

ProAc

Response One SC Loudspeakers



Stewart Tyler has been building his ProAc loudspeakers for so long now that he's confident enough of his designs to remind visitors to his website that 'The ProAc range is ... reassuringly expensive', going on to point out: 'We do not make cheap loudspeakers and certainly do not produce cheap sounds.' Certainly no-one could accuse the Response One SC of being cheap: on a dollar per cubic centimetre basis, it probably rates as one of the most expensive loudspeakers in the world.

The tiny Response One SC has some big shoes to fill: the Response 1S was

lauded as 'redefining the state of the art in loudspeaker performance', and was one of my favourite small loudspeakers.

The Equipment

With the grilles in place, it's nigh-on impossible to distinguish between the old and new models. The cabinets are exactly the same size: 305mm high, 178mm wide and 248mm deep and use the same crimpolene grille perched over a small 'shelf' at the base of the speaker.

Remove the grille, however, and the difference between the two will

Tyler has obviously modified this tweeter from the earlier Response One S, because he's managed to squeeze an extra 5kHz of high-end extension from it, extending the upper reach of the speaker to 30kHz.

be staring you in the face. The bass/midrange driver on the new Response One SC has a copper pole-piece that looks rather like an enormous bullet has been fired from behind the cone. The cone is certainly unusual, in that it's made of an almost totally transparent plastic, but ProAc devotees will be more than familiar with this: the Response One S used the same cone. The driver's cast chassis is identical, but the magnet at the rear has been coated with copper. Tyler has this driver made especially for him in Norway. He rates it as having a diameter of 127mm, but the total moving diameter—including the rubber roll surround—is 112mm, reducing to a diameter of 92mm for the cone itself. The all-important Thiele/Small diameter is 102mm.

The bass/midrange crosses to the tweeter at a relatively high 3kHz, because the tweeter is ProAc's familiar 19mm soft-dome tweeter, with its 'honeycomb wound' voice-coil, which operates from a ferrofluid-filled gap. Tyler has obviously modified this tweeter from the earlier Response One S, because he's managed to squeeze an extra 5kHz of high-end extension from it, extending the upper reach of the speaker to 30kHz. The tweeter's dome is recessed unusually deeply into the face-plate, so there's actually a small bit of cylindrical housing the pressure wave from the dome has to negotiate before it 'sees' the flare that couples it to the air. Special attention has been paid to the area immediately surrounding the flare, which is covered in a close layer of highly absorbent foam.

One advantage of the high crossover frequency is that the components on the crossover can be smaller and Tyler has certainly taken full advantage of

this, with three tiny inductors, a pair of cermet resistors, three poly capacitors and one electrolytic. The components are mounted on a standard PCB, to which the lead-out wires to the drivers are soldered: and what internal wires they are! They're super-heavy duty and soldered to the driver terminals as well, rather than going the low-budget (non-audiophile) route with male/female spade connectors. As you'd expect, the crossover is spit into high-pass and low-pass sections, for interference-free bi-wiring (or bi-amping). I think Tyler has been particularly clever with the terminal posts on the rear panel, because the 'pins' that normally bridge the two sets of terminals when only one set of speaker wires is being used can be 'dropped' down inside the plate, where they still remain captive (and thus won't get lost!) when you bi-wire.

Tyler is renowned for paying proper attention to damping, and no where is this more evident than inside the enclosure of the Response One SC, where bituminous pads have been stapled to the internal walls, and a layer of sheet acoustic foam laid over each pad. Still, there's not quite so much acoustic material inside that I would call the cabinet 'highly damped' (as does the brochure). However, I think this is actually a 'plus' for the Response One SC's sound, because I always find that highly damped cabinets tend to thicken the sound quality a bit.

I was a bit surprised to find the rear-firing bass reflex port is not flared at either end, but this is obviously intended, because ProAc has fitted to the inner end of the tube a specially cut square of wood, right at the end. Initially I thought this was to secure the port to a cabinet

wall, to stabilise the tube (which is quite long), but closer inspection showed the port—and the mysterious square—are free-floating, so the reason will have to await an explanation from ProAc—an explanation which had not yet arrived at the time of going to press.

