One of the world’s most famous loudspeaker manufacturers releases a new, updated ‘Series 2’ version of one of its best-selling, multi-award winning bookshelf/standmount models. What could possibly go wrong?

Ummm… a whole lot of misinformed and anonymous internet users could claim that it’s not a new version at all… that’s what!

THE EQUIPMENT

So let’s start by discussing the topic of what constitutes ‘new’, which is a subject that has proved somewhat controversial amongst audiophiles because, if you frequent the forums, you’ll find many posters claiming the 685 S2 is not a new design at all. So how different is this S2 version from the original 685? According to B&W’s Patrick Butler, who should know, everything about the 685 S2 is new: ‘New cabinet, new drivers, new crossovers. The only thing that is not new is the name.’

He posted on one of the forums in answer to the naysayers. [See full quote on page 35]

The problem is that the definition of what constitutes ‘new’ really depends on how pernickety you wish to be about it. The bass/midrange driver on the 685 S2, for example, is most certainly making its first appearance on the 685 S2. It has not appeared on any previous B&W model. So I’d personally say that qualifies it as being ‘new’. But its cone is made of the same woven Kevlar used in dozens of previous B&W models, including some of its highest-priced offerings. It also uses the same type of aluminium in the driver chassis, the same type of copper for the wire used in the voice coil, the same type of Nomex in the voice-coil former… the point is that in the year 2014, nothing in this world is really completely ‘new’. The bass/midrange driver in the 685 S2 may indeed incorporate materials that have been used previously by B&W, but in its entirety it is, truly, a new driver for B&W.
Indeed B&W’s engineers would have been insane not to continue using their company’s proprietary woven Kevlar as a cone material: it not only has truly excellent mechanical and acoustic properties, it’s also superior to the similar-looking materials used by many other loudspeaker manufacturers. That would also be true of the spider suspension: B&W spends an enormous amount of time and money engineering these ‘soft parts’ and so re-purposing them across several different models makes sound financial sense, both for B&W as a manufacturer and for us as buyers, because the result it is that we end up with a superior product at a lower price.

Speaking of pricing, that’s another area where, in order to remain competitive, B&W had to start production in China, but unlike some other speaker manufacturers, when it did, it did so by establishing its own factory in Zhuhai, rather than outsourcing its production to an OEM manufacturer. And although it now produces many of its lines in Zhuhai (including the entire 600 Series), it has not moved all its speaker production there: the 800 Series and Nautilus models, for example, are still manufactured in B&W’s factory at Worthing, in the UK… and, of course, all the R&D takes place in the UK as well, at the company’s dedicated facility in the idyllic setting of the small English town that is Steyning.

The bass/midrange driver is, as I said before, made of Kevlar (and note that it’s real DuPont Kevlar, not the fake look-alike stuff that’s found on some other brands that claim their cones are ‘Kevlar’). The overall diameter of the driver is 176mm, the moving part (cone plus suspension) is 144mm and the cone diameter is 120mm. The important dimension, though, is the Thiele/Small diameter, which determines the effective cone area (Sd), as this is what the engineers plug into their calculators to calculate how they want to best-tune the bass response, and that diameter was 133mm, to give an Sd of 140cm². The mushroom-shaped dust cap at the centre of the cone is completely different than what was on the original 685, but it’s not exactly ‘new’ since it’s previously made an appearance on B&W’s PM1. The original 685 had a bullet-shaped phase plug that projected through the cone, so you could see the voice-coil former. This ‘exposed coil’ design makes it easy for grit to get into the gap between the coil and the pole-piece, potentially affecting sound quality. This new design completely seals off the voice coil (which is why it’s called a dust cap!) and so to my mind is a considerable improvement.

The 25mm dome tweeter has an unusual dome. There are two different thicknesses of aluminium used to make it. Around the periphery the dome is thicker to enhance rigidity, whereas across the main part of the dome the aluminium is thinner, to ensure the dome is still lightweight. B&W has also decoupled the tweeter from the baffle by surrounding it with a ring of gel. The rear of the dome is loaded by a tube design that’s directly descended from B&W’s flagship Nautilus loudspeaker. Unlike some gel-mounted tweeters, where the tweeter is so loosely mounted that you can make the tweeter ‘wobble’ in the baffle by prodding it with your finger (though you’re probably not supposed to do this, so don’t try it with your own speakers!), B&W’s gel seems made of sterner stuff: I couldn’t perceive any ‘wobble’ at all when I prodded it.

