

Cambridge Audio Aero 2

Don't be fooled by the anodyne exterior. Behind its sober grille is a small loudspeaker that's engineered in a radically different way from other budget rivals...

Review: Nick Tate Lab: Keith Howard

Most seasoned observers would characterise cheap, small speakers as 'much of a muchness'. It's a section of the market not traditionally known for innovative, blue-skies thinking. If one wants to find examples of imaginative answers to the problem of making high quality sound from small electrical signals, budget boxes aren't where you would look first!

So it's more than a little surprising to find that this €499 speaker looks – on first inspection – more bland than most of its competitors. It seems, not to put too fine a point on it, like an average 1990s product: the sort Mission would have been running rings around in dealers' dem rooms.

OUT OF THE ORDINARY

But remove the grille and you find something out of the ordinary. In place of its rivals' standard-issue soft dome tweeter is a Balanced Mode Radiator – something you won't find in any other budget box.

Conventional two-ways have a tweeter to cover the high frequencies, and a mid/bass driver to take care of the rest. The problem comes between around

2-3kHz, where the two units intersect. There's a crossover to gently attenuate one driver as the other takes over; but in passive designs particularly, the response is never as flat as you'd hope, and the phase not as even. Worse still, this happens where the ear is most sensitive – the range of the human voice, which of course is what we spend most of our time listening to.

If you were going to cross two drivers over, this is the last place you'd want to do it – which was precisely what inspired Cambridge Audio's speaker supremo Dominic Baker to look to BMRs.

The Aero 2 has a 165mm bass unit, and bass is all it does. It isn't a mid/bass driver, because according to the designer, it runs from 50Hz to 250Hz, rather than the 2kHz or so you'd normally expect. The

46mm BMR then, is in effect a mid/treble unit, running all the way up to 20kHz and beyond from that 250Hz starting point. This takes the crossover point way below the place where our hearing is most sensitive. It also lets the designer use a bespoke bass driver, rather than one that's also purposed to work in the midband too.

CUSTOM BENEFITS

It's a double benefit, and it's all possible thanks to the use of the BMR. Baker says this gives far superior dispersion too. The BMR is the latest fourth generation unit, and like the bass driver has been custom-made for the Aero 2; the drivers have been designed around the speaker, rather than the reverse. Like all Cambridge Audio products, the units are made in China at Cambridge Audio's own facility.

Dr Graham Bank, inventor of the BMR and co-founder of Cotswold Sound Systems, has worked closely with Baker on the project. The

Aero 2's new generation BMR has twice the excursion of the original design, and is far more linear in the higher frequencies, it is claimed.

The crossover is a simple affair, with just three passive components. For the BMR, one single capacitor feeds it, which Baker says gives a 4th order acoustic alignment. This marries up to a 2nd order electrical low-pass filter for the bass unit.

RIGHT: Hidden behind the grille is a 165mm paper bass driver and – uniquely in this market sector – a 46mm combined tweeter and midrange BMR

Low frequencies need a light and stiff drive unit cone to work best, and the Aero 2 (unusually at this price) uses paper. Baker has spent a long period of time playing with different cone materials but now thinks a well-developed paper formulation is best. Things become more prosaic when you get to the cabinet. The designer contends that fancy, swoopy sides are more about style than sonics, so the Aero 2 gets a classic rectangular box. It's reasonably well braced and certainly

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decently damped, but wins no prizes for the beauty of its vinyl wrap finish or overall aesthetics. Still, it does betoken Cambridge Audio's characteristic no-nonsense approach, and the single-wire speaker terminals underline this further. Dominic Baker believes the cost/benefit ratio of bi-wiring your system isn't good enough to justify bi-wirable binding posts. 'Just buy better speaker cable', he says.

THE MORE YOU LISTEN...

