

# hifi & records

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World premiere: Wilson Benesch Discovery 2

## The Blue Marvel



The lights went out at the Festspielhaus in Baden-Baden. Only a large concert grand was shimmering faintly in the spotlight, when Grigory Sokolov, one of the true piano grandmasters, hit the stage with quick steps. And after the final wave of coughers and throat clearers had fallen silent, Mozart could be heard with such a naturalness that one inevitably got the impression: Yes, this is exactly how it's supposed to sound. It was a night to remember. In a concert hall even the sound of such a mighty instrument is carried by an exalted lightness, if not angelic effortlessness. Bass, mids, highs? They don't matter. Spatial depth, imaging precision, »musical flow«? Nobody will talk about such things after visiting a concert. By high-end standards quite a few people would definitely find a live performance not spectacular enough, a realistic acoustical experience at a trade fair would probably win an epic fail. Yes, we have pretty much lost our way in our pursuit of the perfect sound – »naturalness« is obviously no more a key criterion for playback.

If also the bottled hi-fi shall be enabled to convey such great experiences at least to some extent using only two stereo channels, a lot of things must fit. Beside the recording technique it's consistently the speakers above all which must deliver. Their linearity, radiation pattern and interaction with the playback room are essential (see issue 4/2015, »*The Linear Frequency Response*«). An accurate transient behaviour and low distortion figures follow close behind on the list. But which speaker sounds like a big Steinway or even a whole orchestra? Simple answer: none. High-end can only try to impart a credible illusion; more is not achievable in the comparably small living-room, period. If we nonetheless stick to our high ideal, this is still worth an applause – the gods love those who strive for the impossible.

Among those idealists who are still active in this sense of the high-end branch, Christina and Craig Milnes of Wilson Benesch

may undoubtedly be counted. Together with 16 employees they've been aiming in the British town of Sheffield for almost 30 years to make the impossible possible, after all. Or at least come close to it. Wilson Benesch's first loudspeaker, the ACT One from 1994, was ahead of its time. A picture-perfect 2.5-way column whose carbon fibre sidewalls were tapering backward – the world had never seen something like this before. Fully loaded with fine ScanSpeak drivers which were causing a stir in the scene back then. To me it has remained the epitome of a Wilson Benesch until that milestone by the name of Discovery came out in 2001, which we reviewed in the third issue of that year. From now on there were two markedly different designs which were to leave a profound impact on Wilson Benesch's model range until today.

A loudspeaker designer needs to make a lot of conceptual decisions. Since no driver on this planet can cover the audible frequency range entirely, at least two ways are required: a tweeter and a low-mid driver. The challenge is now to unite these two in such a way that we perceive them as one sound source (otherwise you may just as well stick to the broadband speaker). If this doesn't come off authentically, everything else will be a complete waste of time: a deeper bass, more detailed highs, increased maximum sound level – all worth nothing if a multi-way system acoustically »falls apart« at the listening spot. The reasons for this are manifold, it may be due to a cheeky tweeter, a sluggishly mumbling woofer or two drivers which absolutely don't match. Who aims to realise particularly striking sound qualities, is prone to walk into this trap, for these are almost always detrimental to the homogeneity which, however, is extremely important for psycho-acoustic reasons (plausibility of perception).

While we can unhesitatingly entrust a modern tweeter with the full harmonics spectrum, the low-end extension in the bass is way more difficult. Here a loudspeaker designer sees himself con-

Review: Wilson Benesch Discovery 2 loudspeakers

On discovery tour with Wilson Benesch: the Discovery 2 is a unique loudspeaker in several aspects – and sounds absolutely fabulous.

# Blue Marvel



*The stuff the carbon cabinets are made of: in Sheffield Craig Milnes (left) shows Wilfried Kress the carbon fibre fabric employed by Wilson Benesch.*

fronted with three parameters that he needs to balance out for his concept: bandwidth, sensitivity, and cabinet volume. No matter which way he decides, he'll get nothing for free.

