

REL SERIE S5 SUBWOOFER



No, No, No! It's not a subwoofer, it's a 'Sub-Bass System' says REL! Discontented with the conventional English-language system of spelling (you'll notice that REL drops the final 's' from the word 'Series', so its models are known as the REL Serie S2, REL Serie S5 and so on), it seems that REL is also unhappy with the word 'subwoofer', preferring to call its products 'Sub-Bass Systems'.

I would not be so surprised at this use of language if REL were based in the Far East (or even in the USA!), but REL calls the

United Kingdom home—of which kingdom England gave us the English language. (Though since REL lists its address as being in Bridgend, Wales, the company is actually Welsh... and maybe it's this that makes all the difference.) On the other hand, it may just be that because REL is a specialist sub-bass system manufacturer (it does not make loudspeakers, amplifiers or any other type of audio product) it wants to differentiate itself from those full-line manufacturers who produce 'subwoofers' simply to round out their product ranges.

THE EQUIPMENT

A cursory examination of the REL Serie S5 (variously identified by REL as being an 'S/5' and as an 'S5', so I'll stick with S5 for this review, because it saves ink) might have you thinking that it's a single-driver sub-bass system in a sealed enclosure, using a 300mm front-firing driver. And if that's what you thought, you'd be wrong.

If you'd looked *underneath* the REL S5, you'd have discovered what looks like a second bass driver but is actually a 300mm-diameter passive radiator (of the suspended

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plate type: there's no underlying spidered suspension). So in point of fact the REL S5 is a bass-reflex design, but one that uses a passive radiator in place of a port. There are many good things to be said about this approach to bass reflex design. Firstly—and most importantly of course—you eliminate the port, which is a good thing, not least because ports can often become noisy (the late Chris Green, who used to write for this publication, loved reviewing subwoofers with noisy ports, because he could then literarily describe them as having 'port noise complaint') creating unwanted chuffing or whistling sounds.

The two silver handles on the sides aren't there just to make the Serie S5 look good (although they do)... they make it easy to move around too. The silvery REL logo on the top of the subwoofer *is* there, however, just to make the subwoofer look good. (Though I have a sneaking feeling it may also have been placed there to discourage 'significant others' from positioning vases, statuary, candles—or other decorations—on top of it which, if true, is truly a master-stroke of subwoofer design!)

At the rear of the REL S5 you'll find a satisfactory agglomeration of controls and inputs that includes a Neutrik Speakon for a

aerospace corporations Lockheed Martin and McDonnell-Douglas both use what they call 'Longbow radio frequency guidance' to steer their 'AGM-114L Longbow' and 'RF Hellfire' missiles. Lockheed Martin says the Longbow is a two-way, high-bandwidth data link and that it owns the trademark on the word, so it would appear that this is the self-same technology REL is using in the S5 (since REL makes it clear that it's aware of the trademark, by inserting the appropriate symbol whenever it uses the word). If I am correct in my assumption that it *is* the same technology, we're obviously talking about some pretty serious circuitry! If you wish to connect wirelessly to the REL Serie S5 you'll need to buy REL's 'Longbow Transmitter', available separately for \$399.

Look carefully (i.e. not cursorily!) at the rear panel and you will see something else that is quite unusual: two volume controls. One is for the 0.1/LFE input, the other for the low and high-level inputs. Why two separate volume controls? Herein lies a fascinating story...

REL believes that the only complete, unified approach for a sub-bass system is to



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A second good thing about not having a port is that small creatures are then unable to gain ingress into the cabinet, which they often do with the intent of snuggling up close to the warm electronic circuitry, or to make a nest in the soft internal damping material. There are other advantages of not having a port on an active speaker system that I won't mention, but one other that I will is that the inside of a sealed cabinet is protected from the atmosphere, so grime (which is sometimes conductive) cannot adversely affect the operation of the amplifier circuitry.

