

hardware review



PMC twenty5.24i

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Transmission line loudspeakers have a lot to answer for, at the tender age of 20 my audio expectations were reset when I heard a pair of IMF TLS 80. I genuinely thought I'd reached audio nirvana with this chunky floorstander. A subsequent downsizing of rooms forced me to explore other options, but I often wondered if a modern TL could deliver the qualities that originally hooked me on this design without overloading my smaller listening space with low frequency energy.

Transmission line bass-loading augments a loudspeaker's bass output by coupling the stiff column of air inside a folded tunnel to the back of the bass cone, increasing its moving mass at low frequencies and lowering its resonant frequency. This not only allows the driver to produce deeper bass, it also reduces cone excursion and thus distortion. Mastering this method of bass-loading is much easier said than done, early examples were often characterised by underdamped low frequency resonances and inefficient coupling. By carefully controlling every performance parameter to ensure the loading for each design is optimal, PMC's Advanced Transmission Line (ATL) approach claims to overcome these problems.

ATL

Designing its own bass drivers and enclosures from the ground up, perhaps unsurprisingly, allows the company to achieve a level of performance from its pairings that surpasses what's possible when building cabinets to suit drivers that aren't developed specifically for that application. The damping material that lines the folded tunnel plays a crucial role in this; PMC's acoustic foam is apparently formulated not only to reduce distortion by preventing unwanted rear-radiated mid and high frequency energy from reflecting back out through the woofer and vents, but also to manage the effective length of the tunnel by slowing down the air as it moves through and optimise its coupling to the woofer.

Distortion is reduced further by the inclusion of resonance-absorbing chambers inside the enclosure, these target specific frequencies that cannot be adequately absorbed by the foam without compromising performance in other areas. The termination (vent) itself is often overlooked but a sub-optimal design can generate acoustic noise and reduce the line's efficiency if its shape doesn't allow air to flow in and out smoothly. This is also an issue in conventional bass-reflex systems and a common way to reduce 'chuffing' in these to is flare the end of the port. PMC has



taken this a step further by adopting aerodynamic solutions used in Formula 1; their Laminair system uses curved fins to channel the airflow and greatly reduce turbulence at the edges of the vent. The company cites this as an important advancement in their loudspeakers' ability to deliver clean, dynamic bass at high SPLs.

Twenty5i

The Twenty5i series presents PMC's ATL technology in attractively-proportioned enclosures that, for the most part, won't dominate a room. The 24i is the larger of the 2-way floorstanders in this range and uses PMC's long-throw g-weave mid/bass cone with cast alloy chassis in a slender HDF enclosure, it's just over a metre high with a three metre effective line length that extends low frequency output to 27Hz. A ferrofluid-cooled Sonomex soft-dome tweeter incorporates technology from the flagship Fact Fenestria model. This tweeter was designed in collaboration with SEAS and combines a small diaphragm with an oversized surround to achieve wide-dispersion at high frequencies and high-excursion at lower frequencies; two attributes that aren't typically bedfellows but are crucial to PMC's design objectives.

Company founder Peter Thomas is a strong advocate of wide-dispersion speakers, he believes they deliver a more natural and open presentation with lower levels of colouration than controlled-directivity approaches. The key to a successful wide-dispersion design is a smooth off-axis response that matches the on-axis as closely as possible; research shows a correlation between divergent on- and off-axis responses and poorer perceived imaging and timbre. Wide dispersion and smooth off-axis response are contingent on several design choices; narrow baffles, close driver spacing and a low crossover frequency are all beneficial, and all can be found in the Twenty5.24i.

The tweeter's 24dB/oct crossover point is placed at a low 1.7kHz to achieve a smooth off-axis response. Allowing such an inherently light driver to work down so low should also, in theory, result in a slightly faster and more resolving midrange than a higher crossover frequency. A laid-back upper midrange and more prominent top end



has been attributed to PMC's hi-fi loudspeakers for quite some time so it will be interesting to see if the i series departs from this signature. The tweeter is fitted with a perforated metal grille that's designed to act as a lens, increasing dispersion towards the upper end of the unit's 25kHz limit for sharper imaging throughout the room, widening the sweet spot and reducing the need for toe-in.

All Twenty5i models are supplied with attractive full-length, slim-profile black fabric grilles that are held on with hidden magnets. Although slim the grille frames do still cause a small amount diffraction that affects dispersion and I perceived a less smooth top end and flattening of the soundstage when the drive units were covered. The option to guard delicate parts from inquisitive fingers is, however, very useful if there are young children around.

