

hi-fi news

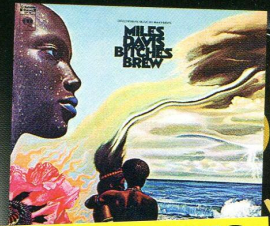
THE HOME OF REAL HI-FI

& Record Review

Exclusive

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PMC fact.12

PMC has aimed for a slim floorstander that performs like one of its pro-style monitors. So does the fact.12 deliver?
 Review: **Steve Harris** Lab: **Keith Howard**

Before the 'fact', as it were, PMC's consumer speaker range always included some huge monitors that were directly equivalent to its professional speakers. With the fact series, though, the goal was to produce genuinely no-compromise speakers within the physical size limitations imposed by modern taste and living conditions.

There would be virtually no budgetary restraints, so the speakers would inevitably be very expensive compared with many outwardly-similar competitors. While the first model, the fact.8 floorstander, costs £5995, the new fact.12 comes in at a rather eye-watering £11,995 per pair.

It almost goes without saying that these models use PMC's much-vaunted Advanced Transmission Line loading principle. In a transmission line speaker, the idea is that much of radiation from the back of the drive unit is absorbed as it passes along the line, which is a tunnel lined with carefully-chosen damping material. But sounds below a certain frequency emerge from the vent at the end of the line, and are effectively in phase with the output from the front of the cone.

The benefits are not confined to the bottom end. Lowering the distortion in the bass means that upper bass and midrange detail is not masked by distortion harmonics from lower notes. So a transmission line can help give a transparent midrange as well as a fast, clean bass. As PMC founder Peter Thomas points out, transmission line speakers are not easy to design, because there are so many variables. The key to it, he says, 'is to match the parameters of the drive unit with the transmission line and the absorption material.'

Over the years, PMC has cunningly juggled those variables to make use of the principle in small standmounts and even in the Wafer wall-mounts. Such tiny speakers can't of course produce the low

bass of a big transmission line design, but a floorstander the size of the fact.8 can have quite a convincing try, as in this design the effective ATL line length, from speaker cone to exit vent, is 3m. The smaller fact.3 has an effective line length of only 1.7m.

NO COMPROMISE THREE-WAY

And so we come to the fact.12, physically hardly any larger than the fact.8, yet costing twice as much. It is an ambitious design, as the aim was to match the performance of the massive IB2i monitor.

'The box dimensions were nailed down pretty early on,' says Oliver Thomas, who has led the fact design project. 'The design brief was "Here's this size of box. Now make it perform like an IB2." Well, to do this, you have to spend out on all the components. And fortunately, that's what I was allowed to do! That's why we ended up with the high cost. There aren't any compromises on any of the parts, and they are all custom-made.'

Essentially, to better the fact.8, it had to be a three-way. As the fact.12's height and width are the same, it doesn't look any bigger in the room, but the front-to-back depth has been increased by 40mm to 420mm, to squeeze in just a little more cabinet volume. To get the most out of the cabinet at the low end, there had to be a completely new bass driver, instead of the fact.8's bass/mid unit, and this in turn led to a new midrange unit.

Designed specifically for the fact.12, the 140mm bass unit has an extremely long throw, something like ± 15 mm, and uses a lightweight alloy cone with a soft coating to ensure freedom from unwanted resonances. This is supported by a large roll

"The key is to match the drive unit with the transmission line"

RIGHT: New 140mm bass drivers are unique to the fact.12, which comes in fine wood veneers or a white option; the 50mm mid is also a new design. A full-height magnetically attached grille seems not to affect sound quality



THE NPL CONNECTION

Some of the work done for the fact.12 design benefited from a technique developed by the National Physical Laboratory, in collaboration with PMC. Laser interferometry has been used to analyse the behaviour of speaker cones for decades. But the NPL has devised a new laser-based technique, Rapid Acousto-Optic Scanning, which can be used to map the sound as it radiates from a loudspeaker. When sound travels through the air, the pressure changes cause the air's refractive index to change. This can be detected by guiding laser light through the air and monitoring the subtle effects on its passage. High-resolution scans of the sound field then give a detailed picture of the speaker's directivity or dispersion characteristic. This can rapidly provide much more detailed information than the traditional method of measuring the speaker.

surround, with reinforcing spars that increase stability but don't affect the compliance of the surround even at high levels.

