Gabriel’s *So* album incorporates prodigious deep bass on tracks like “Red Rain” and “Sledgehammer” that the Toys simply can’t reproduce running full range. With the T5 switched on, the bottom filled out nicely. If I set the crossover point too high, bloat resulted. When I set it too low, there was a discontinuity between the sub and the satellites, and the bottom end lacked harmonic structure and texture. Set properly, the software and hardware worked together seamlessly.



SPECS REL T5 SUBWOOFER

ENCLOSURE TYPE: Sealed, downward firing **WOOFER (SIZE IN INCHES, TYPE):** 8, long-throw **RATED POWER (WATTS):** 125, RMS **CONNECTIONS:** Speaker- and line-level; Neutrik (speaker), RCA (LFE and low-level) **CROSSOVER BYPASS:** None **AVAILABLE FINISHES:** Gloss Black lacquer, Gloss White lacquer **DIMENSIONS (W X H X D, INCHES):** 10.5 x 12 x 11.75 **WEIGHT (POUNDS):** 26 **PRICE:** \$599

Next, I switched to the Rick Rubin-produced Johnny Cash CD *American III: Solitary Man*. It demonstrated that the sub/sat integration was sufficiently well dialed in to prevent Cash’s deep baritone from overexpanding and bloating in the lower registers. Yet, when I turned the sub off, it thinned out Cash’s voice, robbing it of weight and emotional authority.

The Bill Evans Trio SACD *Waltz for Debby* produced an impressive sense of the Village Vanguard’s cramped but recognizable space. Both Evans’ piano and Scott LaFaro’s bass were reproduced with satisfying, though not full, weight, and they were free of additive bloat and/or other bass colorations.

There’s no doubt that the honesty of the Toys’ frequency response helped the effectiveness of the sub/sat blend. These speakers don’t attempt to pump up the midbass to produce the sensation of deeper bass, thus improving the chances of getting good sat/sub integration.

Did the T5 Fool Mother Nature?

The REL T5 is a versatile, well-designed, attractively built and finished compact subwoofer that succeeds at its main task: producing surprisingly deep bass that subjectively extended below 30 Hz in my room when sound effects and the occasional musical and/or spatial accent demanded it.

If you’re considering the T5, just remember that it will work best with satellites that have reasonably flat low-frequency response and that can be run full range without discomfort. To get the most from the T5, you should use the speaker-level input as well as the LFE channel input, even if that means routing the cable through your basement or attic to get it across the room to the sub.



- Michael appreciated the T5’s stereo speaker-level Neutrik connection.

Also remember that placement and level setting will be time-consuming and tricky and that, in the small subwoofer world, if you care about musicality more than bass, less is often more.

Finally, although the T5 is a very good product—and at \$599, a good value as well—don’t ask it to do too much. Unless yours is a very small room, getting the real deal in terms of room pressurization and massive bass-wave launch capabilities requires more subwoofer than a single T5. Much as I’d like to report otherwise, this isn’t margarine, after all. There really is no fooling Mother Nature. ☞

Sumiko • (510) 843-4500 • sumikoaudio.net Dealer Locator Code REL