A truly deep bass and a high maximum sound level require larger cabinets and a greater diaphragm surface. And so the trouble begins with that »boxy sound« which has been an inherent feature of the dynamic loudspeaker since its early days. The latter is fighting an almost forlorn battle on two problem fields. The first are the resonating cabinets themselves, which in spite of super thick walls and high masses can never be controlled perfectly. The second are the sound portions radiated backward into the interior of the cabinet, which can never be fully absorbed, either, and which interfere with the music signal if they get out. And this they do, because the, in this respect, weakest spots of even the most massive cabinets are the often paper-thin diaphragms themselves.

»Little enclosures, little problems« – that sounds logical. And if these are even equipped with a solid metal baffle board and carbon sidewalls, the inevitable cabinet resonances can already be reduced to a minimum. Moreover, large floorstanders have more reflecting surface and also make a visually more conspicuous appearance. Personally I feel that the very big bolides stand right in my way for music listening, and as a consequence I've grown a passion for mini monitors over the years. The Wilson Benesch Discovery was and is still bridging the gap between these two factions: compact enough

to not disturb and wideband enough to qualify as a full-grown speaker.

A proven trick to make do with a cabinet volume as small as possible is the isobaric principle with two woofers coupled by an air cushion, which was invented by RCA engineer Harry F. Olson in the early 1950s and patented by Linn in 1974. The use of two identical drivers requires only half of the cabinet volume, the moving mass is doubled, the radiating surface remains unchanged, yet the price is a sensitivity drop by three decibels. Linn's once promoted view of an interior driver providing ideal »constant pressure« working conditions for the »audible exterior woofer«, seems a little odd today; acoustically the two drivers represent one entity, of course. And mounted vertically, like in the Discovery 2, all forces act via the floor and not upon the baffle board, as is otherwise customary – this should also add to steady mechanical conditions.

Since the two Isobarik woofers are comparable both in basket diameter and diaphragm material to the low-mid driver, which is not limited towards the bass frequencies, the new Discovery may also pass as a 2.5-way system; as usual, Wilson Benesch

specifies the crossover frequencies at 500 and 5,000 hertz. Above 200 hertz the Isobarik woofer has only a vanishingly small proportion, but this can only have a positive effect on the midrange rendering.

Equipped with a stately machine park, which I could admire on the occasion of a visit to Sheffield, Wilson Benesch pro-





*Filigree manual work:  
assembly of the  
carbon braces for  
the dome tweeter.*

duces virtually everything in-house: carbon cabinets, drivers, copper terminals, decoupling feet (these are no conventional spikes, they rather employ the concept of the 4-ball tonearm bearing) and all kinds of turned parts. The Discovery 2 is loaded with the very finest components, featuring with no exception the best Wilson Benesch has to offer. The Brits developed their own low-mid chassis already at an early stage, the »Tactic« drivers with a modern polypropylene diaphragm (of surface-melded threads). Wilson Benesch uses this 6.5" driver in different versions in all models for the middle and bass range – never bigger, never smaller. In the head-high »Cardinal« several of these woofers have to provide for the desired depth then. Larger drivers, says Craig Milnes, never yielded the wanted result. They would develop, test – and scrap again – all imaginable variants. Another evidence of the high esteem in which the acoustic homogeneity is held in Sheffield.

All Tactic2 drivers in the new Discovery have flow-optimised baskets and compact neodymium magnet systems. The in-house »Semisphere« dome tweeter may also fall back on such a powerful drive (in his article »Putting the science back into loudspeakers« John Watkinson claimed that not even the

discs are arranged in a circle, the overleaf sectional drawing shows the construction and the sound guide. Another special feature are carbon strips on the rear which are to stabilise the textile dome whose assembly requires a steady hand (fig. above). A noise test done by myself suggests that the Wilson Benesch dome shows a very clean performance with such a wideband excitation and resembles more a Dynaudio Esotar 2 here than the proven ScanSpeak dome as it is still used by Wilson Benesch in more budget-friendly models. In the meantime I'd rather spare myself the discussion if a 28-millimetre (1.1") dome can go up to 30 kilohertz or even higher. To my mind