For the fact.12, the ATL system is described as 'high-compression', which refers to the relationship between the cross-sectional area of the line in relation to the area of the driver cones. The transmission line is much 'tighter' than that in the fact.8, resulting in higher pressures behind the drive units, and the effective length of the transmission line is increased to 3.3m.

At a crossover frequency of 400Hz, the twin bass units hand over to a new 50mm midrange dome, derived of course from PMC's long-established 75mm dome unit.

'You've got a reduced mass in the diaphragm, so you can get to reproduce sounds a little bit more naturally, with less coloration than the 3in dome,' says Thomas. With this smaller dome, there is less space behind to absorb the rear radiation, so a hollow pole-piece has been used with a damped rear chamber.

While the bass and mid units are both completely new, the fact.12 uses the same tweeter as the fact.8 and fact.3, although in this case the crossover frequency is set at 4kHz rather than around 1.7kHz. Engineered together with SEAS of Norway, this uses a pre-coated Sonomex material and comprises a 19mm centre dome, a 34mm outer surround and special grille, all designed for very wide dispersion. Like the midrange unit, it is ferrofluid-cooled.

Behind the oval panel on the back of the speaker is the crossover, built on a heavy-duty, double-sided glass-fibre circuit board with components mounted on both faces. It uses custom-wound air-cored inductors and

is designed to keep signal paths as short as possible. As usual with PMC, the crossover slopes are 24dB/octave; these steep roll-offs are said to help lower distortion in the design as well as giving better power handling and a seamless handover between drivers with fewer phase issues.

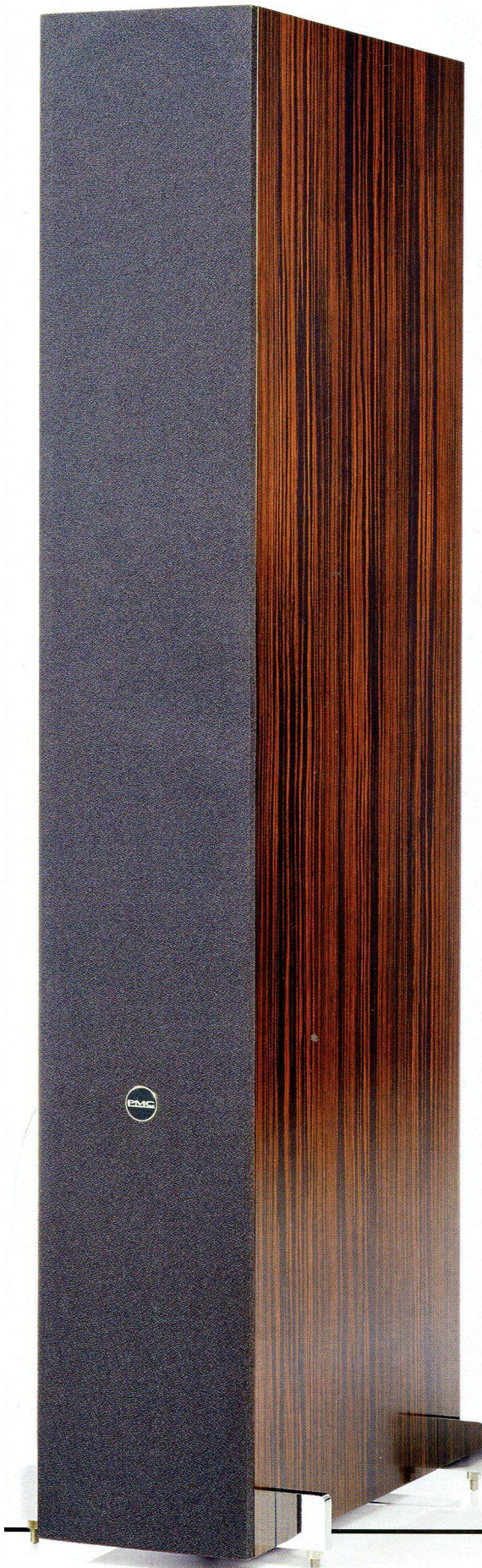
On the outside, the crossover panel carries three sets of silver-plated binding posts, which can be used for tri-wiring or tri-amping when the links between them are removed. Like the other fact models, the fact.12 has switches to trim the bass and treble response, to help in matching the speaker to room conditions.

