



# ORPHEUS

## AURORA 1 LOUDSPEAKERS

The new Aurora range from local Sydney manufacturer Orpheus shows that its chief designer, Brad Serhan, has found it hard to shake the habits of a lifetime. The company's re-designed budget-priced Aurora 1 has most of the little tweaks you generally find only in high-end loudspeakers.

You don't find such tweaks in budget-priced speakers because although each one doesn't cost much on its own, they still increase the manufacturing cost, which in turn forces up the final retail price. To give one example, the screws that secure the Aurora 1's drivers to the front baffle are made from high-tensile steel rather than the usual 'hardware store' grade. Want another one? Not only do the Aurora's drivers have proper sealing gaskets to prevent air-leaks; the rear terminal plate does as well. (Most budget speakers don't have gaskets at all and if they do, they're only on the drivers.)

Serhan also hasn't been able to help himself with the rear terminal plate. Not only is it recessed into the cabinet, which gives a really neat,

flush-fit appearance, the plate also has bi-wirable gold-plated terminals, each of which accepts banana plugs.

Generally, the plate on most budget speakers has only a single set of chromed terminals and is screwed to the outside of the cabinet so it sits proud of it, rather than being rebated into it.

Inside the cabinet there is more of the same. The cabinet is built from 18mm medium density fibreboard (MDF) rather than ordinary 12mm chipboard, and all internal surfaces are covered in non-allergenic foam sheets.

So where has Orpheus made its economies? The quality of the bass driver and tweeter isn't quite up to the standard of those used in Orpheus' top-line models, but neither are these speakers cheap Chinese copies of famous brands. Built in Denmark, the 110mm diameter bass driver has a woven Kevlar cone and a very heavy, powerful (and shielded) magnet assembly. The 25mm silk dome tweeter also has a very large magnet assembly, but is distinguished from ordinary tweeters by having a

large chamber at the rear to improve its performance at the lower limit of its operating range.

It's the crossover network that shows the most definite signs of cost-cutting, because with just three components, it's the simplest electrical network Orpheus has ever built. Even so, there's been no skimping on component quality. The large, air-cored inductor is well wound with thick copper wire and on its own would cost more than the entire crossover network in many small bookshelf designs. Similarly, the 400 volt MKP polypropylene capacitors Serhan uses are rarely found in speakers at the Aurora 1's price.

Because of the 2.6kHz crossover frequency and the relatively high power-handling capacity of the tweeter (compared to the cheap neodymium-powered models that are commonly used at this price range), there's no music-numbing Protec device in sight. Orpheus says this crossover/driver combination results in '*minimal phase angle and a nominal impedance*

*of 8-ohms while maintaining a high sensitivity of 89dB SPL with a 2.83 volt input.'*

Take a close look at the two drivers on the Aurora's front panel and you'll see the bass driver's frame overlaps that of the tweeter. This is a clever way of getting the two drivers' acoustical centres closer without the expense of a specially moulded tweeter surround. It does, however, mean Orpheus has had to rebate the bass driver into the baffle, which costs more than just fixing it to the baffle surface, as happens with most low-cost speakers.

The bass driver is rated at 130mm, but has a Theile/Small diameter of 110mm, for an effective cone area of 95cm<sup>2</sup>, which isn't too bad for such a small cabinet (the cabinet is 280mm deep, 360mm high and 180mm wide). The driver's roll surround is made of rubber, which, although not quite as compliant as foam, will certainly last a lot longer. (Foam surrounds have a nasty habit of rotting away rather quickly in Australia's climate.) The driver chassis is tough ABS plastic, which means that if there's any flux leakage from the shielding (I couldn't detect any) it won't be directed along the support legs.

I usually expect to see very cheap cable and spade-lug 'quick-connectors' in small bookshelf speakers (even if it's an expensive, imported brand) so I was pleased to see Orpheus running true to form and using separate runs of high-quality multistrand cable from each driver to the crossover, and that the wire is soldered at both ends. This means there's no contact resistance to increase over the years, as can happen with spade-lug connectors.

To save you doing the math, the volume of the cabinet is approximately 10.7 litres, which is vented through a front-mounted port that's 100mm long and about 50mm in diameter. Unusually, this port is tapered along its complete length. It is flared only at the exit—no doubt another small economy on Orpheus' part.

