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# THIEL CS2.4 Speaker System

Review by Shane Buettner

*There are few companies in high-end audio with the well-deserved reputation for innovation and performance that Thiel Audio enjoys. Thiel has been manufacturing high performance loudspeakers in the U.S. since the late 1970s. The Thiel 2.4 is one of the company's latest designs, and is a relatively diminutive three-way floor-stander that sells for just \$4,200/pair in satin black. (Thiel's typically lavish finishes can be applied for an additional charge.)*

I'm very excited to be reporting on Thiel's 2.4 loudspeakers, which are truly high-end, high perform-



ance, time- and phase-correct and hand-crafted in the USA. In an industry riddled with over-priced and under-performing components, a speaker like this is a breath of fresh air.

While many magazine reviewers would have you believe that the carriage trade products they have on long-term loan are truly reference-quality, here's a speaker that many people can actually afford (without a second mortgage) that's demonstrably superior to those pretenders in a number of respects.

Regular readers also know that the **Journal** is a big proponent of time-domain fidelity in loudspeakers and that Thiel Audio is distinguished as one of the few remaining manufacturers of time- and phase-accurate loudspeakers. Since the demise of Dunlavy, Vandersteen and Meadowlark are the only others I'm aware of.

I share Richard Hardesty's opinion that time- and phase-correct speakers represent a higher standard of performance and a more sophisticated level of connoisseurship compared to conventional loudspeaker designs. For those who value convincing dimensionality in imaging and soundstaging I don't believe there's a substitute.

By their very nature, time- and phase-accurate speakers require more work and ingenuity on the part of the designer, and very high quality parts in the drivers and crossovers. It's no wonder most designers prefer to tell you that time-domain performance isn't audible—it's very difficult and expensive to properly execute a time- and phase-correct design.

If you're a new subscriber I heartily recommend Richard Hardesty's article *Time and Phase, Not Just*

a *Craze* from the **Audio Perfectionist Journal** combined issues #6&7 for an outstanding primer on the importance of time-domain performance. That issue also contains an in-depth look at Thiel's design philosophies and an account of Richard Hardesty's visit to the Thiel facilities in Lexington, Kentucky.

## Design and Construction

Many loudspeaker designs that sell for ludicrous sums are sold on the alleged integrity of construction in their cabinets and/or the rarity, quality and expense of the materials used in the cabinets, drivers and crossovers. After reading about the design techniques and materials used to create this \$4,200/pair speaker

from Thiel, I hope you'll cast the same jaundiced eye that I do toward the companies selling 7" two-way speakers (or a 7" two-way on top of a vented woofer box) for over twenty thousand dollars per pair based on spurious claims of construction/parts quality.



CS2.4

ance. The contoured edges of the baffle are

## Cabinets

Perhaps the most unique appearance aspect of the Thiel 2.4 is the sloped and sculpted front baffle. The slope is used to maintain physical temporal alignment of the drivers, which, along with the coaxially mounted midrange/tweeter, obviates adjustment of the speaker's tilt in order to maintain optimal image focus or tonal balance. The contoured



designed to break up any early reflections from the drivers that could arrive at the listener's ears close enough in time to the primary signal to cause degrading time smear. Thiel believes the contoured baffle results in a more open and focused soundstage and my listening experience with the 2.4 backs up that assertion.

The 3"-thick MDF front baffle material is robust and rigid. The rest of the cabinet is 1"-thick MDF, and is braced to a truly extreme degree. The Thiel 2.4 cabinet is inert. Rapping the cabinet with your knuckles produces the dullest of thuds, with no sensation of resonance whatsoever.

I assisted Richard Hardesty a few years back when he updated the drivers in *Widescreen Review's* Thiel CS6 speakers to a newer model. I haven't seen any speaker at any price that surpasses Thiel CS6 structural integrity. Although the CS6 front baffle is made of a more advanced material, the 2.4 cabinet seems to be constructed to similarly high standards in spite of the price differential.

I had Thiel send the review speakers in satin black, but for an additional charge Thiel offers a number of exquisite veneers



that are mirror-matched on each speaker pair. You simply won't find finer craftsmanship or greater aesthetic appeal in a speaker cabinet no matter how much more you spend.

