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Wilson Benesch Discovery Speaker

LET'S FACE IT, the loudspeaker has the final say in how a system will sound. So why is it that the component so important comes in so many sizes and shapes, and with so many flavors to boot? Because there's nothing easier than to make something that's a little different. It's called variation on a theme! So everybody throws their hat in the ring and we have mass confusion. And dissatisfaction. Without a doubt medium-density fiberboard (MDF) is today's material of choice for loudspeaker enclosures. And why not? The ease with which it can be used and its low cost, are strong practical reasons. But predominance does not signify the most effective choice, performance-wise. You see, no matter how you slice it or dice it or layer it, MDF is still MDF. Even using an exotic grade of veneer on top will not change that reality.

So, what's the problem? Well, it has been my experience over the years that for "box" loudspeakers there are the ones with the MDF sound and then there are the others. In my experience, for example, the Celestion SL-600 – and later the SL-700 – was a feast for the ears because it utilized a complex aluminum panel for forming the "box." To this day, the neutrality of these speakers is still esteemed.

What we need instead is a departure from the beaten path and to approach the situation from a different angle. A great place to start is to re-evaluate the materials that make up a loudspeaker.

And this is exactly where Wilson Benesch has been focusing their attention for years. They have been one of the leaders in recognizing the importance of bringing refinement to the selection and implementation of unique materials in loudspeaker design.

What's remarkable about Wilson Benesch is that they tackled the situation on a broad scale. Not just trimming something here and there. Instead they designed their own drivers by researching and creating state-of-the-art materials, as well as delving into the exploration of innovative design and manufacturing procedures. That's how a carbon fiber composite – a material that has low mass, high rigidity, and high self-damping – came to be the predominant material for their enclosures and internal bracing.

The Goods

The Discovery is a high-tech, high-performance loudspeaker incorporating numerous advanced design and material techniques. As such it is one of the most technologically sophisticated transducer systems in the industry.

Wilson Benesch describes The Discovery as an integral stand mounted monitor, and refer to it as a "Micro Floorstander". It is a design where a 13 liter enclosure, containing a total of four strategically implemented drivers, is supported by a permanently attached integral stand. This configuration is a deliberate design decision to insure that the implementation of their sophisticated techniques can perform optimally in the home environment. The price of the Discovery loudspeaker is \$8200.

Arnis Balgalvis



It's fair to say that the Discovery enclosure is not your common box loudspeaker. Simply put, the only orthodox aspect of this enclosure is the vertical flat front panel. Beyond that everything is totally unconventional. It is obvious that there are no two outer surfaces that face each other thus avoiding internal standing waves. The curved side walls and the significant slope of the top of the enclosure accomplish that. Only three surfaces are flat: the vertical front baffle, the horizontal bottom and the sloping top. But none of these are parallel. And, more importantly, the resulting configuration was not influenced by styling considerations. As you will see, W-B's idea of departing from the norm was based strictly on innovation driven by technology. So we're back to basics: form follows function.

This unorthodox enclosure, which has a front panel that is 12 inches high and 9 inches wide, and is 14.5 inches deep, houses a total of four drivers. For bass the Discovery uses the Wilson Benesch "Isobaric Tactic" configuration where two identical drivers are oriented with the cones facing each other and the magnet assemblies away from each other. This clamshell arrangement makes up an isobaric system, where both drivers are driven out of phase; this doubles the driving power of the woofer pair and increases linearity in as much as the push/pull motion relative to the magnetic field is much more symmetric. Furthermore, since the Isobaric Tactic configuration increases the cone stiffness dramatically due to the captured air volume between the two facing drivers, cone breakup is further reduced — to insignificant levels.

But there's more: Wilson Benesch took the two facing drivers and mounted them on the bottom, or the horizontal facet of the enclosure, with the result that the cone motion is along the vertical axis. This alignment provides a very sturdy platform from which the bass drivers can perform more effectively. The vertical cone motion in one direction works against the total weight of the enclosure plus stand, while in the other direction it pushes against the floor. Any possibility of rocking the speaker assembly along the conventionally configured horizontal plane is completely avoided.

The internal volume of 13 liters is divided into two independent cavities by a sloping wall within the enclosure. The larger lower cavity reflex loads the bass drivers, while the rest of the enclosure volume is utilized to reflex load the Mid/Bass driver positioned near the top of the front panel so that it faces the listener. Aluminum tubes are used for the ports of the reflex tuning.

