

Vandersteen Model 5 Loudspeaker

In a world where some loudspeaker manufacturers “entry-level” models sell for five figures, Vandersteen Audio is a refreshing reminder that High End audio can be enjoyed by Everyman. The company made its name 22 years ago by providing high performance at an affordable price with its now classic Model 2, a loudspeaker still in production.

Over those 22 years, founder Richard Vandersteen hasn't been tempted to create mega-buck models like so many of his competitors. Instead he has focused on steadily improving his existing mid-priced designs. Until 1990, Vandersteen Audio's most expensive product was the \$1,195 Model 2. That was the year Vandersteen launched his most costly product to date, the Model 3, which was introduced at just \$2,395 per pair.

Given that history, Vandersteen's new Model 5, priced at \$9,800 per pair, seems an extravagant departure. Although a shade under ten grand may not seem much for a loudspeaker company's flagship product, Richard Vandersteen's perspective is that ten thousand dollars is big money by any standard. His thinking is that if he's going to introduce a product at that price, it had better be the best loudspeaker he knows how to build.

The Model 5 is a moderately low-profile floor-standing loudspeaker distinguished by its two-tone look; the black-grill-covered upper section accents the wood beneath it. This look is an example of form following function: the top fabric-covered section is essentially a three-way loudspeaker using Vandersteen's “baffleless” design, coupled to a powered subwoofer housed in the wood-veneered lower portion. The slightly swept-back assembly not only adds to the Model 5's elegance, but time aligns the individual drivers' outputs. The sloping front panel, which is slightly narrower at the top than the bottom, softens the Model 5's appearance so the speakers blend more easily into many environments.

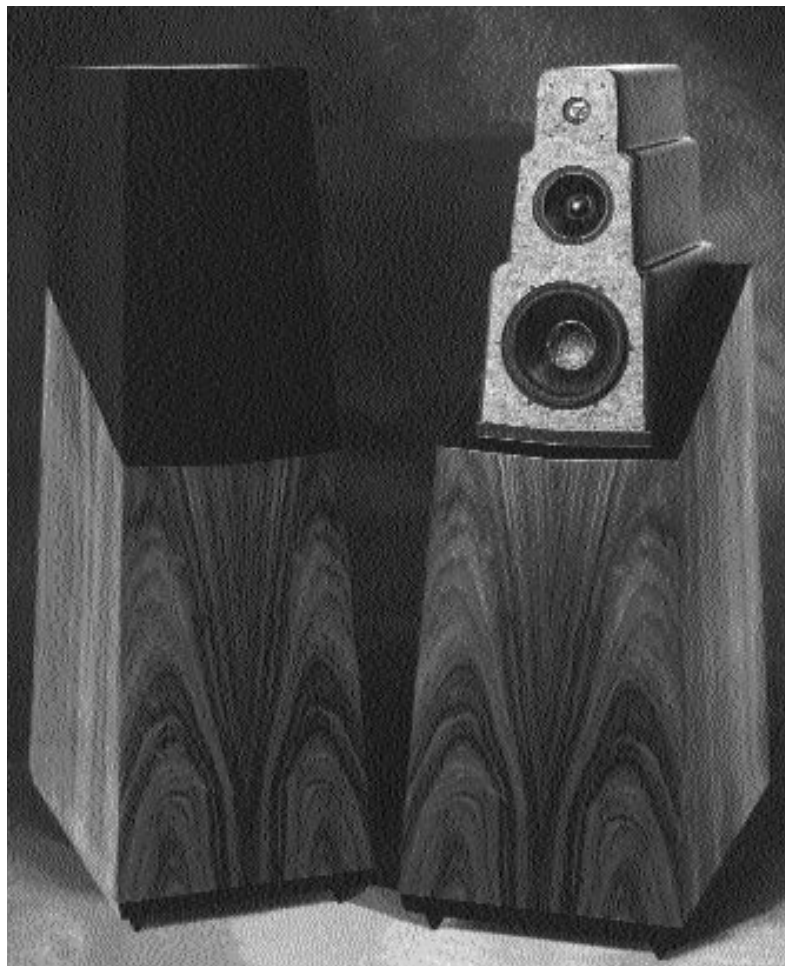
The Model 5's 12-inch subwoofer is powered by an integral 400 watt amplifier. A 7-inch woofer handles frequencies from 100 Hz to 600 Hz before crossing over to the 4.5-inch midrange and 1-inch dome tweeter. A rear-firing tweeter can be engaged at the user's discretion, with complete control over the rear tweeter's level and bandwidth.

Standard wood finishes are light oak, dark oak, and walnut. Premium woods are available at extra charge, as is a high-gloss buffed finish.

My review samples were high-gloss bird's-eye maple (a \$3,000 option). Although expensive, the 30-coat buffed finish is spectacular.

After setting up the Model 5 and learning about its design, I developed a real appreciation for how much thinking and development went into this loudspeaker. Rather than just loading bigger drivers in a bigger box and charging more, Vandersteen developed several innovative technologies for the Model 5.