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It's not just the quality of the high-gloss painted finish, but also the design. Whereas most subwoofers look ordinary and boxy, REL's 'Sub-Bass System' will become a much-admired furniture item in your home... perhaps even more admired if you choose the gloss white lacquer finish over the gloss piano black finish. (Since REL mentions pianos, I think it only fair to point out that piano manufacturers say their black pianos outsell their white models, even though a white piano gloss finish is far easier to keep looking pristine than a gloss piano black finish.)

high-level connection to your loudspeakers (or the speaker terminals on your amplifier), left and right low-level inputs (via RCA connectors) and an LFE (low frequency effects) input that's also accessed via an RCA connector. Back once again in the domain of the English language, it seems REL prefers to call RCA connectors by one of their secondary names [i.e. 'phono' connector, instead of 'RCA'] despite the potential for confusion. (The other secondary name is a 'cinch' connector, though this isn't often used these days.) My personal feeling is that the RCA designator is the most correct of the three identifiers, since the connection was, after all, designed by the Radio Corporation of America.

There is one 'odd man out' connector on the rear of the REL S5, which is an SMA connector for a wireless antenna (which isn't included) so you can connect audio signals to the REL wirelessly. The radio frequency (RF) wireless system REL uses is called 'Longbow' which REL says uses 'a new chipset remarkable for its speed and lack of delay, and which uses a proprietary security codec that ensures exceptional protection of the signal while achieving zero digital compression.' Having never heard of this system previously, I did a quick Google search and discovered that

REL SERIE S5 SUB BASS SYSTEM

Brand: REL
Model: S5
Category: Subwoofer
RRP: \$3,999
Warranty: Two Years
Distributor: Synergy Audio Visual
Address: 107 Northern Road
 Heidelberg Heights VIC 3081
T2: (03) 9459 7474
E: info@synergyaudio.com
W: www.synergyaudio.com



Great bass
Attractive design
Wireless option



Line-level cable
Stand-by mode

LAB REPORT: Turn to page 62
Test results apply to review sample only.

connect BOTH the 0.1/LFE AND either the high-level or low-level inputs at the same time, and have them operating simultaneously. In the words of REL: *'This means you may achieve the best possible 2-channel performance with your CDs or other music signals and instantly transform to a powerhouse with LFE when watching movies. This feature requires no switching but is instead a seamless benefit to doing things the REL way.'* However, the manual also warns that you should *'consult with your dealer before setting [your processor] to 'Large or Full Range' as a few speakers cannot handle the bass that is then directed through to your main speakers.'* In order to ensure correct operation using this connection method, the 0.1/LFE input on the REL S5 has a standard 120Hz 4th-order filter.

To the right of the two volume controls is a rotary crossover control that adjusts crossover frequency from between 30Hz and 120Hz, and below this a two-position phase switch (0/180°). You may have noticed that the lower crossover frequency is lower than on most other products of the REL S5's ilk, which is deliberate, and because the designed operating range of REL Sub-Bass Systems is somewhat lower than many of its competitors, which aim at raising bass levels mostly across the 50–90Hz range. REL sets its sights at rather lower frequencies, aiming for, in the words of its brochure: *'useful output in the 20Hz–50Hz region'*.

REL rates the internal power amplifier with an output of 250-watts continuous. It's a Class-D design... or more precisely, according to REL, a 'Next Gen II Class D' design. Interestingly, it does not have automatic signal-sensing circuitry to turn the S5 to standby whenever it's not being used. Instead, there's just a mains power switch for when you won't be using the S5 for a lengthy period. It seems

the reason for the lack of a standby circuit is that REL thinks reliability is improved when an auto-standby switch is not used. The manual points out (page 18): *'Our experience is that maximum reliability is obtained for all high-performance electronic devices by not switching units on and off frequently as the resultant load created by the inrush of current to cold components produces a long term stress that can, over time, cause wear on the electronic components.'* While I agree with this statement in general terms, I am not convinced that, under normal conditions—and with sensible automated circuitry—a subwoofer would switch on and off frequently enough to result in such stress, or even sufficiently often to outweigh the benefit of the internal components' lives being extended by virtue of not being used at all. At the same time, I am also prepared to admit that I could be wrong: It's a topic I have yet to comprehensively research.

