

# Sonique Diamond

## 550 Reference Monitors



**Most Australian loudspeakers are not actually 'manufactured' in Australia.** Sad but true. For at least the last twenty years this has been because there have been no large-diameter high-quality bass or midrange drivers made in this country since Plessey/Rola shut up shop in the early 70s... with the sole exception (to the best of my knowledge) of those drivers manufactured by Loran, which is based in Melbourne. Loran builds primarily large-cone bass drivers, and it's my understanding that the company's complete production is absorbed by the professional audio market.

So for some time now, Australian manufacturers have been sourcing their drivers from overseas: Sweden, Denmark, France, Germany and, more recently, Taiwan, Korea and China. Despite this, until very recently, at least the cabinets have been built in Australia, either by specialist independent cabinetmakers or by the speaker manufacturers themselves. However, even that is now going by the board. Many Australian speaker

manufacturers are now having their cabinets built in China and inserting the drivers and crossover networks locally. A few are having their speakers built entirely in China.

South Australia's Sonique Audio, headed up by Steve Lund, is one of the exceptions to the rule. Yes, Sonique imports the drivers it uses in its designs (in this case, from Denmark) but the crossovers are hand-built in South Australia by Sonique itself... as are the cabinets. The Diamond 550 is the first in a 'new generation' of Sonique loudspeakers, which is signified by a shift away from the familiar 'X.X' -style numbering system that has served the company so well over the past 14 years. The Diamond 550 assumes the spot in Sonique's range formerly occupied by the Model 4.5. Lund was keen to make it quite clear to me that I should not expect a flood of new products from Sonique, because its 'next generation range' was evolving very, very slowly. 'Engineering

loudspeakers is such an unknown' he said. 'Some products never come to fruition.'

### The Equipment

**The Diamond 550** has certainly come to fruition, and in a most alluring way, thanks to the multi-faceted cabinet—indeed it's the facets on the cabinet that inspired the model name, because the cut of the angles looks rather like the cut of the facets on a diamond. The word 'diamond' is used as a model name by several of the world's most famous loudspeaker manufacturers, but when I raised this with Sonique, the company didn't think it was an issue. 'In the end, there's probably nothing out there that's unique, so we're comfortable with calling it the Diamond,' said Lund.

The complex cabinet shape isn't only easy on the eye, it has several practical and acoustical advantages. On the acoustics side, the non-parallel walls mean there are fewer internal standing waves and superior control over diffraction at the edge of the baffle. From

## Sonique

Brand: Sonique  
Model: Diamond 550  
Category: Loudspeakers

Warranty: Five Years  
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a practical standpoint, it means Diamond 550 can be mounted on its end, like a mini-tower, or laid on its side. When laid on its side in this way, the front baffle is tilted upwards, making it possible to use the Diamond 550 as the centre-channel in a home theatre speaker system.

However, if you plan on using it in this application, be aware the drivers are not magnetically shielded, so the speaker should not be used near a conventional CRT TV. Sonique says that its research showed most Diamond 550 buyers would have plasma or LCD screens (or a video projector), so the company didn't consider the lack of shielding an issue.

Sonique has, however, responded to consumer concerns about health, with the result that it no longer uses the lead linings that were a feature of earlier Sonique products. It has instead switched to using Barium-loaded PVC as an internal lining material (SE models only). Indeed, it has eliminated lead from its speakers entirely, even to the extent of using lead-free solder. Also, rather than using fibreglass (listed in the US as a potential carcinogen) for internal damping, Sonique instead uses pyramidally-shaped foam cut to its own design.

The Diamond 550 is a three-driver, two-way design, using the famous D'Appolito geometry that places the tweeter midway between the two bass/midrange drivers. Sonique rates the diameter of the bass/midrange drivers at 134mm, which is the minimum diameter of the chassis, which is more ovoid than round, as you can see in the photograph accompanying this review. The critical Theile/Small diameter of each cone is 106mm, for an effective cone area (ECA) per driver of 88cm<sup>2</sup>. So, because there are two drivers, the total cone area of the system would be 176cm<sup>2</sup>, which is equivalent to the area of a driver with a Theile/Small diameter of 150mm, which is what you could expect to find in a driver with a nominal diameter of around 185mm.