Drop the needle on a really fine LP recording of Beethoven's 'Pastoral' Symphony [BPO/Karajan - DG SLPM 138 805], and you soon realise that the Aero 2 sounds dramatically different from its contemporaries. Indeed, the very first time you set ears on it, you'll likely find it an anti-climax, because it lacks the bite and the boom of price-rivals such as the Acoustic Energy AE401. This is emphatically *not* the sort of speaker that jumps out at you and grabs your attention, and as a

BMR BASICS

Although originating with NXT (now HiWave), the BMR (Balanced Mode Radiator) - patented in 2005 - is not a circular form of DML (distributed mode loudspeaker, the technical term for an NXT/HiWave panel). It is something quite different and, for audiophiles, significantly more exciting. Despite using a deliberately resonant flat diaphragm, on-axis it appears to behave like an ideal piston, moving as a rigid whole, without breakup modes. The crucial difference is that whereas a true piston becomes increasingly directional - begins to 'beam' its output - above the frequency at which its circumference equals the wavelength in air, a BMR does not. It maintains its off-axis output significantly better, thereby obviating one of the classic conundrums of loudspeaker design. Concentric weights precisely positioned on the back face of the diaphragm are key to this: they ensure that its axisymmetric resonance modes generate zero acoustic contribution on-axis, whereas off-axis they act to bolster output. KH

result of this I'd expect it to underperform at dealer dems where lots of other designs are heard in quick succession.

Fascinatingly though, the more you listen, the more you realise something is missing - namely all the nasties that normally come with speakers at this price

level. Rather like a good electrostatic panel loudspeaker, it's very self-effacing. There's no stinging treble and booming bass; rather you're immediately greeted with an even, seamless sound that's totally devoid of the phase inconsistencies that plague so many other small loudspeakers.

You are left wondering why the treble is so smooth and sweet, when often it's quite the reverse, or why the bass is solid but doesn't boom like disco has just come back and the Bee Gees are Number One again. However, when you've got past its lack of coloration, you find you can hone in on the music much better, because you're listening to far less of the *speaker's* sound.

Cue up some thunderous Scritti Politti from the mid-'80s and the Aero vanishes like no other speaker near its price.

Suddenly you're drawn into that thick arpeggiated synth bassline, over which singer Green Gartside's voice floats silkily on 'Perfect Way' [Virgin 25VC-1028].

There's still a good deal of punch from the Linn drums, and the electronic hi-hats glisten with a wonderful sense of speed. But it's as if they've been left alone to get on with things, rather than having to go through an additional effects processor.

IT'S FULL OF LIFE

There's no sibilance to vocals, and there's a sense of effortlessness in the bass, which bounces along in an unusually unstrained way for a speaker of this size. Despite the BMR lacking a sharpness that accentuates leading edges of notes, the music still sounds both vivid and full of life.

The overall effect then is of a mature-sounding loudspeaker that just doesn't sound 'cheap'. If you were to close your eyes and forget about the styling and cabinet finish you wouldn't be surprised if someone told you it cost well over twice the price. This speaker has an innate rightness to it that makes it far easier to listen to than most rivals. It flows along in a fluid, musical way, showing far fewer signs of stress when called upon to play loudly.

Indeed, in some ways, it's more like that rarest of beasts, a three-way standmount. Herbie Hancock's *Maiden Voyage* [Blue Note BST 84195] proved wonderfully expansive, the Aero 2 setting up a cavernous recorded acoustic inside which instruments were placed accurately. Cymbals were smooth yet metallic sounding, piano was rich and sonorous and the tenor sax came over as a large, lustrous instrument full of texture and body.

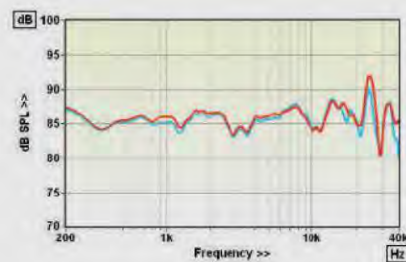
Bass is good too, but when you push this speaker hard, this is where it falters. ➔



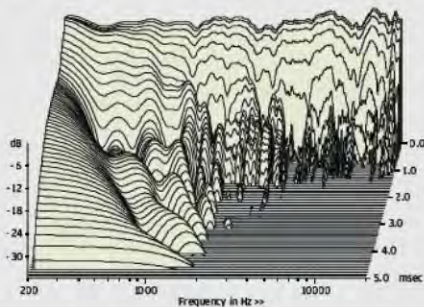
CAMBRIDGE AUDIO AERO 2

Cambridge Audio claims 90dB sensitivity for the Aero 2, a specification that bears little relation to our measured pink noise figure of 85.9dB, which is much more in line with expectations for a standmount of this size. The 8ohm nominal impedance is unreliable too given that our measured minimum modulus of 3.4ohm indicates a 4ohm rating is more appropriate. Because impedance phase angles are quite large at low frequencies, the EPDR (equivalent peak dissipation resistance) falls to 1.6ohm at 98Hz and 1.9ohm at 171Hz, making the Aero 2 a moderately challenging amplifier load overall – particularly for budget amplifiers – although at higher frequencies the BMR driver is substantially resistive.