As for the Owners' Manual that contains this statement, I have to say that it's a beauty! The layout and design are first-rate, the instructions for installing and calibrating the REL S5 are extensive, comprehensive and easy to understand.

REL devotes four whole pages to the various ways the S5 can be connected into your system, fully covering all possible permutations, including connections to amplifiers with a differential (fully-balanced) outputs (many Class-D designs fall into this category), through to monoblocs and even including differential monoblocs. There's also a set of instructions on-line here: <http://rel.net/support/rel-set-up/>

The manual also goes into enormous detail about how to go about locating the REL Serie S5 in your room, including recommending a particular music track to do the set-up (*Cosmo... Old Friend*, which is the fourth track on the soundtrack to the movie 'Sneakers', composed by James Horner and available on Columbia CK 53146).

IN USE AND LISTENING SESSIONS

Installation was a snap not just because of the comprehensive manual, but also because REL also supplies a ten-metre long cable with a Neutrik Speakon connector at one end and triple bare wires at the other to facilitate connection to your amplifier's high-level (speaker) terminals according to

the 'REL way'. Since REL's philosophy is to connect the LFE or line-level terminals as well, it might have been nice if it had included a ten-metre length of RCA–RCA connector cable, but this is something you will just have to supply yourself. However, if it were me, I would far prefer to fork out that little bit more for REL's Longbow transmitter, which not only works 'the REL way' but also means I could get rid of all the connecting wires... except, of course, for that all-essential 240-volt power cord.

Correct operation of the REL S5 is also ensured by the four very large feet upon which it stands, three of which are visible in the photographs accompanying this review. Yes, they're a bit obvious, but their size means that even if you



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place the S5 on thick carpet, the down-firing passive radiator will still be far enough away from the floor that it will deliver its designed contribution to the low-frequency output. Subwoofers with small feet tend to 'sink' into carpeting, which effectively muffles their deepest bass.

Obviously I connected the REL according to REL's preferred methodology for this review.

Because it's so rare that any subwoofer is able to deliver this level of musicality, I was thus favourably predisposed towards the REL S5 even before I'd started my listening sessions in earnest.


After several hours, I was even more impressed than when I'd started. Not least by the ability of the REL S5 to place individual notes precisely at their exact recorded level of

16-footers and six 32-footers. Listening to this CD with the REL Serie S5, I really could 'feel the earth move' (as Hemmingway's Maria originally said and as Carole King was to sing).

But linearity and bass extension mean nothing if there are no dynamics, and here the REL S5 completes the hat trick of sub-bass virtues, because its dynamism is infectious in the same way a great rhythm simply forces you to move your feet. With the S5, the dynamics likewise force you to become totally involved with the music... there's not a single one of your senses that is not totally engaged with whatever is playing... and all that was with music. When listening to movie soundtracks, it only got better, because not only was the music on the soundtrack improved, but also the all-important low-frequency sound effects, which became almost visceral, whether it was the low-pitched background hum of a space station, the 'oomph' of an unseen Tyrannosaurus Rex or the 'crump' of an exploding mortar shell. I also have to report that when watching movies, I found that all these effects were heightened by the effectiveness of REL's unusual 'dual-wiring' trick. Why hasn't anyone thought of this before?

CONCLUSION

It pretty much goes without saying that if 'low bass systems' are the only products you build, you'd want to make absolutely certain that you build pretty good ones!

In creating the Serie S5, REL has not just 'built a pretty good one'; it has built an exceptionally good one! 

greg borrowman

“ *The REL S5 completes the hat trick of sub-bass virtues* ”

I should note, however, that if you listen exclusively to two-channel audio, or are using the REL in a standard two-channel system, there is actually no advantage to using REL's method. The sonic benefits only kick-in when you're using the REL in a x.1-channel system, and the convenience benefits only kick-in when you're switching that system between 'pure' 2-channel and x.1-channel operation. (I've put 'x' rather than a number, because 'x' could be any multi-channel system implementation... 3.1, 4.1, 5.1, 6.1, 7.1, etc.)

