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Perlisten Audio S7t

New kid on the block, Perlisten Audio, is creating a stir straight out of the gates. We test the flagship floorstander
 Review: **Mark Craven & Paul Miller** Lab: **Paul Miller**

There's a perception that the US, the home of muscle cars, foot-long hot dogs and canyons a mile deep, is also the home of monster-sized loudspeakers. And not, it must be said, without good reason – there are various American manufacturers that frequently put the floor into 'floorstander', building models that require considerable carpet space and suit large listening rooms. So it wasn't much of a surprise to discover Perlisten Audio, a new brand from Verona, Wisconsin, kicking things off with the S7t, an almost 1.3m-tall seven-driver tower weighing in at 55kg.

So we're in the foothills of big and heavy territory here (heed that two-man lift icon on the packaging), with a £16,000 price tag to go with it. This is certainly not pocket-change, but factor in the loudspeaker's proprietary technologies, excellent build and finish, and the obvious engineering energy that's been put into it, and it starts to make sense.

DRAMATIC ENTRANCE

Although a new company, Perlisten hasn't settled on just one or two debut products. Instead, it's arriving all guns blazing with an extensive range that aims to cover both the hi-fi and home cinema markets. Topped by the S7t on test here, the rest of the S Series comprises the S5m monitor and S4b bookshelf models, plus S7c centre speaker and on-wall/surround S4s. There's then the more affordable R Series, which apes the model structure of the S but adds a second, more slender floorstander in the shape of the R5t. With a quartet of subwoofers too (one featuring twin 380mm bass drivers), that's 15 models in total.

All the S Series speakers, plus the largest R Series floorstander and Perlisten's four subwoofers, are certified 'THX Dominus', the newest and 'highest-spec' certification that THX has designed for home theatre systems (those who visited a cinema in the late 1980s and 1990s may remember the THX adverts, featuring toy mascot Tex

and the sound of a herd of cows...). To earn the Dominus badge, a loudspeaker must reach certain benchmarks, including a 92dB sensitivity, and measure 120dB at 1m listening distances 'at very low levels of distortion'. If that sounds vague, it's because THX keeps its full measurement ethos under wraps.

Sold off by original founder George 'Star Wars' Lucas in 2002, THX is now under the ownership of gaming hardware specialist Razer. Recently, this has meant its focus

has been on certifying smallscale audio electronics, and launching its first branded hardware, the Onyx portable headphone amp/DAC. So the Dominus specification perhaps signals a return to its roots, and in the

words of Perlisten's CEO Dan Roemer (an acoustic/audio consultant and engineer with companies including Yamaha and Mitek Corp on his CV), it at least signifies the S7t has been subjected to third-party testing [also PM's Lab Report, see p45].

'It is our thinking that THX certification was an excellent way to give credibility to our new brand's designs', Roemer told *HFN*. 'Perhaps contrary to perception, there's no formula within the THX spec. to design a speaker, but rather very stringent and difficult performance criteria to meet.'

FOUR-WAY

I'll admit it, the S7t's driver configuration initially threw me. If you're not paying attention, you might assume its quartet of chequered-finish 180mm 'Textreme' thin-ply carbon drivers are all dedicated woofers, sandwiching its central mid-tweeter-mid DPC array [see PM's boxout, p41, and interview sidebar, p43]. Yet the

RIGHT: Mounted into Perlisten's CNC-machined HDF baffle is its 'DPC array' comprising a 28mm beryllium tweeter and upper/lower 28mm TPCD (thin-ply carbon diaphragm) domes. Custom TPCD bass drivers are configured for either vented or sealed-box alignment

'The three-driver array is set into a dished waveguide'



HURRAY FOR THE ARRAY

Front and centre of what is an entirely symmetrical, large-scale array of bass, bass/mid and mid/treble drivers is a miniature array in its own right – a 'nest' of two carbon-ply domes either side of a central beryllium dome tweeter. Perlisten calls this its Directivity Pattern Control (DPC) waveguide, an 'acoustic lens' technology that is core to the very uniform and transparent sound of these loudspeakers. In practice, all three domes combine low mass with high stiffness but are optimised over discrete bandwidths. They take over from the adjacent bass/mid cones at ~1.4kHz but the 28mm main tweeter continues to work above 4.5kHz where the two 28mm laminated (thin-ply carbon diaphragm) domes roll away.