### Drivers and Crossovers

The CS2.4 uses a newly developed coincident aluminum tweeter/midrange driver (1" dome tweeter, 3.5" midrange) that's unique among coaxial drivers in that it uses a single voice coil—the so-called "unicoil" design. This coaxially mounted



midrange/tweeter relies on a mechanical crossover (no electrical network) between the two drivers that Thiel claims conforms to a phase-coherent 6dB/octave acoustical slope.

As with any high quality speaker there is substantial cost tied up in a Thiel speaker in its drivers and crossovers. The unicoil system offers a very high performance-to-price ratio by using

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***"...the midrange and tweeter are temporally aligned by sharing the same space..."***

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only one motor/magnet system and eliminating the electrical network. Jim Thiel told me that, while this driver is more expensive than a separate midrange and tweeter, it's not as costly to implement as a typical dual motor midrange/tweeter, especially with the crossover eliminated. He essentially considers this design to offer "three-way performance at a two-way price."

Coaxial drivers in general have advantages in a time- and phase-correct speaker. One is that the midrange and tweeter are temporally aligned by sharing the same space. A gentle slope of the cabinet is all that's required to align the coincident driver's output with that of the woofer, and the typically narrow vertical listening window of a time- and phase-correct speaker is expanded greatly. I've never found the narrow vertical window troublesome as my critical listening is done from the same chair at the same height every time. But some people may appreciate being freed from the perceived "head in a vice" constraint.

A potential drawback of using a coaxially mounted midrange/tweeter is whether the drivers stay effectively decoupled from one another and avoid intermodulation distortion. In other words, does movement from one driver cause unwanted movement in the other, which results in distortion? Thiel combats this by shaping shallow midrange cones to form a proper surround for the tweeter.

The 2.4 uses a single-layer aluminum midrange material in its unicoil driver, where Thiel's more costly designs (such as the CS6 and CS7.2) use a three-layer sandwich material for increased rigidity and damping.

Using aluminum for the midrange driver material has tradeoffs. Aluminum is lightweight but very stiff and can operate over a broad range of frequencies with high resolution and low distortion.



tion, which is a prerequisite for drivers in a speaker with first-order crossovers. Aluminum drivers exhibit a so-called “oil can” resonance at certain frequencies, a malady Jim Thiel engineers around by making sure the resonances occur beyond the frequency range at which a given aluminum driver operates in his speakers.

Objectively, an impulse response test will show aluminum drivers as prone to ringing. For example, the driver resonates over a longer period of time after a transient than drivers made of softer materials. On the other hand, softer driver materials don’t operate in linear, pistonic fashion over as broad a range, and tend to absorb energy, either of which can result in lower resolution and compressed dynamics.

Subjectively, the most obvious drawback of aluminum in a midrange driver is that attentive listeners will hear the distinct sonic signature of the metal cone in this critical band.

Aluminum midrange drivers have a sound that will appeal to some and turn others off. It’s my opinion that Thiel gets the most out of this design choice, absolutely minimizing, if not negating entirely, the potential pitfalls.

The 2.4 uses an 8” aluminum woofer with a 7.5” x 11” passive radiator. Vented/ported woofers resonate the mass of air in the port to increase the low frequency output of the driver. A passive radiator does the same thing by using the mass of the passive radiator instead of the mass of the air column of the port but has the same time-domain characteristics as a vented box, which means more phase shift and group delay than a sealed box. When listening, that translates to bass that plays a little slower than the band is actually playing, which has obvious repercussions to rhythm and pace.

Passive radiators, however, are superior to vents in eliminating port chuffing (air moving through the port that’s annoyingly audible at the listening position), and eliminating any potential for the backwave from other drivers in the enclosure coming to the listener through the port too close in time to the primary signal.

Another unique design choice by Thiel is the use of “underhung” voice coils—short voice coils in a long magnetic gap. A typical long voice coil/short gap motor system produces distortion in bass drivers because the power of the magnetic field acting on the coil and the amount of iron in the coil vary as the voice coil moves back and forth, toward and away from the magnet structure. With a short coil in a long gap, even when the coil has moved a long way, it’s still in a uniform magnetic field within the gap. Thiel further eliminates these distortions by using copper sleeves over the pole piece and copper shorting rings around the pole base to stabilize the magnetic field acting on the coil.

