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Physikal

David Price listens and learns from German Physiks' masterful HRS 120 Carbon loudspeaker...

There are not many companies who would say a £16,800 loudspeaker is their 'bread and butter' entry-level product, but when your top model runs out at some €240,000 I suppose the HRS 120 could be described thus. Still, back in the real world where the rest of us live, this speaker will be most people's idea of audio Nirvana. Given that you can buy two pairs of Quad 2905s and still have change for a world cruise, this gets no special pleading...

The great thing about the 'high end' loudspeaker market is that, perhaps more so than any other subsection of hi-fi, your money invariably buys you a focused approach to the problematics of playing music. Whereas you can stick a pair of £129 Wharfedale Diamond 9.1s on the end of a decent system and find that they play most types of music in a uniformly reasonable way, spending one hundred times as much (or more) often means that the speaker will fly with one type of music in one type of room and with one type of system, but sound considerably worse than the aforementioned budget box with another. The question then becomes finding the right high end speaker for you – bespoke like the best Saville Row suit...

As you might expect, the German-Physiks HRS 120 is not your average assemblage of conventional moving coil drive units in an oblong box. At its price point, you're into ribbons (Magneplanar), electrostatics (Quad, Martin Logan), dual concentrics (Tannoy) and omnis (MBL). The HRS 120, as you might have surmised from their shape, herald from the latter category. But of course, they're different inasmuch as they're powered by what German Physiks describe as their Dicks Dipole Driver (DDD).

Used on all models right up to the top of the range Gaudi, this comes in two flavours – titanium or carbon fibre. The review loudspeakers sport the latter, which are said to be a better 'real world' compromise (the former are easy to disfigure, their foil being so thin that one touch pushes them out of shape). The unusually shaped unit, described as a "bending wave convertor", runs all the way from 240 to 24,000Hz, obviating the need for a crossover point in the midband (where the ear is most sensitive) and maintaining phase coherence right where it's needed. Its omnidirectional dispersion is a further welcome benefit, making it work well in many types of listening room [see DDD THEORY box].

The trick was getting the DDD driver to work in box with a bass driver. The tall but slim (320x1145x320mm) cabinet uses heavy panels of MDF with reinforcements fitted to critical points within the structure, in an octagonal shape so the individual panels are smaller and therefore stiffer than they



Education

would be if a conventional square or rectangular cross section had been used. Hawaphon damping material [pictured overleaf] is applied to the inside of each panel - a polymer sheet containing a matrix of small cells filled with very fine steel shot, originally developed as an anti-surveillance measure for use in military buildings. It is said to add mass to the panel and reduce the resonant frequency. Onto this is added a lining of high density felt. Finally, at the bottom of the 29.7kg cabinet, a 250mm moving coil 'woofer' takes care of the last few octaves.

The HRS 120 is a single wired design, with handy jumpers at the back next to the binding posts to offer a degree of treble trim in four steps (-2dB, flat, +2dB and +4dB). This is an excellent, welcome feature; providing it doesn't impede the signal, I have no problems with level controls to get a speaker to work well in a listening room - given that the latter are so variable. Overall construction quality is very good - with fine cabinetry in the customer's choice of hand matched, hard wood veneers. There's also a carbon fibre panelled version at a considerable price premium.

SOUND QUALITY

Despite the fact that the HRS 120 is an omnidirectional loudspeaker, and thus theoretically easier to place, I must confess to spending more time than usual moving my review samples around. In my medium-to-large (by UK standards) listening room, I found they worked best about 3.5m apart, and about 0.75m from the back walls, although the stereo imaging can be improved by moving them further out into the room and closer together. Another issue was that of partnering ancillaries - with only middling efficiency [see MEASURED PERFORMANCE] these won't work with any old 3W single-ended triode tube amp. I found Quad 11-40s just about coped, as did Sugden's IA4 Class A integrated, but they really liked the firm underbelly of NuForce's Reference 9SE 250W monoblocks, allied to the MF Audio Silver Passive Preamp.

Despite sounding quite poor

at first, the aforementioned fettling finally pushed these German Physiks columns into their zone, whereupon there was a 'night and day' transformation, and I suddenly realised they're very high resolution transducers with all the spatial prowess that you'd expect from something that doesn't fire sound at you from a very specific angle via multiple, often tenuously matched drive units! Put simply they offer a 'cathedral-like' listening experience, throwing images way, way out of the box (or, ermm, octagonal cylinder) and apparently dissolving into thin air. The recorded acoustic that they unleash is certainly well lit, but in my system at least - complete with some very smooth source components - never sounded harsh.

