



RICHTER THOR 10.6

SUBWOOFER

Big is bad, ports are poxy and vinyl sucks. These are the three things Richter's managing director, Brian Rodgers discovered when he went on a tour of Australian hi-fi retailers. He was asking them about subwoofers, of course, and the consensus was that their customers wanted subwoofers that were small, they didn't like bass reflex ports to be visible, and they didn't like vinyl finishes (due to problems with the vinyl splitting and peeling at the corners, according to Rodgers).

So when he returned from his road trip, he asked his Senior Engineer, Dr Martin Gosnell, to start developing a brand-new Richter subwoofer, one that was smaller and lighter than the company's award-winning Thor MkV, and to make sure it was either a sealed design, or if it had to have one or more bass reflex ports, that customers wouldn't be able to see them, and that Gosnell could specify any finish he liked, so long as it wasn't vinyl. Oh, it would be good if he could squeeze in a more power-

ful amplifier than was in the MkV as well...

The arrival of the new Thor 10.6 proves that Gosnell met the design brief. It's 20 per cent smaller than the Thor MkV, 30 per cent lighter, and its amplifier is rated at 450-watts, compared to the 300-watt amplifier inside the MkV. Importantly, you can't see the twin (tunable!) bass reflex ports (at least you can't if you leave the loudspeaker grille fitted) and, miracle of miracles, there's no vinyl to be seen, just a very classy matte-painted surface that's so black it's probably the same finish that was used on Hotblack Desiato's stunt ship. (You know, the one Zaphod Beeblebrox 'borrowed'.)

THE EQUIPMENT

Remove the front grille of the Thor 10.6 and you'll instantly see this subwoofer's most imposing feature, a dish-shaped polymer cone with an unusually distinctive neoprene roll surround that was tooled by Richter itself. Richter rates this driver at '10-inches' in diameter, and it's this '10' that informs the model name: 10.6. The '6' bit shows that it's part of Richter's '6 Series'.

Richter might rate the single front-firing bass driver as a 10-incher (254mm), but my reviewer tape measure put the overall moving diameter of the cone plus roll surround at 226mm. The important diameter, the Thiele/Small diameter, is 210mm, which puts the effective cone area (Sd) at 346cm².

It would seem that Richter is using one of the other common methods of stating driving diameter, by referencing either the overall diameter of the driver frame, or the distance between the mounting holes in that frame. Ultimately, it's the cone area that dictates how much air the cone will displace (along with cone travel... or 'throw' of course).

As you can see from our photograph, the Richter has two bass reflex ports on the front panel. The beauty of having ports on the front, rather than on the side of the cabinet (like some earlier Richter models!) or at the back or underneath the cabinet, is that it means you can recess the subwoofer into a wall—or into a cupboard or cabinet—to completely remove the subwoofer from the listening room. In the case of the Thor 10.6 this will be made easier by the relatively small size of the cabinet, which measures just 442×308×390mm (HWD). Then again, the small size means you also might think it's so small in your room that you can hide it somewhere (such as behind a couch or chair) so that there'd be no need to go to such lengths... and you'd be right.

I have to say that although I am not personally particularly perturbed about the actual physical size of any subwoofer (though my better half certainly is!) I *do* care about its shape, as I particularly dislike subwoofers that are as wide as they are high and deep, because I don't find this squat look very appealing. So I particularly liked the profile of the Thor 10.6, which is higher than it is wide. I also liked the fact that the feet are individually height-adjustable. Although adjustable feet are almost universal on standard loudspeakers, they're a rarity on subwoofers, which seems to me rather strange, since a floor doesn't magically 'flatten out' just because you're positioning a subwoofer on it rather than a main loudspeaker. And, just as you don't want a normal loudspeaker to 'wobble', you also do not want a subwoofer to 'wobble'—indeed it is essential that it is completely stable.

But back to those bass reflex ports. Each one is 75mm in diameter and 225mm long, with radiused curves at the exit. They come with tight-fitting grey foam 'port plugs' which you can insert to block one or both ports. This allows you to 'tune' the sound of the subwoofer to better-suit the size of your room, where you have the subwoofer positioned, what you're using the subwoofer for (type of music, type of movie etc) and, of course, your own personal tastes. For example, in larger rooms, leaving both ports unplugged will deliver higher sound pressure levels in the 30–100Hz area, but the frequency response will roll off more rapidly below 35Hz than if both ports were plugged. If you plug both ports, the deepest bass frequen-

cies (those below 35Hz) will be reproduced at a higher (relative) volume, but the bass between 35Hz and 100Hz will be slightly attenuated. In terms of how the settings will affect the music, the sound will be quicker and punchier with both ports left open, but smoother and more extended with both ports

When they coined the phrase 'taut and terrific', they could well have been talking about the Richter Thor 10.6...

blocked. Blocking only one port will provide a middle ground between the two.

