

# Raidho XT-1

« Raidho's X-series speakers have been updated with titanium-coated drivers. Is the 'mini' now a 'max'?  
 Review: **Nick Tate** Lab: **Keith Howard**

There are many imponderables in life, and one that always puzzles me is just why there are so many loudspeaker companies in Denmark. For a country of 5.5 million people – roughly the same as Scotland – it's almost as if every major urban conurbation has its own speaker manufacturer... along with a supermarket, pizza place, bar and hairdressing salon.

A few of Denmark's 'big beasts', including DALI, Dynaudio and B&O, are already well known to *hfn* readers, but for many, Raidho is a brand deserving of the same limelight, and the XT-1 standmount reviewed here is a perfect introduction to its range. The three key figures behind the company's products are CEO Lars Venning, CMO Lars Kristensen (known to many for his earlier work with Nordost) and Chief Designer Michael Borresen. Raidho is owned by Dantax Radio – which took over the brand in 2009, adding it to its more mainstream consumer electronics portfolio of Scansonic and Harmony.

## A WELL-KEPT SECRET

« Meanwhile, although Michael Borresen's name hasn't yet gone down in the pantheon of great loudspeaker designers, fans of the brand feel that it should. There's very much the sense that his speakers are a 'best kept secret'. When I met him a few years back at the Raidho factory, he was sanguine about this – the brand has a small but dedicated following even if the company doesn't have the marketing muscle to fight it out in the mass market with the big boys.

All of his speakers right up to the gigantic D-5.1 have a distinctly clean, smooth but detailed family sound, and the higher you go in the range the more you get of it. The new XT-1 is an improved 'titanium version' of the company's 'entry-level' X-1 mini-monitor [see inset picture, p57], sporting an upgraded mid/bass unit. It costs a hefty £6500 in standard black

finish and £6800 in white. There's also an optional pair of stands that will lighten your wallet to the tune of £499 – aesthetically they're a perfect match and complete the package nicely.

The beating heart of this product is a bespoke 100mm mid/bass unit. Said to have a very compact and magnetically rigid neodymium magnet motor system, it sports a super stiff multilayer aluminium/ceramic/titanium hybrid cone. The XT variant tested here differs from the cheaper X-1 because of its use of titanium in the sandwich [see KH's boxout, facing page].

Although Borresen says that this driver can go higher, he has chosen to roll it off at 3.5kHz, above which Raidho's very own sealed ribbon tweeter takes over – something the designer calls the 'foundation of the company's sound'. Also described as 'the best driver we have', its membrane is claimed to have a mass that's up to 50 times lower than any dome design despite its large surface area. Powerful neodymium magnets are used, too.

This all makes for great transient speed, improved sensitivity and power handling. This tweeter forms the cornerstone of the company's entire range and even appears on the flagship models.

The cabinet has been designed to avoid what Borresen calls 'sonic misinformation', by which he means unwanted resonance.

That's why the small enclosures weigh a not inconsiderable 8kg apiece – the front baffle is cast in aluminium, and sports a largish slot-shaped port. The box looks neat and petite, and has an immaculate finish.

But while the XT-1 is a beautiful thing to behold, its small physical size makes for a mediocre (but not unexpected) quoted sensitivity of 85dB/1W/1m, and seriously



limited bass extension. With this in mind, prospective purchasers should remember that it best suits relatively nearfield use in fairly small rooms, and although it's a surprisingly easy load [see KH's Lab Report, p59], it does need a goodly number of watts to unleash its real ability.

Positioning is also an important factor here, the speaker best sited as close up to a boundary wall as possible to prevent the onset of booming. A subtle toe-in helps snap the stereo image into focus, too.

## SO MUCH TO LIKE

As the saying goes, 'one instinctively knows when something is right'. Just a few bars into pretty much any type of music, and it's apparent that this loudspeaker is exceptionally well voiced – given its limitations, of course. The first time you hear it, you are made aware that a good

*'Its bass is small but perfectly formed; its treble super classy'*





**LEFT:** A sealed ribbon tweeter is joined in the XT version of this miniature standmount speaker by a titanium/titanium nitride-coated ceramic bass/mid driver that's reflex-loaded via a front vent in the base of the cabinet

how the XT-1 cannot transcend the laws of physics, for there's an obvious lack of weight and extension at the bottom end. The track's double-bass work proved taut and tuneful nevertheless, and displayed no particular spot where the port could be heard announcing its presence. Rather, the XT-1 got on with serving up a finely detailed and unexpectedly natural soundstage, inside which the musicians were allowed to really do their thing.