Supertamp's 'Child of Vision' showcased the space, pace and grace of the HRS 120. It's a fine CD transcription of a quite bright, spry sounding original recording, and these loudspeakers communicated precisely this. Most striking was the seamlessness of the sound; not only was it vast in scale but utterly even and all-of-a-piece. Hearing these omnis shows you how intrusive multiple drivers of different sizes firing right at you can sound - there was no sense of listening to a loudspeaker. The tone of the electric piano was startling - beautifully clean and direct, yet lightning-fast and ringing with harmonics. Vocals were completely unspoiled by the sound of little cones heave-ho'ing in front of you - and tonally dry but vibrant all the same.

Moving higher up, and the cymbal sound was truly impressive. Having a penchant for ribbons (i.e. Apogees) at this price point, with a strong second-choice preference for the sublime electrostatic panels of Martin Logan, I wasn't expecting what looks like a moving coil driver with a stretched cone to deliver the goods in the high frequency department! Hi-hats were smooth and very subtly etched; there was no sense of listening to a large cone trying to 'do' treble, the HRS 120 sounding just as finessed as almost any small metal dome tweeter I've heard. This great subtlety and detail up top, allied to that vast spatiality make for a lovely

DDD THEORY

At first glance, the driver looks like a conventional pistonic cone, inasmuch as it has a voice coil/magnet assembly that serves as the actuator and a cone, although this is longer and narrower than usual. But with a piston driver, when the voice coil moves, the entire cone moves together with it (which is why the cone and voice coil structure is made as rigid as possible), and the sound wave produced moves in the same direction as the movement of the cone. German Physiks says the DDD "is rather more complex", however. The lower frequency end of its operating range can be described with Thiele/Small resonant parameters, while in the next frequency band up to the coincidence frequency "it works like a pistonic driver". Next, there's an overlapping band where pistonic movement is "progressively replaced by bending waves until all the radiation is generated purely by bending movement in the cone". Due to dispersion and the cone's special shape, the coincidence frequency is spread over an extended frequency range, rather than occurring at a single frequency like the dipole frequency, says German Physiks. From the upper edge of the coincidence frequency band, it works like a pure bending wave converter where the velocity of the travelling waves in the cone increases with frequency. Finally, the last mode of operation commences above the bending wave band at the dipole frequency, when the first standing wave occurs and where modal break-up begins.

The idea is that, by optimising the key properties of the cone material, namely thickness, elasticity and specific weight, together with the cone's bending stiffness, which is achieved by selecting the correct cone-angle, all four frequency bands may be very closely balanced. The last two modes cover the majority of the DDD driver's operating range and are what differentiate it from conventional drivers. In these two modes, when the voice coil moves, the whole cone does not move together with it, as the open end of the cone is terminated by a rubber suspension and semi-rigidly attached to the driver chassis. Instead the motion of the voice coil causes a wave to travel from the top of the cone down to the open end. This occurs because unlike the piston driver, the DDD driver cone is made from a very light and flexible foil - 0.025 mm thick titanium or 0.15 mm thick carbon fibre. While the shape of the cone gives it rigidity at rest, it is relatively easy to excite waves in the cone material. The trick is in controlling these waves.

listen.

Bass was impressive, although I'd certainly say it wasn't their strongest attribute. LFO's 'LFO' showed that what low frequencies there were, were utterly respectable - taut, tight, tuneful and very well integrated with the rest of the frequency range (certainly better than the Martin Logan Summit with its separate bass box and active drive). But more than this, there's nothing remarkable - there's no sense of massive, swingeing power and subterranean lows you



get from B&W's 801Ds at almost half the price.

Perhaps this is actually a boon for British rooms (I found the MLs overpowering in mine); the low frequencies offering a firm, no-nonsense underpinning to an exceptional midband and treble. You'd certainly not notice this as a two-way, so well integrated are the lows with the rest of the frequency range.

My favourite classic Philips vinyl pressing of Debussy's 'Preludes' showed the beautiful subtlety of these loudspeakers; piano tone was remarkable. Sparkling harmonics – thanks in no small part to the great bandwidth of black plastic via a decent moving coil cartridge – made a dramatic impression, along with breathtaking transients. The latter is something I hadn't expected from such a big 'cone' (if you can call the DDD driver that) – the HRS 120 showcasing the pianist's dazzling speed and control. As the keys were hammered progressively harder through 'La Cathedrale Engloute', so these speakers were able to convey the power of the piece, evoking the cathedral's emergence from the misty waters...

