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*B&W 802 Diamond
Loudspeaker*



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Robert Harley

Photography by Joel Salcido



"The 802D's refinement, transparency, low coloration, and soundstaging are nothing short of amazing at this price"

We're in the midst of an unprecedented period of advancement in dynamic loudspeaker design. After two decades of slow but steady improvements, the last five years have brought forth an explosion of innovative techniques that have made dynamic loudspeakers more transparent and resolving, with vastly lower levels of tonal and dynamic colorations. Today's best "cones-in-boxes" now approach planar loudspeakers in some areas where planars had been untouchable, a notion unthinkable just ten years ago.

This trend is self-perpetuating. When one loudspeaker manufacturer ups the ante, its competitors are compelled to respond with even better designs. Before you know it the entire playing field has shifted upward, with the consumer reaping the rewards of this sonic "arms race."

I've been following this trend for a few years, but the product that fully confirmed it for me is the new B&W 802 Diamond. The 802D is a relatively affordable (\$15,000 per pair), relatively mainstream high-end loudspeaker that has many of the sonic qualities of six-figure models from tweaky esoteric companies of a decade ago. The 802D's refinement, transparency, low coloration, and soundstaging are nothing short of amazing at this price.

Before we consider the 802D's sonic qualities in detail, let's look at the loudspeaker itself. The 802D is the second model down in B&W's line, and looks nearly identical to the model it replaces. Although superficially similar to the previous generation, this new 800 Series incorporates some significant improvements, notably the inclusion of diamond tweeters throughout the line (including in the \$5000-per-pair 805D—review forthcoming). The benefits of diamond-diaphragm dome tweeters were so compelling that B&W found a way to include them in each model in the 800 Series. Diamond reportedly has the ideal properties for a driver diaphragm of high stiffness and low mass.

Although B&W has offered diamond tweeters in the past, the inclusion of this expensive technology in a speaker line that starts at \$5000 is unprecedented. Moreover, the new tweeter is considerably improved over the previous generation. The magnet structure has been redesigned, with additional magnets positioned at the rear of the back plate, on top of the top plate, and on top of the center pole. This configuration increases the magnetic field strength in the gap, resulting in greater efficiency and cooler operation. By running cooler, the tweeter's dynamic range is increased and its dynamic compression is reduced. (Dynamic compression is a change in a loudspeaker's tonal balance and dynamic abilities as a function of playback level. That is, at high listening levels the treble sounds rolled off on musical peaks, and the treble dynamics are muted in relation to the rest of the spectrum. This phenomenon is caused by heat in a driver's voice coil raising the coil's resistance, which reduces current flow and thus acoustic output. This is one reason why extremely high-sensitivity horn loudspeakers can have such lifelike midrange and treble dynamics—the drivers are never run anywhere near their dynamic-compression threshold. In addition, cooler operation confers greater reliability.)





The 802D's tweeter also benefits from a new surround material that improves the phase relationship between the sound emanating from the diaphragm and the sound emanating from the surround. The dispersion is wider and more uniform than in the previous tweeter, which aids in image focus and precision. The tweeter diaphragm itself is created by vapor deposition of diamond on a substrate that is later removed. The ultra-thin diaphragm is then precision cut with a laser and protective-coated with platinum. The dome itself is extremely fragile, which is why it is covered with a magnetically attached mesh grille. The grille can be removed for a listening session, resulting in a slightly more open sound. The tweeter is mounted in a Nautilus tube, the long tapered structure at the top of the cabinet. B&W's Nautilus technology channels the tweeter's rear wave down the tapered tube where it is dissipated rather than reflected back to the dome.

In addition to the new tweeter, B&W introduced some other design changes for this sixth-generation of the 802D (which had not been updated since 2004). The bass driver, crossover, and input terminals are all new within the core platform of the 800 Series.

The 802D's two 8" woofers feature Rohacell cones (as in the previous generation) driven by a new dual-magnet structure. The new magnet material (neodymium), along with the symmetrical dual-magnet arrangement, creates a greater (and more uniform) field strength in the gap for increased linearity and lower distortion.