ProAc apparently no longer offers its Teak and Walnut finishes, but it has more than compensated with 'off-the-shelf' availability of Black Ash, Maple, Cherry, Mahogany, Ebony, and Bird's Eye Maple. I am very partial to ProAc's Bird's Eye Maple finish, which looks wonderful—and particularly so if you have stainless steel stands. If you have black-coloured stands, be warned that ProAc's 'Ebony' finish is not at all black!

Speaking of stands, the ProAc Response One SCs are most definitely stand-mount loudspeakers—even the thought of putting them on a bookshelf or wall-mount is tantamount to sacrilege! Although you can use any stands that elevate the Response One SC's tweeter to seated ear level, you'll need to make sure the stands are very, very solid, because despite its size, the bass/midrange driver is powerful enough to cause unwanted stand movement in any stands that aren't up to scratch, and performance will most certainly suffer as a direct result.

Listening Sessions

Stand-mounting, as I said, is mandatory with the ProAc Response One SCs. Also mandatory is that you place them well out into your room, preferably at least a metre from the rear wall (or whatever else you have behind them). What's neat about the ProAc is that they're so small and light (even on stands), that it's no real chore to shift the speakers back and forth.

ProAc

Brand: ProAc
Model: Response One SC
Category: Standmount Loudspeakers
RRP: \$3699
Warranty: Five Years
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Back against the wall when you're not using them, or just using them for 'background' music, and forth into the room when you're settling in for some serious enjoyment with your favourite platters. At the time I was preparing this review I was house-sitting and for a while had the ProAc's set up in front of a large sliding glass window, which allowed me to listen while enjoying the unaccustomed view, and one of the first things I noted was that the midrange became confused when the speakers were close to the glass. Closing the curtains solved this instantly, but there went the view! Moving the speakers a metre away had the same effect as closing the curtains. I assume the confusion came about from the rear-firing port's output bouncing off the glass, so you'll need to pay attention if your wall is highly reflective and the speakers are close to it.

If you really want to be blown away when you go to audition these speakers, don't let the dealer fire them up until you're firmly seated in 'the sweet spot' and make sure he's preset the volume so it's up at what I call 'audition' level. Then prepare to be blown away. It's not just the sensational midrange sound, which so startlingly resembles the real thing that it's like one of those paintings, where you have to walk up so close to

see that it isn't a photograph that you set off the alarm system, but that the soundfield that delivers it is like being in a hologram. It's not that the sound is in front of you, but that you're immersed in it. I was reminded of the very first time I experienced one of those 3D illustrations and there was that stunning feeling of discovery—and sheer incredulity—when the previously two-dimensional image suddenly leapt from the page. The imaging completely transcends the speakers.

The arrival of the ProAc's for review coincided with my birthday, for which my significant other had given me a copy of 'Anna Magdalena Bach's Book' on which renowned harpsichordist Elizabeth Anderson accompanies her young son, the boy soprano Jacob Lawrence. Lawrence has a fair voice, though if you've heard the likes of Ernest Lough, you've probably been forever spoiled for boy sopranos. I had wanted the recording not to hear Lawrence but because I'd heard that Anderson had tuned her harpsichord following a temperament diagram provided by Bach on the title page of his Well-Tempered Clavier. Like most pianists (or in my case, aspiring pianists) I have a copy of this, and yet it had never occurred to me