Oomph! That huge 300mm diameter hard-coned front-firing driver, backed up by the equally large-diameter carbon-fibre passive radiator, really delivers the low-frequencies with unashamed gusto. As much was immediately evident even in the first few seconds of my audition. There's not even a hint of cone-lag, even when the very lowest notes are being delivered at the loudest levels at which the S5 is capable... and that's VERY loud! The REL S5 delivers beautifully tuneful bass too. No matter whether I was listening to riffs played on an electric bass, bass lines plucked or bowed on a double-bass or the bowed strings of a violoncello, I was able to instantly identify the pitches of the notes being played and, from their tonal accuracy as rendered by the S5, the instrument playing them.

loudness, no matter whether it was, by way of example, a low 'C' being played, or the 'C' an octave above. The low-frequency extension was also superb: you won't plumb the depths of the S5's extraordinary ability to deliver the lowest octaves of music unless you venture into the domain of the pipe organ or the electronic synthesiser, because it can reproduce notes that are lower than all other types of musical instruments can even play. When you play organ through a sub you'll find no finer music for demonstration than Bach's *Toccatà and Fugue in D Minor*, as played by Jean Guillou on the Great Organ of St Eustache [Dorian DOR-90134] which is not only the largest pipe organ in France, but also one of the largest in Europe, with 80,000 pipes, including sixteen



LABORATORY TEST REPORT

Newport Test Labs measured the in-room frequency response of the REL Serie S5 as extending from 24Hz to 140Hz ± 3 dB with its crossover control set to 120Hz, and from 20Hz to 95Hz ± 3 dB with its crossover control set to 30Hz. These traces, which were identical for both the line-level and high-level inputs, are shown in Figure 1. (To obtain this response, Newport Test Labs positioned the REL S5 more than three metres from any wall. Moving the S5 closer to a wall would increase the level of low frequencies and improve l.f. extension even more.) You can see that with the crossover set to 120Hz, the output of the REL S5 is at its maximum at 60Hz and very flat between 40Hz and 100Hz (very, very flat... it's actually 40Hz–80Hz ± 1 dB). When the crossover control is set to 30Hz, the frequency at which the maximum output occurs drops down to 38Hz and the ± 1 dB response now extends from 25Hz to 64Hz.

Figure 2 shows the REL Serie S5's frequency response measured using a nearfield technique that simulates the response that would be obtained in an anechoic chamber, but the technique involves measuring the bass driver and the passive radiator separately. You can see that the bass driver's minimum output

occurs at around 32Hz, coinciding (as it should) with the passive radiator's maximum output. Whereas I would have expected to see a fairly clean 'valley' in the bass driver's response at 32Hz, the presence of a slight 'bump' on the floor of the valley would seem to indicate some 'bootstrap' interaction between the bass driver and the passive radiator. Although interesting from a technical standpoint, it would have no bearing on the sound quality of the S5.

When driving the REL Serie S5 using the LFE input, there are some minor differences in its frequency response at the frequency extremes, with a slightly more-extended

high-frequency response and a slightly attenuated low-frequency response (compared to the line/high-level response, the LFE response is 2.5dB down at 20Hz). In Figure 4, Newport Test Labs has shown both the two nearfield responses (using a 120Hz crossover frequency) and the far-field (2M) pink noise response at the same crossover setting so you can see how the different measurements 'fit', to give an ever-better overall picture of the REL Serie S5's excellent performance.

Due to the lack of a standby circuit, Newport Test Labs measured the power consumption of the REL Serie S5 when it was delivering wideband noise at 93dB SPL at 2M. It consumed only around 30-watts from the 240V mains supply, which is insignificant, and this consumption figure dropped to less than 20-watts when there's no input signal.

Newport Test Labs' measurements proved the REL Serie S5 to have a very flat frequency response that is well-extended into the low frequencies so that there is useful bass output right down at 20Hz. The Serie S5 design also proved itself capable of delivering very high in-room sound pressure levels with negligible distortion. So, overall, this is a highly accomplished and beautifully executed design that I recommend very highly.

