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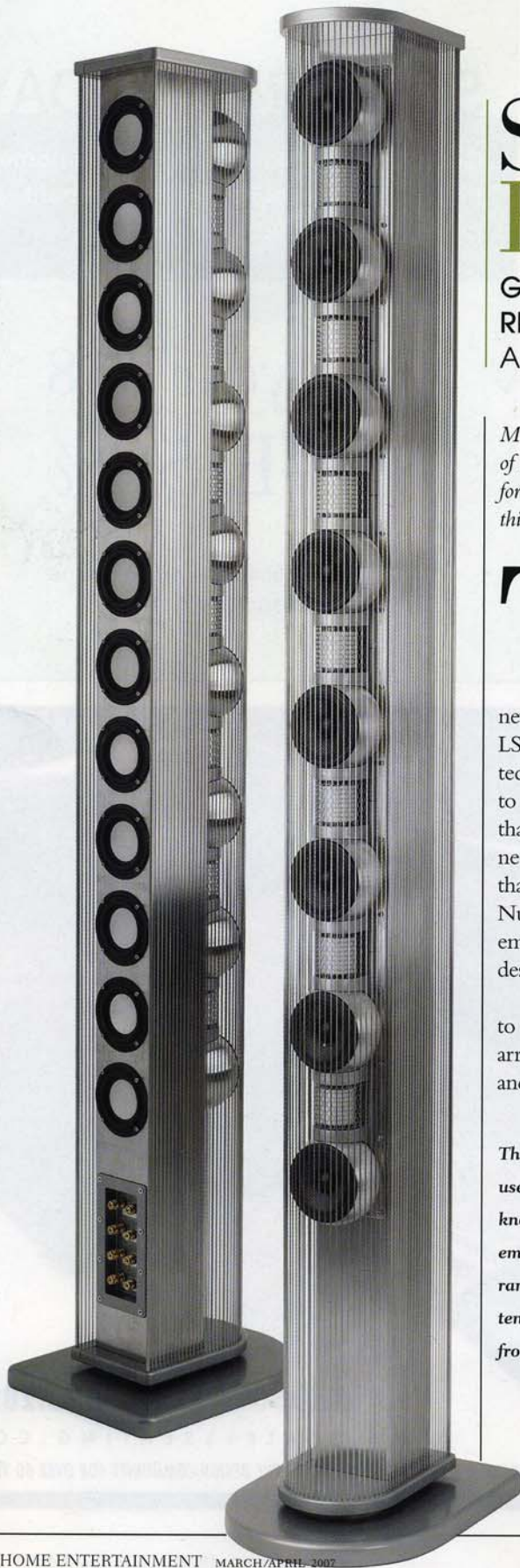


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SOUND, EVOLVED

GALLO ACOUSTICS' NUCLEUS REFERENCE 5 LS IS A POWERHOUSE IN A PRETTY PACKAGE. > BY STEVE GUTTENBERG

Music, in performance, is a type of sculpture. The air in the performance is sculpted into something.—Frank Zappa

Too bad Zappa didn't live long enough to hear Anthony Gallo Acoustics' new Nucleus Reference 5 LS speaker. It's Gallo's most technically ambitious effort to date, and for a company that made its reputation pioneering spherical speakers, that's really something. The Nucleus Reference 5 LS is empathically modern, yet destined to become a classic.

The LS in the name refers to the speaker's "line source" array of tweeters, midranges, and rear-mounted subwoof-

The Nucleus Reference 5 LS uses a driver configuration known as a line array, which employs many tweeters and midranges in order to create consistent, smooth dispersion of sound from top to bottom.

ers that project sound in such a way as to minimize reflections off the ceiling and floor while increasing lateral dispersion. This configuration results in a massive sound, projected with exacting imaging focus. Play Zappa's *Yellow Shark* and you can pick out every instrument in the 26-piece Ensemble Modern orchestra. *Shark* is one of my favorite Zappa CDs and it never sounded as fully realized and "sculpted" as it does here in Anthony Gallo's living room, played through his latest creation.

Gallo spent two years designing and refining the Nucleus Reference 5 LS's silver foil cylindrical tweeter, 4-inch carbon fiber midrange driver, and 4-inch aluminum subwoofer. Wait a second—the midrange and subwoofer drivers are exactly the same size. How can that be? Gallo explains: "It's not just a small woofer, but a bona-fide subwoofer driver. It has an oversized four-layer voice coil." That big voice coil lets it handle a lot more power, and the hard-anodized aluminum cone was intentionally designed to be too heavy to

produce midrange frequencies. The speaker's 12 4-inch subwoofers have nearly the surface area of a jumbo-size 15-inch subwoofer.