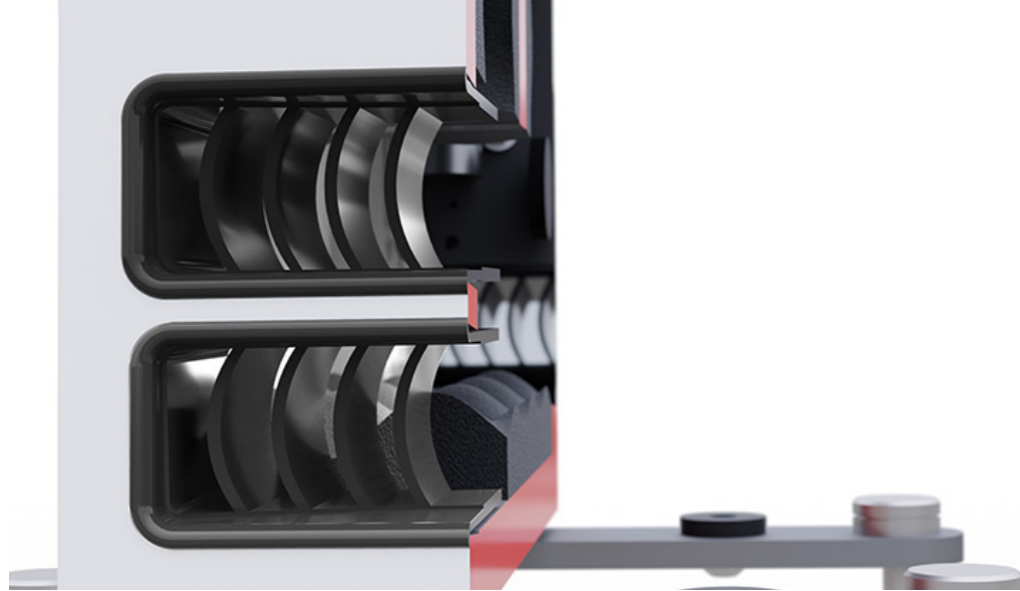
Borrowing yet more technology from the Fact Fenestria, the anti-vibration plinth bars supplied with the floorstanding Twenty5i models may not look all that special but they contain a vital new addition in the form of tuned dampers. These squidgy discs sit between the base of the loudspeaker cabinet and top of the plinth and damp a narrow-Q resonance in the midrange caused by the coupling between the loudspeaker and floor.¹ According to PMC, removing this resonance significantly improves image definition, separation and dynamic attack. Keen to test this for myself, before installing the bars I auditioned the speakers on generic spikes and IsoAcoustics OREA isolating pucks. While both the IsoAcoustics and PMC buffers delivered clear improvements over rigidly coupling the speakers to the room, I found myself preferring PMC's solution by quite some margin with these speakers. It offered the most open soundstage with the cleanest transients and lowest noise floor.

Set-up

A stubborn bass null that presents itself whenever speakers are pulled out from my room's boundaries dictates placing them close to the front wall. Despite the low-Q tuning of transmission lines being more forgiving of placement than the higher-Q tuning of bass-reflex systems and PMC's permission to site the Twenty5i series as close as just 100mm from the front wall, my experiences with vintage TLs had me worried that the 24i's low frequency extension would be too much for my 16m² (172 square feet) listening space. My concerns were largely unfounded, I was able to tune the 24i's bass by moving my listening seat a few inches forward from where I sit when listening to my reference speakers that roll off earlier. I settled on a placement approaching an equilateral triangle with the speakers two metres apart and their distance to my seat slightly further than this.

PMC recommend angling the speakers such that the tweeter beams intersect half a metre behind your head. Given the HF unit's strong ability to maintain output off-axis

I arrived at a more conservative toe-in of just a few degrees from the speakers being square to the wall behind. Encouraging more reflections from the side walls traded a small amount of centre image focus for a wider soundstage that stretched the full width of the room and allowed the speakers to disappear more easily. With suitable recordings this set-up produced an especially immersive sound field with images appearing from well beyond the boundaries of the listening space. Phantom image placement is greatly influenced by the room's acoustics, but I'm in no doubt that the



wide-dispersion and smooth off-axis response of the PMCs is of benefit here. A visit from family necessitated that I sit near a side wall for one of our listening sessions and I was impressed by how little the tonal balance changed when seated so far off-axis. The centre image, of course, pulled towards the speaker I was closest to but the precision of the stereo imaging remained excellent.

The Twenty5.24i's 8 Ohm nominal impedance isn't especially current-hungry but it does need more power than the 89dB/1w/1m sensitivity rating suggests. Though satisfyingly expressive at low volumes, its low distortion design begs to be tickled so it's important to have an amplifier with sufficient headroom for loud transients. I'd recommend a minimum of 50 watts RMS per channel in smaller rooms and 200 watts in larger spaces to enjoy the thrilling speed, control and dynamics these speakers are capable of producing; the more power you can give them, the more they'll impress.

Sound quality

Most of my impressions were formed using a Yamaha A-S3000 Class AB integrated with Revox B77 1/4-inch reel-to-reel tape deck and Schiit Yggdrasil OG D/A converter as analogue and digital sources. I find the 100 watt A-S3000 pairs well with many loudspeaker designs, its MOSFETs counter some of the dryness that stems from its very high damping factor but it still hits hard when it needs to. I also spent some time with the recently-released Yggdrasil LIM ('Less Is More') DAC.