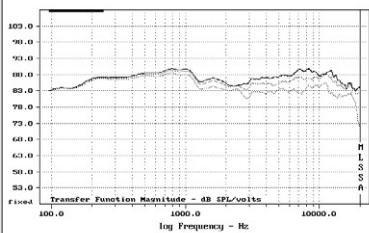


it's absurd, because only very few microphones can actually transmit such high frequencies at all – and on CDs they will definitely not be present. I find it interesting, though, that Wilson Benesch uses no ferrofluid, not either in the

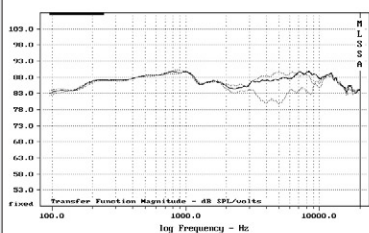


## Lab Report

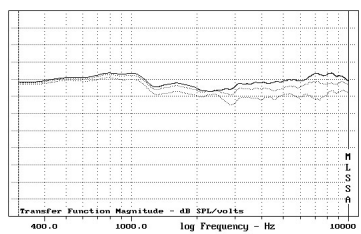
Frequency Response on axis/15°/30°



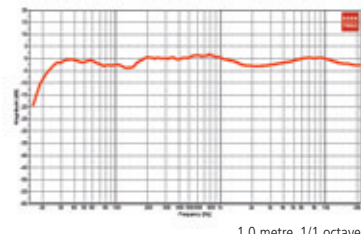
Frequency Response vert. ±10 cm



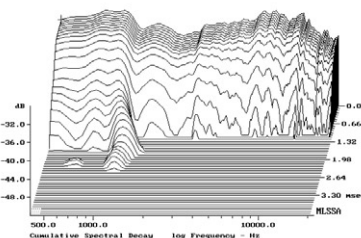
Linearity Wilson Benesch Discovery 2



Tonal Balance in-room, on axis



Waterfall Wilson Benesch Discovery 2



Nominal impedance	4 Ω
Minimum impedance	3.5 Ω @ 39 Hz
Linearity (300 Hz - 10 kHz, on axis)	± 2.7 dB
Linearity (300 Hz - 10 kHz, 0/15/30°)	± 3.2 dB
Sensitivity (500Hz - 5 kHz)	87.0 dB



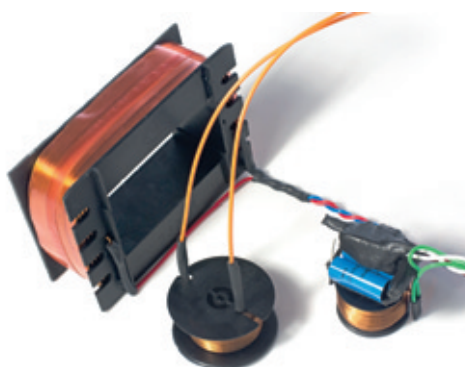
in the Discovery he stuck to the proven 6/6/12 concept in view of the greater linearity.

ScanSpeak textile dome tweeter custom-made to in-house specifications. The fact that practically nothing of the original Discovery has survived in the new model, is also reflected in the price tag: the Discovery 2 costs more than twice as much as the first version 16 years ago. But this is a fate high-carat loudspeakers are sharing with many other manufactured goods, similar observations can be made with noble fountain pens and mechanical wristwatches – not all things become cheaper every day.

Thus the Discovery formula is clear: a hightech enclosure with, owing to the Isobarik woofer, as small dimensions as possible, loaded with cutting-edge drivers, yet classic cone materials. The crossover can do completely without correction elements and is therefore not of the complex type. You can see it pictured below, the filter steepness is 6 dB for the bass and the low-mid driver with its unfiltered low end, and 12 dB for the HF dome tweeter. Craig Milnes has been known recently to use preferably minimalist crossovers and low-mid drivers without any filtering at all, but