The first of these is the decision to roll off the bass driving the main power amplifier, then boost the bass in the subwoofer amplifier to restore flat response. The Model 5 has no internal high-pass filter to keep low bass out of the 7-inch woofer. Instead, it is supplied with a pair of line-level high-pass filter modules that fit in your system between the preamplifier and power amplifier. Each small filter box has an integral interconnect that plugs into your power amplifier, and a jack for connection to the intercon-



nects from your preamplifier. When purchasing the Model 5, you must specify whether you want filter boxes with balanced or unbalanced connections. These high-pass filter modules cost \$595 for the unbalanced version and \$795 for balanced. Some home-theater controllers (Theta's Casablanca, for example) provide user-selectable high-pass filtering, which obviates the need for the Vandersteen filter modules.

The subwoofer amplifier has a bass-boost curve that exactly complements the bass roll-off curve provided by the high-pass filter boxes. In effect, bass is reduced before the power amplifier, then added back inside the speaker's subwoofer amplifier. Specifically, the roll-off is 6 dB per octave with a -3 dB point of 100 Hz.

Putting the high-pass filter *before* the power amplifier provides several important advantages. First, the power amplifier never has to handle low bass, which leaves more of its power for the upper bass, midrange, and treble. Second, the crossover

inside the loudspeaker can be simpler and less damaging to the signal

because it needn't filter low frequencies. Third, the

impedance seen by the power amplifier is

more resistive and less inductive, which

makes the loudspeaker easier to drive. External filters before

the power amplifier also ensure that the subwoofer

amplifier built into the Model 5 is driven by the same

amplifier driving the rest of the spectrum, which contributes to a seamless blend between

subwoofer and woofer. Finally, the subwoofer amplifier can drive the subwoofer directly, with no passive crossover parts (typically a large series inductor) between them.

All these factors make life much easier for a power amplifier. Consequently, the Model 5 can be driven by a mid-powered amplifier, despite its moderate sensitivity of 87 dB.

Another innovative design technique addresses the issue of room-induced peaks and dips in the frequency response. A loudspeaker can be engineered to be flat in an anechoic chamber (a reflection-free room), but when played in a real listening room, it will be colored by the room's selective reinforcements and cancellations of certain frequencies. The frequencies of these colorations are determined by the room's dimensions. Vandersteen attempts to reduce the severity of room-induced bass coloration by including inside the Model 5 what is essentially an 11-band bass equalizer. Specifically, the Model 5's rear panel has 11 tiny adjustment screws, each of which adjusts the amplitude of one of 11 adjustable bass frequencies between 20 Hz to 120 Hz.

Correctly calibrating these adjustments to your particular room requires a special test signal and a spectrum analyzer. Your dealer should install and cal-

ibrate the Model 5s. If you cannot have them calibrated, set all the controls to their straight-up position; it is impossible to correctly adjust them by ear. Richard Vandersteen has developed a special instrument for quickly and precisely calibrating these adjustments. This custom device, which will be available to dealers, outputs a test signal to the Model 5's subwoofer and displays the amplitude of the 11 adjustable frequencies via an LED display. It took Vandersteen about five minutes to dial in the review pair in my listening room.

Rather than simply spacing the adjustable frequencies some arbitrary distance apart, Vandersteen came up with a clever method of finding out which frequencies are most likely to cause trouble in a listening room. A computer program was fed the typical dimensions of dozens of listening rooms, from which the program calculated which frequencies would most likely be boosted and attenuated. The frequencies that came up most often were chosen for adjustment on the Model 5. (They are, in Hertz: 20, 24, 30, 36, 42, 50, 60, 72, 84, 100, and 120.)

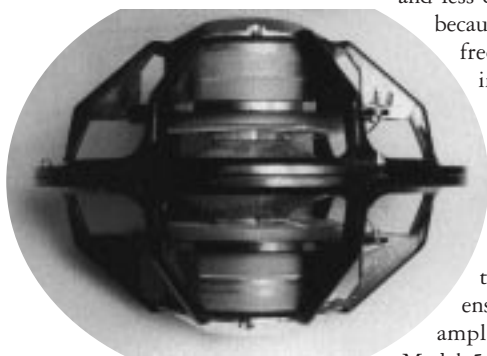
These adjustments aren't designed to produce perfectly flat response, but to gently bring down the level of peaks and fill in the valleys. Large amounts of equalization over narrow bands can easily become audible; the Model 5's relatively narrow range of adjustment (+6 dB, -12 dB) is meant to even out the worst room problems, not surgically correct high-level, narrow-band peaks or dips. You'll still need to follow good loudspeaker-placement practices to avoid lumpy bass.

In addition to these fine tweaks, the Model 5's rear panel provides four other user-accessible controls. The first sets the rear-firing tweeter's output level in five 1.5 dB steps (plus an off position). The companion adjustment controls the frequency at which the rear tweeter begins to roll in. Vandersteen agonized over building a speaker with a rear tweeter – its inclusion runs contrary to the company's long-standing principle of designing phase-correct loudspeakers. A rear-firing tweeter that reflects energy off the rear and side walls cannot be phase-correct relative to the front-firing drivers. This tweeter was included, however, to compensate for overly damped rooms.

A second pair of adjustments set the subwoofer level and "Q" (Quality Factor) respectively. A loudspeaker's Q describes the behavior of the woofer in the enclosure. A high-Q alignment (also called "underdamped") produces a big, full, and poorly defined bass. A low Q alignment (overdamped) sounds tighter and more articulate, but at the expense of bass weight and fullness. The Model 5 lets you set the Q for your preference and room.