The integration of these units, however, is key [see interview sidebar, p43]. Not only is this triple-driver array set into a dished waveguide that's mapped to the directivity of the midrange cones above and below, but the physical profile and output of each tweeter unit is designed to optimise the response and dispersion of the ensemble, controlling both the vertical and horizontal directivity. While the sophisticated drivers and very complex crossover [achieved without compromising sensitivity – see Lab Report, p45] are bespoke, the thinking behind this full-range line of drivers is not dissimilar to the XA (eXpanded Array) proposed in the 1980s and latterly implemented by Snell Acoustics in its asymmetrical 1999 XA90ps floorstander and tall, slim but symmetrical XA Reference Tower of 2002.

Perlisten credits Comsol's acoustic modelling software for much of the high-level number-crunching – establishing the dome size and shapes, the profile of the waveguide, fine-tuning the crossover topology and spacing between the drivers (and grille design) to optimise the tower's vertical polar pattern. Comsol modelling was first employed in high-end audio, I believe, by Edwin van der Kley Rynveld for the Siltech Pantheon loudspeaker [*HFN* Feb '08]. PM

two cones nearest the DPC are bass/mid units, handling frequencies up to 1.1kHz, while the outer pair are used for low frequencies from 500Hz down, resulting in a four-way configuration with corresponding complex crossover design.

Sensitivity is rated at 92.2dB, and low-frequency reach down to 32Hz or 22Hz (re. -10dB). Why the two figures? Because, although at first glance this appears to be a sealed cabinet, there are side-facing vents towards the bottom of the enclosure that work in tandem with a pair of Helmholtz tubes. These can be sealed or left open for a vented box design trading greater bass extension for slightly compromised transient performance. Making this adjustment is not a 30-second process (it involves removing the S7t's base plate) but according to UK distributor, Karma AV, your Perlisten dealer is trained for the task.

Viewed front on, the loudspeaker has a purposeful look, its drivers dominating the front baffle. Yet this isn't a function-over-form design. There's an elegant curve to said baffle and a sumptuous finish to the cabinet as a whole.

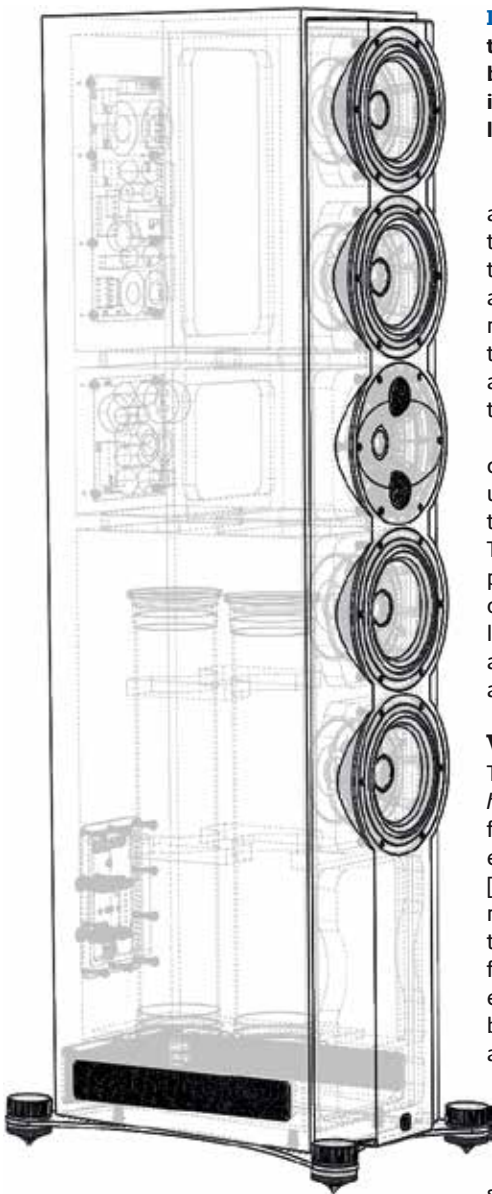
Colour options are standard piano black and piano white, in addition to the £18,300 Special Editions in natural wood cherry, black cherry and ebony, plus ebony high gloss. Opt for one of the SE variants (ours is the ebony high gloss) and the DPC waveguide switches from moulded glass