that the illustration was an instruction on how the instrument should be tuned to play it! On the evidence of this CD, Bach's temperament is exceptionally fine, such that listening to French Suite No 2 (Tracks 6, 7 and 8), or Partita No 3 in A minor (Tracks 40 to 45) while not like hearing the works for the first time, it gives them a whole new freshness and vitality. The liner notes to this CD, by Martin Jarvis, propose that Anna Magdalena could have composed the Aria (Track 20) that her husband later developed into the Goldberg Variations. Anderson plays the Aria beautifully, but I'm afraid that I remain so smitten by Kempf's working of it that, for me, his version remains unassailable. The harpsichord sound was rendered evocatively by the ProAc Response One SCs. A copy of one of Pascal Taskin's 1769 harpsichords (modified by Alastair McAllister) it has a beautifully full, warm sound that sets it some incredible distance from the twangy, thin-sounding instruments that you more usually hear. I do, however, wonder whether using Bach's temperament was at least in part responsible for the particularly euphonic sound, because I feel sure that I have not heard Anderson's harpsichord sound so beautiful on her earlier CDs—but then I wasn't listening through ProAc's Response One SCs! However, this same CD also shows the ProAc's Achilles Heel, because Anderson uses the organ in Melbourne's Scots' Church to play several tracks and the speakers' lack of bass extension was, of course, immediately evident—there's no way a speaker as small as the Response One SC is going to give a realistic delivery of very low bass. What amazed me about the organ sound, however, was that although it was evident the low pedal notes were recessed, I didn't have a sense of there being anything 'missing' as such—the ProAc is so perfectly voiced that the organ sound still felt properly balanced.

My birthday present to myself also arrived in the nick of time to premiere on the ProAc's: a collection of Vladimir Horowitz performances on the Andante label. I was captured on the very first track, which is Ernst von Dohnanyi's *Capriccio in F Minor Op 28 No 6*, recorded in 1928. Andante has done a fine job reducing surface hiss without removing

any of the performance which, like all early—and late!—Horowitz, is simply astounding. Such feats of prestidigitation whilst all the while remaining immensely musical seem superhuman, even now. Has Rachmaninoff's third Piano Concerto ever been played better than this Horowitz/Albert Coates version in 1930? I don't think so. But if you need to hear truly superhuman, try Poulenc's *Presto in*

B-flat major, on Disc 4 of this set—what a closer!

If you're into small ensembles, singer/songwriter soloists, a cappella groups and suchlike, you're going to love the detail the Response One SCs can deliver—I've never heard The Idea of North sound so uncannily real... except for the time I heard them singing live and even then the sound was close to what I recall.

Another bit of good news is that if you blow your budget on the speakers, you won't have to go overboard on the amplifier, because I found the Response One SCs to be extraordinarily amplifier-friendly. You do need to provide plenty of power to get them sounding as dynamic as they can, but you need to be a little careful, because they harden up and lose their gloss if over-powered. Underpowering is also fraught: I don't think SET aficionados should apply without checking that they're first comfortable with playback levels. That said, I really think the Response One SCs are a 'small room' loudspeaker, for which a SET would be fine.

Conclusion

You may be wondering why, at the very beginning of this review, I said ProAc's Response 1S was one of my favourite speakers. I said 'was' because its place has now been usurped by this new SC version, which is clearly better every respect, and a wonderful loudspeaker into the bargain. If you're after a superior speaker system for a small room, look no further.

James Ross

LAB
REPORT

Readers interested in a full technical appraisal of the performance of the ProAc Response One SC Loudspeakers should continue on and read the LABORATORY REPORT published on the following pages. All readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Test Results

ProAc's Response One SC performed superbly 'on the bench' at Newport Test Laboratories. Figure 1 shows the speaker's frequency response with a pink noise signal. The response has not been smoothed. As you can see, the response falls almost entirely within a 5dB range between the 75Hz and 20kHz, or in other words, 75Hz to 20kHz ± 2.5 dB. This is excellent performance. Note particularly the linearity between 200Hz and 2kHz, where the response is almost perfectly flat.