The standout quality on this track was the surprisingly deft handling of hi-hat cymbal work, for not only was the texture of the instrument uncannily realistic, but it syncopated brilliantly with the snare drum. The effect was a snappy, shuffling feel to the rhythm, further augmented by the fine dynamic shading as the XT-1's delicate high frequency unit faithfully conveyed drummer Leo Morris's nuanced accenting.

#### STRAIGHT TO THE HEART

If the XT-1's bass is small but perfectly formed, and its treble super classy, then what of the midband? Here the loudspeaker impressed most of all. The honey-sweet sound of Grant Green's gorgeous guitar licks was allowed to play effortlessly alongside the marvellous Hammond organ work with little sense of strain. The result was a joyously free and easy sound, and one that translated very well across various different musical genres.

The Human League's 'Open Your Heart' [*Dare*; Virgin CDVR2192] sounded especially captivating. This seminal early-'80s electronic pop song couldn't be further away from Green's loose, groove-driven jazz, yet the XT-1 still cut right to the emotional heart of the music.

Indeed, the way this loudspeaker drills down into the spirit of things is very special. This highly retro-sounding Martin Rushent production came across as remarkably direct and engaging, but once again it was the emotions provoked that really engaged me, rather than any one or other hi-fi aspect. The XT-1 is so musically fluent that the listener becomes oblivious to its limited deep bass, and it's certainly boosted by an unerringly bouncy mid-bass that just can't help but push the song along. It's only when you play music with dramatic dynamic shading that the XT-1's limitations really show up.

For example, Bassomatic's 'Fascinating Rhythm' [*Set The Controls For The Heart Of* ➔

octave or two of bass simply isn't being reproduced, but if you can live with that then there is so much to like. It offers superlative clarity over its slightly narrower-than-normal bandwidth, allied to great

spatial dimensionality, fine dynamics and detailing, and a sense of musical enjoyment.

Grant Green's 'Ease Back' [*Carryin' On*; Blue Note TOCJ-866] shows

#### TITANIUM OVERCOAT

Raidho is well-known for using optimised anodising processes to create three-layer sandwich diaphragms with aluminium cores and ceramic skins. As well as being stiff – which pushes up the frequency of the cone breakup modes – these diaphragms also have better internal damping than simple metal diaphragms, so that when breakup does occur the resonances are of much lower Q. This means less peaking in the frequency response and faster decay of the resonance. Raidho's X [pictured] and XT-series both use its X-driver, whose cone is treated to an 80-hour electrochemical process that reacts with the aluminium diaphragm to create the ceramic skins. But in the X-T driver the cone is then treated to a further process in which layers of titanium nitride and pure titanium are deposited on the ceramic surfaces, improving stiffness and damping still further. KH

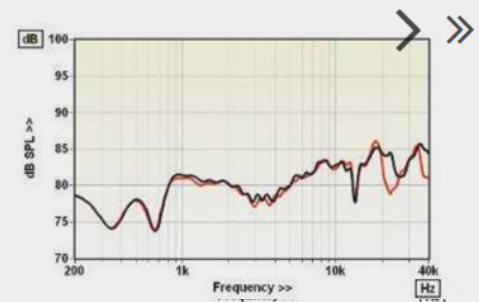


## LAB REPORT

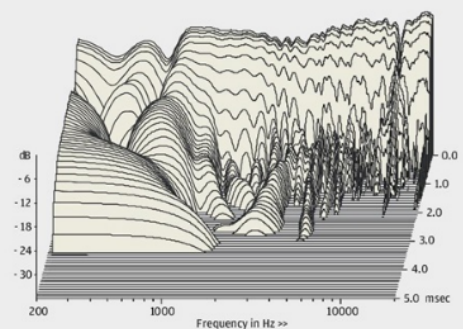
### RAIDHO XT-1

Small loudspeakers are an embodiment of the old adage that you can't get a quart out of a pint pot: low sensitivity and restricted bass extension go with the territory. Raidho claims 85dB sensitivity for the XT-1, but that is extremely optimistic, all the more so given that low impedance has not been exploited to help matters. Raidho claims a minimum modulus of 6.0ohm, which is exactly what we measured. In combination with notably low impedance phase angles, this results in a minimum EPDR (equivalent peak dissipation resistance) of 4.1ohm at 115Hz, so the XT-1 is an exceptionally easy load to drive. Given our low measured pink noise sensitivity figure of 80.3dB, reduced impedance and higher sensitivity might have been a better trade-off. But perceived sensitivity will certainly be higher when the XT-1 is used close to a room boundary.