In common with almost all speakers that are made right here in Australia (the giveaway to those that

are not is the phrase 'Designed in Australia', rather than 'Made in Australia'), the Orpheus Aurora 1s have a real wood veneer. I personally think that wood is rather wasted when the finish is Black Oak, as on my review samples, but it would certainly make the alternative Rosewood finish look stunning.

### Listening Sessions

If you're auditioning these speakers in a showroom, make sure the cabinets are arranged so that when you're looking at the speakers, the tweeters are at the outer side of the cabinet, so they're closest to the side walls. If they've been accidentally swapped around (in a busy showroom, it happens, trust me!) you won't be absolutely knocked out by the clarity of the imaging. I was warned in advance about this, but after listening to the Aurora 1s for several weeks, I thought I'd switch the speakers around, move them further apart, and then adjust my listening position until I found the sweet spot.

I was a little surprised to find that although I could still get a 'sweet spot', the imaging wasn't a patch on what it was with the speakers properly aligned. Visually, I thought the speakers looked better with the tweeters 'outside', but if you listen to your speakers with the grilles in place—as most people do—this side of it won't matter a jot. Incidentally, although I mostly listened without the grilles (when reviewing it's one less thing to unpack and re-pack) I thought that in the interest of thoroughness I should try it both ways, so I did, and can report that there's not much in it. Maybe the extreme highs are a little softer, but you'd only ever tell in a direct grilles on/grilles off A-B test, and even then you'd be hard-pressed to hear a difference. So do what you want to do with the grilles, and don't be dictated to by the audiophile police.

Where you should pay attention to the audiophile police is in the manner of mounting these speakers. Yes you *can* put them on shelves—or even mount them on the wall if you want—and you'll hear great sound,

but if you want to extract the maximum depth and airiness of which the Auroras are capable (and you'll find what they can do is quite breathtaking), do yourself (and them) a favour by mounting them on stands that let the speakers sit level, and bring the tweeters to ear level. These stands should be at least 50cm from a rear wall. (I found a metre worked better in my room.)

It didn't take more than the first track on the first CD I played through the Auroras to realise why Orpheus speakers are used in the edit suites at ABC radio stations throughout Australia, and in Channel 10's TV edit suites as well. The sound has that crisp clarity that's the hallmark of a great monitoring loudspeaker, making it easy to isolate individual sounds in

## ORPHEUS

**Brand:** Orpheus

**Model:** Aurora 1

**Category:** Loudspeakers

**Suggested Price:** \$825.00

**Warranty Period:** Five Years

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For additional information, turn to page 114 and circle 0361 on our Reader Information Service Card.

family, none is more beautiful or melancholy than the oboe'. On this CD there are 16 tracks that highlight the oboe's sound at its best, from Albinoni's *Oboe Concerto in D Minor* (the *Adagio*) to Ennio Morricone's *Gabriel's Oboe* (from the soundtrack to the movie *The Mission*) to modern works from Bernstein, Ross Edwards, Carl Vine and Graeme Koehne. If you're comparing the Auroras with another contender and using this CD, I suggest listening to the melancholy of the sound, rather than worrying about pitch or tone or any of the audiophile buzz-words like pace or timing. You'll actually hear the 'melancholy' through the Aurora 1s and I'd venture that if you can hear it as well through the other pair of speakers, you're going to have your work cut-out to make a decision between the two! (The CD is ABC Classics 980 046-3.)

I thought I'd try to give the Auroras a hard time with another new ABC release that's doing regular tray-time at my abode, Mike Nock's 'Big Small Band Live'. By 'Big Small Band' Nock means he's trying for a big-band sound whilst using only one instrument in each section, rather than multiple instruments. My only gripe is that because I think Nock is a master at extracting emotion from a piano, I'm disappointed he's playing keyboard on this release (admittedly a Kawai 9500!), but he *was* touring when this CD was recorded and I guess it's just not practical to cart a grand around on a tour. Anyway, dynamic and driving as the music on the CD is, it failed to give the Auroras a hard time at all, even when I cranked the volume up to levels I consider unfair for a small bookshelf design. I need not have worried: the Aurora 1s didn't think it was unfair—they sounded clean and sweet through it all.