Although B&W apparently designed the 685 S2 as a bass reflex loudspeaker, providing it with a front-mounted bass reflex port that’s 40mm in diameter and flared at both ends using B&W’s trademarked dimpled ‘Flowport’ material that’s intended to reduce turbulence, the 685 S2 comes with foam bungs that can be used to block off the port entirely, to turn the loudspeaker into an infinite baffle loudspeaker. But, in an even-more curious twist, each bung comes with a removable centre section, so by using only the outer ring, you can make the diameter of the port narrower, and also provide a different surface for the air that does flow through the smaller port (in this configuration the air flows over foam, rather than plastic). B&W reportedly provides these bungs in order to allow you to ‘tune’ the bass response to suit your personal tastes and your room’s acoustics… and you can most certainly do this, as I was to discover.

B&W’s custom speaker terminal plate is beautifully made, and allows bi-wiring or bi-amping, via the provision of two pairs of gold-plated, multi-way colour-coded speaker terminals. (Although B&W apparently designed the 685 S2 as a bass reflex loudspeaker, providing it with a front-mounted bass reflex port that’s 40mm in diameter and flared at both ends using B&W’s trademarked dimpled ‘Flowport’ material that’s intended to reduce turbulence, the 685 S2 comes with foam bungs that can be used to block off the port entirely, to turn the loudspeaker into an infinite baffle loudspeaker. But, in an even-more curious twist, each bung comes with a removable centre section, so by using only the outer ring, you can make the diameter of the port narrower, and also provide a different surface for the air that does flow through the smaller port (in this configuration the air flows over foam, rather than plastic). B&W reportedly provides these bungs in order to allow you to ‘tune’ the bass response to suit your personal tastes and your room’s acoustics… and you can most certainly do this, as I was to discover.

B&W’s custom speaker terminal plate is beautifully made, and allows bi-wiring or bi-amping, via the provision of two pairs of gold-plated, multi-way colour-coded speaker terminals. (For the colour-challenged, there are also ‘+’ and ‘−’ markings moulded into the terminal plate.) I was particularly impressed with the gold-plated terminals because they come with freewheeling ‘collars’ that mean that when you tighten the terminals over bare wire, the strands of wire don’t get cut or twisted (which they otherwise often do with ordinary terminals), and you get a much better electrical connection as a result. All speaker terminals should have similar collars.

As with most loudspeakers, the crossover network is mounted on the rear of the terminal plate however, unlike most speakers, B&W has made the wires that connect the plate to the drivers so short that it’s impossible to remove it. All I could see on the crossover PCB was a single very large air-cored inductor and a capacitor, so unless B&W has other components located inside the cabinet, the crossover is as straightforward as two-way crossovers get, with no frequency or impedance compensation at all.

The cabinet is primarily made from 15mm MDF which, for the same price, can be finished in either black ash vinyl or white… your choice. The baffle, however, has a super-smooth plastic-like finish that’s so smooth it looks as if it could be metallic (it’s not).
The speaker grille is black acoustic cloth stretched over a black plastic grille that attaches to the baffle via four pegs. When I unpacked the speakers, I discovered thin white strips at the top and bottom of the grille, sandwiched between the grille and the baffle. I had no idea what these strips were for, but they looked so good that I thought they may be a design feature. A quick email to Convoy International, B&W's Australian distributor, revealed that the strips are fitted solely to protect the grille and grille pegs during transport, and should be removed prior to installation. Me, I think I'd leave them there!

IN USE AND LISTENING SESSIONS

One thing that will attract many people to the 685 S2s is that these speakers can be mounted in so many different ways: on shelves, side-tables, speaker stands, or even wall-mounted. And if you move to a new home, where space is more constricted (or you gain increased space) you can re-mount the speakers differently, so you won’t have to purchase a new pair of speakers.

The mounting method you use will affect the type of sound you get from the 685 S2s. If you put them on stands and keep them clear of nearby walls you’ll get great stereo imaging and image depth, but a little less bass extension than if you were to place them on a side-table or on a wall. However, if you place them on a side table, shelf, or mount them on a wall to extract a little extra bass, you’ll get the same stereo imaging, but not quite the image depth. (It’s always ‘swings and roundabouts’ when it comes to positioning speakers.) You can tune the bass not only with speaker placement, but also with the aid of the foam bungs provided with the 685 S2s. Again, the effect the bungs have on the bass will be influenced by where you’ve positioned the speakers.

For this review, I listened to the B&W 685 S2s without any bungs fitted at all, and with the speakers placed on stands that in turn were positioned around two metres from the rear wall, and three metres in from each side wall, in effect forfeiting some of the 685 S2’s bass extension for improved stereo imaging, greater image depth and a better sense of image height. I was so happy with this arrangement (as you’ll find in a moment) that if I owned the 685 S2s and wanted more bass extension, I’d get it by adding a subwoofer, rather than re-positioning the speakers.