Once the system had been properly set-up, these loudspeakers shone with almost anything they were fed, but if there was one genre they loved more than any other, it was jazz courtesy of a pair of crossed



HISTORY

After years of mathematical modelling and physical experimentation, Peter Dicks created his first design concept in 1978, but it took until the early 1990s when Mainhattan Acustik, run by IT expert Holger Mueller, licensed the design and German Physiks was born. It took two years to make the first commercial product, refining the Dicks Dipole Driver to fit the Borderland loudspeaker. In 1993, with sales continuing to rise, Mueller established a new company to exclusively manufacture the German Physiks range of loudspeakers, and since then it has prospered, especially in the Far East.

microphones, fed straight into a two-track open reel. Lou Donaldson's 'Alligator Bogaloo', courtesy of BlueNote records back in 1967, showed why. The sheer size of the recorded acoustic was astounding, dwarfing even the mighty B&W 801Ds in my listening room. Massive, smooth, even and uncoloured saxophones soared around my listening space, with life-size drums, churning hi-hats and a decently deep double bass – the player's fingers marching up and down the fretboard with military precision.

CONCLUSION

This is a very distinctive pair of loudspeakers. Having tried every high end design in my house from Quad 989s to Meridian DSP7000s, via Perigee Acoustics FK-1F and Martin Logan Summits, I have to confess that I've never been completely convinced by any of them. Yes, I've loved them all for different reasons, knowing that what they do, they do brilliantly. And so it is with the German Physiks HRS 120 – they are superb in many respects, but not all. The interesting thing though is that in their inevitable weaker areas, they are less compromised than others. For example, B&W 801Ds give stunning visceral bass but are rather tonally 'grey'. Quads 989s are lovely spatially but weak and compressed at frequency extremes. These loudspeakers' least convincing aspect is their bass, but even this is still good by class standards – making them an even more enticing purchasing proposition.

Invest in an excellent pre-power amplifier combination and a decent, smooth front end – either analogue or digital – and these will unlock the music held on the disc in a joyfully natural and unfettered way. Superlative spatial projection and a wonderfully fast, even and open sound all the way up the scale make them exceptionally enjoyable. There are other loudspeakers at - or less than - their price that can do some other things better, but I can't think of any which are such consummate all rounders – as such, they're a brilliant appliance of science.

REFERENCE SYSTEM:

Michell GyroDec/TecnoArm/vdH Frog turntable
Note Products PhoNote phono stage
Marantz CD63KI DP CD player
MF Audio Silver Passive Preamp
World Audio K5881 (modified) power amplifier
NuForce Reference 9SE power amplifiers
Quad 989 loudspeakers

MEASURED PERFORMANCE

The German Physiks HRS 120 loudspeakers measure unusually for an omnidirectional design that uses a full range type driver, in that they have a rising response towards 20kHz. Usually, with full range drivers, output tails off towards the upper end of the frequency spectrum, despite designers' best efforts, as the laws of physics come into play. Simply, there is great difficulty in making a larger diaphragm move effectively at high frequencies. As a result, the technology put into the HRS 120s' DDD driver clearly is very effective in this respect.

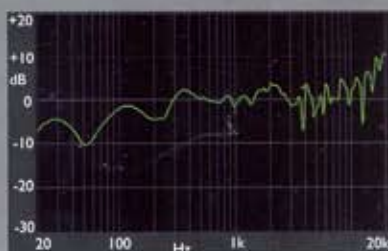
That said, the output is rather uneven, due to reflections from many surfaces interacting and it is quite likely that the sound will change according to the speakers' positioning - experimentation will be the key here.

At the low end, the German Physiks are rather uneven, with a suckout at 200Hz that may well rob upper bass detail. Other than this, output is maintained down to around 70Hz, which is fine, but the HRS 120s are unlikely to offer the ultimate in low end power.

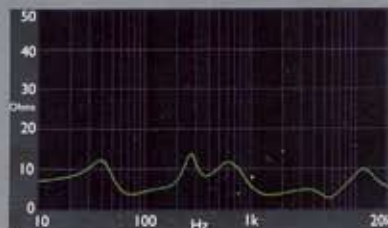
Electrically the HRS 120s are fairly even, with no impedance nasties waiting to trap unwary amplifiers. That said, however, their average measured

impedance is 5.7 Ohms, dropping to a minimum of less than 3 Ohms, so they are a stiff load and will require plenty of current from a muscular amplifier. Measured sensitivity in the listening attitude was 82.5dB, which equates to around 86dB for a conventional design, so amplifiers of 40-50W would be a wise idea. AS.

FREQUENCY RESPONSE



IMPEDANCE



VERDICT

Vast soundstaging allied to a lightning-fast, natural sound puts these up with the very best at the price - but careful set-up is essential.

GERMAN PHYSIKS

HRS 120 (approx.) £16,000

www.german-physiks.com

FOR

- sublime soundstaging
- speed, musicality, dynamics
- delicate tonality
- engineering

AGAINST

- limited bass
- system & room dependent