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PMC's fact fenestrias are towers of power



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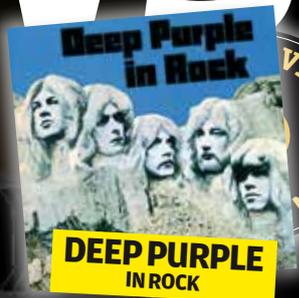
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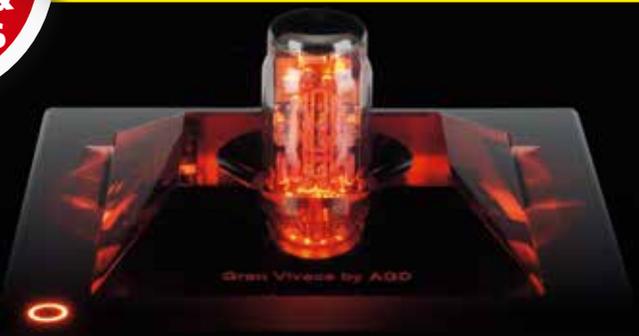
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PMC fact fenestria

Launched three years ago but only now released for review, PMC's flagship fenestria is a towering statement
 Review: **Andrew Everard & Paul Miller** Lab: **Paul Miller**

The PMC fact fenestria – the British brand's flagship 'domestic' speaker (note lower case f) – was launched at a packed press conference at Munich's High End Show. That's the 2018 High End Show, and it's taken over three years for it to arrive for review – in which time the price has risen from the inaugural £45,000 to the £54,995 for the pair you see here. In the intervening period there's actually only been one Munich show – that in 2019, at which the company launched its smaller 'fact signature' models: the 2020 show fell victim to the pandemic, as did this year's at least twice, being rescheduled from May to September, then cancelled completely.

All that while we'd been wondering what had happened to the fact fenestria speakers, which take their name from the idea of an open window on the music or, as PMC put it at the launch, "the speakers you'll never hear". Yes, we get the idea of neither adding to, nor subtracting from, the sound, but for years they were truly living up to that never-to-be-heard billing.

FLOAT ON

Anyway, now they're here, and still pretty imposing at 1.7m tall, and weighing a healthy 80kg apiece complete with their stabilising plinth. Expert installation is required, not just because of the size and weight of the things, but because the construction of the speaker involves a lot of assembly work on delivery. The speaker involves two bass cabinets – one sitting on that substantial plinth, the other inverted on top, plus a floating metal section, called the Nest. This slots into a cutout formed by those two assemblies, on which are mounted the tweeter and midrange driver.

Even then you're not done, as the outer 'cabinet' of each speaker is formed by four 'planar wings'. Far from decorative, these are part of the mechanics of the entire assembly, acting as tuned mass dampers to tackle resonances [see PM's interview

with designer Oliver Thomas, p43]. But at its heart, the fact fenestria is a relatively simple speaker – a three-way design with elements, although all-new here, familiar from other PMC models. The tweeter is a 19.5mm version of the company's long-running Sonomex design, with a soft dome and neodymium magnet, mounted in a 36mm surround, itself isolated by a silicon mount PMC calls an 'Aureole'.

SHAKEN NOT STIRRED

The tweeter shares that 'Nest' assembly, which is open-backed, milled from a billet of aluminium and shaped both to avoid baffle diffraction and isolate the whole assembly from the bass 'bins', with a rear-chambered development of the company's famous 75mm soft-dome midrange driver. The new version uses a cotton dome rather than the silk of past designs, as does the tweeter, here doped with a revised chemical cocktail. This is said to give better stiffness as well as lightness, while any unwanted rear energy vents into a tuned chamber [see PM's boxout, p41].

The bass section – or rather sections – of each speaker demonstrate familiar PMC thinking, using the company's ATL (Advanced Transmission Line) loading, venting out via Laminair ports. The latter are tuned using Oliver Thomas's knowledge of airflow gained during his time spent working in F1 engineering. Rather like the diffusers used on racing cars, this design is all about smoothing airflow. For the fact fenestra, both the geometry of the ATL and the choice of lining materials within the 'tunnel' have been refined. So no major changes to the thinking here, but tweaks.