fibre to CNC-milled hardwood, while binding posts and mounting plate gain a smart rose gold-plated finish [see pic, p45].

Close inspection reveals some luxurious touches that also extend to the 'standard' S7t. For instance, spikes for the bottom of the circular feet at the corners of its heavy steel plinth feature tiny holes that enable height adjustment without you having to lift the cabinet itself. The magnetic grilles aren't an afterthought either – the S7t comes with five circular affairs, for the drivers and the central DPC array. You could, for example, choose to cover the four woofers but leave the DPC 'on show'.

NEW KIDS... SOLID BLOCK

Perlisten loudspeakers are relatively new, so we were keen to discover how the S7t had been 'voiced'. The quartet of woofers might suggest a preposterous level of bass – Dominus reminding me of the *Indominus Rex* mega-dinosaur from the *Jurassic World* film series – and, perhaps, a degree of boisterousness alongside the fidelity we'd demand at this price. Instead, the sound proved astonishing in its resolution, with a soundstage you want to dive into, and a way with the low-end that favours control, speed and impact rather than showboating. Oh, and this speaker will happily go very loud, with dynamic élan too, especially on the end of Constellation Inspiration monoblocks [*HFN* Sep '19] in the *HFN* listening room. ↪



LEFT: Line diagram shows the position of the bass/mid crossover [top], DPC crossover between bracing struts [centre] and the two internal Helmholtz resonators [bottom]. The latter may be 'shorted' with foam plugs

Another track, 'Bonde', features Cooder and Farke trading licks on guitar and banjo, the interplay between the instruments easy to discern, although both coming across as part of a united package. There was so much insight into their tonal tricks and techniques that it wasn't until later that my attention spread to other details, such as the rich, deep, massed backing vocals.

Volume up high, I found the S7t's dynamic flow and leading-edge ability utterly thrilling, but reduce the level and the speakers are arguably less exciting. The bass weight and tone is there, as is the pronounced but unfatiguing presentation of upper frequencies, but there's a slight loss of snap. Certainly, a strong part of the appeal of this speaker is its power handling, and controlled energy when pushed.

VIEW FROM ABOVE

The S7t's manifestation of soundstage height is impressive too, and keenly felt in the polar-opposite – style-wise – electronica of Koan Sound's 'Funkblaster' [OWSLA-OWS004]. The speaker flexed its muscles here, maintaining rich, pure mid tones while its tweeter punched out high frequencies without finding a strident edge. The hard-hitting, multi-layered bass was served without bloom, mud or any feeling of colouration. Its stop-start nature is designed to engineer a jerky, robotic feel and the way these drivers recoiled with no overhang – perhaps a by-product of Perlisten's work with subwoofers? – accentuated the effect.

As the spec and PM's measurements reveal, this isn't the most bruising of loudspeakers when it comes to ultimate low-end extension, even running in vented mode. Yet it sounds completely in control all the way down, never putting a foot

wrong with the memorable bassline in 'Billie Jean' [Thriller; CDEPC 85930], and still having more than enough output to do justice to Hans Zimmer's 'Cornfield Chase' [Interstellar OST, WaterTower Music; 44.1kHz/24-bit], where

organ and strings are joined by thunderous bass details that readily flap trouser legs.