Switching to disco-tinged rock revealed the Aurora's only limitation, which is that they can't go really loud at really low frequencies, so the 'thud' of a kickdrum is back in the mix, as are any synthesised underlying bass lines. Oddly enough, I thought this generally worked in the Auroras' favour, because such CDs are often mixed with the so-called 'beat' at an

artificially high level (recording engineers nearly always take advantage of the fact they can stuff a microphone inside the kickdrum), so the Auroras' slight roll-off tended to normalise the balance. Overall, my guess is that Orpheus has been able to extract pretty much all the low bass that's possible without compromising the woofer's performance higher up in the passband or over-taxing the bass reflex port.

I couldn't finish up this review without returning to mention the imaging again, if only to reinforce in your mind how good it is. It's fabulous. It's not just that you can hear instruments properly spaced across the stage, it's also that you can hear how high the sound sources are above the stage and their relative depth on the stage in relation to each other, and to your listening perspective. I was intrigued enough to pull out the *Stereophile* test disc where Atkinson walks around a hall dinging his bell and telling you where he is. Listening through the Auroras, I didn't need him to tell me where he was: I already knew.

## Conclusion

Orpheus's new Aurora 1 is an exciting speaker not just because of its great sound, but because in showing what it's possible to achieve at this price level, it will serve as a benchmark to 'keep the bastards honest', by which I mean other speaker makers who don't have quite the grip on what constitutes 'good sound' and 'good value' as the team at Orpheus. **AHF** *greg borrowman*

## LAB REPORT

Readers interested in a full technical appraisal of the performance of the Orpheus Aurora 1 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.

the mix. It's particularly noticeable on vocals, so is a great help when positioning microphones. Yet—and this is the important bit—the clarity never promotes any sharpness that would over-emphasise sibilants.

The other hallmark of a true monitor is frequency balance, and the Aurora 1 has that in spades, if you don't count the low frequency performance, where it's obviously a little bass-shy due to its smallish cabinet and bass driver. My listening sessions demonstrated that so far as the ear is concerned, the Aurora 1's response is very flat from at least A<sub>1</sub> (55Hz) to higher than high C (4.1kHz) and judging by the purity of the harmonics, extends easily out to 15kHz without any major digressions. I suspect that there are some small deviations in response that have been 'engineered-in' to improve the clarity I noted, but these do not detract from the overall uniformity of the response. Indeed they serve to demonstrate why the difference between a speaker that sounds good and one that sounds better can simply be a matter of tweaking one small section of the audio spectrum by a few dB in relation to another. This is something a measurement may never reveal but the ear can tell you straight away.

What all this means is that when you're listening to Diana Doherty's sublime new CD, *Souvenirs*, you'll hear an oboe sound that's second to none and I'd have to agree with Martin Buzacott's comment that 'Of all the instruments in the orchestral

# TEST RESULTS

## Test Results

I have started off with the gated high frequency response (Figure 1) first not just because it's delightfully flat and shows a superb off-axis plot, but also because I suspect that small, innocuous 'bump' at 1.5kHz is what's responsible for the speaker's seeming clarity and crispness with vocals, so contrary to Greg's assertion in his review, I believe these things can be measured.

I put the word bump in inverted commas in the previous sentence, because across the region of the graph shown, 600Hz to 20kHz, the on-axis frequency response of the Aurora 1 is  $\pm 2.5\text{dB}$ , so the bump is more of a blip, really. For those that need it spelled out, that's a very flat response. Notice how well the off-axis trace tracks the on-axis trace, meaning that although the level falls off very slightly for off-axis listeners, the tonal quality is identical. It's true that there's a small discrepancy between the two at 725Hz, but I doubt this would have any audible effect. Above 10kHz, of course, the off-axis trace rolls off fairly rapidly, but in a controlled way that means there's still useful output at 15kHz, which is close to the upper limit of hearing for pretty much everyone over the age of 30.

The pink noise graph shows the response right across the audio band and if you iron out the slight jaggies in the response at 160Hz and 80Hz caused by the acquisition method, shows the Aurora to be within  $\pm 3\text{dB}$

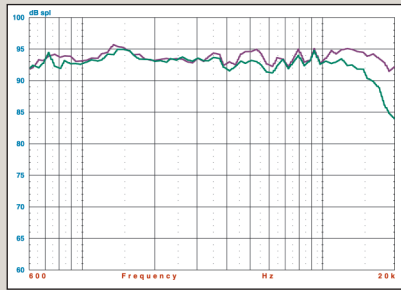


Figure 1. Gated sine frequency responses at one watt, at one metre. (On tweeter axis and 30° off-axis, horizontally.)