Big subwoofers tend to excite nasty "room modes," or resonances, that can make bass sound boomy or bloated, but since the 24 woofers in a pair of Nucleus Reference 5LSs launch bass over such a large area, they produce smoother and flatter bass response. Those woofers receive their marching orders from a separately housed, Gallo-designed, 250-watt-per-channel stereo amplifier.

Looking at the slender speaker, which measures 7.25 inches wide by 10.75 inches deep, it's hard to believe it could produce credible deep bass. But the performance of Gallo's woofers and midrange drivers is enhanced with his proprietary S-2 technology: paper-like flakes that fill the interior of the speaker and "fool" the drivers into behaving as they would in a much larger cabinet. S-2 really works—when I first hear the speakers playing, I assume the subwoofers in Gallo's room are turned on, but they are not. The speaker is far less imposing than just about any high-end flagship speaker I can recall.

I am devoting a lot of space to describing the woofers' fat sound, but Gallo's cylindrical tweeter is no less remarkable. It uses a 3-inch-tall silver foil diaphragm to project sound in a 300-degree lateral arc;

each tweeter's surface radiating area is the equivalent of 20 1-inch dome tweeters. A pair of Nucleus Reference 5 LS speakers employs 14 tweeters, and this sheer force of numbers contributes to the effortless treble response. Cymbal crashes sound, well, like *crashes*, and the treble detail and attack is startling when I first hear it.

The 4-inch carbon-fiber midrange drivers flanking Gallo's tweeters are housed in 5-inch stainless-steel spheres. Gallo pioneered the use of round speaker enclosures, starting with his very first commercial designs. Spherical speakers are acoustically superior to rectangular ones, especially for the crucial midrange frequencies that cover the range of the human voice.

Yet another technical departure: The speaker doesn't use any internal crossover circuits. In other words, the midrange and tweeter are powered directly by your amplifier—without any power-sapping resistors, inductors, or capacitors between the amp and each driver. The complete speaker weighs 120 pounds; it is, for the time being, only available in a natural stainless finish (black may be offered if there is enough demand). Even the grilles' "string" rods are fashioned from stainless steel.

It would have been much easier to fabricate the speaker's bass cabinet and the midrange spheres out of aluminum, but according to Gallo,

stainless sounds better, possibly because it's significantly stronger and more rigid than aluminum. That's an essential attribute for cabinets because a strong cabinet is less likely to "sing along" with the tweeter, midrange, or subwoofer drivers. Rap your knuckles against the column and it feels like solid metal. All of the midrange balls and tweeters are attached to a steel plate, and that assembly is isolated from the subwoofer column with a layer of silicone material.

As I listen to Keith Richards' *Main Offender* CD, the band's fluent reggae grooves take on a life of their own. The massive bass pulse is as much felt as heard and the drums sound incredibly lifelike. Even more impressive is the Harper Brothers' *Remembrance*, a jazz CD recorded live at the Village Vanguard. The sense of being in a small jazz club is spot-on perfect, and the sound of Philip Harper's trumpet and Justin Robinson's sax rings true. Brass instruments are particularly difficult to reproduce, but the Nucleus Reference 5 LS totally nails the sound.

I am listening in stereo, but I imagine these speakers will also prove quite popular for home theater applications. To create a surround-sound system based around the Nucleus Reference, the company recommends the Gallo Reference AV Center speaker and the Reference AVs as surround



Stainless steel "strings" protect the Nucleus Reference's tweeters and midrange drivers from damage, while allowing their sound to disperse freely—and adding a distinctive look.

speakers (both models are \$1,200 each). Then again, if you really want to go all out, replace the AV Center with a pair of Reference 5 LSs flanking the sides of the screen and run them as dual center speakers, and another three or four 5 LSs as surround speakers. As for separate subwoofers, Gallo recommends using at least four of his TR 3 cylindrical subs (\$850 each) in larger theaters. But the Nucleus Reference 5 LS makes a lot of bass on its own, so adding subs may not really be necessary.

By all means, experience the Nucleus Reference 5 LS for yourself—and bring some Zappa CDs. [HE](#)

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