Forward response, measured on the axis of the BMR unit [Graph 1, below], is essentially flat in trend with small enough departures for the response errors to be ± 2.5 dB and ± 2.8 dB respectively for the review pair (200Hz-20kHz) – excellent figures for a passive speaker, let alone one at this low price level. Pair matching wasn't so outstanding at ± 1.6 dB over the same frequency range but below 15kHz the matching was much tighter. Bass extension of 57Hz (-6dB re. 200Hz) matches that of many floorstanders and helps explain the modest sensitivity but the diffraction-corrected near-field measurement showed the upper bass to be peaked up by about 4dB at 100Hz. Ultrasonic output from the BMR is uneven but reaches to above 40kHz. The cumulative spectral decay waterfall [Graph 2, below] shows a fast initial energy decay but with what are probably bass/mid unit breakup modes visible in the low treble. KH



ABOVE: Forward response is very flat in trend and reaches above 40kHz thanks to the HF BMR driver



ABOVE: Cabinet looks well enough controlled but some bass/mid modes are visible in the mid-treble



LEFT: Designer Dominic Baker doesn't advocate bi-wiring, believing you get the finest sound by spending your money on a single run of better quality cable

what a stronger, stiffer cabinet could do with these fine drive units.

As it stands however, the Aero 2 is cracking value for €499. You'll not get a finer all-round performance at the price if you're looking for a mature, grown-up sound that lets you dig down into the mix and enjoy it, rather than being assaulted by boom and tizz. Its seamlessness is uncanny, its transparency superb and the box throws images out with ease and confidence.

There is one last caveat (though not a criticism), which is that you will need a decently powerful amplifier to get the best out of this speaker, as the Aero's actual sensitivity is a bit lower than that quoted [see Lab Report].

The sheer smoothness and evenness of the Aero 2 means you can turn a pair of them up quite a lot louder than many less couth rivals. At this point however, you begin to hear the cabinet make its presence felt slightly, as there are limits to what a 6.8kg fibreboard box can do.

CRACKING VALUE

In an ideal world, the cabinet would be thicker and better braced. Indeed, there's the sense the Aero 2 is two great drive units in search of a box that's worthy of them.

Of course, the need to keep the price down to €499 has precluded this, but it would be fascinating to hear a more solidly dressed version that cost a couple of hundred pounds more, like Q Acoustics' Concept idea.

Turn up the wick on 4hero's 'Give In' [Raw Canvas RCRCD02] and this little loudspeaker sounds superb, with loads of power, punch and a wonderfully creamy texture to vocals and strings – but still you wonder

Cambridge Audio's own integrated amplifiers are excellent, and you should also consider Creek's fine Evolution 50A [see *HFN* May '13].

Indeed, the Aero 2 is the sort of speaker that deserves to live happily on the end of a really good source and amplifier – in which case it just gets better and better. ☺

HI-FI NEWS VERDICT

If there is such a thing as 'budget esoterica', then it is surely epitomised by Cambridge Audio's Aero 2 standmount speaker. It displays a far more couth, civilised and polished performance than its price would suggest – you just don't expect this much from a €499 box. With so few flaws and so much to love, this little loudspeaker just gets on with the job of making music in an enjoyable yet inoffensive way.

Sound Quality: 82%



HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	86.4dB/85.9dB/85.7dB
Impedance modulus min/max (20Hz–20kHz)	3.4ohm @ 138Hz 21.7ohm @ 29Hz
Impedance phase min/max (20Hz–20kHz)	-58° @ 86Hz 40° @ 207Hz
Pair matching (200Hz–20kHz)	± 1.6 dB
LF/HF extension (-6dB ref 200Hz/10kHz)	57Hz > 40kHz > 40kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	1.1% / 0.3% / 0.2%
Dimensions (HWD)	370x203x311mm