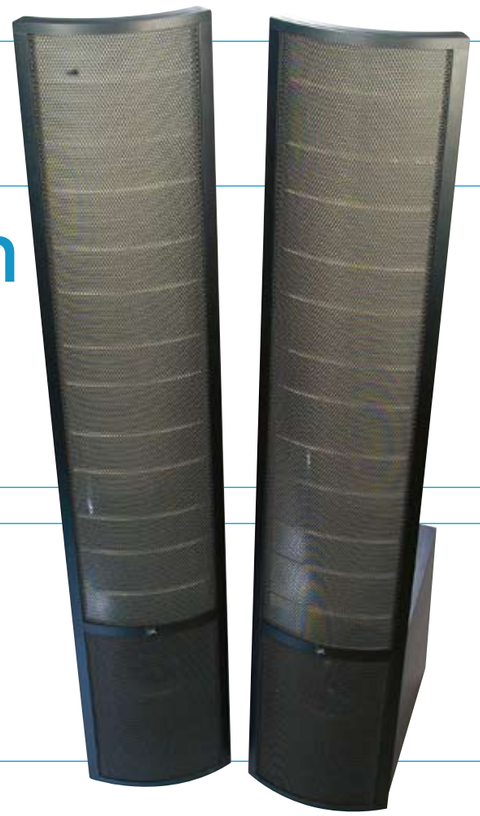
MartinLogan

Vantage Electrostatic Loudspeakers



MartinLogan

Brand: MartinLogan
Model: Vantage
Category: Electrostatic Loudspeakers
RRP: $10,995
Warranty: Five/Three Years
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Electrostatic loudspeakers are the Holy Grail of hi-fi. Audiophiles agree that the perfect electrostatic speaker would be superior to all other loudspeaker types except, perhaps, the perfect plasma speaker!

So far, no-one has yet developed the perfect electrostatic loudspeaker, but the company that's come the closest is undoubtedly US-based MartinLogan, which started building superior electrostatic speakers more than two decades ago and has been improving them ever since.

And the perfect plasma speaker? Plasma's high-voltage operation, uncontrollable continuous radio-frequency emissions and poisonous gas leakages are just three of the so-far insurmountable problems that have crippled the production of commercial plasma speakers, and in my view, they're problems that are not going to go away anytime soon.

MartinLogan's new Vantage incorporates several technologies that have previously been available only in MartinLogan's top-of-the-line electrostatics. Two of these are XStat and ClearSpar. The Vantage takes its XStat frame from the higher-priced Summit and its ClearSpar spacers from the flagship Statement e2.

The Equipment

In an electrostatic speaker, sound is produced by an ultra-thin membrane of coated plastic (the diaphragm) that is forced to move backwards and forwards by high-voltage electrodes (called stators). The perforated panels at the front and back of the Vantage are the stators. Between them is the diaphragm, though on the Vantage, because the diaphragm is extraordinarily transparent, it's difficult to see in the flesh, much less in our photograph.

Electrostatic speakers have numerous advantages over conventional dynamic speakers. Chief amongst these is that the diaphragm is so thin and light (127 microns thick) that it has virtually no inertia, and can start and stop almost instantaneously. Then there's the fact that the stators drive the membrane uniformly over its entire area: so there are none of the standing waves or spurious unwanted movements that affect conventional cone and dome drivers. Electrostatic panels are also naturally dipolar, so their dispersion mimics that of most musical instruments.

Yet another advantage is that there's no need for a crossover network: a single electrostatic panel can cover the entire frequency range if necessary—though in the Vantage, MartinLogan uses electrostatic technology only for frequencies above 400Hz: Frequencies below this are handled by a conventional 203mm diameter aluminium-coned moving-coil bass driver. There are two reasons for this. The first is that because of the dipolar nature of an electrostatic panel, the bass produced on one side of the panel actively cancels the bass from the other, so bass output falls with diminishing frequency. This characteristic can be solved in other ways but in this Vantage, MartinLogan has, for reasons of cost-effectiveness and panel size, elected to use a conventional dynamic driver as the solution.