Turning our attention to the rear panel of the Richter Thor 10.6 we find a large and impressive plate that has more features than I am used to finding on a subwoofer, and better-quality fittings as well. Looking at the features first, the Thor 10.6 has the usual rotary volume level and crossover controls (with the crossover control handily marked with calibrations at 10Hz intervals from 40Hz to 90Hz, with additional calibrations at 140Hz and 160Hz). But the volume control also has a setting marked 'REF'. Richter's Owner's Manual doesn't explain this, so we asked Richter, and were told that 'REF' should be used when the Thor 10.6 is being set up and controlled from a home theatre amplifier or receiver. In this case the volume should be set to REF and then volume controlled from that amplifier or receiver.

The Thor 10.6 has equalisation built in, switchable between three modes: 'Music', 'Merlin' and 'Home Theatre'. The 'Music' and 'Home Theatre' modes are self-explanatory. The 'Merlin' mode apparently perfectly matches the frequency response of the Thor 10.6 to that of Richter's Merlin loudspeakers. The somewhat flowery prose in the Owner's Manual puts it thus, and is here reproduced verbatim: *'Merlin mode has been exactly tailored to allow a seamless audio experience from Merlin's tight bass response deep down by approximately and additional 1.5 octaves. The phase and magnitude response has been matched specifically so that you can combine these two products as the perfect complement allowing you to cover the entire audio and subsonic spectrum with no compromise. Setup together you will experience performance usually only found in the very highest quality active integrated loudspeaker systems, you will experience an extraordinary new sense of dimensionality and atmosphere without compromising musically, transient emotional content, detail or a sense of point source.'*

The Richter Thor 10.6's low pass filter is not only adjustable, it's also switchable (or 'defeatable', if you prefer this terminology): You can switch it out of circuit by setting the 'Low Pass' switch to 'Off'. Setting this switch to 'Off' is recommended if you're using the LFE output from an AV receiver to provide the subwoofer's signal, as most AV receivers pre-filter the signal presented at their LFE output. (And you'd also set the volume to 'REF' as noted earlier.)

Multiple inputs are provided on the Thor 10.6 subwoofer. There are both balanced and unbalanced LFE inputs.

The balanced LFE input is a standard XLR socket, while the unbalanced LFE input is the left-channel of the line-inputs. There are also unbalanced line inputs (left and right channels) via RCA terminals. There are also high-level (speaker-level) inputs, accessed via multi-way gold-plated speaker terminals.

Speaker-level inputs are now a rarity on subwoofers, but they're extremely useful if you want to use the subwoofer with an ordinary stereo amplifier that has neither LFE nor line-level outputs. Even if your stereo amplifier does have line-level outputs (or pre-out or a record-out terminals... all are suitable for driving a subwoofer), it's often

preferable to use the speaker level terminals, then connect your main speakers to the 'To Speakers' terminals on the Thor 10.6. With this wiring arrangement, the Thor 10.6 'strips' the low frequencies from the signal going to your main speakers, relieving them from any low-bass duties, which will improve their performance as a direct result.

The Richter Thor 10.6 also has a 'Pass Through' output that allows you to 'daisy-chain' multiple subwoofers to improve performance. When you use only a single subwoofer in a room, the volume of the sound will vary throughout the room depending on where the listener is sitting because of room modes. By using two (or even more!) subwoofers in a room—but they must be positioned at different points in the room for this trick to work—it's possible to 'even out' these variations, so the volume is the same no matter where you sit. In most cases, a single subwoofer will suffice if only one or two people are listening and they're seated close together. It's only when multiple listeners are spaced in different places in a room that multiple subwoofers might become necessary.