The driver cones are made from Nomex and bonded to the rubber roll surrounds in such a way that the roll surround follows the angle of the cone,

rather than bulging away from it, unlike a standard 'half-roll' surround. The centre dustcap hides the fact that venting holes are punched in the cone close to where it joins the voice-coil former, and the dual-layer, 26mm diameter copper-clad aluminium voice-coil is exposed underneath the spider, so there can be no question of any unwanted heat building up in the motor assembly. The large unshielded driver magnet, which sports a 'shorting ring' to reduce distortion, is supported by a heavy-duty cast alloy frame. The wires that link the drivers to the crossover are very heavy-duty with clear sheathing, and soldered at both driver and crossover.

The large crossover network is all hard-wired and thermoglued to a section of MDF fixed to the bottom of the Diamond 550 cabinet. Two air-cored low-loss inductors are cross-mounted so there can be no interaction between them. There are also two high-voltage metalised polypropylene capacitors, a bipolar electrolytic and three ten-watt ceramic resistors. These all result in a minimum phase first-order (6dB/octave) network with a nominal crossover point at 2.8kHz. Sonique says the network tolerance is better than 2 per cent.

Crossover is to a Vifa XT25 controlled directivity dual-concentric ring radiator tweeter: a tweeter that is immediately recognisable from its unique wave-guide central plug. This tweeter has a dual rear chamber and the version used by Sonique eschews the use of ferrofluid for damping. The fact that the unusual waveguide on the XT25 makes it instantly recognisable is something I commented on to Steve Lund, who informed me that although the XT25 in the Diamond 550 'is the real McCoy' I should not be so quick to jump to conclusions. He told me that there are now many XT25 'look-alikes' available where the imitators have copied the external appearance of the XT25, but not the performance, so that it is no longer possible to simply assume an authentic Vifa XT25 is being used, simply by glancing at the front baffle.

The Diamond 550's bass reflex enclosure (the 165mm long, 65mm

diameter port exits through the rear panel) is built entirely from 20mm MDF that can be finished with your choice of Atlantic Jarrah, Tasmanian Oak, Black Oak (standard versions) or 'Espresso' (SE version only). The cabinet is 525mm high, 210mm wide and 270mm deep. Sonique specs the design with a frequency response of 55Hz to 20kHz  $\pm$ 3dB, a sensitivity of 90dB (at one metre with 2.83V across the terminals) and a nominal impedance of 4 $\Omega$  (3.3 $\Omega$  min at 200Hz).

### Performance

Don't be tempted by the fact that you can use the Diamond 550 as a centre-channel into thinking you can get away with using the same horizontal orientation when using them as conventional left and right channel speakers... or even as front main speakers in a home theatre system. It's possible, of course, but you'll get superior performance with the speakers arranged vertically, so the bass/midrange drivers are above and below the tweeter, rather than to either side. As for where you place them, a stand-mount position is preferred, but the Diamond 550s work remarkably well on a bookshelf and, although I didn't try it, I think they'd also be excellent candidates for wall-mounting, with appropriate hardware. I used them on stands that were about half-a-metre from my rear wall and of a height that put the tweeters level with my ears.

I didn't have to make any notes as to what I considered the strongest point of the Diamond 550's performance: it was immediately obvious right from the outset. Their imaging capability is second to none... quite extraordinary in fact. Fire



up the Janet Seidel Trio's CD 'Delovely' at the first track and you'll hear brother David and guitarist Chuck Morgan's introductory bars establish a performing stage that has true-to-life width and depth, then you'll hear the near-surround impression of the room acoustics as the audience starts applauding and then finally, when Janet starts into the verse: 'I feel a sudden urge to sing/The kind of ditty that invokes the spring/So control your desire to curse/While I crucify the verse...' her voice is so up-front and so perfectly focussed, with the piano (which she's playing) chiming in with beautiful tone, just behind her, that it'll take your breath away. (If you're a Cole Porter fan, you'll love Delovely. It's on the La Brava Label—[www.labravamusic.com](http://www.labravamusic.com).) For such small speakers, the Diamond 550s also do a wonderful job with image height, easily fighting well above their weight.