RIGHT: The 19.5mm soft dome treble and 75mm soft dome mid are isolated from the main cabinet by a separate, hourglass-shaped baffle. Pairs of transmission line-loaded 165mm bass units, with flat carbon-fibre/cell foam sandwich diaphragms, are mounted above and below



GRAND DOME

Front and centre of the tall, elegant fenestria is the PMC75-S midrange dome, a development of the iconic PMC75 used in PMC's active studio monitors and SE Home models for years. Previously, PMC had damped internal resonances immediately to the rear of the dome but has greatly improved this in the PMC75-S by using a vented (hollow) pole-piece to dissipate rear-radiated energy into a separate chamber. The latter extends out from behind the motor structure, its computer-modelled profile spun from a single piece of aluminium. A bitumastic material coats the inside of the chamber together with multiple layers of acoustic foam to absorb the unwanted rear output of this mid driver. Reduced distortion and improved response 'flatness' are the key benefits, the latter also enhanced by the re-designed, two-part 150mm magnet and motor design with its copper shorting ring.

The dome driver itself is made from cotton, impregnated with a plasticised lacquer to combine light weight with a high degree of self-damping. A dual suspension/surround, also fashioned from a doped cotton but with a tighter weave, permits greater displacement without rocking – read higher SPLs with lower distortion. The entire midrange assembly is isolated from any main cabinet vibrations by PMC's 'Nest' – a profiled, machined aluminium frontispiece mounted onto the cabinet with silicone bushes. The compliance operates over three axes and is tuned to be effective down to very low frequencies, claims PMC. PM

However, while ATL and the Laminair ports are found in other PMC designs, the bass drivers here are all-new, and developed purely for this speaker. The 16.5cm flat-diaphragm 'piston drivers' use a membrane comprising carbon fibre layers sandwiching a Rohacell foam core. These are driven by 14cm magnets, and are mounted between the main enclosure and a decoupled secondary baffle, which floats on a magnetic suspension sealed with a gasket. The enclosures themselves use a range of thicknesses of HDF (High-Density Fibreboard), from 18mm up to 30mm, this also forming the internal 2.4m-long ATL labyrinth as a structural part of the cabinet assembly [see illustration, p41].

Those planar wing panels, available in Tiger Ebony, Rich Walnut or White Silk, attach to the sides of the bass enclosures via floating mounts, allowing them to damp out resonances by vibrating in opposition to the main speaker. The technology, echoing that used to stabilise tall buildings in earthquake zones, creates an effect PMC says operates down into the lower midrange, and also helps reduce room interactions. Having once been resident on a high floor of a hotel when a – mercifully small – earthquake struck, I get the principle. Amid the shaking there was a definite sense of a great mass literally swinging into action up above to calm things down.

The crossover here is massive and complex, filling the plinth, which is CNC-routed from a single piece of HDF, and connecting out to the driver sections via

a series of multipin connectors between plinth, enclosures and Nest. The crossover points are at 380Hz from the bass to the midrange, and 3.8kHz from midrange to tweeter. The company provides a couple of adjustments to the rear of the plinth, allowing the treble and bass each to be subtly adjusted. Three sets of substantial spanner-friendly rhodium-plated combination terminals are provided with jumper bars to allow single-, bi- or tri-amping/tri-wiring, and high-quality – and very sharp! – spikes are provided.

SOLID ROCK

The fact fenestria speakers certainly make a statement in any room, even though they're not as big as some pictures might suggest. They're relatively slender at just 37cm wide, and PMC says the ATL design means they're not fussy about positioning, and should be used with a slight toe-in to firm up the image. I'd advise the usual cautions about using them in corners or equidistant from walls, but they do seem very room-friendly. And, of course, those controls down on the crossover do allow a modicum of room-tuning – though I'd go easy with the bass boost, however tempting it may seem.

As far as the listening position is concerned, things are similarly simple – just ignore that big bass-box on the top, and sit with your ears on the same level as the Nest midrange assembly, and you won't go far wrong. In that position the fact fenestrias sound similar to, but rather better than, a good two- or three-way speaker ☞



LEFT: The fenestria is divided into two mirror-image cabinets where the pairs of 165mm cellular/carbon-fibre bass 'piston drivers' feed into folded 2.4m transmission lines that exit at the very top and bottom of the enclosure

Bryston power amplifiers were employed in the development here – PMC distributes the Canadian brand in the UK – and this may explain why even with the Classé Delta Pre/Mono amps [HFN Jun '21] in harness, I was aware of having to crank the level on the preamp pretty hard to stir the fact fenestria speakers into life.

Given the power on tap from the Classé amps – PM measured 400W/8ohm and 760W/4ohm – this is clearly something to be considered. It's not just a matter of needing high-quality amplification for these speakers as high power is required, too.

Given that power, the fact fenestrias can certainly deliver, rocking out with the raw southern swagger of the title track of Blackberry Smoke's *You Hear Georgia* set [3 Legged Records 3LG14CD]. There's fine instrumental definition and speed, all underpinned with a big, solid bass thump, and impressive soundstaging.

