
Subject: In room response

Posted by [PaulW](#) on Thu, 14 Aug 2008 00:30:48 GMT

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Today I had a little play with a basic SPL meter and some test tones and was reasonably gratified that the expected room modes were present at the calculate frequencies, so I can work on those. What was a totally unexpected was an -18db hole at 45hz! Any idea what causes this and if anything can be done about it?The speakers are 7 Pi's and the room is 17.5 x 12.2 x 8.5 (LWH)To be honest I didn't spend a great deal of time on this (to boring when there's music to listen to) so may have to revisit the exercise again sometime.Paul W.

Subject: Re: In room response

Posted by [Wayne Parham](#) on Thu, 14 Aug 2008 04:10:00 GMT

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Sounds like a big mode to me! Could be a cancelation notch from the distance between speakers too.

Subject: Treatment for a cancellation notch?

Posted by [PaulW](#) on Thu, 14 Aug 2008 15:30:40 GMT

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The passive treatment for room modes is going ahead slowly and the speakers are sounding better with each iteration and as I add hi-frequency diffusion the treble just gets better and better (ceiling panels next). Based on my quick and dirty measurements thought I have a strong boost centered around 130Hz and this negative one centered around 45Hz.I'm going to put in another passive resonator to target the 130's, but would placing a sub between the two 7 Pi's help with the cancellation effect or would that just add to my boosted room mode problems?For sub duties I have a little active KEF unit to play with so I guess I should try it out. I also still have the spare Omega Pro 15 that I rejected due to cosmetic damage and the supplier didn't want back - would this be useful for making a sub and if so any tips regarding design parameters?Paul W.

Subject: Re: Treatment for a cancellation notch - Multiple subs

Posted by [Wayne Parham](#) on Thu, 14 Aug 2008 16:24:18 GMT

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The best thing to do is to add subs. I think you and I discussed this before, but just to be sure I'll

hit the high points. The idea of adding subs isn't just to augment the low end but also to smooth room modes. Having just two subs added to the two bass bins you already have will give you four bass sound sources. This smooths room modes by averaging, filling in holes and partially cancelling peaks. The Omega 15 can be used in cabinets from 2.0ft³ to 5.0ft³ tuned to 40Hz. It

speakers you have now. However, I think for a dedicated subwoofer, I'd prefer it in a larger box than this. You can go as large as 8.0ft³, tuning a little lower to 30Hz, and get a nice EBS alignment. That will give deeper extension and will blend nicely with the bass bins you already have.

Subject: Re: Treatment for a cancellation notch - Multiple subs

Posted by [PaulW](#) on Fri, 15 Aug 2008 10:35:08 GMT

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Yes, we have discussed this before and I will admit to have a bit of reticence in adding more speakers to my rather small room for reasons of visual impact, more wires, which is why I'm still pursuing the passive route at the moment.....But I do have that Omega Pro 15 sitting there doing nothing, and enough materials, so for the price of a small plate amp.....OK, more things to investigate, no idea what EBS alignment is but will do in the next hour or so! However, to shorten the process in getting some guidance, do you know of any sites/forums that could aid me in the designs, remember total non-techie here (just handy with a saw and soldering iron) rather than continually asking here about non-Pi stuff. Paul W.

Subject: Re: Treatment for a cancellation notch - Multiple subs

Posted by [Wayne Parham](#) on Fri, 15 Aug 2008 16:07:53 GMT

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No problem, that's what this forum is here for.

Subject: OK where to start

Posted by [PaulW](#) on Sat, 16 Aug 2008 12:30:08 GMT

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"Extended Bass Shelf" aligned sub then. Had a look around the web, think I understand(ish) the principle. Design a box to go with the intended driver, for a flat response, then upsize by 60-80% and tune the port - sounds simple. So spent awhile putting meaningless (to me) numbers into a spreadsheet (for fs, Qts,) and get out some equally meaningless numbers and plots, but get a box internal volume of 3.9cu-ft, so $x 1.7 = 6.63\text{cu-ft}$. Then calculate port dimensions (not looked

into this bit yet) build box, attach plate amp and connect. Is that about it? Or would it be better to upsize the basic 4 Pi cab by 80%? I have to say I'm not really into this "design it yourself starting from scratch" stuff and am always happier to use someone else's (who at least knows what they are doing) tried and tested design Paul W.

Subject: Re: OK where to start

Posted by [Wayne Parham](#) on Sat, 16 Aug 2008 16:48:00 GMT

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If you build the cabinet between 4.0ft³ and 5.0ft³, tune the cabinet to 38Hz. If 5.0ft³ to 6.0ft³, tuned to 35Hz. If 6.0ft³ to 7.0ft³, tune to 33Hz. If 7.0ft³ to 8.0ft³, tune to 30Hz. Do not go larger than 8.0ft³. To tune the box, size the port according to the Helmholtz formula below. Make port area at least 20in².

Subject: Room measurements

Posted by [PaulW](#) on Sun, 17 Aug 2008 03:10:48 GMT

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As, over the last few days I've decided on the final position of the foam bass traps and the panel resonator in the room I thought I'd take some more measurements but just for the bass below 255Hz as this seems to be the element that's giving me most concern - so out with the tripod, meter and in with the ear plugs! I'm constantly surprised by how ragged the output seems to be for something that sounds so good, though please bear in mind I've no specialist measurement kit just the good old radio Shack SPL meter. The bass output has been sounding very much better since the treatment was introduced and this is much smoother than when first measured and obviously the scale makes the plot look quite dramatic. Anyway the most dominant (+18db) room mode in the 130's (Hz) is now gone and next I'll tackle the one covering the 90's, also the major dip I had at about 45Hz seem to now be two dips either side, but I was much more careful with the measurements this time so it could have been an error previously. Going to have a play with my little KEF sub over the next few weeks and see how this changes the output, before going for a bigger sub build with the Omega Pro 15. Paul W.

Subject: extended chart 20-300Hz

Posted by [PaulW](#) on Sun, 17 Aug 2008 10:58:14 GMT

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