Overall, these room-matching adjustments are unprecedented, and allow you to dial in a pair of Model 5s to your particular listening room with considerable flexibility. I'll report on the musical effects of these controls later in the review.

Looking next at the drive units, the 12-inch subwoofer driver was designed from scratch for the Model 5. It features a dual-motor construction that pushes and pulls the cone back and forth (see photo). This dual-motor technique, with one magnet assembly and



voice coil on either side of the cone, allows for higher power handling (there are two voice coils through which current flows, each working half as hard as a single coil). Moreover, a cone pushed and pulled behaves more linearly than a cone driven by a single voice coil, that is, the inward and outward strokes exhibit a more similar motion. The 42-pound driver, which has an excursion of a full inch, is slot-loaded in the cabinet's lower section.

One problem with such massive motor assemblies is the stress they put on the cone. When driven over the relatively narrow area of the voice coil, the cone can flex and produce distortion. The Model 5's subwoofer driver avoids this by using a very stiff cone made from two spun aluminum cones sandwiching a honeycomb material.

Because the driver is mounted horizontally in the enclosure, gravity pulls the cone downward and displaces it from its optimum central position. This effect is overcome by delivering a small amount of current from the integral subwoofer amplifier through one voice coil, pulling the cone into its centered position.

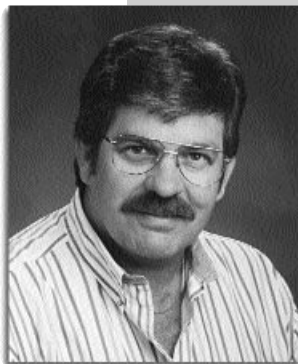
The Model 5's woofer is a 7-inch unit mounted in a transmission-line enclosure. A transmission line absorbs the driver's rear wave so that it can't reflect from the enclosure and interfere with cone movement. The driver features a die-cast basket and an unusual cone made from polypropylene-coated Kevlar.

The 4.5-inch midrange driver is a patented open-basket design that minimizes the basket and magnet profile to reduce internal reflections. The rear wave produced by the cone can easily travel past this structure, in contrast to conventional magnet assemblies that reflect rear-launched energy back into the cone. This reflected energy can cause the cone to vibrate and introduce a time-smeared signal into the listening room. The Model 5's midrange is the same driver used in the Model 3. As with the woofer, the midrange driver is loaded in a transmission line to dissipate the driver's rear-launched energy.

Finally, the custom 1-inch alloy-dome front-firing tweeter features a dual-chamber design. The rear-firing tweeter is a stock Vifa unit. All the drivers (except the subwoofer and rear-firing tweeter) are matched in left/right pairs to 0.1 dB at six frequencies for precise imaging. If one driver fails, you must replace both the left and right drivers.

Moving next to the crossover, the massive board uses all first-order filters, as do other Vandersteen designs. A first-order filter attenuates the audio signal at the rate of 6 dB per octave above or below the crossover point. This means that a tweeter crossed over at 4 kHz will receive energy at 2 kHz that is down in level only by 6 dB (a 6 dB attenuation is half the amplitude). The tweeter receives energy at 1 kHz that is down in level by 12 dB (one-quarter amplitude). Although the amplitude of the signal driving the tweeter is halved for every halving of frequency, the driver's excursion quadruples with each halving of frequency. This means a driver crossed over with a first-order filter exhibits significant excursion outside

Richard Vandersteen Talks with Robert Harley



During a panel discussion among loudspeakers designers at a hi-fi show, an audience member objected to the way designers auditioned their products during development: "One really needs rigorous double-blind listening tests under laboratory conditions with statistical analysis of the results to accurately determine loudspeaker quality." Panelist Richard Vandersteen fired back: "Hell, just open a bottle of wine and spend an evening listening to music through 'em. You'll know if they're any good or not!"

Such down-to-earth pragmatism exemplifies Vandersteen's approach to building loudspeakers. This former truck driver has enjoyed phenomenal success simply by making loudspeakers people enjoy listening to music through. The Vandersteen Model 2, in production in various forms for 22 years now, is perhaps the most popular High

End loudspeaker of all time.

After two decades of building moderately priced designs, Vandersteen has introduced the ambitious Model 5. During an evening at my home after setting up the Model 5s, we talked about the 5's genesis, loudspeaker design, and musical values. I began by asking him how he came to be in the loudspeaker business.

Richard Vandersteen: My parents, being immigrants, were always involved in music. Dad sang tenor. Music was always a big part of the family, but we were not well-off people. Early on, even before my teens, we made our own stereo equipment — mono at that time — for our own use.

Building loudspeakers was a hobby all through high school. I came up with the idea of making a loudspeaker without a baffle and was shocked [when somebody told me] there was a speaker called the Dahlquist that was also baffleless. Well, it wasn't true, because his patent stated that all the drivers needed to have a baffle 1/4 wavelength around them. You still don't get the advantage of removing the baffle. So I moved forward with my baffleless design. This approach makes the crossovers difficult to design, because you don't have the baffle to average the energy and smooth the response. It relies purely on the quality of the driver and the sophistication of the crossover to make it work, but it can be done.

We took the speaker [the Model 2] to the [Consumer Electronics] show in 1977 and picked up a bunch of dealers and orders. I quit my job, and building loudspeakers became our full-time work.