I also listened to the speakers with both speaker grilles fitted: the main rectangular fabric grille and also the small circular perforated metal mesh grille that provides additional protection for the tweeter. Before doing this, I did A/B comparisons of all four possible variations (no grille+no mesh; with grille but no mesh; etc) and although there were slight differences in tonality for each variation, I was happy with the sound quality across all variations, so I’d recommend using the speakers with both grilles fitted. If you are interested in trialling the differences for yourself, I’d suggest you do this when you’re auditioning the speakers, so your dealer can help with the A/B comparisons. At the same time the dealer could show you how to safely remove and replace the tweeter mesh—there’s a special technique you need to use, otherwise you could damage the mesh, the tweeter or both!

My first impressions of the B&W 685 S2 were of a hugely engaging sound quality that had me instantly relaxing and enjoying the music—something I often find hard to do when reviewing. There was certainly not even the faintest suggestion that the 685 S2s were not giving their all in the treble department, with a breezily airy high-frequency delivery that, while bright and crisp-sounding was not overly so in either department. Listen to Leigh Raymond’s violin (particularly Track 7) on Susy Blue’s album Nobody’s Somebody. Track 3 is also excellent for testing out the B&W 685 S2’s bass extension (which is impressively deep)… but listen to the lyric at your peril!

The midrange was equally bright, and so bouncy that the energy in the room was palpable. It’s rare to hear such levels of dynamics issuing from such small and inexpensive loudspeakers. The dynamic capabilities stretched to enabling me to turn the volume up louder than I should have... only to discover that the 685 S2s can play very loud: indeed if you go too far, and over-cook it, it’s only a slight edginess creeping into the highs that will warn you not to turn the volume control any more clockwise than you already have.

Tonal balance across the upper bass, midrange and lower high-frequencies is impressive, with the transition from the upper mids to the lower highs being handled more transparently than was the case with the early version of the 685. If you want to hear the 685 S2s at their best, fire up your favourite female vocalist, preferably accompanied by only a few musicians and prepare to be impressed by the clarity of the voice, the delineation between the vocal and the instruments... and indeed the delineation between the instruments themselves, particularly when they’re all playing in the same octave. I marvelled at the sound of Hollie Fullbrook’s new project, Tiny Ruins (previously only Fullbrook, but she’s now joined by Cass Basil on bass and Alexander Freer, percussion) which has just released an absolutely outstanding album, Brightly Painted One. Fullbrook’s vocals are perfectly pitched, with her acoustic guitar elegantly weaving its sound through the lyrics, backed up by tasteful percussion and a perfectly-recorded bass. The B&W 685 S2s sounded fabulous throughout the entire album and if you want to talk about perfect balance, just listen to the ethereal opening bars of The Ballad of the Hanging Parcel. (And at about 1.06 in, listen to the realism of the percussion entry and towards the close, to the depth of the soundstage.)

CONCLUSION

The original B&W 685 was such a high-quality loudspeaker—a design that picked up awards right around the world, including a prestigious EISA award—that whoever at B&W it was who was in charge of the team charged with improving it must have had a good few sleepless nights wondering if it could actually be done. The proof that it could is here: this new B&W 685 S2 is not only a significantly better speaker than the original; it’s also one of the best small two-way designs I’ve ever heard. I’ll bet right now that it, too, will pick up an EISA award. Here in Australia, the B&W 685 S2s have already won a ‘Best Loudspeaker’ ($1,000) award from Sound & Image Magazine for 2014–15. For small loudspeakers, these B&W’s sound fabulous! – Greg Borrowman

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Newport Test Labs first tested the in-room frequency response of the B&W 685 S2 using a pink noise test signal, averaging the response across nine different microphone positions, then measured the high-frequency response using a gating technique that simulates the response that would be obtained if measuring in an anechoic environment, after which the two different measurements were spliced together at 9kHz via post-processing. The result is shown in Graph 1. As you can see, the B&W 685 S2's frequency response is fairly smooth and controlled over the audio bandwidth, extending from 70Hz to 33kHz ±3dB. Although ±3dB is a good ‘window’, for a loudspeaker frequency response, the distribution of the variations in response is not random, because the average level of the response from around 100Hz to 1kHz is within ±1dB but around 2.5dB above the average level between 2kHz and 10kHz, so high frequencies will be reproduced a little quieter than bass/midrange frequencies. However 1kHz is high enough in frequency that very few fundamentals will be affected by this diminution, only harmonics. The rather dramatic peak in the high-frequency response visible at the far right of the graph is the resonant frequency of B&W's metal dome tweeter. As you can see, the peak starts at 30kHz (‘way above the limit of human hearing of 20kHz) and rises 23dB to peak at 36kHz before dropping away. This peak characterises this particular tweeter, but would not be audible.