Bass output also punches well above its weight, with good extension for such a small speaker and a nice balance and high-end extension that saw it segueing beautifully with the top end. I listened entranced to the tone and volume of the bottom-most octaves of Ivo Janssen's Yamaha C7 as he played *Transcriptions of Bach's Concertos After Vivaldi and Others* ([www.voidclassics.com](http://www.voidclassics.com)). What little I thought was missing in sheer bass power was overwhelmed by the clarity and delicious spectral purity of the bass, with absolutely no muddiness or clouding of the bass lines. The high-frequencies were simply superb, to the point where it's easy to tell that Ivo should have clipped his fingernails before the recording session:

you can hear the ever-so-faint clicking as he curls his fingers on the keys!

One of my current faves for evaluating midrange reproduction is Janis Ian's CD 'Unreleased 3', many of the tracks on which were 'home recorded' direct to DAT with the result that you get a directness to the sound that just isn't captured on even the best commercial CDs. Listen to Ian's voice and guitar on the worktape of *Forever Blue*, and you'll hear instantly that the Diamond 550s would be right at home sitting up on the console in a recording studio, ready to reveal even the most subtle nuances of sound. (This CD is only available direct from [www.janisian.com](http://www.janisian.com), with all sale proceeds going to The Pearl Foundation charity, but I feel duty-bound to warn that some tracks source from cassette recordings and are best skipped in the interests of fidelity while one or two other tracks show why some recording engineers will end up burning in reverb hell.)

### Conclusion

If you'd prefer a small enclosure, but insist on sonic realism and wide dynamics, I think you'll find Sonique's new Diamond 550s a perfect fit. And if you're after great-sounding speakers for a home theatre system, I was so impressed by the performance of just a pair of Diamond 550s that I think if I'd had five in the room, plus a sub, I would have been blown away...

greg borrowman

### Test Results

The free-field frequency response of the Sonique Diamond 550 design, driven by a bandlimited pink noise signal, was measured as extending from 64Hz to 20kHz  $\pm 3$ dB, a very good result. It's likely that Sonique's specification, which puts the low-frequency  $-3$ dB point a little lower (55Hz) is the result of Sonique measuring the response in a room or using a somewhat more forgiving test stimulus than pink noise. In musical terms, the difference in extension is inconsequential: just two notes. The graph of this response (Figure 1) has been smoothed to 1/3rd octave post-measurement, for print clarity. You can see the response rises nearly  $+2.5$ dB above reference at around 150Hz, so that bass between 100Hz and 400Hz is very slightly emphasised. The dip between 2 and 6kHz is mostly due to a problem with microphone positioning when measuring D'Appolito arrays, because at the 'standard' measurement distance of just one metre there's frequency cancellation in this area that does not occur at normal listening distances. In this case, it's complicated by the fact that the Sonique Diamond 550 has a first-order crossover, rather than the usual D'Appolito third-order crossover.

The same measurement distance issues were evident in the gated sine frequency response, which shows essentially the same dip across the same frequency range. Note however that above 9kHz, where the pink noise trace appears to roll off (a function of the band-limited pink noise signal), the gated sine measurement stays within  $\pm 1$ dB out to 20kHz. (Although this particular graph stops at 20kHz, Australian HI-FI Test Laboratories has previously measured the response of the Vifa XT25 tweeter as extending to beyond 40kHz, so the same would be true in this Diamond 550 design.)

Figure 3 shows the nearfield response of both bass drivers (summed) and the rear-firing port. (Ignore the blip in the driver's response at 50Hz: it was caused by some mains hum in the measuring equipment.) You can see the bass driver's response is extended: easily within  $\pm 1$ dB between 100 and 300Hz and within 2dB between 90Hz and 500Hz. The port's peak output at 50Hz is a very close match for the driver's minima, which is a fraction above 50Hz, and the output

LAB  
REPORT


Readers interested in a full technical appraisal of the performance of the Sonique Diamond 550 Reference Monitors 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.

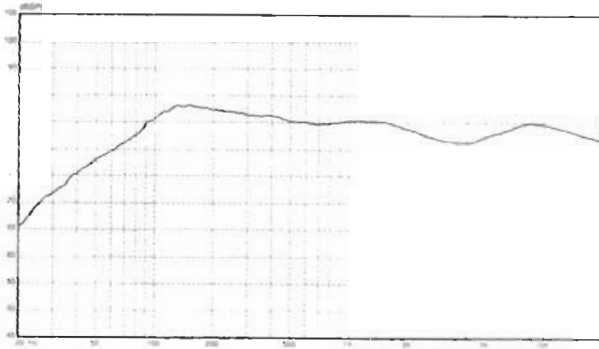
is spread over a fairly wide bandwidth. There is considerable leakage of sound through the port between 600Hz and 1kHz, with just 13dB difference in level between the reference trace at 800Hz—though because the port is rear-firing, this would be greatly attenuated at the listening position.