Wilson Benesch specifies the frequency response of the Discovery at a very impressive 45 to 24 kHz +/- 2 dB on axis, and 38 to 30 kHz at the -6 dB points. The bass to midrange transition takes place at 500 Hz, with first-order slopes in both directions. However, because the mid-driver type is exactly the same unit as that used for the bass, driver dissimilarities are avoided and the bass to midrange transition is executed in an uncommonly continuous manner.

The upper cross-over frequency for the midrange to tweeter transition is at 5 kHz, with a first-order slope for the midrange, but a second order for the tweeter. As a result, the critical midrange spectrum, in this case a very wide 500 to 5000 Hz range, gets handled by a single driver. The sensitivity is specified at 88 dB SPL at 1 meter on axis, with 2.83 V input.

Appearing just below the midrange driver, at a very effective height of 31 inches, is the 28-mm ScanSpeak soft-dome tweeter. This unit uses a double magnet configuration and is built by Scan Speak to W-B specs. Wilson Benesch chose to have the bottom bass driver of the Isobaric Tactic pair visible by leaving its basket and magnet structure exposed below the enclosure. In addition, being that each of the internal upper and lower chambers is reflex ported with an aluminum tube, the two tubes extend from the bottom of the enclosure. They are located behind the magnet/basket assembly for the lower bass drivers. By allowing some of the system component parts to be visible, the high-tech appearance of the Discovery is enhanced.

The Discovery speaker system stands 43.25 inches tall, is 9 inches wide, and 14.5 inches deep and it weighs 35 kg or about 16 pounds. The stand consists of a hollow oval aluminum piece, roughly 5 inches across. It extends for the full length of the loudspeaker, and comprises

the total height of the system. The upper portion of the stand attaches to the two sides of the enclosure along their rear edges. This provides a sturdy backbone for the enclosure since its two side panels meet the stand along their full height. At its bottom, the stand is firmly fixed to a horizontal base plate.

The base consists of a hefty flat slab of steel thus concentrating mass at a point where it does the most good to boost stability. The base has a pleasantly contoured shape and contains three hefty spikes. One is fixed at the narrowed front portion, while the other two are placed about a foot apart at the wider rear section. The two spikes at the rear are adjustable and screw into threaded holes. These are brawny custom machined spikes: they are 2.125 inches long and come with a large round knurled cylindrical head 1.125 inches in diameter for easy gripping when they are used to adjust the speaker's final vertical position. Each has a threaded section 0.875 inch long and 0.5 inch in diameter which then turns into a 0.75 inch long tapered spike with a very sharp point facilitating the piercing of even considerably thick carpets. The two adjustable spikes contain heavy-duty nuts under the base to allow the spike to be locked in place after adjustments are concluded, creating a very stable and tight assembly.

Four very substantial speaker terminals, also custom machined, are located near the bottom and on the rear of the stand column. This is also where the crossover has been placed, but, of course, it is located inside the stand pillar. Four terminals are provided to allow the Discovery to be bi-wired if desired. Jumpers are supplied for conventional two-wire connections.

A fabric grille is supplied to cover the front panel components. Though it does give the speaker a discreet appearance, the grilles were off during all of my listening sessions. Besides, the exposed look was far more appealing to me, and may well be to you, too.

The Materials

There's more to an enclosure than just an unorthodox shape. Where Wilson Benesch leaves its mark is in the application of new effective materials. This is not something new for them — they have

been at this since 1996. I reported on these developments in my review of the Wilson Benesch ACT 1 loudspeaker in *The Audiophile Voice*, Vol. 5, Issue 3.

Carbon fiber, the choice of material for the Discovery side panels, is what put W-B on the map. The outstanding stiffness to weight ratio of this compound, along with the curved shape, creates a level of structural integrity that is simply unapproachable with the conventional MDF approach.

Wilson Benesch pioneered the use of carbon-fiber in audio products around 1990. The products to first benefit from these materials were their Turntable, the ACT tonearm, and several cartridges. Then in 1996 they initiated research in the loudspeaker area as well and realized significant benefits in two important areas. While one focused on the implementation of carbon-fiber in the construction of the speaker enclosure, the other led to the realization of a vastly improved bass and mid driver.

This new driver, the Tactic, derived benefits from research done at the polymer science department of Leeds University.