This short soundtrack instrumental is cinematic to the extreme, and through the S7t it left me reeling – apologies for anthropomorphising, but this floorstander

DAN ROEMER

Perlisten is nothing if not an enigma – a new brand yet one betraying the extraordinary deep and secure foundation in loudspeaker design expected of a decades-old company. During an appropriately extended Zoom call, CEO and co-founder, Dan Roemer, got to the heart of the brand's thinking and direction.

'In most loudspeakers, the polar response is typically a by-product of the crossover design. For us the speaker's polar performance and predictable in-room behaviour is key, and so the crossover design is directed by these requirements, not the other way around. Matching notional filter responses to the specific bandwidths of individual drivers rarely guarantees any particular polar response.'

Dan elaborates on Perlisten's design goals. 'We first establish the desired family of curves to deliver the sensitivity, bandwidth, power response, on- and off-axis directivity, etc, that we want – we've spent many years creating and establishing these targets. Next, we design the drivers from the ground up, and set the waveguide and physical layout to meet these polar response targets. Only then is the crossover optimised to meet the family of target curves we established at the outset.'

Almost inevitably this results in some overlap in driver bandwidth and a more complex crossover topology to boot. 'Yes', admits Dan, 'but this gains us a more predictable and consistent in-room response, applicable across a range of "timbre-matched" loudspeakers. Different models are derived by adjustments in sensitivity and bandwidth.' PM



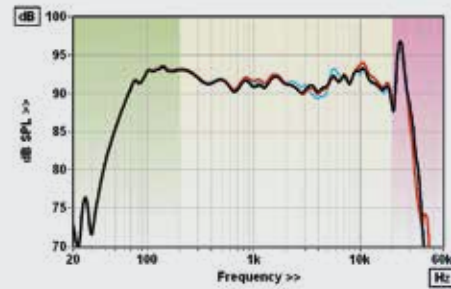
'Diaraby', the closing track on Ali Farka Touré and Ry Cooder's *Talking Timbuktu* [World Circuit WCD 040] found me catching my breath. I'd opted for this album as a loosener, hoping to bathe in the delicious delivery of its semi-acoustic bass and precision percussion, yet quickly it was the soundstage presentation that delighted me. The various instruments, including Touré's vocal and what I will best describe as a slide guitar, were drawn in a 3D space, hand percussion a presence roaming the rear, different elements emerging from points high above. While it was expansive, layered and popping with detail, this spread was also a seamless wall of sound – best heard on-axis, but still remarkably cohesive and three-dimensional from the wings.

'This album lurks in every audiophile's collection'

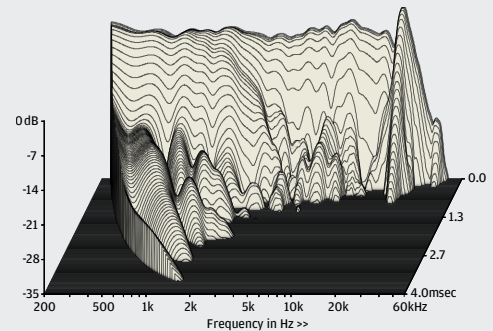
PERLISTEN S7T

Measured on the axis of the beryllium dome tweeter – the centre of the DPC array – the Perlisten S7t's response is impressively uniform [Graph 1]. Its maximum ± 2.4 dB response error occurs between 10kHz, where there's a peak in output associated with a mild presence band boost, and 20kHz where there's a notch prior to the dome resonance at 24kHz [pink shaded area, Graph 1]. Pair matching is very tight at 0.7dB (200Hz-20kHz) and while the magnetically-attached grilles introduce a further ± 0.7 dB variation in mid/presence band output [blue trace, Graph 1] they are otherwise benign. *Sans* grilles, the response errors hold to a tight ± 1.1 dB and ± 1.3 dB between 500Hz-8kHz where sensitivity is very close to Perlisten's claimed 92dB (91.6dB/1kHz/2.83V).