Figure 2 shows the effect of applying one-third octave smoothing to the trace depicted in Figure 1. After smoothing, the trace was shifted vertically a little, to make the graph calibrations easier to read. The smoothed response extends from 65Hz to 20kHz ± 3 dB. You can see there's a tiny lift in the response (a dB or so) between 2kHz and 10kHz, after which the response rolls off smoothly to 20kHz. There's a slight emphasis around 150Hz, but it's so slight it would likely not be

audible. The low-frequency roll-off is superbly smooth and controlled.

As regular readers will know, using pink noise to test a speaker is a hard ask, because it consists of all frequencies in the audio band applied simultaneously, at high level, for an extended period of time—which tends to heat the magnets rather dramatically. Figure 3 shows the high-frequency performance of the ProAc Response One SC with a far less demanding gated sine signal that also has the advantage of showing the response free of any room influences (i.e., anechoic). Again you can see the superb flatness across the midrange actually extends right up to 5kHz within ± 1 dB! There's then a 2.5dB dip between 5kHz and 6kHz followed by a 2.5dB peak between 6kHz and 7kHz, after which the response stays slightly above 'reference' out to 12kHz, then slightly below reference out to 16kHz before rolling off to 20kHz. The more extended response using this signal is what you could expect

with a typical music signal.

The near-field response of the ProAc (Figure 4) shows that the port's peak output at 70Hz is tuned 5Hz higher than the bass driver's null at 65Hz, which is almost always proof the port has been 'ear-tuned' rather than designed by a computer. The port's Q is fairly high, but it's very effective over the region 40–120Hz. There is some high-frequency leakage though the port between 500Hz and 1kHz, as you can see by the trace, but since this is more than 20dB below the port's peak, and the port is also rear-firing, would not contribute to the on-axis sound. You can see the bass driver is very linear above 100Hz, with a steep roll-off below this frequency. That said, this trace is not totally accurate, since bass drivers with exposed pole-pieces, as with this one, do not lend themselves to near-field microphone measurement techniques.

Figure 5 contains a total of three traces. The lowest trace, towards the

bottom of the graph, is that of a reference precision 5Ω resistor, graphed for calibration purposes. The slight kinks at 100Hz, 1kHz and 10kHz are there because it's at these frequencies that the computerised test equipment automatically switches ranges to improve accuracy, and so should be ignored. The other two traces show the impedance of the left and right ProAc Response One SCs overlaid, which serves to show ProAc's quality control. As you can see, QC is superb, particularly at low frequencies, where even a misplaced damping pad or baffle can affect performance. The only differences in impedance between the two speakers are at 250Hz and just under 2kHz, but the differences are so small they're completely insignificant. As for the modulus itself, the impedance for the most part stays well above 8Ω, but because it falls below 8Ω between 120Hz and 650Hz, with a minimum impedance of 4.8Ω at 250Hz, the 'nominal' impedance (based on IEC 60268-5, which says the lowest impedance should be not less than 80% of the nominal impedance) would be 5Ω rather than the 8Ω rating given by ProAc. And, since some consumers are put off by 5Ω nominal ratings, being used to the more common 8Ω and 4Ω ratings, giving the Response One SC a 4Ω rating would shoo it in! The lower of the two resonant bass peaks comes in at 24Hz, with a value of 24Ω, while its twin is at 87Hz, with a value of 17Ω, so you can expect the bass driver to be rolling off at 85Hz. The impedance graph shows no evidence of cabinet resonances or untoward effects, though there's obviously some tailoring done in the crossover, despite its relative simplicity.

Newport Test Laboratories also couldn't come within cooee of ProAc's sensitivity specification of 86dB SPL which ProAc says is 'linear for 1 watt at 1 metre.' NTL recorded a figure of 83dB at one metre, using 2.83-volts (equivalent) of pink noise. (This is the level that would produce 1 watt into a perfect 8Ω load, and is obviously much lower than that used by ProAc.) NTL's test is very stringent, and given the size and design of the Response One SC, I would have predicted around 83–84dB SPL, so as far as I'm concerned, the ProAc is right on the money in the sensitivity stakes. It is, however, very low sensitivity, so you'll need to

make sure you drive the Response One SC with a suitably powerful amplifier. *Steve Holding*