Most electrostatic panels are flat, which dramatically limits their horizontal dispersion, and is one reason there aren't more electrostatic speakers on the market. MartinLogan curves the Vantage's panel using a proprietary process, effectively solving this problem. It refers to this aspect of its design as CLS (Curvilinear Line Source). Another problem that has prevented the mass production of electrostatic speakers is the application of the conductive coating on the membrane that's necessary so the stators have something to 'drive'. If the coating isn't perfectly applied across the entire membrane, there will be 'dead spots' on the panel's surface. The Vantage's diaphragm is made using a new process in which the conductive surface coat is applied in an oxygen-free argon-filled chamber using a plasma bonding process. This bonds the molecules of the coating to those of the polymer of the membrane, rather than merely acting as a surface coat, as in previous membranes. The result is what MartinLogan calls its 'Generation 2' diaphragm.

MartinLogan's stators are also unique. Because the membrane is positioned between the stators, the sound it produces needs to travel through them before you can hear it, so the stators have to be acoustically transparent. Improvements in materials technology have enabled MartinLogan to increase both the size and number of perforations in the Vantage stators to maximise the 'useful playing area'. This is what MartinLogan calls its 'MicroPerf' stator technology. The improvement is so significant that MartinLogan says the useful playing area of the Vantage panel is the same as that of earlier electrostatic loudspeakers with panels almost twice the size.

There's another, not-so-publicised advantage to the MicroPerf stator, which is that it makes it easier to vacuum the speakers. Vacuum the speakers? Unfortunately, when an electrostatic diaphragm becomes dusty, it can give off a soft 'hissing' sound—not to mention that the layer of dust increases the mass of the diaphragm, rolling off the high-frequency response. So for maximum performance, you should vacuum the Vantage's panels at least four times a year: even more if you're in a dusty environment. The speakers should be turned off at least eight hours before being vacuumed, to allow time for the electrostatic charge to dissipate, and the small brush attachment on your vacuum cleaner should be used. Note that the speakers should be turned off not for safety reasons—you can't get an electric shock from the Vantages, even if you touch the stator with your fingers—but so that the dust releases from the membrane more easily. If you leave the power on, the dust will seem to 'stick' to the panels.

MartinLogan says the voltage build-up in its speakers is 'ten times less than the static electricity that builds up on the surface of your television screen.' In the Vantage (and in other current MartinLogan designs) MartinLogan has a sensing circuit that switches the charge off when the speakers are not being used simply to prevent dust from being attracted to the panels. Unfortunately, the circuit has no energy-saving advantage. Each Vantage panel will consume about 8-watts of your mains power when no audio signal is present, irrespective of whether the high-voltage circuitry is active or not.

Because of the large panel sizes common in early-model electrostatic loudspeakers, even long-time audiophiles think all electrostatic loudspeaker designs are large. If this sounds like you, get ready to be surprised by how small the Vantages are. Their measured physical dimensions are 1447 × 273 × 413 mm (HWD) which isn't that large to begin with, but that 273mm depth comes from the bass enclosure at the bottom of the panel, which extends upwards only a little way, as you can see on the photograph—and check for yourself in the flesh! Above this point, the Vantage is only a few centimetres deep, and even this is because of the way the panel is curved: the panel itself is even thinner.

The thinness of the panel is the result of advances in adhesive technology. Whereas early-model panels were arc-welded to ensure rigidity, MartinLogan now uses adhesives developed for aerospace applications to assemble the stators and ClearSpar spacers. It says these adhesives produce bonds that are stronger than those created by welding.

Listening Sessions

The curvilinear MartinLogan panels may have freed up listener position in the horizontal plane, broadening the sweet spot dramatically, but the Vantages still need to be positioned very carefully to ensure the best possible sound, because vertical dispersion is still restricted. The vertical dispersion is very good, but you will hear a 'sweet spot' to the sound from the centre of the panel, so if you're sitting three metres from the speakers, the ideal 'ear height' will be around 90cm or so. Because the panels slant back slightly when the base of cabinet at the bottom is parallel with the floor, the ideal ear height will drop as you move closer to the speakers and rise as you move further away. You can use this interesting fact to compensate for seating height, if you like. Otherwise, if your seating height and speaker-listener distance are unable to be altered, you will need to tilt the speakers using the adjustable spikes provided specifically for this purpose. You will also have to experiment

choose your favourite vocalist: the Vantages will deliver his or her voice pure and direct, without any overtones, sibilances, chesty underpinnings, or any of the myriad flaws that plague speakers that use conventional dynamic drivers.

with how far you place the speakers from the rear wall because, due to the dipolar nature of the radiation, the potential for interaction between the reflected sound and the direct sound is substantial. In almost cases, you'll find—as I did—that the Vantages will work fine placed 20–30 cm from the rear wall. To its credit, MartinLogan devotes five full pages in its manual to speaker positioning and room effects, to the extent of actually giving mathematical formulas (based on ceiling height and room width) for determining the best position for the Vantages in your room.