Steve Holding

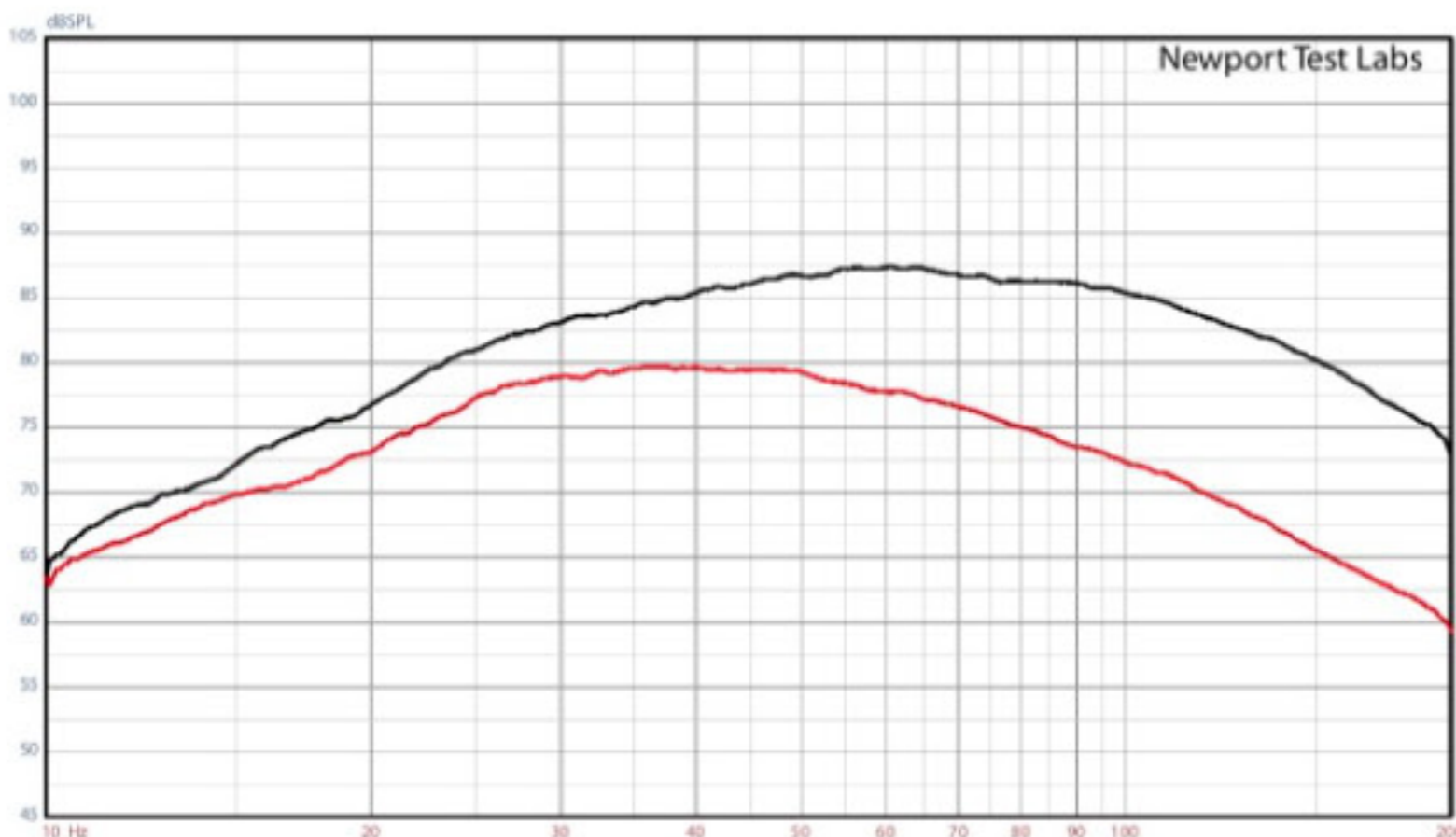


Figure 1: Pink noise frequency responses (smoothed) measured at 2.0 metres with crossover control at minimum (30Hz) and maximum (120Hz). [REL Serie S/5]

