



## PSB SUBSERIES 200

### SUBWOOFER

Look at the back of the PSB SubSeries 200 and you'll see a small inscription that says: 'Developed by PSB Speakers in partnership with NAD Electronics'. If you're thinking that it's strange for two competitors to form a partnership, you obviously don't know that both companies are owned by Canadian company Lenbrook Group. In the case of PSB, Lenbrook purchased the company from its founder, Paul Barton and, since Barton was also PSB's head designer, had the good sense to keep him on as an employee.

It's a uniquely synergistic partnership, because although NAD has made speakers, it's more famous for its electronics—particularly for the Class-D amplifiers that are contained in NAD's 'Master Series' components. So as you've probably already guessed, the amplifier inside the PSB SubSeries 200, which is rated with an output of 200 watts continuous, is one of NAD's own Class-D amplifiers.

#### THE EQUIPMENT

Unboxing the SubSeries 200 was like meeting an old friend, because I had reviewed the larger SubSeries 300 for *Australian Hi-Fi Magazine*

some months ago, a review in which I hope made it clear that I very much liked the 'form factor' of that subwoofer. That same form factor is visible in the SubSeries 200, except that, as you'd likely guess from the model number, the SubSeries 200 is smaller than the SubSeries 300. Unlike most subwoofers, which to me seem rather squat and boxy (I know there are notable exceptions) both subwoofers are taller than they're wide (or deep), though some of that height is due to the rather long feet underneath the cabinet that elevate it 90mm above your floor in order to give the large (67mm diameter) down-firing bass reflex port plenty of room to breathe. Although the SubSeries 200 is smaller than the 300, it's not particularly small, measuring 338×443×391mm (WHD).

That smooth-surfaced cone you can see on the front baffle of the SubSeries 200 is rated with a diameter of 254mm. My tape measure put the overall diameter at 238mm and the Thiele/Small diameter at 210mm, for an effective cone area (Sd) of 346cm<sup>2</sup>. The cone itself is made from polypropylene while the surround is made from butyl rubber. The cone is driven by a 38mm diameter voice coil that's surrounded by a magnet that weighs almost a kilogram. PSB says that its engineers 'worked hard at minimising the distortion of this driver, using both finite element analysis (FEA) software and a laser-based Klippel analyser.'

A volume level control, crossover frequency adjustment control and a phase switch (0/180°) are located above the bass driver cone in a small cut-out in the front baffle. The crossover frequency can be adjusted from 50Hz to 100Hz. There's also a small chameleon LED to indicate power status, which glows red when the subwoofer has power available but is in standby mode, and green when the subwoofer is good to go. Like most modern subwoofers, the SubSeries 200 has an automatic signal switching circuit triggered by an audio signal that turns the 240V power on and off. This means you don't have to worry about switching the amplifier on and off manually and helps extend the life of the subwoofer's amplifier circuitry. When the amplifier is in standby mode, it draws less than half a watt of mains power. The automatic circuitry cannot be over-ridden: your only other power option is 'Off' which you can do by switching the rocker switch on the rear panel of the SubSeries 200. The only time I'd ever bother switching this would be if I were going away from home for more than a few weeks.

The rear panel of the SubSeries 200 is dominated by the amplifier plate, but because the amplifier is a Class-D type, which generates very little heat, there are no heat-sinking fins.

The plate has a dedicated LFE input, plus an LFE output so you can loop to another subwoofer if you decide to run more than one (which you'd be advised to do if you have problems with room modes caused by the shape and dimensions of your listening room), plus line-level inputs and outputs (via gold-plated RCA terminals), as well as high level (speaker) inputs, which are via multi-way banana terminals.

Like other PSB subwoofers, including the larger PSB SubSeries 300, the PSB SubSeries 200 has what PSB dubs a 'smart bass' circuit, which is actually PSB's proprietary version of a limiting circuit: a type of circuit designed to prevent audible overload. In doing this, it not only prevents audible overload, but also physical overload—either of the internal amplifier or the bass driver itself. Having tested this with the PSB SubSeries 300 and found it audibly transparent (that is, the circuit has no effect on the sound quality *per se*, but simply limits its volume, I wasn't going to test it again on this PSB SubSeries 200, but 'completeness' got the better of me and I did, with exactly the same results. The circuit was not only effective, but also audibly transparent.

My sole criticism of the manual PSB provides with the SubSeries 200 is the same one I levelled at the SubSeries 300, which is that it's a 'generic' one, intended to cover multiple models, so some of the connection diagrams shown in it do not apply to the PSB SubSeries 200—something some users might find

## Play a track with deep bass—any track, any musical genre—and you'll hear beautifully deep bass sound

confusing. However, if you don't want to use the positioning and calibration techniques I will give you the links for later in this review, the manual provides enough advice on these matters to get you up and running... which is more than you find in many subwoofer manuals these days.