Robert Harley: The story goes that when asked if you were showing the speaker at CES, you said: "What's CES?"

RV: That's exactly right. Every retailer has had the nightmare of a guy coming into their store saying that he has a better speaker than anything in the place. [Well, I was] one of those guys. I was driving for a company called Beacon Oil, delivering jet fuel and gasoline to stations and military installations. I parked the truck in front of a store in Visalia [California] and brought in these speakers that looked like R2D2 in *Star Wars*. They humored me, but after hearing the speakers, they thought there was something to them.

But the speaker was not attractive; it had a midrange and tweeter stuck on top of a woofer box with no covering. We wondered how to make it look good enough that people would want to put it in their homes. It had been raining that day, and I looked around and saw closet poles with jackets hanging on them. I put a closet pole on each corner [of the speaker] and wrapped fabric around them. It was a form-follows-function thing. I made sure it didn't compromise the sound. That's how the speaker came to look the way it does.

The retailer encouraged me to take the speaker to CES, and yes, I had no idea what CES was. I had never bought commercially available equipment and so had no idea that there was a High End audio industry out there. [The store's co-owner, Nevin House, is now National Sales Manager at Vandersteen Audio.]

RH: What is it about the Model 2 that's made it such an enduring favorite for 22 years?

RV: There are a couple of things. Because 70 percent of the cost to build a typical loudspeaker goes into the enclosure and veneers, only a little money is left over for the drivers and the crossover components that actually do the work. But in the Model 2, we put 70 to 80 percent of the money into the drivers and the crossover components, which meant we put a lot of quality into the speaker.

its frequency band. Consequently, power handling and dynamic capabilities are reduced.

First-order crossovers have, however, one massive benefit that many designers believe outweighs the drawbacks described: They can provide perfect phase response. That is, several drivers connected with first-order crossovers produce sound in unison. By contrast, drivers connected with second, third, or fourth-order crossovers produce sound that is slightly staggered in time relative to each other. A loudspeaker with first-order crossovers produces a coherent wavefront in which the outputs from all the drivers are aligned in time – just as in live music.

To realize a time-aligned wavefront at the listening position, the drivers must be staggered in the cabinet so that their outputs combine in phase. Although the Model 5's drivers are arrayed for correct time behavior, Vandersteen has left nothing to chance. The Model 5 is supplied with spacer washers that fit between the spikes and speaker cabinet and allow you to perfectly time-align the Model 5 at your precise listening distance and ear height. By putting more spacers in the front than the rear, you can easily adjust the amount of tilt. The Model 5's owner's manual includes a chart that tells you how many spacers to install under each spike based on your listening height (floor-to-ear distance) and listening distance.

The Model 5's cabinet construction is an all-out effort at controlling enclosure resonances and reducing diffraction. The top section, which houses the 7-inch woofer, 4.5-inch midrange, and front and rear tweeters, isn't actually an enclosure in the conventional sense. It is a nearly solid block of machined MDF (Medium Density Fiberboard). The structure is made from 22 layers of 3/4-inch MDF bonded with an anti-resonant adhesive. This construction, called constrained-layer damping, is often used in turntables. Vibration is dissipated as a minute amount of heat in the adhesive layers. Although the black paint covering this structure appears smooth and continuous when new, expect to see tiny cracks in the paint at the 21 constrained-layer joints as the speaker ages. That's a natural effect of the tiny relative motion between adjacent layers.

In addition, the structure is barely wider than the individual driver units so as to reduce diffraction from the enclosure. Diffraction is a re-radiation of energy at a discontinuity near the driver. Diffraction creates small ripples in the frequency response and degrades imaging. (This is why a center-channel speaker's front baffle should be flush with the front of a video monitor.) To further reduce diffraction, the drivers are surrounded by an absorbent felt-like material.

At the front of this structure are three 1-inch-thick driver mounting plates made from a high-pressure epoxy laminate. This dense material, which can be machined, provides rigid coupling between each driver and the laminated structure. An additional benefit is that the driver/mounting assembly can easily be removed for replacement.

The subwoofer enclosure is equally impressive. The Model 5's lower section is made from 1-inch and 2-inch MDF in a similar constrained-layer damping construction. The amount of bracing in the subwoofer

The other reason is, the [Model 2] was at the right place at the right time. It had bass and was affordable. It wasn't cheap, by any means, but it was priced at what people could afford [\$860 per pair]. And it had that uncanny natural openness that comes when you remove the baffle. The Model 2 sounded like Magneplaners or electrostats of the time, but without the difficulties of placement.

Because it's been refined over 22 years, it can bring higher performance to the customer than if we tried to invent a new model every six months or so. I can't imagine doing that. I would never get a speaker refined to the point I would be proud of it in that short a time. The Model 2 started out as a good, basic idea, and improving technology has allowed it to keep getting better. It's far more sophisticated and refined than it was in 1977, but the basic design has not changed in all those years.

RH: There's also a certain kind of musicality to the Model 2 that appeals more to music lovers than to audiophiles trying hear every last iota of detail. They're easy to listen to.

RV: There's some truth in that, and it's simple to explain. In an A/B comparison, people buy what's brighter and boomier. Many products have been designed to make them sell in a brief demo. I didn't come out of the industry. I'd never worked retail. I just designed speakers from the beginning to be true to the input, and never played the game of running the tweeter louder in order to sound more spectacular for that short-term buying decision.