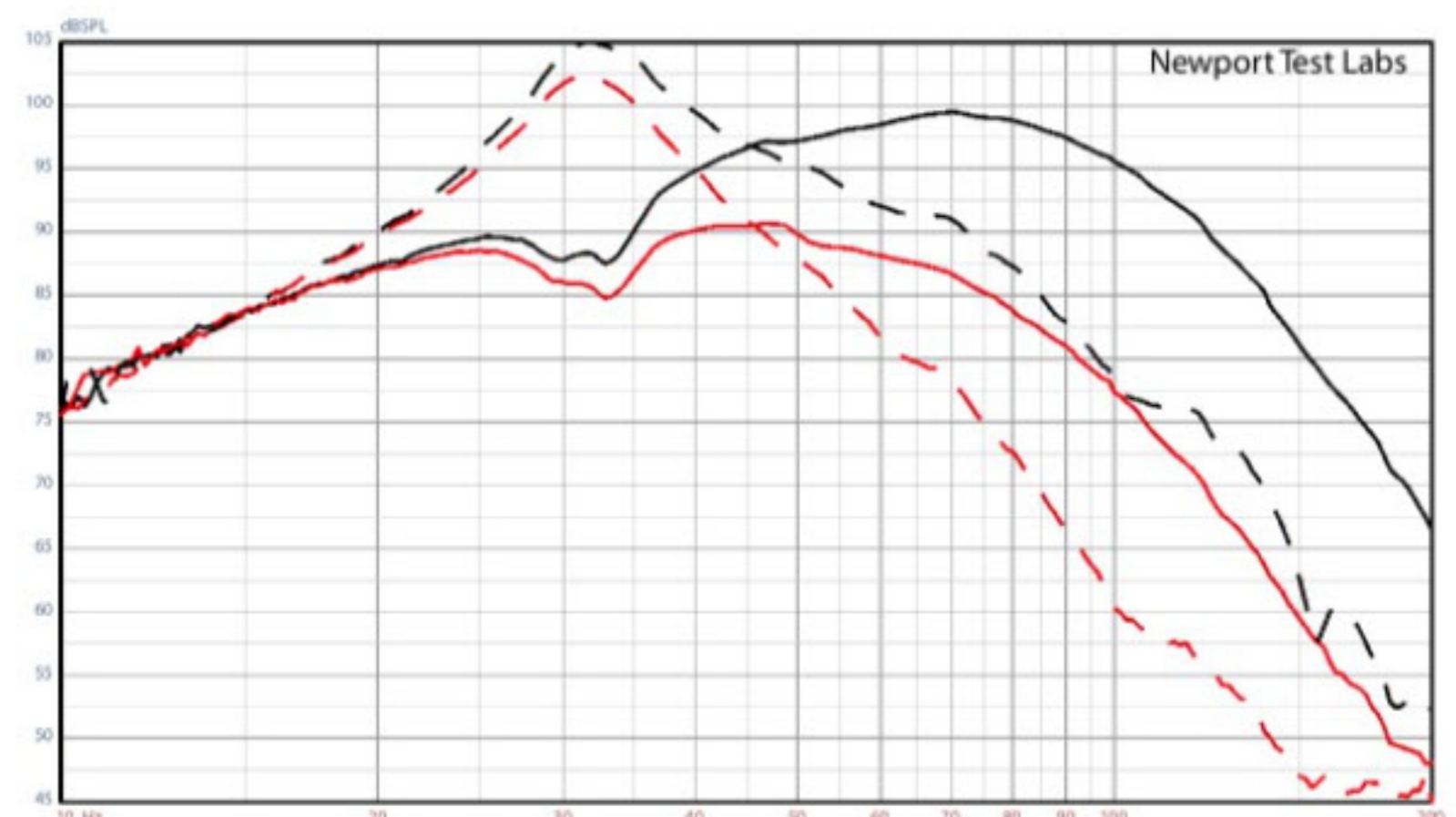


Figure 2: Nearfield sine frequency response of bass driver (solid traces) and passive radiator (dashed traces) with crossover control set to 30Hz (red traces) and 120Hz. (Data has not been re-scaled to compensate for differences in radiating areas.) [REL Serie S/5]