The HF response falls steeply following the dome resonance to 30.6kHz/27.6kHz (-6dB re. 10kHz), as does the bass below 49Hz (-6dB re. 200Hz), supplemented by a limited port/slot output at 23Hz. Boundary reinforcement will produce deeper bass in-room. Nearfield analysis shows the upper/lower woofers have a -6dB bandpass of 56Hz-540Hz while the innermost cones extend out to 1kHz (-6dB) just prior to the crossover. Distortion is a very low $<0.1\%$ through the midrange (re. 90dB SPL) while the 180mm TPCD cones show minor but well-controlled break-up [CSD waterfall, Graph 2]. This performance comes at the expense of a tough amplifier load – minima of 2.84ohm/15.1kHz and 3.1ohm/154Hz, maximum swings in phase angle of $+59^\circ$ /20kHz and -50° /80Hz, and taxing combinations at 4ohm/ -36° /104Hz and through the high treble where sub-4ohm loads from 9.5-21kHz meet swings in phase from -15° to $+60^\circ$. PM



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



ABOVE: Aside from a minor HF mode in the bass/mid cones at ~ 10 kHz, cabinet and drivers are well damped

LEFT: The S7t's four-way (500Hz/1.1kHz/4.4kHz) crossover is split between the bass/mid and DPC array drivers enabling bi-amping/bi-wiring if the gold-plated links are removed (as here). Side and rear vents come into play if the S7t is configured in reflex mode

its blues-rock mix did sound a little unadventurous. I've also heard Pink Floyd's 'Comfortably Numb' [*The Wall*; Pink Floyd Records, 96kHz/24-bit]... a lot. But another go through these flagship floorstanders wouldn't hurt. The tone of Roger Waters' bass guitar was exquisite, as was the more subtle low brass.

NEW DISCOVERIES

Surprisingly, however, I felt I was hearing it in a way I hadn't before, not in terms of microscopic detail, but in imaging. And at this scale, this resolution and with this dynamic flavour, you remember why it's a track destined to lurk in every audiophile's collection. It was spine-tingling, emotional stuff, and I never wanted Gilmour to stop wailing.

As for getting a sense of the recording space, and painting a visual picture, the S7t doesn't fail. Rogrigo y Gabriela's furious flamenco guitar jam 'Terracentric' [*Mettavolution*, Rubyworks; 44.1kHz/24-bit] had a degree of physicality that was tangible. The feeling of air being shifted by these speakers was palpable, as was the evocation of the duo on a small stage. Again, these speakers do 'loud' with real class so, naturally, you wouldn't buy the S7t (or SE) to play them quiet. But you should definitely think about buying them. 🗨️

HI-FI NEWS VERDICT

New American brand Perlisten has hit a home run with its debut S7t floorstander. This is undoubtedly a technically clever loudspeaker, but engineered for one simple goal – making great-sounding music. It offers a large, involving soundstage, full control across the frequency band, effortless dynamics and ability to switch from up-and-at-'em rock to startling intimacy. What comes next? I'll be listening...

Sound Quality: 90%



seems to understand exactly what a piece of music is calling for, whether set to work with modern pop, jazz, hard rock or an orchestra. Gang Of Youths' 'In The Wake Of Your Leave' [Warner Music CD] sounded lush, with a size and edge to its snare drum but a sparkling flavour to the euphoric choral notes and vocals.

On the other hand, Airbourne's 'Breakin' Outta Hell' [eponymous; Spinefarm Records SPINE799188] was fast, meaty and mean, even if

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83V – 1kHz/Mean/IEC)	91.6dB / 91.4dB / 89.5dB
Impedance modulus: minimum & maximum (20Hz–20kHz)	2.84ohm @ 15.2kHz 17.5ohm @ 62Hz
Impedance phase: minimum & maximum (20Hz–20kHz)	-50° @ 80Hz $+59^\circ$ @ 20kHz
Pair matching/Resp. error (200Hz–20kHz)	0.7dB / ± 2.4 dB/ ± 2.1 dB
LF/HF extension (-6dB ref 200Hz/10kHz)	49Hz / 30.6kHz/27.6kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.14% / 0.07% / 0.6%
Dimensions (HWD) / Weight (each)	1295x240x400mm / 56kg