RH: The Model 5 costs \$9,800, which isn't expensive by today's standards, but is several times more than any of your previous products. Why have you never made a \$60,000 loudspeaker? Why did it take you so long to introduce a speaker even close to \$10,000?

RV: For years, our dealers and customers have wanted us to make a flagship. But it was never a personal challenge to me. I never really considered it a challenge to make an expensive speaker that sounded good. If it's expensive and you have that much money to spend on it and it *doesn't* sound good, you'd better find a new way to make a living.

What got me up every morning, excited and willing to go to work, was how much performance can you give the customer for as little money as possible. To this day, I consider that a far greater challenge than making an expensive speaker that does amazing things.

I must admit, though, that it's been a fun designing and building and selling the Model 5. We're tremendously back-ordered. It's been far more successful than I ever thought. I used to say: "How many \$10,000 speakers could [you sell]?" Well, the fact is: many.

And it's been fun designing a product where you can take all of your ideas and not have to think about what it costs if you include, for instance, a push-pull woofer. The Model 5 woofer development and tooling cost was very expensive. But it was neat to be able to make a push-pull woofer because I believe it makes better bass. It's a better idea, it's a better principle, and it's nice to have enough money to be able to do it.

I don't know what I could put into a speaker that would make it cost \$60,000. We buy from the companies that make the most expensive drivers in the world. I guess we could put more of them in a box. But being time and phase correct requires that you have only one driver per frequency range, because if you try to use two drivers for any one frequency, you get automatic time smear. Putting more drivers in a bigger box isn't really an option. It goes against our basic philosophy of speaker design.

RH: So the Model 5 is your statement product?

RV: At this point, it is. The beauty of the 5 is that it's fully upgradable. As we find ways to make it better, [a customer can simply install] a new part with a Phillips screwdriver and a soldering pencil in his living room.

RH: The other factor in waiting so long to introduce such an ambitious product is that you had a long time to think about what it should be.

RV: Yes, and probably what came to me in those 20 years is understanding that this is a major investment for most people. We sometimes get jaded in our industry, and think that \$10,000 isn't expensive. But \$10,000 is a lot of money. It's a serious investment for most people. That's why we put the time and energy into making it fully modular and upgradable, so that we could maintain that investment.

But the basic design principles in the Model 5 are no different from anything

enclosure is remarkable. All of these techniques make the Model 5 one heavy loudspeaker. Each unit weighs 183 pounds.

The Model 5's final innovative technology is its upgradability. Every component in it can be replaced in the field with a soldering pencil and a screwdriver. If there's ever a Model 5A with a new tweeter, for example, you simply remove the tweeter and its mounting plate and install the updated tweeters. The subwoofer amplifier and crossover slide out from the rear panel on rails for easy upgrades or repairs.

To say I was impressed by the Model 5's insightful design, parts quality, and build integrity would be an understatement. This loudspeaker is packed with careful thinking and meticulously executed down to the smallest detail. Moreover, the parts and build quality are first-rate by any measure. I get the feeling Vandersteen didn't cut corners on the Model 5 – this is the best loudspeaker they can build. In addition, the superb owner's manual deserves special mention. The 21-page book explains not only the practical aspects of setup, but also the theory behind this unique loudspeaker's design.

Sonics

The first thing that struck me about the Model 5 was its overall top-to-bottom harmonic coherence. The music had a seamless quality, as though each frequency range were an integral part of the same fabric. So often in reproduced music, harmonics sound detached from their fundamentals – the treble rides on top of the musical tapestry rather than being woven inside it. The Model 5's seamless coherence was complemented by a smooth octave-to-octave balance and full measure of bass warmth. The Vandersteen presented the music with an organic wholeness than encouraged exploration of musical meaning rather than analytical dissection of the sound.

I spent a day with the Model 5 before Richard Vandersteen arrived to adjust the room-matching controls, which gave me an opportunity to assess this feature's value. After the 11 bass controls were adjusted, the bass went from sounding much like that of other full-range loudspeakers to something truly special. Adjusting the controls took out most of the bloat, thickness, and turgidity that characterize loudspeakers with prodigious bass output operating in moderate-sized rooms. The bottom end became cleaner, quicker, and more agile. Pitch definition improved, and the musical contributions at very low frequencies became more meaningful when they weren't obscured by mid-bass room colorations. The improvement was similar to that rendered by the Tact RCS 2.2 room-correction system, but less dramatic.

One aspect of the Model 5 I particularly enjoyed was its transient fidelity in the bass. The bottom end had a quickness of attack and decay that better conveyed the music's rhythmic underpinnings. A good example is the timpani on the piece "G-Spot Tornado" from Zappa's orchestral masterpiece, *The Yellow Shark* [Barking Pumpkin R271600]. The closely spaced beats that drive the forceful rhythm never smeared into each other; instead, the dynamic envelope of each drum stroke was distinct. I also heard this quality on

we've done before. There's really nothing new in it. It's just taking to an extreme level what we've been doing in the Model 1s, 2s, and 3s since the mid-Seventies.

RH: How long have you wanted to include the Model 5's low-frequency adjustment feature?