When positioning the Vantages in Australia, given that many homes in this country have large sliding glass windows, usually positioned to best take advantage of the sun, bear in mind that it's best if the speakers are not positioned where they'll have extended exposure to ultraviolet (UV) radiation. In practise, this means you should not position them where they'll be exposed to direct sunlight. If the sunlight is coming through glass, the UV will largely be removed, but for the longest service life possible, I would recommend positions that are well clear of windows that get a lot of sun.

Wiring up the MartinLogans I was delighted to find the best-designed speaker terminals I have ever run across. They're shaped like wings, rather than being hex-shaped—or worse, round—so they're superbly easy to tighten. Unfortunately, the speaker posts don't have holes in them, and there's not a lot of 'grip' underneath the wings, so unless you have very thin speaker wire, most of it won't make contact with the terminal. In this case, you'll need to terminate your speaker wires with spades. MartinLogan could certainly improve this aspect of design.

Don't forget that you're going to have to run a 240-volt cable to each of the speakers, which supplies the power for the electrostatics, as well as for the 200-watt amplifier that drives the bass driver. Not that you can be complacent about the amplifier you use to drive the Vantages. Their nominal impedance is 4Ω, which is towards the low side in any case, but impedance drops to just 1Ω at 20kHz, so any amplifier you use will need to be capable of handling such a load. I don't think this is much of an issue, since it seems reasonable to assume, given the price of the Vantages, that they will be used with a high-quality, audiophile amplifier or receiver. I also learned that you can't assume that just because the Vantages are 93dBSPL efficient you'll be able to use a low- to medium-powered amplifier. I found the Vantages effortlessly soaked the output from a 100-watt amplifier and begged for more. In the process of determining performance with different amplifiers I connected a Class-D (digital) amplifier, which turned out to be a mistake: to my ears, this was a match not made in heaven. So far as the MartinLogans are concerned, it's 'linear-amplifier-only' territory… in other words, amplifiers with conventional Class A/B output stages. You will also have to keep a weather eye out for hum caused by earth loops. One of the amplifiers I trialled while preparing this review created just such a loop when connected to the Vantages, resulting in a quite loud, pervasive 50Hz hum, so this is something else to be taken into consideration when selecting ancillary equipment. (It was the only amplifier of the five I tried that created an earth loop.)

I have probably made it sound selecting an amplifier a little more difficult than it will really be in practise, because in real life whoever is selling you a pair of MartinLogan Vantages will have worked all of the foregoing out already, so when you audition them for the first time, you'll be listening to a pre-tuned, synergistic system. You'll be in for a treat, so don't forget to take your favourite CDs, lunch, dinner and a sleeping bag, because if you're anything like me, you'll find it difficult to tear yourself away from the Vantages. I started the session intending to run through my standard set of audition tracks, and my current 'heavy-rotation' discs, but found myself playing discs I hadn't played in years, just to see how they'd sound on the Vantages. To my enormous regret, every disc I played sounded wonderful. Why to my regret? Because my house is so close to the sea that unless I kept the windows permanently closed, the diaphragms of any electrostatic speakers I owned would very rapidly quickly acquire a light crusting of salt, which wouldn't do much for the sound!

To hear the Vantages at their best, I'd suggest starting out with acoustic guitar: popular, classical, jazz… it really doesn't matter. Close your eyes and if you're not convinced the guitarist isn't playing in the room with you I'll… um.. well it won't come to that, because you won't fail to be convinced. I listened to the famous Slava Grigoryan: I still can't get over his CD 'Sonatas and Fantasies', in particular his arrangement of Nicolo Paganini's *Caprice in A Minor* (Op 1 No 24): it was one of the few times I have ever agreed with ARIA (it won the ARIA award for Best Classical Album in 2002). The immediacy of the guitar sound is breathtaking, and the blush of the string sound captivating—you can really hear the heart of the guitar. Grigoryan's technique is faultless and his playing not only inspired but also still improving. This must partly be due to his willingness to range across almost every music style, in partnership with a bewildering array of equally talented musicians.