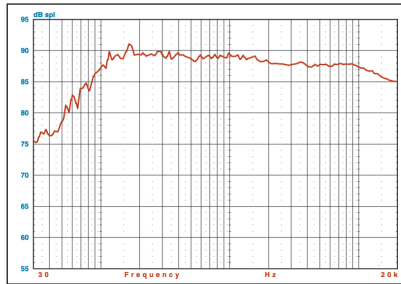


Figure 2: Pink noise frequency response at one watt at one metre.

from 70Hz to 20kHz. In an ordinary lounge room that treats the bass a little more kindly than the test environment used by *Australian HI-FI Test Laboratories*, I'd accept that you could tack a little more extension to the bottom end within this window, so Orpheus' spec of 60Hz is justified. And as Martin Colloms says in his book *High Performance Loudspeakers*: 'Every 10Hz of clean, uniform bass extension is worth having, is musically important, and adds value to the system.'

The same can't be said of the sensitivity rating of 89dB. Under *Australian HI-FI Test Lab's* standard test procedure, the Aurora 1 returned 86dB SPL. This is actually very good, because the wideband nature of AHFTL's test raises the hurdle somewhat for bookshelf speakers, but it's 1dB below 'average' and a good 3dB short of 89dB. It means you'll get audible benefits from increased amplifier power, though the performance will be fine even with as low as 30 watts continuous per channel. The impedance of the Aurora 1 (Figure 4) is controlled, falling below 7 ohms only at 10Hz and across the region 180–350Hz, so it's a really easy design to drive and will have any amplifier sounding its best. As you can see, the curve is 'classic' vented enclosure, with the fundamental resonances at 35Hz and 90Hz, and the

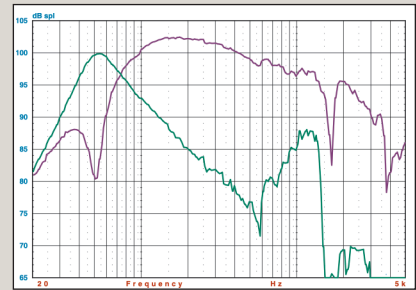


Figure 3. Nearfield frequency responses, showing bass driver response and port responses. (Note data for port has not been re-scaled to compensate for difference in radiating area. See copy.)

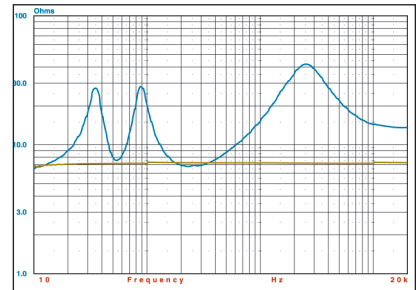


Figure 4. Impedance vs Frequency. (Second trace shows result for a precision 7-ohm resistor, for calibration purposes.)

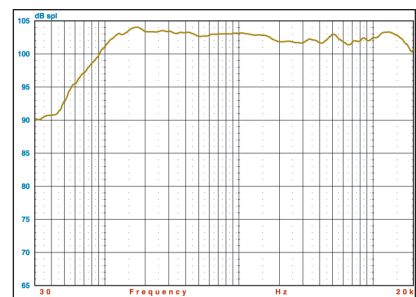


Figure 5. Composite graph of pink noise response manually spliced to gated HF response, then all manually smoothed to one-third octave.

minima between them at 55Hz, coinciding perfectly with the peak output of the port (Figure 3).

Since I've mentioned Figure 3, this nearfield graph shows good performance from the bass driver. The port has some midrange output, as you can see, but the level is not high (note that it would actually be lower than shown on this graph, because the trace's level has not been corrected to compensate for the difference in area between the bass driver and the port).

The final graph (Figure 5) is a composite graph where the pink noise response has been spliced to the gated high-frequency on-axis graph and the whole lot smoothed to one-third octave. This graph shows the Aurora's frequency response extending from 80Hz to 20kHz  $\pm 2\text{dB}$ . **AHF**

Steve Holding