To make a long and complex story short, the investigation there led to a new material that, though derived from polypropylene, is significantly stiffer and far better damped than conventional polypropylene. This study was a sophisticated process involving the investigation of molecular structure, stereo specific catalysts, crystallization, weaving, and controlled melting. The end result was a stiffer and significantly better damped material that was exceptionally suited for use as a cone material.

In addition to the more rigid and better behaving cone, the new Tactic driver also features a completely redesigned magnetic circuit and drive mechanism. In the new unit, the speaker cone can move air with less interference, since the impeding effect of the magnet structure in the back of the cone was reduced by selecting a smaller, but more powerful magnet. Here, they chose a rare earth material made of Neodymium Iron Boron (or NdFeB). According to Wilson Benesch, this is the "most powerful magnetic substance on the planet". NdFeB is available in many grades, but the type used in the Tactics is among

the very most exotic available to any manufacturer.

The new driver also features a stiffer basket structure that presents less restriction to the rearward airflow of the cone. The result is a Tactic driver that is significantly more controlled, is 50 per cent more powerful, despite a 50 per cent size reduction for the magnet structure.

That, of course, is the Tactic Driver, the staple of the Wilson Benesch loudspeakers. It is their fundamental building block and comes in a 7 inch size. It can be used singly as a mid-range driver or in pairs in the Isobaric Tactic arrangement. The Discovery demonstrates the application of both configurations. This loudspeaker system is rated at 200 watts peak and is claimed to produce sound levels in excess of 110 dB SPL.

Setting Up

I'm happy to report that the Discovery is a very user-friendly product. This speaker was easy to set up and easy to enjoy. I found it of great help that the Discovery was a one-piece affair. Sure, with the spikes in place, the speakers were a little cumbersome to position. I quickly learned that by tilting the speaker and keeping one spike on the ground, repositioning was fairly simple, and I could easily achieve any position I desired very efficiently. I would suggest that during set-up the rear spikes be omitted while searching for initial placement. Just take a 3/4-inch thick piece of wood and use that to support the rear of the speaker. Install the spikes after you're close to the final position.

Though a little top-heavy, the Discovery did not present any problems on a floor where the three spikes were in full contact with the surface. However, in situations where the floor surface is tender, and where the spikes are not used, I would suggest carefully stabilizing the speakers while setting up. A 25-pound bag of lead shot on each base should do the trick to load the speaker down, but that's in the case where the base sits on a soft surface such as a thick carpet and the spikes have been deemed to be too damaging to the floor.

Performance

I came to the Discovery speaker system very familiar with the advantages of the Wilson Benesch approach to speaker design. Having lived with their ACT 1 some time ago and then getting another tutorial in the form of the smaller W-B Arc at HE2002, I approached this review with anticipation. And I was not disappointed – this is one great speaker! Fast, extended, expansive, and very seamless, and remarkably uncolored, the Discovery was a joy.

Besides the overall stellar performance, one pleasant surprise of this speaker was its ability to play loud and do so with utmost clarity. There were numerous times when I found myself staring at the speaker in disbelief. I found it hard to fathom that a speaker this size could actually fill the room with great sound. And I was not alone — several audiophile visitors had the same experience.

Of course, do not expect miracles in the low bass department — Tactic drivers, isobaric loading and all, can only do so much. Yes,

N O T E S

Wilson Benesch Discovery Loudspeaker, \$8,200.00 in standard finish of silver or black. Wood finish options \$395.00 additional. Importers and Distributors: The Sound Organization, 11140 Petal Street, Suite 350, Dallas, TX 75238; phone 972/234-0182, FAX 972/234-0249, E-mail steve@soundorg.com; website www.soundorg.com.

Associated Equipment

Spectral SDR-3000 Transport, SDR-2000 Pro Processor, Jeff Rowland Design Group Synergy III preamp and Model 12 monoblock power amps, interconnects TARA Labs RSC The One with on-board ISC, and RSC the One and The Omega Speaker wire, MIT Oracle V2 speaker interface. Echobuster and ASC Tube Traps room treatment.

Virginia, those laws of physics are still hard at work!

But for me, whatever the Discovery did in the bass region was far more than I had expected. This is one speaker that sure can boogie. As a matter of fact, there were instances when I was amazed to hear just how effectively this speaker could rock the house. Which brought to mind the time when another speaker managed to almost make me jump out of my seat: During demanding low frequency passages its cone would bottom out with a shot-like impact during duress.