### IN USE AND LISTENING SESSIONS

The rotary controls on the front baffle are actually quite long, so although the plate on which they're mounted is recessed quite deeply into the front panel, the knobs still protrude beyond the baffle. This won't matter a jot, of course, because once you've set them



Being located as they are on the front baffle, the rotary volume and crossover controls and the phase switch are very easy to access.

to the correct positions (about which more in a moment), you'd put the grille back on the front panel which would hide them—and the driver—from sight. Unlike full-range speakers, where the presence of a grille can sometimes affect sound quality, the same is not true of a subwoofer, which will sound identical irrespective of whether or not the grille is fitted or not.

If you have not positioned a subwoofer in your room previously, the first thing you will have to do is establish the best position in the room sonically, which you can do by following the system outlined here: [www.tinyurl.com/subwoofer-placement](http://www.tinyurl.com/subwoofer-placement)  
This is a simple (but rather lengthy)

procedure, but you only have to do it the once. (And, if for reasons of matrimonial harmony you are obliged to put the PSB SubSeries 200 subwoofer where it will *look* the best, rather than where it will *sound* the best, you don't have to worry about the procedure at all!).

However, wherever any subwoofer ends up in your listening room you will always have to calibrate its volume, phase and crossover controls correctly to ensure the best sonic transition from your main speakers to the subwoofer (and *vice versa*). You can very easily do this using the simple and straight-forward procedure outlined here: [www.tinyurl.com/subwoofer-calibration](http://www.tinyurl.com/subwoofer-calibration)

My listening room is rather large, even by Australian standards, so I really wasn't expecting the PSB SubSeries 200 to be able to surprise me with its low-frequency and sound pressure level capabilities, but it did nonetheless. Play a track with deep bass—any track, any musical genre—and you'll hear a beautifully deep bass sound that is fast and tuneful with a truly musical sonic character. The arrival of the PSB SubSeries 200 in my home virtually coincided with the arrival of a CD that is a collaboration between famous Australian cellist Zoe Knighton and Ian Munro who, although he is becoming increasingly renowned as a composer, is one of Australia's finest pianists. Their collaboration is titled 'Northern Cello', where the two play works by Grieg, Sibelius, Peteris Vasks and Arvo Part. Being a huge fan of Vasks, his work *Gremata Cellam* (for solo cello, though Knighton does a bit of singing on it), was the first I played.

Since the cello is not a particularly low-pitched instrument, I used small bookshelf speakers in order that I could set the subwoofer's crossover to its maximum position and so have it reproducing lots of cello sound. It turned out to be a particularly good test for the PSB, with plenty of string plucking which enabled me to gauge the speed of the bass driver and its ability to stop as fast as required, plus plenty of sustained bowed notes on the lowest string. The first movement, *Fortissimo Marcattissimo*, is like a masterclass in celloism, with myriad double stops and even some triple stops, many played at seemingly impossible tempi. The sonority Knighton is able to extract from her cello whilst performing is simply astounding, and the fact that I was able to hear it so clearly a testament to the quality of the PSB's own performance.

The second movement, *Pianissimo dolcissimo*, is such a contrast I almost thought another composer had written it. The sounds Knighton manages to extract from her cello in this movement are almost ethereal, making the cello almost replicate the effects one expects to hear when listening to Mongolian throat singers or David Hykes' Harmonic Choir.

The Vasks work leads into Arvo Part's 'Fratres', and here Munro's piano rumbles in the lowest octaves to prove the performance of the PSB SubSeries 200. The clarity of the PSB sub's delivery is perfect—just listen to the sound of the piano at around 4 minutes into the track, as just one exemplar. You also get to hear how well the PSB is able to separate the two different sound qualities of the instruments so you always hear a piano playing along with a cello, not some amorphous 'pianello'.

The PSB SubSeries 200 is so good that this Canadian manufacturer may have inadvertently scored an 'own goal'.

I was thrust into another musical world when I then played the CD starting at the true beginning, which is Grieg's *Cello Sonata in A minor, Op. 36*, and listened to the beautifully romantic melodies that inform the first movement. I have always been bemused by this work, because one of the criticisms of it is that Grieg recycled some of his own melodies in it. Could the people who levelled this criticism have named any composer (past or present) who hasn't recycled their own themes and melodies?

