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Subject: 3 pi plans

Posted by [pubble](#) on Mon, 21 Jun 2010 11:02:00 GMT

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Could you send me a copy of the pi 3 plans and crossover plans.I have delta 12 lf and psd 2002.

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Subject: Re: 3 pi plans

Posted by [Wayne Parham](#) on Mon, 21 Jun 2010 12:41:29 GMT

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Subject: Re: 3 pi plans

Posted by [tom-m](#) on Thu, 27 Jan 2011 19:41:15 GMT

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Hi Wayne,

Could you please send me the 3 Pi plans for the TD12 and B&C version?

Thanks,  
Tom

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Subject: Re: 3 pi plans

Posted by [Wayne Parham](#) on Fri, 28 Jan 2011 00:06:49 GMT

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Subject: 3 pi Wave Deluxe

Posted by [Muzikal-JRNE](#) on Mon, 31 Jan 2011 21:23:20 GMT

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Hello Wayne. First of all, Thank you for sharing your wisdom and experience with the DIY audio community. I have read (and will continue re-reading until I have fully absorbed them) your (3) excellent white-paper and crossover documents.

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I am interested in building a version of the Econowave Deluxe,

<http://techtalk.parts-express.com/showthread.php?p=1626379#post1626379>

but with the Eminence H290 horn. After reading your white-paper I think it will be a excellent SQ horn with the DE250 compression driver. I like the KAPPALITE 3012LF woofer modeling in the Parts Express 1.6 ft<sup>3</sup> cabinet and the idea of implementing an L-pad for tweaking the HF driver levels.

Do you think I should use your 3pi crossover as a starting point to match with the 3012LF woofer and an added L-pad, or use the Econowave Deluxe crossover as a starting point and work on modifying it for the Eminence H290 horn? Would you share with me the plans for the 3pi w/ the DE250 and Delta12LF?

Any guidance is greatly appreciated.

Thanks, Joe

P.S. I have a calibrated microphone and a laptop with REW software that I can use to get measurements for designing the crossover.

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Subject: Re: 3 pi speaker

Posted by [Wayne Parham](#) on Tue, 01 Feb 2011 03:05:50 GMT

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They are designed and optimized for the drivers and horns chosen.

Understand that most of the design effort is in the matching of the drivers/horns and crossover. You can do a lot with computer models, but naturally, it's best to verify with measurements. In any case, there is a fairly substantial amount of work involved in optimizing the crossover and getting everything right.

If you've read the things I've written on the subject, then you know the goal is not just to make response good on-axis but off-axis as well. The design should place the forward lobe properly out in front of the speaker. The vertical nulls should be widely spaced, above and below the speaker, outside the horn's coverage angle.

Similarly, cabinets for loudspeakers like these should be designed with care. They aren't necessarily (or even usually) boxes that simple Helmholtz models can fully simulate. The reason is they are relatively large, often large enough that internal standing waves develop in the passband. For this reason, driver and port position are usually important factors, as is the amount

and position of stuffing inside the cabinet.

The baffle is generally large enough that there is no meaningful baffle step. This is discussed in the "High-Fidelity Uniform-Directivity Loudspeakers" document starting around page 21, but I think it merits another mention here.

Small mini-monitors sometimes benefit from baffle step compensation, because the radiation transition frequency is relatively high. But baffle step compensation isn't appropriate for larger speakers designed for constant directivity when used indoors. Used outdoors, it might make sense but not so much indoors because baffle step doesn't happen below the Schroeder frequency, where room modes set the pattern more than the speaker does.

Baffle step is non-sequitur in a large cabinet used indoors because directivity is ambiguous below the Schroeder frequency. There is no clearly defined step in the response curve caused by directivity change, because below the "transition" frequency, room modes modify the directivity and prevent it from being omnidirectional.

There are several variables to set simultaneously, some that represent competing priorities, and balancing them all is not an entirely trivial task. This is what separates the good basic designs from the fully optimized audiophile quality loudspeakers.

considerable amount of design and test time by sticking with the plans. You can deviate, of course, with varying degrees of success depending on how much time you are willing to invest in your design and test efforts. Do not expect different drivers to work as drop-in replacements, as they are unlikely to be the same, and so you'll have to go through a design/test cycle to get the best results.