Thiel’s crossover networks are all hard-wired (no circuit boards) using the finest quality parts, including polypropylene and polystyrene capacitors, along with very pure, low oxygen copper, and air core inductors. The network in the 2.4 conforms to a first-order, 6dB/octave acoustic slope between the woofer and the coaxial midrange/tweeter. Thiel’s networks are complex as they compensate for impedance and phase deviations between the driver elements as well as damping driver resonances.

All in all, there's enough engineering innovation and quality parts and construction in the Thiel 2.4 to flat-out embarrass many of the ultra expensive designs out there.

### **Adding Multichannel Capability to a Thiel Speaker System**

Another consideration that may be enticing to some is found in Thiel's unique options for adding multichannel based around their stereo speaker pairs. Their PowerPoint® surround speakers are attractive, versatile beyond belief (they can be easily installed on floors, ceilings or front, side or rear walls!) and constructed to Thiel's exacting standards using high quality drivers similar to those in their floor standing designs.

Thiel's MCS1 is designed for center channel use and employs a coaxial midrange/tweeter very similar to the one used in the 2.4. The long-awaited SmartSub® system is among the most innovative subwoofer/room correction system designs around, which I hope will be enough to one day lure Dr. Boom himself (Richard Hardesty) out of retirement from the field of reviewing subwoofers.

### **Setup and Reference System**

I achieved the sound I liked best with the 2.4s just under 7 feet apart (center to center), with a distance of just over 9 feet from each speaker to the listening position (an included angle between the speakers and listener of considerably less than 60 degrees, which is less than Thiel's user manual recommends).

In my 24.5' x 17.5' room the distance from the coaxial mid/tweeter to the respective side wall was just over 5 feet and each speaker was more than 5 feet from the front wall. This did not optimize bass performance in the room as there was little if any boundary reinforcement from this position, but produced the best soundstage with the most coherent, convincing, precise imaging and best soundstage depth.

The amplification components in my system during the Thiel review consisted of VTL's TL7.5 preamp, Theta Citadel monoblock power amplifiers (both of which I bought after reviewing them for the **Journal**), and Ayre's P-5xe phono stage. Source components included Ayre's D-1xe CD/DVD player, and a Linn LP12 turntable with all the latest accoutrements: Cirkus bearing, Lingo power supply, Ekos tonearm,



Akiva cartridge, and the "Speed" carbon fiber mat from Extreme Phono.

My system cables are all AudioQuest's battery-biased lines: Sky and Cheetah interconnects and Kilimanjaro speaker cable. My power cords are AudioQuest NRG-5 and Richard Gray's Power Company High Tension Wire power cords. I also use RGPC 400S power line conditioners.

### **Listening**

As soon as the Thiel 2.4s were set up in my room, they made great sound, immediately exhibiting the expansive soundstage and convincing image focus that sets time- and phase-coherent designs completely apart from conventional speakers.

Conventional speakers tend to create a strong image deep in the center of the soundstage that compresses sharply front to back at both sides, rather like a triangle. The Thiel 2.4s main-

tained layered image depth and excellent focus far out to both sides, and far behind the speakers. The imaging capability of this speaker can't be described as anything less than spectacular.

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***“The Thiel 2.4’s soundstage was completely and utterly free of the physical boundaries of the speakers...”***

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The Thiel 2.4’s soundstage was completely and utterly free of the physical boundaries of the speakers, and very open sounding. Not only did this speaker never sound boxy, it never sounded like it was there at all, even in the bass. Vandersteen’s 3A Signature, which I owned for nearly three years, has better bass extension, but that comes at the price of sounding a tad boxy in the lower registers.

The Thiel 2.4 doesn’t go as low, but you never hear the box either. I suspect this is a tribute not only to the cabinet con-



struction but also to Thiel’s distortion-minimizing woofer designs, explained in detail earlier. Superior components like the Thiel 2.4 make your system sound less mechanical, less like a system and more like music naturally occurring in space. To that point, “free” and “open” are two words that pepper my notes on the listening sessions I spent with this speaker. Occasionally I felt this speaker gave up a rather teensy bit of ground to the dense, fully rounded 3-D imaging I get from my reference speakers. But take this nit-picking in its proper context. No conventional [phase incoherent] design I’ve heard at any price is even worthy of comparison to the spatial precision and dimension of the Thiel’s soundstage.