Forward frequency response [Graph 1, below], measured at 1m on the tweeter axis, shows that the output is shelved down below 800Hz, which boundary gain will lift. Other notable features are a presence band suckout centred on 3.5kHz and rising output thereafter, so the XT-1 will sound most neutral when listened to a little off-axis. In combination these features result in high response errors of  $\pm 5.8\text{dB}$  and  $\pm 6.2\text{dB}$  respectively (200Hz–20kHz), but again boundary gain can help here. Pair matching over the same frequency range was fair at  $\pm 1.2\text{dB}$ . Diffraction-corrected nearfield measurement showed the bass extension to be 57Hz (–6dB re. 200Hz), but as important to bass quality is an 8dB peak at 100Hz, which might suggest some boominess. The CSD waterfall [Graph 2] shows low-level resonance through most of the treble. KH



ABOVE: Small cabinet and an 'easy impedance' means low sensitivity. Bass improved by rear wall positioning



ABOVE: Cabinet resonances are necessarily of a low order but there are a cluster of modes above 2kHz

### HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	82.4dB/80.3dB/80.1dB
Impedance modulus min/max (20Hz–20kHz)	6.0ohm @ 177Hz 12.9ohm @ 29Hz
Impedance phase min/max (20Hz–20kHz)	–24° @ 105Hz 24° @ 25Hz
Pair matching/Response Error (200Hz–20kHz)	$\pm 1.2\text{dB}$ / $\pm 5.8\text{dB}$ / $\pm 6.2\text{dB}$
LF/HF extension (–6dB ref 200Hz/10kHz)	57Hz / >40kHz/>40kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	– / <0.1% / 0.3%
Dimensions (HWD)	320x145x230mm

**LEFT:** No bi-wire option or binding posts for bare wire here, as the 3.5kHz crossover is accessed via a single set of gold-plated 4mm sockets

box means less chance of wrecking the music's natural acoustic with malign cabinet resonances and diffractions, yet this one proved even better than expected with the Allegri Quartet playing Beethoven's String Quartet Op.18:4 [Vivat VIVAT103]. The opening *Allegro* came over in a highly atmospheric way, the little loudspeaker 'disappearing', while throwing out a vast, cavernous space where the musicians sat etched in precise locations before me.

Depth perspective was excellent too and the gently damped reverberations of

the Menuhin Hall clear to hear. Switching genres, The Dandy Warhols' 'Bohemian Like You' [Thirteen Tales From Urban Bohemia; Capitol Records 857 7872] underlined the XT-1's ability to craft a very believable acoustic space. A very coherent, capacious and see-through space that utterly belies the scale of the speaker itself. ☺

### HI-FI NEWS VERDICT

Raidho's new XT-1 is a brilliant but flawed little loudspeaker. It's highly adept at conjuring up a vast stereo soundstage, inside which instruments are precisely located and able to flourish. It is exceedingly good at unlocking the emotion in the music too, with its exquisitely graceful treble performance, fine midband detailing and delicate rendering of tonal nuances. Only in the bass does it show its vulnerability.

Sound Quality: 88%



### SPACES CLEARLY DEFINED

In fact, I've heard few small speakers that do better at coping with power. Of course there are a few occasions when it really makes its diminutive dimensions known – such the closing snare-drum break on 808 State's 'Pacific 707' from 90 [WEA WMC5-50], where it simply lost impact and body. So while this wee speaker does sometimes sit on dynamics, it comports itself so well in other areas that you can't help but forgive it.

One of the traditional strengths of a small speaker is midband (vocal) imaging, and here the XT-1 does not disappoint. A compact

The Bass; Virgin CDV 2641] saw the little speaker a tad out of its depth at high volume levels. To be fair, it remained surprisingly composed when downwind of a good few hundred watts of solid-state power from editor PM's Devialet 800s. Even so, the Raidho XT-1 won't be displacing your Focal Grand Utopias into the spare room, if powerful dance music is your thing!