The second graph (Graph 2) shows the high-frequency response of the B&W 685 S2 in even more detail, by using a gated sinus
technique for the entire graphed bandwidth (400Hz to 40kHz). You can see the roll-off from 1kHz to 2kHz that was also evident in Graph 1, but the higher resolution made possible by sinus gating reveals a small peak in the frequency response at 3.7kHz and a larger suck-out at 6.6kHz. These response variations are so narrow in bandwidth—and so high in frequency—that they would not be audible. The ‘smoothing’ effect is shown in Graph 6. The three different traces on this graph show that there are very slight differences in the high-frequency response depending on whether you use the main speaker grille or not, and on whether you leave the small tweeter protection grille on or not. The flattest, most linear response is returned without any grilles fitted at all (black trace) but I doubt that anyone could hear the difference between these three options when using ordinary music programme material.

The low frequency response of the B&W 685 S2 was measured using a near-field technique that simulates the response that would be obtained in an anechoic chamber (Graph 3). The woofers’ response (naturally) varies depending on whether or not the port bungs are used. Without either bung (black trace), you can see a classic ‘bass reflex’ roll-off, where the output of the bass/midrange driver drops quickly down from 100Hz to a minima at 46Hz. The bass driver’s lack of output at 46Hz is compensated for by the output of the bass reflex port (red trace), as you can see. The port’s output peaks at 46Hz, showing ‘classic’ alignment by B&W’s design team. With the port partly blocked by one of the bungs (the one with the hole in its centre), the 685 S2 is still technically a bass reflex design, but you can see the response rolls off less steeply below 100Hz, and the minima is now at around 26Hz, and not as ‘clean’ (because the port’s walls are no longer smooth). With the bass reflex port fully blocked, the trace shape becomes that of a classic infinite baffle (sealed enclosure) design, and rolls off completely smoothly below 100Hz.

Because of the complexity of the alignments possible with the B&W 685 S2, Newport Test Labs’ tests of its impedance have been split across two graphs. Graph 4 shows the impedance of both the left and right speakers, with no port bungs fitted, plus the phase response. You can see the impedance minima is at 50Hz, with the expected dual resonance peaks at 30Hz and 83Hz, reaching around 400 Hz. Note that the left/right speaker matching is outstandingly good, shown by how well the two traces overlay each other. Although the impedance remains above 5Ω across most of the audio range, it drops below 5Ω at 9kHz and continues down to a minimum of 3.5Ω at 20kHz, before slowly rising. This modulus should be easy for any well-designed amplifier to drive, but means that technically the design should attract a ‘nominal’ impedance rating of 4Ω under IEC rule 268-5 (16.1). Phase angle is well-controlled, because although it swings ±60° it doesn’t do so where it would place excessive demands on the driving amplifier. Graph 5 shows the impedance with a full bung (blue trace) and with a half bung (pink trace). You can see from the LF/HF traces that the electrical crossover frequency is exactly 2kHz, so I have to assume that B&W’s specification of 4kHz refers to the 685 S2’s acoustic crossover point. The traces show that there are no cabinet resonances: hardly surprising for such a small enclosure. (The glitches on the traces at 1kHz are caused by the test equipment’s auto-range switching, so ignore them.)

Newport Test Labs measured the sensitivity of the B&W 685 S2 design as being 86dB SPL at one metre, using a 2.83Veq wideband pink noise test signal. This is very close to B&W’s own specification of 87dB SPL and an excellent result for such a small loudspeaker, since the particular measurement technique used by Newport Test Labs makes it exceedingly difficult for bookshelf and stand-mount loudspeakers to record high SPLs. This result, combined with the B&W 685 S2’s impedance, means that you will get best performance from these speakers if you use an amplifier rated with an output power of at least 50-watts per channel into both 8Ω and 4Ω loads.

I must admit to being surprised at how B&W has been able to engineer the low-frequency performance of the 685 S2 so as to give users very useful options for tuning the bass without compromising the speakers’ bass response in any of the three modes: it’s an exceptionally talented juggling act. But the remainder of the design is equally good, because the 685 S2 delivered an excellent set of results, through all Newport Test Lab’s testing. So, overall, an outstandingly well-designed loudspeaker. — Steve Holding

Hi Folks,

I thought I would chime in and clarify a few points.

With the exception of subwoofers, each model in the new 600 series is entirely new. New cabinet, new drivers, new crossovers. The only thing that is not new is the name.

In North America, 683 went from $1500 to $1650 per pair. I calculate that as a 10% increase in price. Not bad considering the last 683 came out 7 years ago and the cost of producing products has escalated. Add in hugely improved performance, and I’d call that a bargain.

Regarding the move to China, we moved the entire production line and managers to our facility in China. 800 Series then had room to expand production. The 800 Series line runs constantly to keep up with demand. That requires more skilled employees, not less. So a bit of a win-win. Products stay affordable while production expands.

Regards,

Patrick Butler
B&W Group North America
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