To investigate the PSB SubSeries 200's performance in the lowest musical octaves I turned to an old favourite that co-incidentally features Vask's own double bass concerto, a disc titled 'The Sonatas: Brahms, Gubaidulina, Hindemith & Vasks', on which Niek de Groot (double bass) and Catherine Klipfel (piano) play works by these composers. Naturally, the Hindemith is his famous *Sonata for Double Bass and Piano*, of which Sasha Brandt once said: 'I love everything about this piece, with one exception; it's hard to find a pianist who is willing to tackle it with you!' Niek de Groot plays an Amati double bass made in Cremona, in 1680, which is reportedly the only remaining double bass from that era and the PSB SubSeries 200 certainly did its sound justice, in that it was easy to hear the superiority of its tone over that of lesser instruments.

Since it's almost inevitable that many people reading this review will be intending to use the PSB SubSeries 200 in either a dedicated home theatre set-up, or one that does double duty as a stereo rig and a 5.1-channel (or more-channel) rig, I also spent quite a bit of time with it using it exclusively to watch/listen to TV and to movies (the latter sourced from various mediums). Given the PSB SubSeries 200's performance with demanding music, I was not the least bit surprised to


The LFE output is so you can loop to another subwoofer if you decide to run more than one in order to equalise the room modes in your listening room

find myself totally satisfied with its performance in an AV scenario—and

most so with movie soundtracks. With these I found the sound of the continuous low-frequency energy used by producers to induce suspense in viewers was particularly effective, inducing in me the exact degree of suspense required, yet not aurally intruding on the soundtrack itself. Sound effects were also delivered naturalistically, and when I found the very lowest of them being 'felt' by my stomach, rather than 'heard' by my ears, I knew PSB's SubSeries 200 was the 'real McCoy'.

## CONCLUSION

The PSB SubSeries 200 is so good that I think that in bringing it to market this Canadian manufacturer may have inadvertently scored an 'own goal'. By this I mean that its bass extension and distortion-free volume levels are so good that many people who compare this subwoofer with the larger and more expensive PSB SubSeries 300 subwoofer might well opt for the PSB SubSeries 200, and I can't say I'd blame them. But if this happens it is at least true 'own goal' because I have heard

most of the other subwoofers available in Australia that sell at around the SubSeries 200's asking price, and this little PSB sub blows them out of the water too. 

Gary Williams



## CONTACT DETAILS

**Brand:** PSB  
**Model:** SubSeries 200  
**Category:** Powered Subwoofer  
**RRP:** \$1,399  
**Warranty:** Two Years  
**Distributor:** Convoy International  
**Address:** Unit 2, 314 Horsley Road  
 Milperra NSW 2214  
**T2:** (02) 9774 9900  
**E:** info@convoy.com.au  
**W:** www.convoy.com.au



- Bass for size
- Driver/port locations
- Performance



- High-level outputs

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Readers should note that the results mentioned in this laboratory test report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

# LABORATORY TEST RESULTS

Newport Test Labs' fourth graph (why not make it the first, guys?) tells the story here most clearly, with the lab having measured the PSB SubSeries 200's frequency response at a distance of two metres from the subwoofer, using pink noise as a test signal. The captured data was then smoothed to one-third octave via post-processing.


The black trace on Graph 4 shows the SubSeries 200's response when the crossover is set to 150Hz (its maximum setting) and you can see that it is extremely flat from 35Hz to 125Hz and overall extends from 24Hz to 180Hz  $\pm 3$ dB. This is an outstanding result.

When the crossover control is set to its minimum (50Hz) setting, the response is at its most flat across the 25–65Hz region after which it rolls off very smoothly. This response appears to get a little extra energy down at 25Hz. In this configuration, the PSB SubSeries 200 returned a frequency response of 18Hz–75Hz  $\pm 3$ dB.

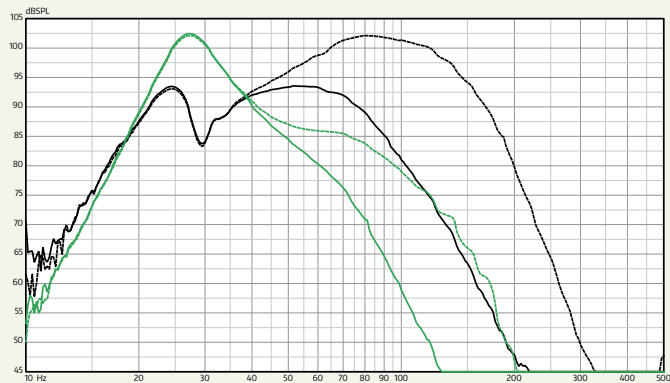
The first three graphs really show how PSB's engineers achieved these results. Graph 1 shows the nearfield sine response of the bass driver (black traces) and the port (green traces) with the crossover set to maximum (dashed traces) and minimum (solid traces). You can see that the bass driver's natural response peaks at 80Hz but is getting quite a bit of extra assistance from the bass reflex port across its operating region. The driver's minimum output is at 29Hz. You can see that this doesn't quite marry with the maximum

output of the port, which occurs at around 27Hz, and it would appear that this is due to PSB's engineers 'tweaking' the alignment to get a little extra low-bass from this design.