Time is not the only domain in which the Thiels are coherent. Tonally the 2.4 is exceptionally balanced from top to bottom, as even and neutral a presentation as I’ve heard from a speaker. The top is airy and extended without being zingy or calling undue attention to itself, and the midrange is resolved, if a little cool (more on that in a minute). The mid-bass (50Hz-100Hz) sounds noticeably quicker and cleaner than typical vented designs, if just a tad over-damped. Combined with the aluminum midrange, this gives the 2.4 the cool signature Thiels are known for.

Low bass (50Hz and below) is where I’d describe this speaker having a slight subtractive coloration. Although its -3dB point is specified at 33Hz, low bass lacked size and impact in my room, but also sounded just a bit loose at the same time.

Big acoustic bass sounds, for example, were a little thin on body sound and the strings didn’t snap quite as tautly as I’m used to. I’m certain I could have improved the bass extension by moving the speakers closer to the room boundaries, but my biases are such that I’d prefer to maintain the spatial performance derived from having the speakers out in the room.

If you want more bass from this speaker it’s my opinion that you should add a quality subwoofer to your system and leave the speakers out in the room where they image best.

What about that aluminum midrange driver? Does it have a sound? Yes, in my opinion, it does. The Thiel 2.4 unequivocally does NOT have anything resembling the harsh, metallic sound of other speakers I’ve heard using aluminum midranges. (Monitor Audio and RBH are two examples of speakers I’ve heard using aluminum midranges that sound just plain nasty.) There is a damped, restrained coolness in these Thiels, and

the midrange of the 2.4 is certainly not as relaxed as other speakers that don't use aluminum midrange drivers, including the Vandersteens I own. But there is a big difference between sounding cool and sounding metallic, and in my system these Thiels never crossed that line.

On harder recordings there's definitely less forgiveness than some are used to hearing, but there was no bite or glare either and this sound didn't prevent me from getting deeply involved with the music and thoroughly enjoying this loudspeaker. So long as you stay away from components with a pushed, hard midrange you'll hear open, highly resolved, slightly-on-the-cool-side-of-neutral sound from these speakers.

Further expanding the 2.4's charm is a very engaging sense of transient speed, dynamics and lifelike snap. Drum kits had outstanding pop and excellent dynamic contrast. Micro changes in voice level or the intensity of plucked strings were clearly apparent.

While the 2.4s were in my system they pulled double-duty for home theater playback and did an excellent job. I used Theta's powerful Citadel amplifiers (400W per channel into 8 ohms), and was more than pleased with how the Thiels performed in my system even when driven at demanding levels.

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***“I think at \$4,200 a pair  
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finest values in audio.”***

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In terms of overall resolution this speaker outclasses nearly everything I've heard at or near its price point, and is frankly superior to many speakers I've heard that cost multiples of its price. If pushed I'd admit that I believe the Vandersteen 3A Signature can take you farther into the recording space, and reveals more low level detail, but I also think a lot of listeners will gravitate to Thiel's clean, open and lively sound. And if form factor becomes an issue, the Thiel has scoreboard, although that comes at a price.

Another factor in the valuation of this speaker is what's happening with the dollar. It is not my intent to get jingoistic here, but current events dictate that buying speakers made right here

in the US of A has never been a better deal. With the poor position of the dollar in the world economy, and the fact that importers and distributors have to add a good percentage to the price of their products to cover their expenses and make a profit themselves, the odds are you'll pay more and get less from an imported speaker.

## Conclusion

The Thiel 2.4 is simply superb. It occupies a small footprint in-room for a full-range, floor standing loudspeaker and can be purchased with a gorgeous furniture-grade finish that makes it an attractive and practical speaker to share your living space with. I feel compelled to mention the price because I think at \$4,200/pair this speaker is one of the finest values in audio, but I also feel that mentioning the price denigrates this speaker in some respect. The Thiel 2.4 is not a terrific speaker at this price—it's a terrific speaker in its own right, regardless of all other factors, and I thoroughly enjoyed listening to it.

The Thiel 2.4 is a hand-crafted, high resolution, time- and phase-coherent speaker that will simply embarrass many conventional designs costing much, much more. That its looks match its high standard of performance is the icing on the cake. The Thiel 2.4 is the kind of product that high-end enthusiasts should celebrate! [ARJ](#)

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