While the 24i's voicing isn't strictly neutral, it serves a wide range of music well and delivers plenty of insight and excitement even at lower listening levels without losing engagement, which is when speakers with a flatter frequency response can sound a bit lacklustre. It delivers a full-range sound that's uber crisp and revealing without being brash. Lows are extended but fast and tuneful, mids are lucid but forgiving, and highs are incisive and airy. Timing and transient attack are especially impressive and are qualities that stand out to a greater or lesser degree depending on the equipment upstream.

With the Yggdrasil OG as source, the 24i's breath-taking speed and resolve is on full display. The simultaneous tom and snare slam at the beginning of Bryan Adams' Run To You is delivered with explosive attack and the clarity and openness of the reverb on the decay is exhilarating. There is excellent separation between the metronomic snare rim shots and repetitive bass and electric guitar riffs that propel the verses towards the chorus, they all cut through with an urgency that shifts bums onto the edges of seats. The bass runs are especially nimble, easy to follow and aren't masked at any point by the alternating kick drum pattern. Adams' raspy sibilants verge on

piercing in places but fit well with the intensity of the track. The Yggdrasil OG and PMC combo pushes this intensity to the limit without inducing fatigue, and I suspect this is in part due to how the 24i's middle frequencies are voiced.

I've grown to prefer an almost neutral or flat transition from midrange to treble but – when a designer pursues a different voicing – too little energy in this area is invariably better than too much as the latter often causes glare that can be tiresome. The 24i's gently downward-sloping midband avoids this problem and not only offers some mercy to edgy productions but also enhances the perception of distance to the musicians by pushing instruments deeper into the soundstage. This is very effective with large-scale classical music and transforms what might be a modestly-sized listening room into a larger performance space that starts at the speaker's baffle and extends backwards, a perspective that will appeal especially to listeners who enjoy sitting a row or two further back from the stage.

The PMCs do an excellent job of resolving the venue's acoustics in Saint-Saens' Symphony No. 3 in C Minor, Op.78 *Organ* (Telarc SACD 60634) and convey the vast scale of the recital to great effect. They may not reproduce the low organ notes with the rumbling heft I remember so fondly from the big IMFs (hardly a fair comparison given the patent difference in the size of not only the speakers but also the rooms they were used in) but they do it with more control and remain exceptionally composed during the crescendos, presenting an image that better escapes the enclosures. Hans Zimmer's *Blade Runner 2049* soundtrack is a punishing workout for even the burliest of loudspeakers, I was extremely impressed by the 24i's lack of distortion as the visceral low frequencies pressurised the room and convinced me there was a spacecraft descending from above. Throughout my audition I was perplexed by just how little the mid/bass cones move in response to strong impulses. Even with a fat-bottomed production like Daft Punk's *Random Access Memories* that usually has small woofers flirting with their end stops, the PMC drivers were barely twitching, which is quite remarkable given the strength of bass hitting my listening seat and demonstrates just how effective the ATL loading is at controlling excursion.

Subtle enough to avoid colouring the timbre of instruments, the 24i's laid-back upper midrange does present the stripped-back, singer-songwriter genre with less intimacy than I'm used to. This is partly compensated, however, by a smooth transition from midrange to bass, an area that often makes or breaks an otherwise promising design. Too much output here imparts a boxy colouration that undermines transparency while too little conveys a lack of soul. PMC's engineers have pitched the Twenty5.24i's lower mids just right with enough body to balance the speaker's very well-lit top end but not so much as to mask its swift transient response and decay; there's an



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immediacy to the sound of fingers pressing and plucking guitar strings that's particularly addictive.

Swapping the Yggdrasil OG DAC for the LIM version reveals a warmer side to this floorstander with a little less focus on the leading edges of notes and more on the body and release. Jennifer Warnes and Joe Cocker's voices in the moving duet, Up Where We Belong, resonate with richer tonal mass and their starkly differing textures and styles of delivery are contrasted more vividly; Warnes' angelic purity next to Cocker's road-worn huskiness. From the piano to the percussion, the 24i reproduces every instrument in this track with excellent timbre and you can feel the emotion in each player's contribution. The cymbal and triangle work is stunning with this combo, you get a deeper appreciation of its interplay with the piano melody. My Revox tape deck steers the presentation further in this direction and injects more bloom into the release of notes. As well as tempering some of the PMC's breakneck speed, it also confirms that this transducer is more than capable of fleshing out complex harmonic structures when given the opportunity.



Verdict

If you've previously shied away from transmission lines in fear that they'll overload your room with an excess of bass energy then you need to audition PMC's Twenty5i series. The two-way, floorstanding Twenty5.24i is an infectiously peppy loudspeaker that delivers a crisp, open sound with a pacy and tuneful low end that firmly underpins without dominating proceedings. Highly revealing of what's upstream and quick to identify weaknesses in a system, it pays to partner the 24i with befitting amplification and sources; ideally those that strike an engaging balance between transparency and musicality.