GROOVE KINGS

The same is true with the latest Crowded House set, *Dreamers Are Waiting* [EMI 3534658], the loudspeakers giving fine insight into the performances. They lurch appealingly into 'Playing With Fire' with real drive, and just as easily slip into the easy groove of 'Start Of Something', the beautiful harmonies on this song persuasively rendered to draw the listener into the very heart of the music.

Similarly, these speakers grab your attention with the vocals on Paula Cole's *American Quilt* album [BMG 538668572], set against superb, if spare, backing and with fine ambience. And when the fact fenestrias get the opportunity to show their scale and weight, as in the refined yet dramatic performance of Walton's *Crown Imperial*, from the Dallas Wind Symphony's album of the same title [Reference Recordings RR-112], they can delight.

They deliver detail deep into the orchestra – twinkling tuned percussion and glorious woodwind and brass timbre, but for all their size these never sound like big, slow speakers. Instead, they're fast and agile, while still capable of massive slam. The slow processional theme has richness and weight and the great percussion crump at the end of that section shakes the room. Fabulous stuff. ☺

from the company's main fact range and with a hefty dose of bass to underpin goings-on. We've had some big speakers through our hands demonstrating much more 'character' – for good or bad – than the fact fenestrias make obvious, but there's little chance you'll consider these speakers to be inauspicious or just plain ordinary on your first acquaintance with them.

One point worthy of consideration, however, is PM's observation regarding the sensitivity of the speakers [see Lab Report, p45]. While they present a relatively easy-going 6ohm nominal load, they fall some way short of the quoted 86dB/2.83V/1m, suggesting some decent amplifier power won't go amiss. I imagine that some of the larger

'They are fast and agile, combined with massive slam'

OLIVER THOMAS

Commercial Director and CTO, Oliver Thomas, kick-started the fenestria project in 2013 as an exercise in 'blue sky thinking'. PMC's iconic midrange dome was to remain at the heart of the speaker but it was also an opportunity to evolve its design. Improving the dissipation of the dome's rear radiation was key [see boxout, p41], so did PMC look at the frequency-selective metamaterial approach to damping seen in KEF's LS50 Meta [HFN Jun '21]?

'Not directly', admits Oliver, 'though we do have a parallel technology in development'. The design goals for the fenestria were arguably broader in scope, both in reducing driver distortion and minimising cabinet noise.

For example, the curved side panels act as tuned mass dampers, working in anti-mode to the main cabinet resonances. 'These panels are working hardest below 100Hz', reveals Oliver, 'and we have chosen the compliance of the rubber mounts, in tandem with the mass of the curved panels, to best achieve this. The position of the mounts is critical too, situated at points of maximum displacement'.

Where does the fenestria take PMC? 'There's new tech, including a smaller mid dome already used in our ci140 on-wall speakers. Also the anti-vibration mounts inspired the decoupling between the cabinet and plinth in our twenty5i series. The bass units are so expensive to manufacture there's a limit to what we can put them into', laughs Oliver, 'but there's a deal of learning here that'll inevitably trickle down into our domestic designs'. PM

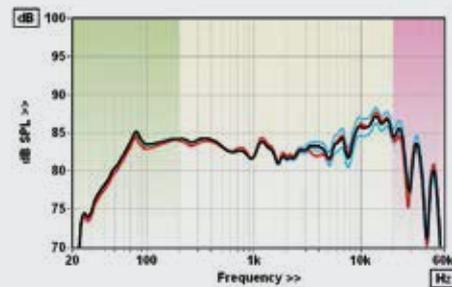


LAB REPORT

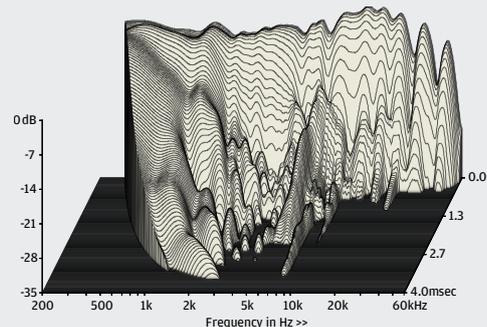
PMC FACT FENESTRIA

For the size of cabinet, the fenestria's 86dB rated sensitivity is not especially high and, in practice, turns out to be substantially lower on test at 82dB/1kHz, increasing to 82.7dB when averaged across 500Hz-8kHz. Thankfully the speaker is a complex but not especially tough 6ohm nominal load to drive. There's a 4.7ohm/81Hz minimum and despite the load remaining sub-8ohm from 8Hz-170Hz, 370Hz-2.7kHz and above 4.6kHz, the largest phase angles are a very modest +25°/-32°. High SPLs will still demand a high power amplifier but, despite the diminished sensitivity, THD is low at ~0.25% through the bass and very low through the passband of the dome mid at ~0.1% (re. 90dB SPL). Driver modes are very well controlled too [see CSD Graph 2].

