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Subject: 3 Pi and 4 Pi comparison

Posted by [ccvogel\\_1951@yahoo.com](mailto:ccvogel_1951@yahoo.com) on Tue, 07 Aug 2012 12:07:23 GMT

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Hi, Wayne -

I am considering building a 3 Pi or a 4 Pi and would like to compare plans. I am particularly interested in comparing the crossover designs and components.

Can you please send me plans (including crossover info) for each speaker system?

Thank you.

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Subject: Re: 3 Pi and 4 Pi comparison

Posted by [Wayne Parham](#) on Tue, 07 Aug 2012 12:46:41 GMT

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The crossovers are similar, as are all other aspects of the design. They have similar spectral balance, similar radiation pattern, etc. You should consider them to be nearly equivalent, and make your selection based on the midwoofer families you prefer. More info here:  
Options in a nutshell

UpgradesPlease decide which model you prefer and let me know. I'll send plans then.

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Subject: Re: 3 Pi and 4 Pi comparison

Posted by [ccvogel\\_1951@yahoo.com](mailto:ccvogel_1951@yahoo.com) on Tue, 07 Aug 2012 14:10:23 GMT

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Wayne -

Thanks for the links. I read through all three of them and found them very informative.

I think that budget considerations point to the Three Pi with the Eminence Delta 12LF, but I'd like your advice, given the following added information:

[1] I do not wish to use subwoofer(s).

[2] I will be using 7 cu ft speaker cabinets [home built in the 1950s].

[3] I have always preferred the effortlessness of 15-in woofers, but the Eminence Omega Pro 15 modeled by WinISD in a 7 cu ft box is down 3 dB at about 41 Hz, whereas the Delta 12LF appears to go down to 27 Hz...BUT, I don't know if it can really deliver down there.

Can you see a straightforward choice for my project?

Thanks for your help!

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Subject: Re: 3 Pi and 4 Pi comparison  
Posted by [Wayne Parham](#) on Tue, 07 Aug 2012 15:36:15 GMT  
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sub, I'd go with that. It sounds good without a sub, but please be mindful that flanking subs smooth room modes. That's even more important than the extra extension, in my opinion.

Room modes, multisubs and flanking subs! I'm also a little concerned about the adjustment to box size you mentioned. I can appreciate your wanting to use a cabinet you built in the 1950s. I'm pretty sentimental, so there's a big value to me in that. But the problem is large cabinets always have internal standing waves in the midbass and midrange, and they might cause ripples in response.

A 7ft3 box is great for a sub, but for fullrange mains, it presents a potential problem. Depending on where the midwoofer and port is, it may have a standing wave node line up in such a way that you get a response aberration. The only way to know for sure is to measure it. So I'm always kind of iffy on the mods. The speaker described in the plans is tested, and if you deviate, you have to go through some testing to know what you've got.

High-Fidelity Uniform-Directivity Loudspeakers

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Subject: Re: 3 Pi and 4 Pi comparison  
Posted by [ChrisR](#) on Tue, 07 Aug 2012 15:43:56 GMT  
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Wayne, what are your thoughts on reducing the internal volume of those big boxes with rigid foam attached to the walls, under the R13 fiberglass? I did that for one set when I changed drivers and nothing bad seemed to happen.

Chris

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Subject: Re: 3 Pi and 4 Pi comparison  
Posted by [ccvogel\\_1951@yahoo.com](#) on Tue, 07 Aug 2012 17:09:14 GMT  
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Wayne -

Thanks for all the thoughtful advice.

Given your concerns about adjustment to box size, I think I might head in another direction entirely.

It is also a goal of mine to recreate the experience of listening to the classic 15-in woofers of the 1950s and 60s. These 7 cu ft boxes were once loaded with JBL D130s - I might go that way again.

Thanks for all the contributions you have made to DIY audio!

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Subject: Re: 3 Pi and 4 Pi comparison

Posted by [Wayne Parham](#) on Tue, 07 Aug 2012 19:17:39 GMT

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ccvogel\_1951@yahoo.com wrote on Tue, 07 August 2012 12:09 Given your concerns about adjustment to box size, I think I might head in another direction entirely.

It is also a goal of mine to recreate the experience of listening to the classic 15-in woofers of the 1950s and 60s. These 7 cu ft boxes were once loaded with JBL D130s - I might go that way again.

As I said earlier, I can sure understand your desire to re-use your original 1950s cabinets. I would probably do the same thing. But please do remember what I said about standing waves, if sound quality is important to you. Because it isn't really a matter of whether the midwoofers are 2226 or D130 or another woofer entirely - what matters is their position in the cabinet. The relationship between source and reflector positions are what matter here. So the port and woofer placement becomes critical.

The position of damping material is important too, especially in larger cabinets. If a piece is installed that spans the cross-section, it will do a better job of attenuating midrange standing waves than just lining the walls.

chrisR wrote on Tue, 07 August 2012 10:43 Wayne, what are your thoughts on reducing the internal volume of those big boxes with rigid foam attached to the walls, under the R13 fiberglass?

I did that for one set when I changed drivers and nothing bad seemed to happen. I've known a lot of people that used false walls inside cabinets so the acoustics of the internal cabinet were not affected by the dimensions of the external cabinet. In a way, it's similar to putting a speaker on a stand or a bookshelf. Nothing wrong with that.

On the other hand, the larger cabinet isn't necessarily bad. It will give more bass extension than the smaller cabinet, and if tuned properly, it might sound great. I think most of us understand the effects of box size and Helmholtz frequency in bass response.

The problem to me is one of confidence. I know how the boxes I've designed will perform

because they have been thoroughly tested. I've measured cabinets of similar size that had arbitrarily placed midwoofers and seen 6dB ripple that no amount of stuffing would reduce. Without stuffing, they can give you a 10dB bump. So you just have to be careful of those standing waves in the midrange. You have to test them and see what they do.

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