The set-up avoids an overemphasis in the bass and the highs. Craig Milnes targets an agile and precise bass, hence some Wilson Benesch speakers tend towards the lean side (lately the Square models in issue 3/2015), but the Discovery has exactly the right figure. Since HF drivers cannot uphold a perfect omnidirectional sound distribution in the uppermost octave, a compromise is needed here as well: an elevation on axis helps the 30-degree curve which determines the direct sound impression with speakers that are not angled in. In return the radiated HF energy is boosted which becomes apparent to a greater extent in less dampened rooms. Also in this discipline the Discovery 2 keeps up a British, cultivated style and prefers to remain unobtrusive than strike with exaggerations. In the critical presence range it shows an aristocratic restraint. In short: it is well-mannered. And yet, or just because of this, it sounds phantastic.

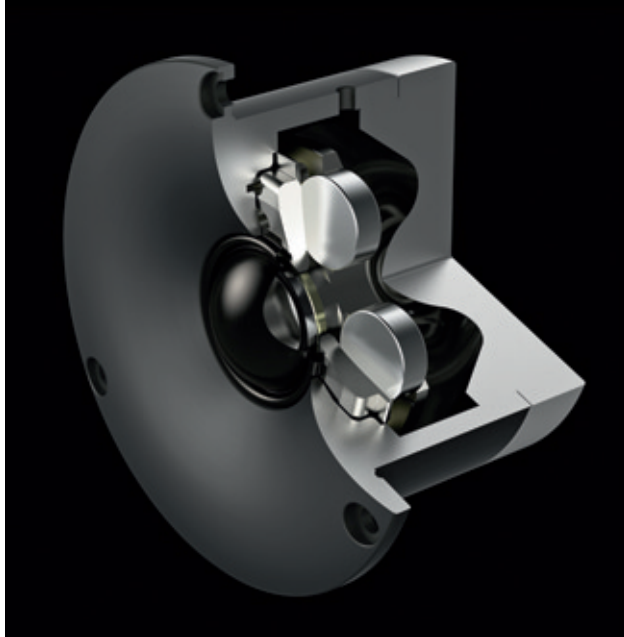
Since the vertical radiation pattern is largely anisotropic or direction-depen-



### Wilson Benesch Discovery 2

WxHxD	23 x 110 x 40 cm
Warranty	5 years
Manufacturer	Wilson Benesch
	Falcon House
	Limestone Cottage Lane
	Sheffield S6 1NJ
Web	wilson-benesch.com

*The sectional drawing of the Semi-sphere dome (right), the exterior Isobarik woofer (left) plus the crossover and terminal of the Discovery 2 (below).*



dant, one shouldn't sit too high, otherwise the presence will suffer, the standard ear height of about three feet is perfect (please do never judge the Discovery 2 while standing!). By angling in the acoustic balance can then be adjusted beautifully. Already with the first few bars, the placement hadn't yet been optimised at all, the Discovery 2 made one thing very clear from the start: here we're talking about serious music reproduction, here something is happening between the speakers. Voices sounded so lifelike that one turned their heads instinctively. Even from the side room one still had a feeling that there was really somebody talking or singing. Fascinating!

After that I fell completely for it, an objective, neutral evaluation is hardly possible for me any more. Hi-fi and high-end criteria? See Baden-Baden, forget it. This is the first loudspeaker since the Magico V2 which keeps »sending me off on a journey«, as I had once put it. Its unique purity (once again the cabinet!),

its way to paint fine details without ever drifting off into clinical analysis, its credible room imaging command our due respect, but what really matters: the Discovery 2 makes me forget so effortlessly that I'm listening to two speakers. Essentially I cannot pay a bigger compliment to Wilson Benesch, the second Discovery is yet again a milestone.

## Result

An incredibly fascinating loudspeaker which deserves

to be combined with the best sources and amplifiers. Only very few dynamic transducers sound as little »boxy« as the Discovery 2. This quality has its price, but those who, like myself, have a rather critical attitude towards the battleship speakers, will find a life-time partner in the Wilson Benesch Discovery 2.

Wlfrid Kress ■



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Wilson benesch  
THE FUTURE IS CARBON