The increasing use of exotic capacitors has been one of the driving forces behind the recent improvements in dynamic loudspeakers. Once reserved for ultra-expensive products from tweaky manufacturers, these capacitors have found their way into a much wider range of products as designers increasingly recognize the role of capacitor quality. The 802D, and in fact the entire 800D Series, now features Mundorf silver/gold/oil capacitors in all sections of the high-frequency network. These capacitors, which can cost \$300 each, were chosen after extensive listening comparisons. Switching to the Mundorf caps resulted in a "dramatic increase in sound quality" according to B&W. The crossover is minimalist, with first-order slopes in the high-frequency section. Crossover frequencies are 350Hz and 4kHz. As a final touch to the crossover redesign, the custom input terminals are now made from oxygen-free, high-purity copper rather than brass.

That's what's new in the 802D, but it's worth recapping the core technologies and platform on which these innovations are based. First, the enclosure features B&W's Matrix technology, a three-dimensional honeycomb structure that braces the cabinet and reduces enclosure resonances. This technique has long been used by B&W; the Matrix 801 was introduced in 1986. The enclosure is raised off the base, providing an air gap for the massive, flared, downward-firing port. The port is dimpled like a golf ball, a B&W-developed technique called Flowport that reduces port turbulence and noise.

"It struck me just how much you get physically for \$15,000 a pair"



The 800 Series' most distinctive visual feature is the spherical head that houses the midrange driver and also supports the tweeter's Nautilus tapered tube. The spherical structure, which is molded from a synthetic mineral-filled resin called Marlan, presents a diffraction-free platform for the midrange driver, as well as dissipates the midrange driver's rear wave. The Kevlar midrange driver is also unusual in that the surround is extremely narrow—almost invisible, in fact. B&W calls this technique FST, for Fixed Suspension Transducer. The FST is a narrow ring of foamed polymer that radiates very little sound of its own, and also reflects less energy back into the cone.

Other refinements for the new series include magnetically attached grilles, bright trim rings, and the addition of piano black lacquer finish in addition to rosenut and cherrywood. The cabinets are made in B&W's new cabinet factory in England.

After unpacking the 802Ds, but before listening to them, it struck me just how much you get physically for \$15,000 a pair. Aside from the diamond tweeter, Nautilus loading, Matrix enclosure, and other technologies, the 802D is beautifully built and visually stunning; it seems like it should cost much more than \$15,000. The spikes, for example, are large, elaborate devices that are cleverly designed and nicely finished. In fact, they are the beefiest, best-designed, and easiest to install and adjust of any spike I've encountered. Moreover, the 802D comes out of the box on rollers in place of the spikes, allowing easy movement and fine-tuning before spike installation. The black lacquer of the review samples was gorgeous; the spherical midrange enclosure is polished by hand and is sprayed with seven coats of lacquer.

LISTENING

I installed the B&W 802 after about two months with the Vandersteen Model 7, a speaker that costs exactly three times the price of the 802D. I drove the 802D with what have become my reference electronics, the stunning BAlabo BC-1 Mk.II preamplifier and BAlabo BP-1 Mk.II power amplifier, as well as with a more real-world amplifier of a cost likely to be used with the B&Ws—the \$8000 Simaudio i600 integrated amplifier. I also spent some time with the 802Ds when I had the Audio Research Anniversary Reference preamplifier in my system.

B&W 802 Diamond Loudspeaker



B&W 802 Diamond Loudspeaker



I had heard the 802D at this last CES under fairly relaxed conditions and was taken aback by its transparency, low coloration, and ability to involve me in the musical performance. In fact, our Alan Taffel, with whom I listened to the 802D, called it the “Best Bargain” at the show in his report in Issue 202.

In my room, the 802D exhibited even more of the qualities that made it a standout at CES. The 802D was obviously a considerable step up from any previous B&W product. This new iteration vaults the 802D into the territory occupied by loudspeakers with esoteric marques, most of which are priced considerably higher.

The 802D was transformed into such a strong contender by its extremely low levels of midrange and treble coloration and vastly improved dynamics and resolution, all of which made it less present as a sound source and more of a transparent window on the musical performance.