The treble control gives subtle boost or cut options but for the first time, in the fact.12, the bass trim switch gives a boost as well as a cut, rather than two degrees of cut. In our case, auditioning in the Editor's listening room, the best settings were flat for the treble and down for the bass.

MAGNETIC GRILLES

As for the cabinet itself, our review pair came in a new White Silk finish. This has been included along with a range of wood finishes at the request of some overseas distributors, who asked for a semi-matt furniture white rather than a high-gloss finish. In this livery, with its grilles on, the speaker is certainly self-effacing in the room, but lacks the luxury feel of PMC's hand-matched wood veneers (Graphite Poplar, Tiger Ebony or Rich Walnut).

To give stability, the cabinets have neat and sturdy metal outriggers, to which the spiked feet are attached. The grilles attach magnetically, making it easy to remove and replace them, and there are no visible attachment devices on the baffle. We initially tried the speaker both ways and found almost ↻



OLIVER THOMAS

Studying mechanical engineering at university Peter's son, Oliver Thomas, specialised in motor sport, and went on to work for Red Bull Racing. He's been with the family firm on and off, working on the design side, for around seven years, and the fact series is Oliver's baby, as he's led the design team on this range since the outset. But after the fact.12, what comes next?

'We've now reached the pinnacle of the right size for a standard-sized room,' says Oliver, 'but I can't say categorically whether we will or won't do larger or smaller models! We've got a theoretical fact family of speakers, and we'd like to make every single one, though I don't think there's necessarily a commercially viable reason for all of them. But perhaps as and when we develop a drive unit which would suit, say, a certain size of the "fact family", we'd take it from there.'

What about home theatre?

'We do have customers that have multichannel fact systems, utilising fact.8s with fact.3s, and now they could choose fact.12. Although it's not in the same range, the twenty series centre speaker is voiced very similarly, so it's a useful step-in if you want to have a multichannel system with fact quality.'

Would there ever be a fact active system? 'It's something for the future, that we'd want to do. And yes, if you want to do an even better speaker at that size, you would have to step up to active, to get further control over the drive units.'



no discernible difference in the sound. So, leaving the grilles off if only for the sake of audiophile credibility, we settled down to listen in earnest.

STUPENDOUS SOUNDSTAGE

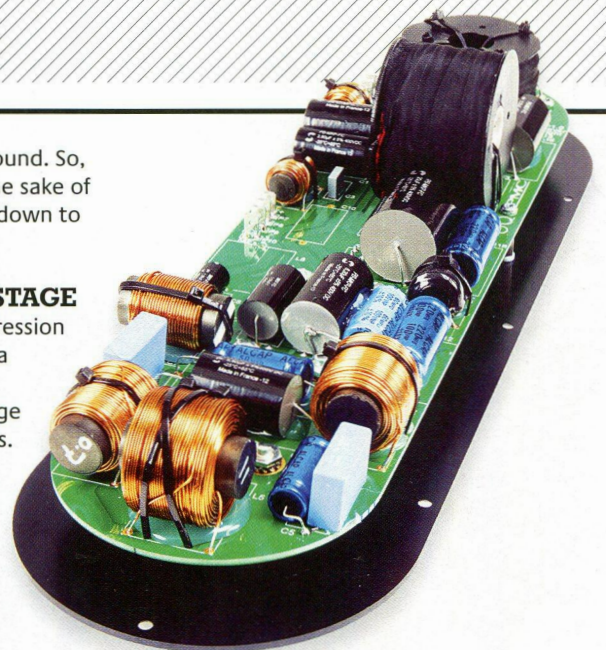
Perhaps my most immediate impression of the fact.12 was that here was a speaker that really did produce a seamless, lifelike stereo soundstage between and around the speakers. A good example of this was on Muddy Waters *Folk Singer* [MFSL UDCD 593] where a reverberant studio sound is used to compensate for the lack of amplification, with the echo effect often making Buddy Guy's guitar obligatos sound electric even though they aren't.