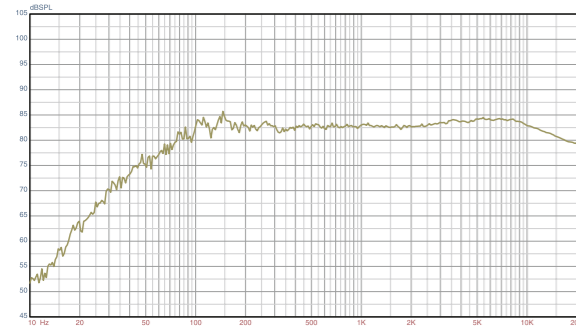


Figure 1: Pink noise frequency response (unsmoothed) at one watt at 1.5 metres.

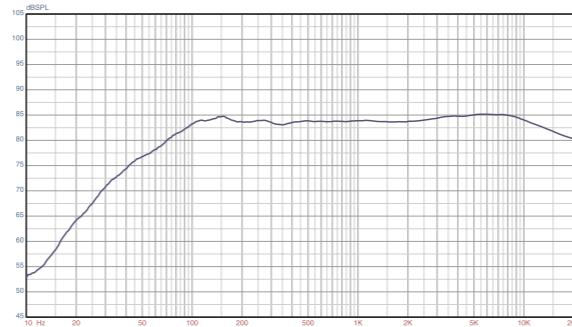


Figure 2: Pink noise frequency response (smoothed to one-third octave) at one watt at 1.5 metres.

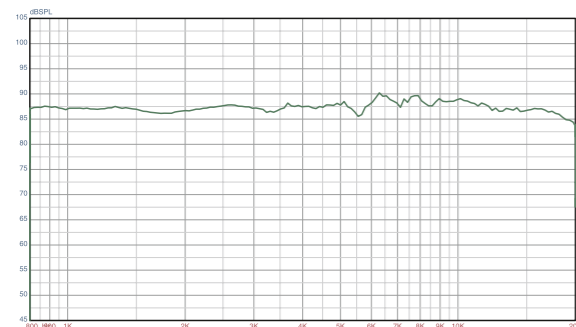


Figure 3: Gated sine frequency response (unsmoothed) at one watt, at 1.5 metres.

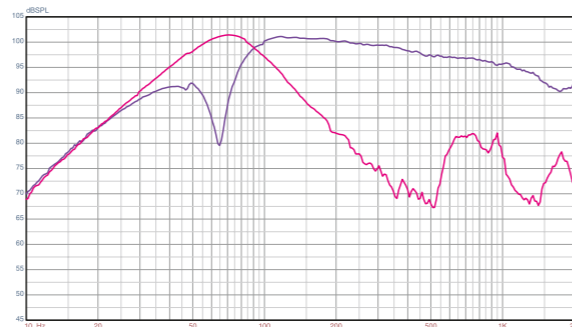


Figure 4: Nearfield frequency response of bass/midrange driver and rear-firing reflex port. (Note data for port has not been re-scaled to compensate for differences in radiating area or location.)

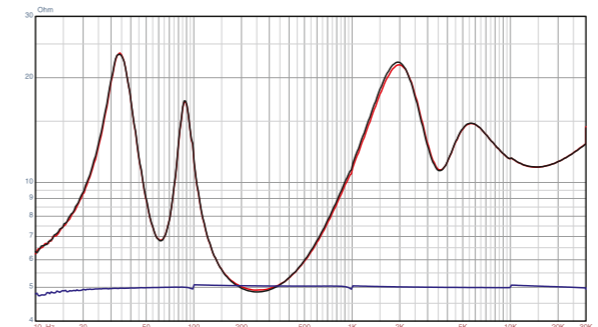


Figure 5: Impedance vs frequency, with both left and right speakers graphed (see copy). Trace under is that of a reference 5Ω precision resistor, measured at the same time for calibration purposes