Starting with the overall tonal balance, the 802D had warm, full, rich bass and midbass, and a relaxed midrange and treble. This is a very easy loudspeaker to enjoy music through by virtue of its lack of treble forwardness or etch, warmish tonal balance, and midrange liquidity. Despite an overall balance that was smooth and unaggressive, the 802D had remarkable treble resolution. This new B&W had the very pleasant quality of sounding easygoing, but maintaining alongside that sense of ease a very fine rendering of low-level detail. The 802 presented a wealth of information to the listener, but in a way that didn't call attention to itself. That's the best kind of resolution—the kind where you're not aware of more “detail” *per se*, but nonetheless hear the musical effect of more detail in your increased involvement with the music and greater appreciation of the musicians' expressiveness. A significant contributing factor to the treble resolution was the lack of etch, grain, and glare, along with the ability to portray extremely fine transient information. The 802D reproduced low-level transient detail such as brushes on cymbals with great finesse and refinement. B&W's claims for the new tweeter, specifically that it is more dynamic and less prone to dynamic compression, seem positively conservative in the face of the driver's fabulous performance. This high-frequency transducer was astonishingly clean, dynamic, and free from tizziness even when pushed very hard. For example, I was listening to the cleverly named “Horn of Puente” (a tribute to Tito Puente) on

the disc *XXI*, from Gordon Goodwin's Big Phat Band at a realistic level for an 18-piece big band. The number features an extended and exuberant trumpet solo, much of it played in the instrument's upper registers at full tilt. Most tweeters would wither trying to reproduce so much high-frequency energy at this playback level, but the 802D sailed through with no hint of strain. The trumpet's sound was completely lacking in glare, grain, hardness, or other artifacts. Most loudspeakers have you reaching to turn down the volume during such passages; not the 802. Moreover, the 802D conveyed a full measure of the trumpet's life and verve. It's a delicate balancing act to reproduce a trumpet with a full measure of upper-midrange and treble energy without making it sound strident. Significantly, the soundstage didn't congeal when the speaker was pushed; the trumpet stayed focused, soaring over the sections behind it. The wonderful arrangement remained clean and precise rather than degenerating into a smeared blur, even at extremely high listening levels. The 802D's tweeter is spectacular by any measure.

SPECS & PRICING

Type: Floorstanding three-way dynamic loudspeaker

Driver complement: two

8" woofers, one 6" Kevlar midrange, one 1" diamond tweeter

Woofer loading: Ported

Sensitivity: 90dB, 2.83V/1m

Impedance: 8 ohms nominal, 3.5 ohms minimum

Frequency response: 34Hz-28kHz +/-3dB

Crossover frequencies: 350Hz, 4kHz

Recommended amplifier power:

50Wpc to 500Wpc unclipped

Dimensions: 14.5" x 44.7" x 22.2" (not including spikes)

Weight: 159 lbs. each, net

Finishes: Piano black gloss, rosenut, cherrywood

Price: \$15,000 per pair

ASSOCIATED COMPONENTS

BA1abo BC-1 Mk.II and Audio Research Anniversary

Reference preamplifiers;

BA1abo BP-1 Mk.II power amplifier; Simaudio i600

integrated amplifier; dCS Puccini/U-Clock and Meridian

808.3 CD players; Meridian

Sooloos music server; custom

fan-less, drive-less PC-based

music server for high-res digital

files, Berkeley Alpha DAC; Basis Inspiration turntable/Vector

4 tonearm with Air Tight PC-1

Supreme cartridge; Aesthetix

Rhea Signature phonostage;

Shunyata Hydra-B Mk.II and

V-Ray Mk.II AC conditioners,

Shunyata CX-series power

cords; Audience aR12T AC

conditioner; ASC 16" Full-

Round Tube Traps, ASC Tower

Traps; AudioQuest Wild Blue

Yonder, and WEL Signature

Interconnects and bi-wired

AudioQuest Meteor cables;

Straight Wire Info-Link HD 26 to

Male XLR digital interconnect;

Billy Bags equipment racks

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The midrange was smooth, well integrated with the treble, and had much greater transparency than any previous B&W models. The 802D was transparent enough to easily resolve changes in upstream components, AC power cords, and tweaks. For example, I replaced my music server's stock breakout cable from the Lynx AES16 card (it has a "D" connector on one end and XLR on the other) with one from Straight Wire and immediately heard exactly what the Straight Wire was doing. (At \$250, the Straight Wire Info-Link HD 26 to Male XLR is an essential upgrade if you use the Lynx card.) The 802D also let me hear how the Audio Research Anniversary Reference preamplifier became more broken-in during my brief time with it, conveying the ARC's improving sense of ease, relaxation, and bloom. The 802D was extremely open and transparent, giving me the distinct impression of hearing through the playback system back to the original musical event. On the Analogue Productions LP reissue of *Way Out West*, Rollins' sax had a tremendous sense of presence, bloom, air, and liquidity of timbre. The B&W didn't match the three-times-the-price Vandersteen Model 7 in this regard, but it came a lot closer than one would expect considering the price differential.