The PMCs gave an enormous soundstage here, with a huge width that seemed to extend well beyond the speakers and fill the room's back corners – in other words, there was still a real feeling of depth to the soundstage even at the extreme edges. There was also a most convincing illusion of stage height.

It was the sheer bass clarity of the speaker, I think, that really helped convey the booming weight on Muddy's voice, and also the top-to-bottom authority of his acoustic guitar, once again giving weight without loss of clarity or control. On 'Good Morning Little Schoolgirl' the PMCs revealed the quick, subtle pulse of Willie Dixon, who never plays one more bass note than necessary but puts them all in exactly the right place.

The fact.12's soundstaging abilities were confirmed with Saint-Saens' *Danse Macabre* with the Minnesota Orchestra [Reference Recordings RR82]. There was a huge, impressive perspective, with the solo violin, then the sweeping first violins, layered in space against the mass of lower strings. Rich orchestral timbres combined with speed and precision, while the xylophone, like the solo violin, seemed exquisitely placed and balanced against the massive orchestral forces around it. The bass too was impressive, with the double-basses cleanly underpinning the music.

With the sometimes fearsome-sounding piano on Mitsuko Uchida's *Debussy Études* [Philips 464 698-2], the fact.12 managed to convey the most absurdly complex treble passages without making them a mere jangle. It passed the acid test of 'Pour Les Quartes', when a salvo of notes sent



ABOVE: PMC's substantial crossover has custom-wound air-cored inductors on a heavy-duty, double-sided glass-fibre circuit board with components mounted on both faces

out into the hall would be followed cleanly by the returning echoes.

In general on this recording there was good sense of the size of the piano, and a sense of its sitting firmly on a stage, again with a convincing feeling of height. The weight and power of the lower register was very impressive here. When a single very low note was played softly, it would speak with real sonority.

CONTROL AND DETAIL

Moving on to a very different kind of live recording, but another one where the acoustic can prove problematic, I put on Marta Gomez's *Entre Cada Palabra* [Chesky JD301]. The fact.12 made light work of the heavy bass on this track, which can all too often sound rather overpowering and uncontrolled. But in this case, there was absolutely no loss of control. The big, fat bass

'You could feel the big, fat bass guitar sound in your chest'

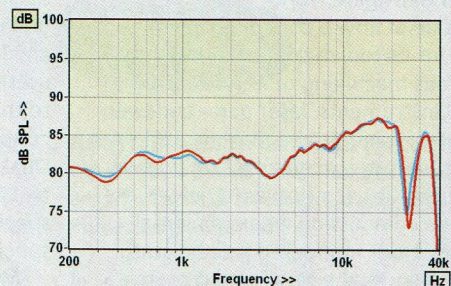
guitar sound was extended enough that you could feel it in your chest, and yet it was 'tuneful,' making perfect sense as a bass line, and never muddying the overall sound. When it came to space, there was a fine sense of scale too, with quite good depth – although I felt that a little *more* depth layering and distance would have been possible.

At the top end, as the drummer/percussionist threw in everything but the kitchen sink, the fact.12 revealed the smallest tinkles. On a later, delightfully swinging track, 'Negrito', where the flute is so beautifully captured centre-stage, ➔