RV: A speaker like the Model 5 needs to be placed where it looks good in the room, where it images, and where it has a proper tonal balance. The difficulty is finding that place in the room where you get good imaging as well as good bass transient response and the fewest bass problems. With a separate subwoofer, you have the advantage of putting the sub in the corner, where its response is linear, then positioning the main speakers wherever they need to be for staging. The Model 5 was meant to put all of that into one box.

But what happens if the best place in the room visually and for soundstaging has poor bass? I knew from the very beginning that if we were going to make an expensive, full-range speaker, it had to have bass adjustments. The idea goes back at least a decade. It's always a difficult challenge to achieve good bass and good staging, especially in a domestic situation. Providing bass adjustments is an elegant solution.

RH: Tell us how you approach new designs.

RV: Most of our testing and development work is on new drivers because the basic design hasn't changed since the mid-Seventies. All our speakers have been time and phase correct with minimum baffle.

But as you evaluate midrange drivers, tweeters, woofers, or crossovers, you have to ask yourself: "How do you really know how it should sound?" We started from the very beginning evaluating all the drivers in live-versus-reproduced comparisons. We would record a sound, play it back, and decide which driver most accurately replicated the live event. I don't know how you could design a loudspeaker without having made your own recordings. It's a big guessing game, wondering what someone did in a recording studio.

You have to use a variety of music or you can go wrong. We're all familiar with the sound of a live piano, but when you record it, something gets lost. The leading-edge presence, the percussive quality, and the air around the instrument are unique. You may find a tweeter that produces the most amazing playback of any piano you've ever heard and think you've made a significant discovery. But that tweeter may ring like a dinner bell, and with strings, it will peel paint off the walls.

Then we use test equipment to make sure that we've still honored the laws of physics. If you judge it only with your ears you could be misled and spend a great deal of money developing it before you realized that it does piano well, but it doesn't work in general terms.

We need to make live versus reproduced evaluations so that the end result is not referenced to the last speaker or tweeter we heard, but to live music. It has to be true to the sound, and also to live music's emotional engagement.

RH: Does it ever happen that a driver that is better in an objective sense – greater resolution, for example – is less musically engaging?

RV: Sometimes, if you're going for more refinement, it can sound like there's more definition. What you need to determine is if the driver is really resolving more information or separating that information from the musical tapestry and forcing it forward. It may be interesting in the short term – maybe long enough to get a customer to buy it – but it isn't what you want to listen to over the long term.

RH: Do some audiophiles go wrong in valuing specific performance attributes in loudspeakers at the expense of the overall musical experience?

RV: That's not exclusive to audiophiles. Whenever I rent a car, the first thing I do is turn the bass and treble controls back to normal. When we take pictures, we tend to want our colors exaggerated because the photograph pales next to the real thing.

The sad thing is that audiophiles are educated and have a lot of information available to them. They're not just ordinary citizens when it comes to the reproduction of music. They're shouldn't be hoodwinked by this kind of phenomenon. [But many are.]

A component may make ten recordings sound amazing, [yet] it is a detriment to music. Too many audiophiles have too little money invested in music and [too much] in equipment. The important thing is music. When the music suffers, the customer's contentment diminishes. Customers need to choose products based on the last time they heard live music, not the last hi-fi system they heard. ♪

kick drum as a suddenness of impact and equally fast decay. The Model 5's dynamic agility and low-energy storage in the bottom end were remarkable.

Very often bass described as "fast, clean, and detailed" lacks weight and body. An inherent trade-off in loudspeaker design is bass quantity for bass quality – that is, the more bass the loudspeaker produces, the less articulate. The Model 5 managed to combine taut definition with a wonderful weight and fullness. This loudspeaker sounded big and full in the bottom end; electric bass had a purring quality, and acoustic bass was portrayed as a large wooden body.

Moreover, the Model 5's extreme bottom end had real power behind it. My brain didn't have to fill in the missing fundamentals in the lowermost octave: I could feel them in the seat of my pants. Even the lowest organ pedal notes – a metaphor for the voice of God – on the Rutter *Requiem* [Reference Recordings RR57] had a "center-of-the-earth" solidity. That's saying a mouthful: I've heard this recording many times on the mighty Genesis 200s with their sixteen 8-inch servo-driven woofers and 1500-watt woofer amplifier. No, the Vandersteens didn't move as much air as the Genesis, but the Model 5 did convey the instrument's fundamental character without strain. Moreover, hearing such high levels of very low bass from a cabinet the size of the Model 5's was startling.

Tweaking the Model 5's bass adjustments also conferred a significant increase in midrange clarity. It was as though stripping away the mid-bass thickness allowed the midrange to open up and bloom. I've heard this phenomenon before when positioning loudspeakers, and also with DSP room-correction systems. Getting rid of bass colorations gives instruments in the midband more room to breathe. Overall, the ability to dial in the bass to a particular room was a powerful tool that allowed the Vandersteen to reach that next level of musical performance.

In absolute terms, the Model 5's overall perspective was on the laid-back side, with a slightly soft treble. Vocals didn't project forward into the soundstage the way they do with some loudspeakers; instead they stayed in line with, or slightly behind, the loudspeaker plane. In this regard, the Model 5 was somewhat less vivid and immediate than most loudspeakers, which some listeners may interpret as a reduction in excitement and detail. For me, however, the lack of midrange and treble aggression tended to pull me into the music rather than keeping me at arm's length. Moreover, the smooth tonal balance made the Model 5 utterly unfatiguing; I could listen at fairly high volume for hours without that telltale sign of fatigue: a sense of relief when the music is turned down.