From here it's a natural step to vocals, and once again, simply choose your favourite vocalist: the Vantages will deliver his or her voice pure and direct, without any overtones, sibilances, chesty underpinnings, or any of the myriad flaws that plague speakers that use conventional dynamic drivers. The MartinLogans are also highly forgiving of the acoustic in which the voice was recorded. If it's a dry recording, the dipolar nature of the sound will repair the 'deadness': if it's a live recording, you'll hear the venue re-created in front of you. At least a part of this magic must surely be that the sound doesn't have to straddle an awkward 'crossover point' and make the transition from a midrange driver to a tweeter (or worse, from a bass/midrange driver to a tweeter!). From 400Hz up, you're listening to just one single driver.

MartinLogan has done wonders with the bass, but even ML can't work miracles, and while the bass is certainly very satisfying, more than sufficiently loud to match any SPLs the panel can deliver, and with more than enough low-frequency extension to reproduce the lowest notes of any musical instrument (with the exception of some pipe organs), the delivery of bass 'power' seems to elude it: perhaps this will forever be the preserve of very large drivers in equally large cabinets.

Conclusion

MartinLogan's Vantage electrostatics are certainly not for the faint-hearted: careful positioning will be required, along with meticulous selection of associated equipment—particularly amplification—and regular vacuuming will almost certainly be required. The pay-off will come every time you settle down to listen to music, when you'll realise it's all been worth it, and that all is right with the world. It's the first time I've ever felt envious of those who don't live by the sea…

greg borrowman

LAB REPORT

Readers interested in a full technical appraisal of the performance of the MartinLogan Vantage Electrostatic Loudspeakers should continue on and read the LABORATORY REPORT published on the following pages. All readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Test Results

Figure 1 shows the frequency response of the MartinLogan Vantage measured with a pink noise signal. The response is particularly flat between 2kHz and 20kHz then rolls off to 35kHz before starting to rise slightly to 40kHz. (That 40kHz is the measurement limit: the Vantage's frequency response actually extends beyond 40kHz.) Below 2kHz the response rises by 2.5dB, which would tend to give the midrange some prominence, before returning to reference at 150Hz. The response rises again below 150Hz to peak at around 40–60Hz approximately 7.5dB above reference, which would certainly have an effect on lower-pitched instruments. You can eliminate this peak by turning down the volume of the bass driver, but if you do this, you'll lose bass below 40Hz. As plotted on the graph, the MartinLogan Vantage has a frequency response of 28Hz to 28kHz ±5dB.

Figure 2 shows the impedance of the MartinLogan Vantage. As you'd expect for an electrostatic design, the traces for the left and right speakers are almost identical, though I was interested to see the deviation between the left and right speakers above 15kHz. I didn't expect this and have no explanation for it, but it's not significant. What is significant is the very, very low impedance at 20kHz, where it dips well below 1Ω. There are many amplifiers whose automatic protection circuits will activate when presented with such a load, so you'll need to ensure that if you plan to connect the Vantages to an existing amplifier that it will happily drive them. *Steve Holding*

Figure 1: Pink noise frequency response (unsmoothed) at one watt at 1.5 metres.

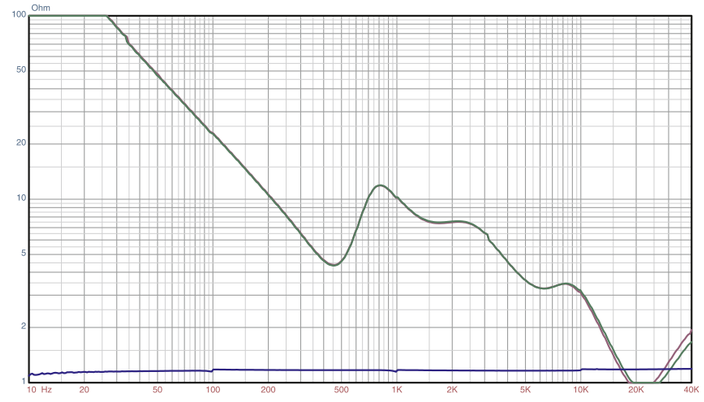

Figure 2: Impedance vs frequency, with both left and right speakers graphed (see copy). Trace under is that of a reference 1Ω precision resistor, measured at the same time for calibration purposes.