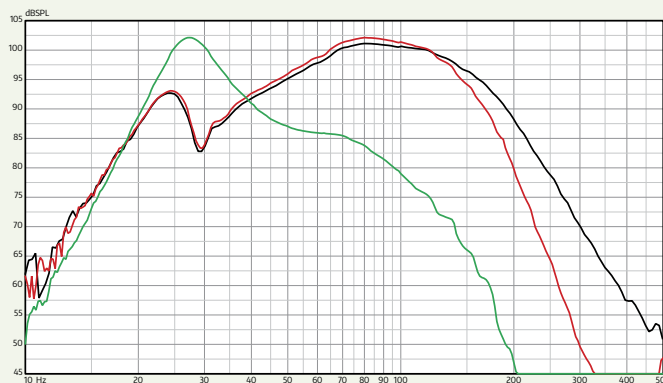
Graph 2 shows the difference between using the PSB SubSeries 200 with the crossover set to 150Hz, and with the crossover bypassed (by using the LFE input). You can see the output is essentially identical below 125Hz, other than a slight difference in level due to the crossover circuitry. Above 125Hz you can see the SubSeries 200 rolling off the response fairly steeply when the crossover is in circuit, whereas the high-frequency response is slightly more extended—and rolls off a little less steeply—when the LFE input is used.

As I said at the beginning of this section, it's Graph 1 that tells the story here, and it's an excellent story, because the PSB SubSeries 200 is a very well-designed subwoofer that has a flat and extended low-frequency response and whose controls will enable it to be integrated with any main speaker system you might use, whether it's a bookshelf/standmount model or a floorstander. 

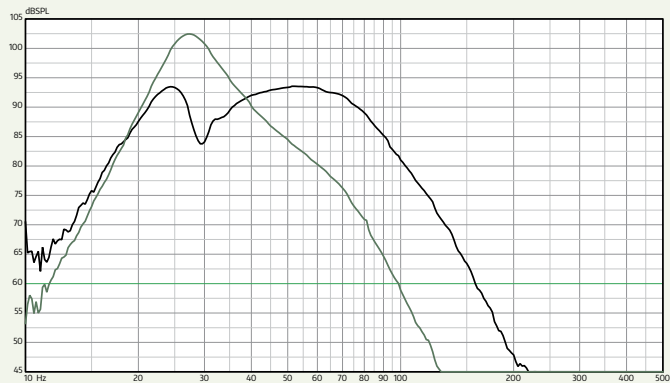
Steve Holding



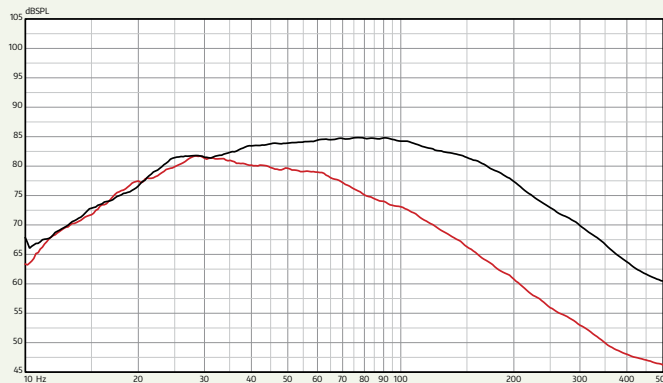
**Graph 1.** Nearfield sine frequency response of bass driver (black traces) and port (green traces) with crossover control set to 50Hz (solid traces) and 150Hz (dashed traces). (Note that data for port has not been re-scaled to compensate for differences in radiating area.)



**Graph 2.** Nearfield sine frequency response of bass driver using LFE input (black trace) and with crossover set to 150Hz (red trace) plus response of bass reflex port (green trace) with crossover control set to 150Hz. (Note that data for port has not been re-scaled to compensate for differences in radiating area.)



**Graph 3.** Nearfield sine frequency response of bass driver with crossover set to 50Hz (black trace) plus response of bass reflex port (green trace) with crossover control set to 50Hz. (Note that data for port has not been re-scaled to compensate for differences in radiating area.)



**Graph 4.** Pink noise frequency responses (smoothed) at 2.0 metres with crossover control at 150Hz (black trace) and at 50Hz (red trace).