The treble was clean and smooth, with low levels of grain. The extreme top-end wasn't quite as open and airy as I've heard, but this slight reduction in top-end bloom was a small price to pay for the utterly natural way in which the treble integrated with the rest of the spectrum. Turning on the rear-firing tweeter (at its lowest output level) worked well in my room, restoring some openness and creating a more expansive soundstage. I heard no drawbacks from engaging the rear-firing tweeter.

I don't want to suggest that the Model 5 is over-

ly soft, rolled off, or lush. On the contrary, it resolved well without sounding artificial or hyped. Instrumental timbres were liquid without sacrificing inner detail. Specifically, woodwinds lacked the metallic sheen and glare in the upper registers that can obscure their body. (Listen to Paul McCandless' oboe on Oregon's *Beyond Words* [Chesky 130]. Saxophone was rendered with a wonderful warmth and body, the antithesis of thin and hard. Coleman Hawkins' tenor on the new reissue *Bean Bags* had a burnished, almost smoky, quality that suggested the instrument's size and shape. (This disc is one of six superb HDCD reissues from Koch Jazz taken from the Atlantic Jazz catalog and transferred from the original analog masters.) The Model 5's rendering of timbral shadings, overall tonal balance, and spatial perspective were similar to that of live music, which generally sounds less vivid than most reproductions.

Although easy to listen to, the speaker never shortchanged me on musical detail. A quick listen may suggest that the Model 5 is less resolving than many High End contenders, but the Model 5's strength lies in resolving musical information in a subtle, understated way. I could listen deeper and deeper into the soundstage's inner recesses and still discover more fine detail. With each shift of my attention, I was rewarded with a wealth of newfound musical information. This experience never occurs with aggressive loudspeakers that make my ears batten down the hatches under a barrage of hyped detail.

I wrote this paragraph a few days ago and had been thinking of other words to express the Vandersteen's subtlety in presenting detail. Then I received Issue 117 and read HP's observation on resolution, which fairly jumped off the page: "One should never be aware of the resolution of a piece of audio gear, as opposed to being aware that one is able to listen more deeply into the textures of the instruments and the musical line itself." That thought perfectly described my experience with the Model 5, and crystallized my thinking about why it let me "listen more deeply into the textures of the instruments and the musical line itself" without sounding overtly detailed.

The Model 5 handled full-scale orchestral music surprisingly well. I say surprisingly because it usually takes a huge loudspeaker (such as the Genesis 200) to convey fully the size and scale of symphonic music. To hear such a large, full-bodied, and dynamic presentation from a moderately sized cabinet was a revelation. At times I heard what I thought were the Model 5's dynamic limitations as a hardening of timbres and congestion of the soundstage. It turned out that it was actually the 100-watt per channel Audio Research VT-100 Mk II running out of power. When driven by the ARC Reference 600s' 550 watts of tubed power, the Model 5 retained its composure at any sane listening level. Although loudspeakers with first-order crossovers are more prone to dynamic congestion, I heard virtually none with the Model 5.

Finally, the Vandersteen's soundstaging was exceptional by any standard. The presentation was at times significantly wider than the loudspeaker boundaries, with almost a wrap-around effect to the sides of the listening room. This effect is quite fragile,

however, and the room must be carefully treated. (The Avalon Eidolon is magical in this regard, throwing a tangible soundstage almost all the way around the listening position on some recordings.)

Image outlines tended to be somewhat diffuse rather than razor sharp. Where the Eidolon presented images as crisp outlines surround by a bloom of air, the Model 5 tended to slightly diffuse the transition between the image and the surrounding bloom. Nonetheless, it was superb at separating instrumental images from one another and from the surrounding acoustic. In addition, depth was presented with fine gradations – almost along a continuum, rather than in several discrete layers.

The Eidolon provided an interesting point for comparison with the Model 5. The Eidolon is, in my view, a significant step forward in the loudspeaker art in terms of midrange transparency, resolution, and soundstaging. It seems to let you hear the music as existing in space, rather than as coming off a pair of loudspeakers, to a greater degree than any other system I've heard. So how does the Eidolon compare overall with the Model 5?

Surprisingly, I regard the Vandersteen, at half the price, as in the same general league as the Eidolon in terms of overall musical experience, although the two are different sonically. As good as the Eidolon's bass is, the Model 5 excels in extension, authority, and, slightly, in pitch definition. Further, the Model 5's bass adjustments allow the Vandersteen to have a smoother in-room response and seemingly greater dynamic agility.

The midbands of the two loudspeakers exhibited the most difference. The Eidolon was more forward in the upper mids, had greater resolution, was quicker, more transparent, and produced an eerie sense of presence. Transient information was faster and cleaner through the Eidolon, which gave a greater feeling of the loudspeaker disappearing. Moreover, its soundstage was wider and had more precise image focus. The Eidolon also had a greater sense of treble extension – that impression of air in the top octave that forms a halo at the soundstage's edges.