"The 802Ds easily resolved the spatial differences between source components"

The bass leaned toward the warm, full, and rich side rather than sounding overly controlled or pinched. Acoustic bass was rendered with a sense of weight, with a little more emphasis on the instrument's resonant body than on the attack of the strings. Despite the generous bass weight, the bottom end was clean and articulate. The wonderful, uplifting bass lines on Paul Simon's *Graceland*, for example, were lively and upbeat, and rendered with excellent pitch definition. Bottom-end extension was fully satisfying; even on organ pedal points, I never heard the port "chuffing" or contributing a sound of its own. This is only the second loudspeaker I've had in my new room, and the first (the Vandersteen) had adjustable bass, so it's hard to know yet how much of this warmth was the loudspeaker and how much was my room.

With a sensitivity of 90dB, a minimum impedance of 3.5 ohms, and the minimalist crossover, the 802D was very easy to drive. (The 90dB sensitivity rating is truthful, in that it is measured with a drive signal of 2.83V across 8 ohms, which dissipates 1W of power. Sensitivity specs are often exaggerated by applying a drive signal of 2.83V across a nominal 4-ohm loudspeaker, which doubles

the power dissipated, making the loudspeaker appear 3dB more sensitive than it actually is. The 802D's highish 90dB rating is even more impressive than it appears when compared with other sensitivity ratings.) The 150Wpc Simaudio i600 integrated amplifier had more than enough power, even when reproducing the massive dynamic contrasts of Reference Recordings 176.4kHz/24-bit HRx files from my music server. Some loudspeakers benefit from a really big amplifier (the Vandersteen 7s, for example) but I got the impression that the 802Ds left nothing on the table when driven by 150Wpc.

In soundstaging, the 802Ds hit it out of the park. The pair of loudspeakers threw a wide, deep, seamless panorama in front of me with absolutely no trace of the sound being attached to the two enclosures. The stage extended well beyond the loudspeaker boundaries, and had tremendous depth. In addition, the soundstage had amazing precision and focus, with instruments firmly anchored in specific locations. Image outlines were razor sharp and delineated with surgical precision, qualities that heightened the sense of realism. The 802Ds beautifully resolved bloom and air around instrumental outlines, along with a holographic dimensionality, particularly with the Audio Research Anniversary Reference preamplifier in the system. To their credit, the 802Ds easily resolved the spatial differences between source components, amplification, and cables. Moreover, the B&Ws didn't overlay every recording with a similar spatial perspective, instead changing dramatically depending on how the recording was made.

Several experienced high-end manufacturers visited me while I had the 802Ds and all expressed amazement not just at how good the 802Ds sounded, but also that any \$15,000 speaker could deliver such performance. Of course, \$15,000 is a significant investment, but these industry veterans are accustomed to hearing six-figure mega-systems.

CONCLUSION

B&W's new 802D sounds significantly better than any previous B&W loudspeaker I've heard, particularly in transparency, resolution, and the beautiful combination of treble ease with detail. This isn't a slight improvement over previous designs, but a major step up.

Even in today's highly competitive loudspeaker market, the 802D stands out for its sound quality and exceptional value. It delivers many of the qualities we associate with esoteric designs from small, tweaky manufacturers, but in a relatively mainstream product. In addition, the build and finish quality are exemplary, and far nicer than you find in similarly priced products from companies who lack the economy-of-scale manufacturing enjoyed by B&W. Make no mistake; this is a lot of speaker for the money.

If you're in the market for a loudspeaker anywhere near this price range, you must audition the B&W 802D. I think that you'll be pleasantly surprised by just how much performance your loudspeaker dollar will buy. **DB**