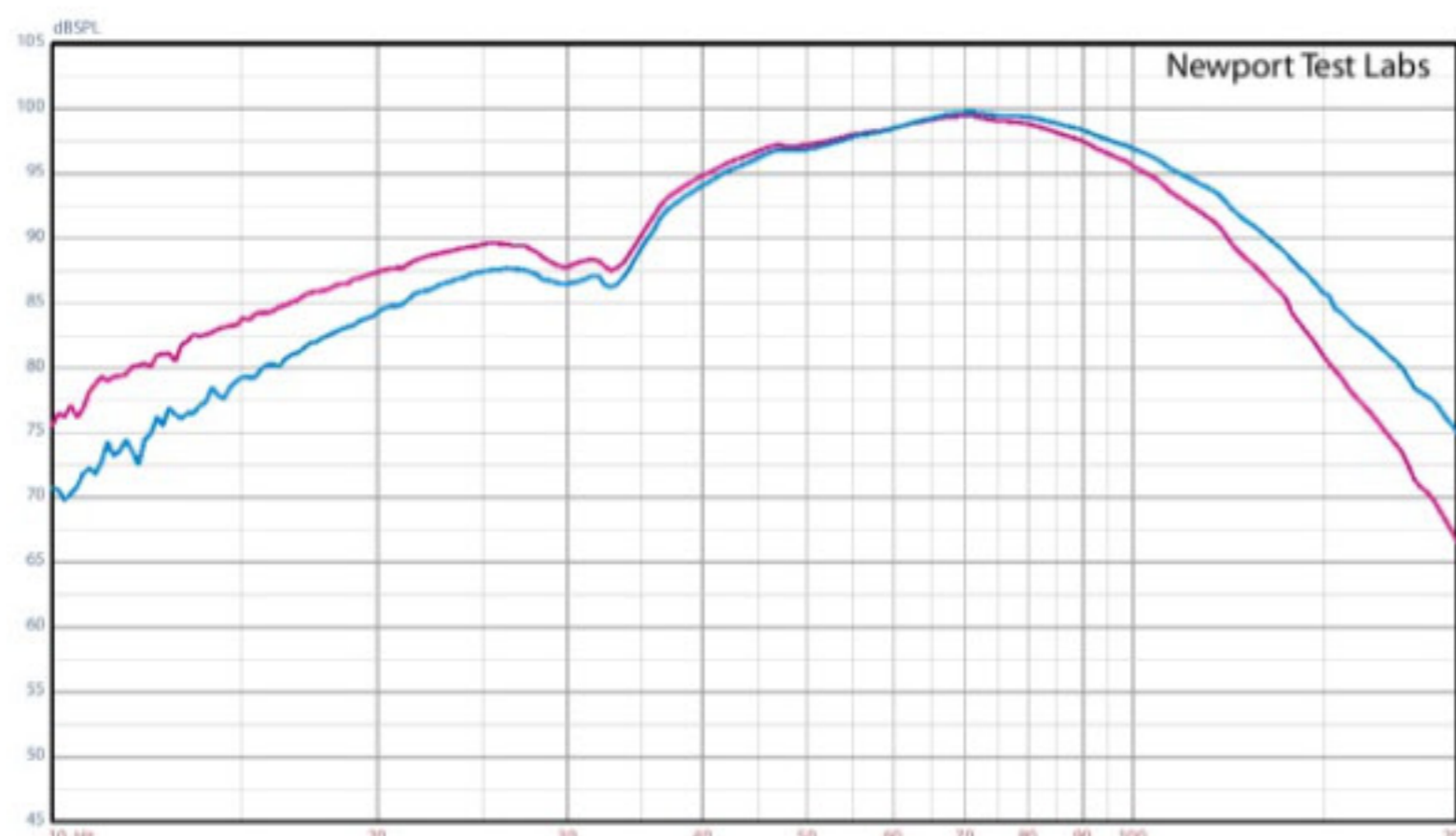


Figure 3: Nearfield sine frequency response of bass driver when driven via line input (pink trace) and LFE input (blue trace) with crossover set to 120Hz. [REL Serie S/5]