The ideal listening axis, on the mid dome, is not far off the 'average' seated height but if you sit higher (towards the treble dome) then the response dips between 2kHz-5kHz (-3.7dB/4.6kHz). This effect was more obvious with one speaker, hence the 1.3dB pair matching (tightening to 0.5dB, 200Hz-3kHz and 5kHz-20kHz). Otherwise the forward trend has a mild 'BBC dip' with a lift above 8kHz responsible for the ±3.1dB and ±3.3dB response errors, followed by some lobing above 20kHz [pink shaded area, Graph 1]. PMC's useful HF control operates above 2kHz [blue traces, Graph 1] tilting up/down to reach a sensibly modest, but certainly audible, ±1.1dB above 6kHz. Meanwhile, the quartet of bass drivers peak at 79Hz (40Hz-425Hz, -6dB), augmented by the folded transmission lines at 22Hz-136Hz to deliver a low, corrected LF extension of 33Hz [-6dB re. 200Hz; green shaded area, Graph 1]. PM



ABOVE: Response inc. nearfield summed driver/port [green], freefield corrected to 1m at 2.83V [yellow], ultrasonic [pink]. Left, black; right, red; ±HF, blue



ABOVE: Cabinet is fairly 'silent' leaving a bass driver mode at ~1kHz and minor dome modes at 5kHz-8kHz

LEFT: PMC's three-way 380Hz/3.8kHz split crossover supports tri-amping and tri-wiring if the link plates are removed from the trio of chunky cable connectors. Subtle ±LF and ±HF bass/treble tone adjustment is possible at 90Hz and 2kHz

the instrument convincingly scaled without being unnaturally close-up. But then that's the hallmark of these speakers – they have all the weight and solidity of those multiple bass drivers, without ever sounding over-large or ponderous.

STATELY SOUNDS

This is apparent with the Band Of Brothers' set *A Jazz Celebration Of The Allman Brothers Band* [New West Records NW6474]. It's a concept that sounds like it shouldn't work, but it does, the jazz musicians charging through 'Whipping Post', thanks in no small part to the fact fenestria's combination of weight, information and speed, driving the rhythms thrillingly. The sound is big and punchy, with really powerful, characterful brass.

And that attention to detail is once more reinforced with John Challenger's atmospheric *Salisbury Meditation* album [AJM AJM001, 96kHz/24-bit], helped by the way these speakers cast the organ slightly distant in the acoustic, just as it should be. The impression of walking into a cathedral and hearing the instrument playing, rather than a close-up view, is highly persuasive with Albinoni's 'Adagio'. It's a great, unforced, stately sound, complete with the resonances of the space, and a fine exemplar of what the fact fenestria can achieve. ☺

HI-FI NEWS VERDICT

These flagships manage to sound suitably big and weighty, without any of the excessive bloom or slowness one might expect from those two hefty bass bins on each channel. It's a striking piece of engineering, and delivers speed and detail, along with exceptional soundstaging and an involving effortless listen. Just don't stint on the amplification, for these speakers need plenty of grip and power to be heard at their best.

Sound Quality: 88%



However, you don't need massive musical forces to hear what these speakers can do. With Martha Argerich's legendary 1965 recording [Warner Classics 9029669767, 192kHz/24-bit], the pianist, then just 24, plays with vivacity and wonderful expression, and there's a great sense of ambience around the piano in the studio, plus speed, attack and lightness of touch all at once. The imaging is rock solid, and

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83V – 1kHz/Mean/IEC)	82.0dB / 82.7dB / 81.3dB
Impedance modulus: minimum & maximum (20Hz–20kHz)	4.7ohm @ 81Hz 11.6ohm @ 255Hz
Impedance phase: minimum & maximum (20Hz–20kHz)	-32° @ 29Hz +25° @ 160Hz
Pair matching/Resp. error (200Hz–20kHz)	1.3dB / ±3.1dB/±3.3dB
LF/HF extension (-6dB ref 200Hz/10kHz)	33Hz / 26.8kHz/25.9kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.25% / 0.09% / 0.9%
Dimensions (HWD) / Weight (each)	1700x370x623mm / 80kg