I was pleased to find that the Richter Thor 10.6 has multiple power switches. There's a main power switch, so you can switch the amplifier off completely, effectively isolating it from the mains power, plus there's a secondary power switch so you can choose between having the subwoofer power-up



Cello sound is glorious no matter what's being played, but one that I always recommend to friends asking about cello is Elgar's superb *Cello Concerto in E minor*. Listen to this on a lesser subwoofer and you may wonder if you're hearing a human voice, but listening via the Richter 10.6, there is no room for doubt. I don't think the great Jacqueline Du Pre would be my first choice for either performance or sound quality, but she's certainly my sentimental favourite, so for this work, emotion trumps both performance and sound quality, with the steely Maria Kliegel's performance coming in a close second.

Recognising that many readers of this review will be primarily looking to purchase a subwoofer to enhance their enjoyment of movie soundtracks, with music as a secondary reason, I also evaluated the Richter 10.6 in a five-channel home theatre system (I'd like to go Atmos, but my better half told me six loudspeakers in our smallish family room—though I like to call it my home theatre room—were more than enough). Watching movies, I was impressed by the speed and stopping power of the Richter 10.6, as well as its ability to deliver the very lowest sounds on my Blu-rays. The 'depthiness' is certainly enough to rattle furniture and create an intensely powerful sound field in the listening room, no matter whether you're experiencing a pitched battle, a factory scene or just the director injecting low-frequency FX to generate tension in the audience.

Now you're probably imagining that I used the 'Home Theatre' mode when watching movies, but you'd be wrong. I did switch to the Home Theatre mode when I first started watching, but I wasn't convinced by the sound I was getting so I experimented with the other modes and interestingly enough, found that in my home theatre system, which has fairly small front speakers, I preferred the overall sound when the subwoofer was set for 'Merlin Mode' and both ports were unplugged.

Also interesting is that when I was using the Richter 10.6 in my main system, I preferred the 'Music Mode' equalisation, but with the ports plugged when I was listening to classical music and unplugged when I was listening to anything else. This might sound like a bit of a bother, but it only takes a few moments to plug or unplug the ports, and mostly I listen to either one type of music or the other in any one listening session... I tend not to chop and change between the two genres, so it took only a few seconds of my time per day to make the switch... though admittedly I had not bothered to fit the grille, so the switching process was quicker than it would have been if I had.

CONCLUSION

Aussie company Richter has succeeded where most other subwoofer manufacturers have not. It's managed to build a small subwoofer that doesn't sound small at all, exhibiting marvellously deep bass performance, with tuneful, rhythmic musical delivery and superbly low levels of distortion.

Even if it didn't have the extraordinarily high level of connectivity, multiple EQ modes and classy finish the Richter 10.6 would have been on my short list. But because it does have all these extras, it elevated itself right to the top of that list.  *Samuel White*

Readers interested in a full technical appraisal of the performance of the Richter 10.6 Subwoofer should continue on and read the LABORATORY REPORT published on the following pages. Results displayed in the graphs and associated comments about those results should be construed as applying only to the sample tested.

CONTACT DETAILS

Brand: Richter
Model: Thor 10.6
RRP: \$1,499
Warranty: Two Years
Distributor: Richter Audio Pty Ltd
Address: PO Box 231
 Church Point NSW 2015
T2: (02) 9999 3176
E: info@richter.com.au
W: www.richter.com.au



- Amazing bass!
- Connectivity
- EQ modes



- Two colour choices
- Single grille colour

LABORATORY TEST REPORT

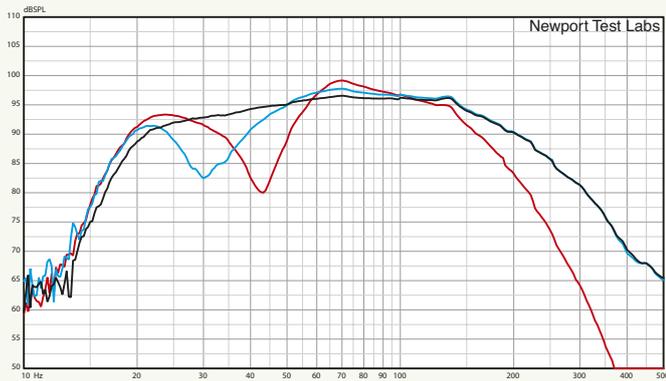
Graph 1 shows the effect of bungs and low-pass filter on the near-field frequency response of the Richter 10.6 subwoofer's bass driver. The black trace shows the driver's response when both bungs are fitted, the blue trace shows the driver's response when only one bung is fitted, and the red trace shows the driver's response when no bungs are fitted. The trace also shows the difference between the response when the low-pass filter is out of circuit (black and blue traces) and when it's in circuit, but set to its maximum crossover frequency of 160Hz. You can see

that when the low-pass filter is active, the high-frequency response rolls off at around 18dB per octave above 150Hz, whereas when the low-pass filter is defeated, the natural roll-off of the driver is at a much more leisurely 12dB per octave. The traces show that when one bung is fitted, the cabinet is tuned to 30Hz and when both ports are left open, the tuning is 43Hz. The output of the ports is shown in Graph 4.