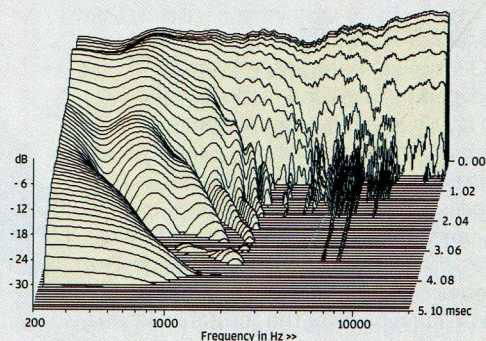
PMC fact.12

PMC claims 84dB sensitivity for the fact.12 but our pink noise figure of 83.0dB suggests that even that may be a little optimistic. Certainly the fact.12 is well short of achieving the ~90dB sensitivity typical of many modern floorstanders of similar form factor, and so will demand higher volume settings. An upside of this is that PMC has resisted any temptation to use low impedance to enhance the sensitivity. Although our measured minimum modulus of 5.1ohm is a little low for the nominal 8ohm impedance figure (which implies a minimum impedance of no lower than 6.4ohm), the EPDR – which takes account of impedance phase angle as well as modulus – dips to a low of 2.6ohm at 79Hz, which in the context of many competitors makes the fact.12 a relatively easy load to drive.

On-axis frequency response – measured, as specified by PMC, on the midrange driver axis – is essentially flat in trend to about 4kHz after which, typically of the marque, the response begins to rise [see Graph 1, below]. Off-axis listening will ameliorate this. Nevertheless the frequency response errors, 200Hz to 20kHz, were about average at ± 4.2 dB and ± 3.9 dB respectively for the review pair, and pair matching was first-rate at ± 0.8 dB. Our bass extension figure of 42Hz (-6dB re. 200Hz) should be regarded as an approximation as it took some juggling of the near-field driver and port outlets to achieve a credible response. Ultrasonic bandwidth is limited by the narrow response notch just above 20kHz. Apart from some low-level 'grassiness' in the treble, the cumulative spectral decay waterfall is clean [see Graph 2], with fast initial energy decay across the spectrum. KH



ABOVE: The forward response shows a presence / treble lift that's ameliorated by off-axis listening



ABOVE: Cabinet resonances are well controlled as are those associated with the cone and dome drivers

LEFT: The rear panel of the fact.12 has links that allow bi- or tri-wiring/amping and user-adjustable switches for trimming bass or treble. The fact.12 is mounted on sturdy outriggers

the speaker also unveiled the silky quality of Marta's voice, and the way it's reinforced by the reverberant acoustic. It also allowed you to hear those background vocals on the chorus, leaving the feeling of a nicely-balanced performance that just sounded totally relaxed – you could imagine that this track marked a point where the musicians had got comfortable with everything around them so that the whole thing gelled. It takes subtlety in a speaker to convey this.

A VINTAGE TO SAVOUR

Turning to classical music, I put on Heifetz in the Mendelssohn Violin Concerto [JMCXR-0010]. Here the speakers brought out tremendous detail in the violin sound – you could hear every nuance of Heifetz's fingering and get a real feeling of the resonance of his instrument, and also feel the ambience of the hall. You wouldn't say that the PMCs flattered the sound but its incisiveness was never unpleasant.

As for the orchestra, the bottom end was clean and quick, giving you a real insight into the great musicianship and discipline of those Boston SO players. In the midrange, the orchestral timbres remained a bit puddingy, as the recording revealed its age, but you felt that the PMC fact.12 was providing a sound that was vintage in the best sense: a sound to be savoured. ⏻

HI-FI NEWS VERDICT

With the classic PMC virtues of transparency and excellent imaging, a beguiling mid leads seamlessly to a fast, clean and powerful bass, even if it can't have quite the 'welly' of a big-driver monitor. Looking at the fact.12 for the first time, you might wonder at the price. But listening to it, you might wonder instead how a speaker this size can sound this way, and decide the price tag is justified. Well worth seeking out.

Sound Quality: 85%



HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	85.1dB/83.0dB/82.4dB
Impedance modulus min/max (20Hz–20kHz)	5.1ohm @ 13.2kHz 20.4ohm @ 22Hz
Impedance phase min/max (20Hz–20kHz)	-57° @ 65Hz 7° @ 3.4kHz
Pair matching (200Hz–20kHz)	± 0.8 dB
LF/HF extension (-6dB ref 200Hz/10kHz)	~42Hz / 24.4kHz/23.9kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.7% / 0.1% / 0.5%
Dimensions (HWD)	1110x168x420mm