The impedance graph (Figure 4) shows

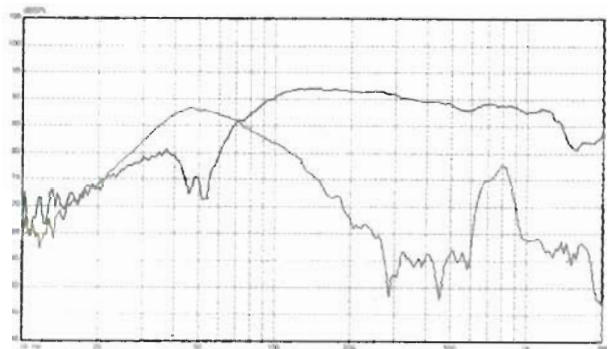
near-perfect matching of the left and right speakers, such that above 32Hz, the two traces look like they're just the one. The difference below 32Hz is tiny and inconsequential. I'd agree with Sonique's assessment of the design as being a 4Ω (nominal) load, but the graph shows the impedance as 3.4Ω at 200Hz, and 3.3Ω at 9kHz. The two bass resonant peaks are at

31Hz and 88Hz.

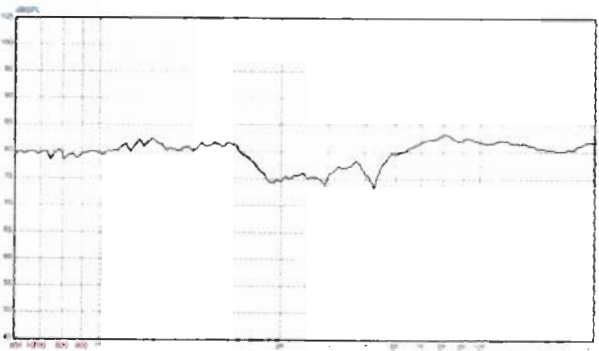
Speaker sensitivity, measured using *Australian HI-FI Test Laboratories* standard—very stringent and quite unique—test methodology, came in at 90dB SPL—exactly as specified by Sonique and putting the Diamond 550 design significantly above average in terms of efficiency.  Steve Holding



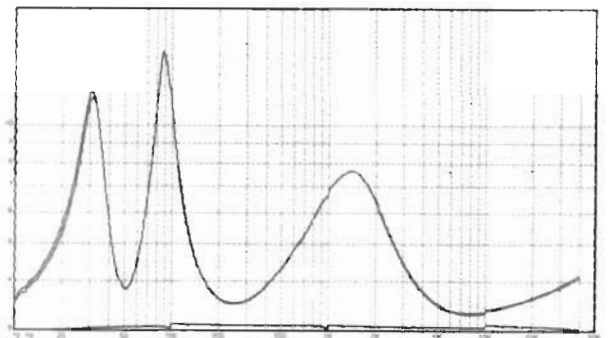
**Figure 1:** Pink noise frequency response (smoothed to one-third octave) at one watt at 1.0 metre.



**Figure 3:** Nearfield frequency response of both bass drivers and reflex port. [Note data for port has not been re-scaled to compensate for differences in radiating area.]



**Figure 2:** Gated sine frequency response (unsmoothed) at one watt, at 1.0 metre



**Figure 4:** Impedance vs frequency, with both left and right speakers graphed (see copy). Trace under is that of a reference 30Ω precision resistor, measured at the same time for calibration purposes

### SONIQUE NOTE

While the review measurements are excellent, it should be noted that Sonique loudspeakers will measure even better at a typical listening distance of 3 Metres, rather than the 1 Metre used in this review.

Tweeter to Woofer time alignment changes with listening distance and will therefore affect measurements. Sonique expects differences in sound pressure measurements, particularly in the crossover midrange region, when the measurements are made at 1 metre instead of the 3 metres that Sonique specifies.

Sonique designs, measures and performs quality assurance measurements at a meaningful distance of 3 metres on all products except subwoofers. Our own tests show that this produces excellent results for realistic listening distances.

For detailed Sonique specifications, please contact Sonique Audio or your Sonique Retailer.