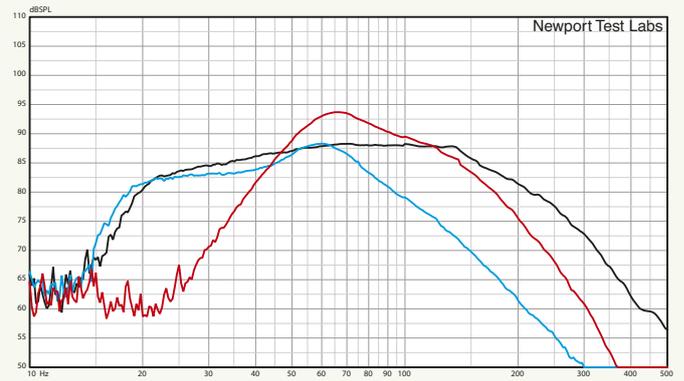
In Graph 2, *Newport Test Labs* has shown the effect of the three equalisation curves on the near-field response of the Richter 10.6's bass driver when both ports are plugged and the low-pass filter is not in circuit. The 'Music Mode' equalisation results in the flattest and most extended response, with the frequency response extending from 20Hz to 220Hz ± 4 dB, as you can see from the black trace. In 'Merlin Mode' (blue trace) the Richter 10.6's high-frequency response is rolled off above 60Hz at around 12dB/octave, and the very low-frequency response is given a little added extension below 20Hz. The 'Home Theatre Mode' equalisation delivers maximum output at 60–70Hz, but is rolled off above and below these frequencies, at around 30dB per octave below 60Hz and at around 12dB per octave above 70Hz, so the response is around 45Hz to 140Hz ± 4 dB and, as you can see, is the least flat of all the responses.

Graph 3 shows the Richter 10.6's response in Music Mode with both ports unplugged. You see the bass driver's low-frequency response (the black and blue traces) rolling off below 70Hz to the minima at 43Hz, before rising to peak at around 22Hz before rolling off again. The red trace shows the output of the two bass reflex ports, and you can see that the ports start contributing to the output at 15Hz and are fully operational at 22Hz, after which the output is linear until 65Hz, where it starts rolling off, neatly intersecting with the roll-on of the bass driver. Note that the blue trace was measured with the low-pass filter in circuit and set to 160Hz, and the black trace was with the low-pass filter out of circuit.

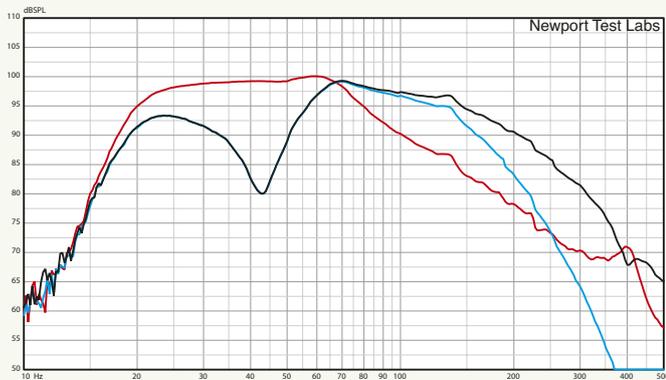
Graph 4 also shows the Richter 10.6's response in Music Mode but this time shows the difference between operating the subwoofer with both ports unplugged (the black traces, with the solid trace being the near-field response of the bass driver, and the dashed trace the near-field response of the port) and with only one port plugged (the green traces, with the solid trace being the near-field response of the bass driver, and the dashed trace the near-field response of the port). You can see the cabinet seems better-tuned when