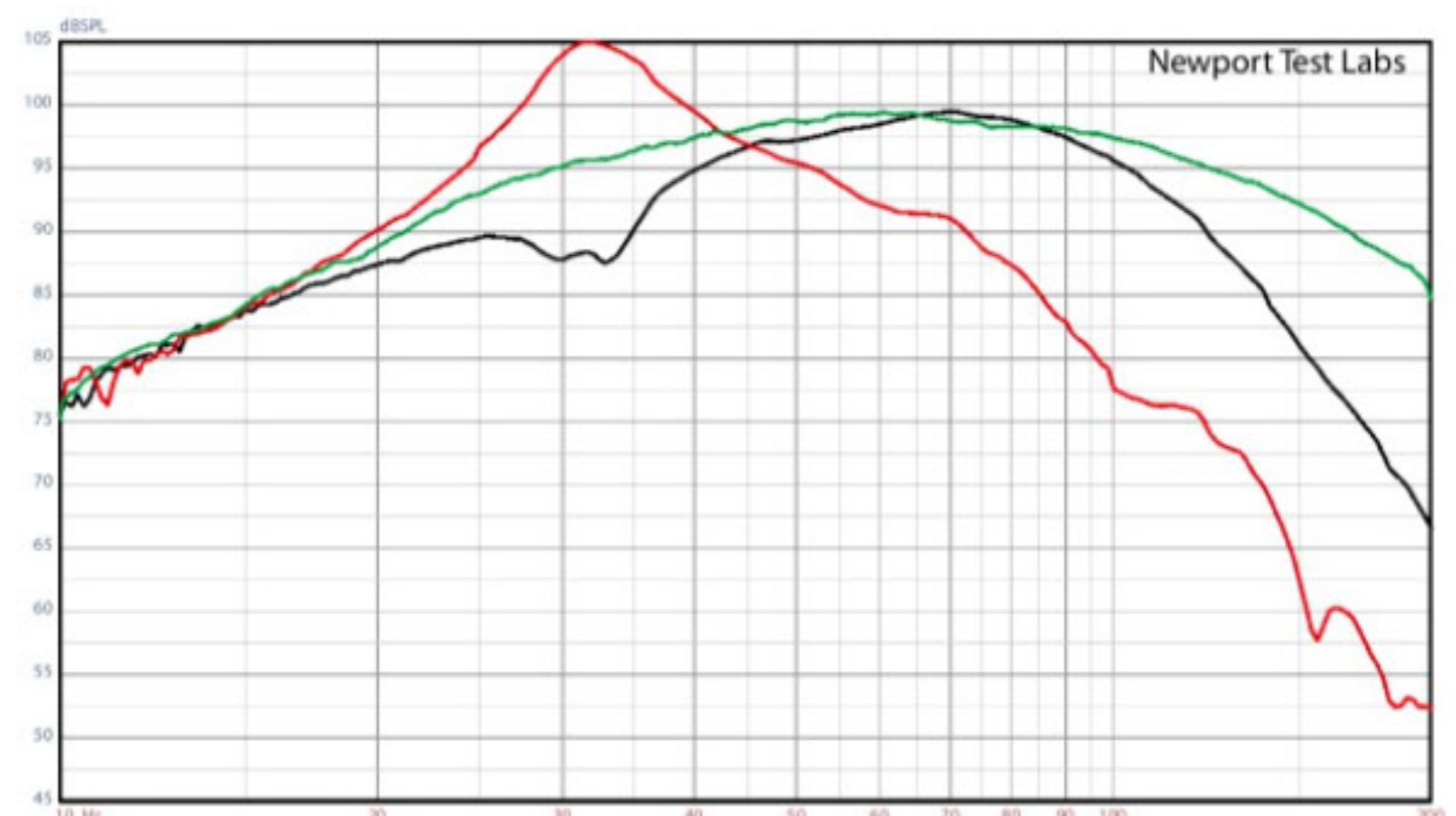


Figure 4: Nearfield sine frequency response of bass driver (black trace) and passive radiator (red trace) with crossover control set to 120Hz, plus smoothed far-field response measured using pink noise. (Data for PR not re-scaled.) [REL Serie S/5]