The Vandersteen was, however, more tolerant of grain or brightness in electronics and sources. The Eidolon was, by contrast, ruthlessly revealing of any imperfections in the signal feeding it. The Model 5 can thus be matched with lesser electronics and, by virtue of its integral powered woofer, a lower powered amplifier.

Two friends of mine are independently in the market for a world-class "last speaker I'll ever buy." When I mentioned the Model 5 as a possible candidate, their separate reactions were identical: less than enthusiastic. They wanted a loudspeaker with impeccable credentials and a pedigree from the upper echelons of the High End. Vandersteen was simply not "High End" enough.

That's unfortunate because the Vandersteen 5 is fully the equal of – and better than in some respects – many of the High End's most vaunted loudspeakers that sell for several times the Model 5's price. Its market acceptance may be hindered by Vandersteen's reputation for building affordable, workmanlike speakers for a rel-

atively large audience.

But in terms of musical performance, the Vandersteen Model 5 is truly world-class. In fact, the Model 5's sound quality, and the emotional involvement in the music that sound quality engenders, is among the highest I've experienced as a reviewer. For the record, the other systems I rank at the top of my list are the Avalon Eidolon, Genesis 200, and Avalon Radian HC (driven by Spectral amplification and front end), all of which I've reviewed and lived with. I've also heard the most highly regarded ultra-expensive loudspeakers at shows and dealers; although these monsters can reproduce a drum kit 10 dB louder than the real thing (which isn't the Model 5's *raison d'être*), I remain less than impressed by them as vehicles for connecting with the music.

I spent three weeks with the Model 5 driven by an Audio Research VT-100 Mk II power amplifier (100 watts, \$4,995) before switching to the updated ARC Reference 600 Mk II power amplifiers (550 watts, \$36,000 per pair). Although the VT-100 Mk II was a good match for the Vandersteen, the Reference 600 was staggering. As great an amplifier as the Reference 600 is, I never thought it was overkill on the Model 5; the Vandersteen fully resolved and exploited the magical qualities of these \$36,000 reference amplifiers. Although the Model 5 is tolerant of mediocre electronics, I wouldn't hesitate to match it with top-notch amplifiers and sources. This experience speaks volumes about the Model 5's resolving power and overall quality; a lesser loudspeaker would not have thrown into such sharp relief the differences between these two superb amplifiers.

Conclusion

The Vandersteen Model 5 is a landmark product not because it establishes some performance benchmark in specific areas, but because it adeptly combines strengths in every area to create an immensely musical experience. This loudspeaker simply has no glaring flaws.

No, the Model 5 doesn't have the massive transient attack of a Wilson X-1 Grand Slamm, the ease, grace, and utter effortlessness on orchestral climaxes of the Genesis 200, nor the almost spooky midrange transparency and clarity of the Avalon Eidolon. What the Model 5 does, however, is balance what's musically important to create a presentation in which the overall musical result is greater than the sum of its sonic parts.

Manufacturer Information

Vandersteen Audio
116 West Fourth Street
Hanford, California 93230
Tel: (559) 582-0324
Website: www.vandersteen.com
Source: Manufacturer loan
Warranty: One year parts and labor (extended to five years parts and labor at no charge)
Frequency response: 22Hz-30kHz +/-2dB
Sensitivity: 87dB at 1 meter, 2.83V input
Impedance: 6 ohms nominal, 4 ohm minimum
Supplied Accessories: Spikes, spike spacers, AC cords, trim tool
Price: \$9,800-\$12,800 depending on finish; high-pass filter modules - \$595 unbalanced, \$795 balanced

Associated Equipment

Front End: Krell KPS-25s; Parasound CDP-2000; Arcam Alpha 9. Line-stage preamplifier: Audio Research Reference One; preamp section of Krell KPS-25s. Power Amplifiers: Audio Research VT-100 Mk II; Audio Research Reference 600 Mk II. Interconnects: Cardas Neutral Reference; AudioTruth Diamond; Straightwire Crescendo. Cables: AudioQuest Dragon 2 and Dragon + bi-wire. Accessories: Monster Cable HTS-2000 AC power conditioner; MIT Z-Stabilizer II; MIT Z-Center; MIT Z-Isolator HC; MIT Z-Cord II; Billy Bags 5500 equipment rack, ASC Tower Stouts; Tower Slims; and 16 Full-Round Tube Traps, RightWay Audio Suspensors.

One area in which the Model 5 did set a benchmark, however, was its bass. The combination of extension, weight, authority, dynamic fidelity, and pitch articulation without bloat or thickness was revelatory. Moreover, I suspect that the bass adjustments will make it possible to realize this performance in a variety of rooms.

Although this speaker can compete musically with virtually any on the market, the haymaker for me was its price and size. Its real achievement is delivering world-class performance for \$10,000. Throw in the moderate cabinet dimensions, ease of placement, room-matching provisions, and ability to be driven by

medium-sized amplifiers, and the Vandersteen Model 5 looks awfully hard to beat.

ROBERT HARLEY

Robert Harley, Technical Editor, Audio, for our sister publication, The Perfect Vision, was Consulting Technical Editor of Stereophile and Technical Editor of Fi. He has written extensively on digital audio and has published two books, The Complete Guide to High End Audio and Home Theatre for Everyone. He has worked as recording and CD mastering engineer. He will be contributing reviews, both Upstairs and Downstairs.