Not so with the Discovery. Rather than initiating signs of distress, what it could not do, it omitted, gracefully. It did not pretend to perform in an area it where it could not go, and at the same time it did its best not to compromise the result by muddying or distorting the performance.

In the final set-up, I ended up with the Discovery speakers being located rather far apart. I don't know if it's the room or what, but this is roughly where other speakers end up most of the time. The Discovery speakers also sounded their best when they were pointing directly at me. With this alignment, due to the symmetrical curvature of the side panels, I could see a little of both sides of the speaker equally from my listening position. Thus situated, they set the stage for some rather expansive and coherent spatial exhibitions. That is, it materialized in a presentation that was captivatingly focused and dimensional. Add to that a very incisive and fast response and the result was absolutely stunning.

That incisive and fast part is something special — it's an aspect that sets this speaker apart from the crowd. This essential quality of sound reproduction is what lends a degree of credibility to the replicated sound. It's just not a slam-bang affair where the effect is forced — it's a refinement that materializes at all playback levels. It allows us to find more authenticity in transient attacks be they rim shots or violin bows or trumpet blats. It's a start-stop take on the transient situation that gets a chance here to be treated with very careful attention.

I am not talking about a particular set of colorations that make it appear the speaker is different. For

the Discovery, I believe it's a case of significantly lower colorations — be they cabinet or driver induced — that allow this speaker to make its significant point in this critical area.

For example, the Reiner *Scheherazade* on one of the consistently remarkable XRC D discs (Rimsky-Korsakov, *Scheherazade*, JVC JMCXR-15) was rendered spectacularly. When the rhythmic fervor gets to be as dramatic and bombastic as in this work, it was ever so gratifying to hear a myriad of inner details revealed so unusually well crafted. The forcefulness was astounding with the remarkably rendered subtleties during the cascading scales. The attacks and decays had an immediacy that very convincingly conveyed the dynamic spontaneity of a full-tilt orchestra.

The same highly resolved excitement was exhibited by the Stan Kenton orchestra on of track 1 of *Fire, Fury, and Fun* (Stan Kenton and his Orchestra, Creative World STD 1073). While the cymbals were tight and rich in revealing their complex shimmer, I was stunned by the power of the clear rendition of the trumpet choir on the left that followed the trombones on the right. Not only was the image rife with focused immediacy, but the force and assertiveness with this level of clarity was ever so gratifying. The bite of the brass was all there, exceptionally emphasizing the excitement, but without the edge that grates the senses.

And yet when it came to something delicate like a string quartet, the Discoveries were also right on top of things. Playing Mozart string quartets (*Mozart String Quartets K. 499, K. 589*, Arcana A403-1) rendered a very woody and resinous string sound. I clearly got the feeling of the bow biting into the strings, but without being strident. This was a serious case of de-blurring taking place. The performers were clearly depicted horizontally with each instrument's personality intact and each occupying a palpably prominent space. And once again, this coherence remained intact even during exaggerated loudness levels.

In the end such essential subtleties as sonorities, harmonization, harmonics, and intonation were revealed with a sense of delineation and delicacy, so that the whole listening experience ended up to be very exhilarating and remarkably

rewarding. Only later did I come to the realization that the factor that played such a huge part in weaving such a musical spell, was an astounding absence of veiling. This speaker has the ability to be resolute and be deliberate no matter the subtlety or force of the material.

Summary

I found the Wilson Benesch Discovery to be an absolutely delightful loudspeaker and one of the most exciting products to come my way. I feel it is a breakthrough product in the very competitive mini-monitor field. With its significantly reduced colorations and very refined dynamics, the Discovery allows musical events to be expressed in an exceptionally exciting and involving manner, allowing us to get closer to the recorded event.

Wilson Benesch deserves a lot of credit for seeking out and pioneering the application of new materials. I found their Discovery to be proof-positive that they have succeeded at the difficult task of effectively implementing these materials to significantly advance the state-of-the-art of loudspeaker performance.

As with all front runners in all innovative endeavors, the initial designs come at a price. But the bottom line is the ability to effectively communicate the essentials of musical values, and that is something that the Discovery accomplishes with flying colors. Obviously, it has my highest recommendation. You owe it to yourself to seek out one of their 14 dealers and experience this outstanding product.

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