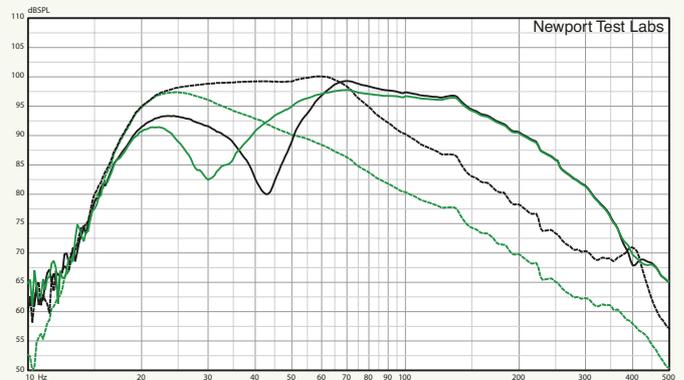
Graph 1. Frequency response of Richter 10.6 Subwoofer showing effect of bungs and low-pass filter. Both bungs installed (black trace); one bung installed (blue trace); no bungs (red trace). Low-pass filter off (Black and blue traces); low-pass filter on, LPF max (red trace).



Graph 2. Frequency response of Richter 10.6 Subwoofer showing effect of different EQ modes. Home theatre mode (red trace); Music mode (black trace); Merlin mode (blue trace).



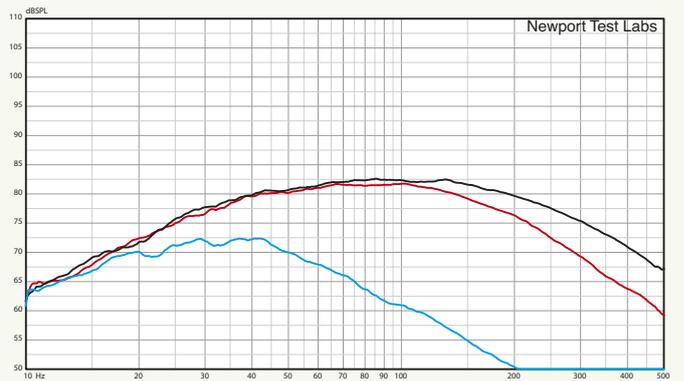
Graph 3. Frequency response of Richter 10.6 Subwoofer in Music Mode, showing output of bass reflex ports with no bungs installed (red trace); nearfield driver response without low-pass filter (black trace) and nearfield driver response with low pass filter set at maximum (blue trace).



Graph 4. Nearfield frequency response of Richter 10.6 subwoofer. Dashed black trace is ports without plugs, dashed green trace is port with other port plugged. Black trace is nearfield woofer response with no port plugs, green trace is nearfield woofer response with one port plugged.



Graph 5. Nearfield response of bass driver with both ports plugged. Black trace is with low pass filter set to maximum (160Hz), red trace is with low pass filter set to 70Hz, green trace is with low pass filter set to minimum (40Hz). [Richter 10.6 Subwoofer.]



Graph 6. Far-field frequency response of Richter 10.6 subwoofer measured using pink noise test signal. Music mode, ports plugged, black trace with LPF off, red trace with LPF set at 160Hz (max), blue trace with LPF set at 40Hz (min).

both ports are unplugged than when just a single port is plugged.

The low-pass filter's action is shown in Graph 5 for three settings of the low-pass filter control, with the Richter 10.6 operating with both ports plugged. Again we see that with the low-pass filter set at maximum (black trace), the near-field response is 20Hz to 220Hz \pm 4dB. With the low-pass filter set at its minimum point (40Hz, red trace) the

Richter 10.6's response extends from 17Hz to 51Hz \pm 4dB. When the low-pass filter is set to 70Hz, the response extends from 18Hz to 120Hz \pm 4dB.

The far-field in-room frequency response of the Richter 10.6 subwoofer is shown in Graph 6. With the low-pass filter set at its minimum (40Hz) setting, *Newport Test Labs* measured the frequency response of the Richter 10.6 subwoofer as 15Hz to 68Hz

\pm 3dB. With the low-pass filter set at 160Hz (maximum), the frequency response of the Richter 10.6 was measured as extending from 24Hz to 220Hz \pm 3dB. Finally, *Newport Test Labs* measured the response without the low-pass filter in circuit (black trace) as 26Hz to 260kHz \pm 3dB.

As you can see, the Richter 10.6 returned outstanding results in all *Newport Test Labs'* laboratory tests. \blacktriangleleft Steve Holding