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Subject: Speaker stuffing

Posted by [gstarey66](#) on Tue, 04 Feb 2014 17:23:59 GMT

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Hello Wayne,

Have completed a 4PI speaker build with the exact sizes your plans give but with one variation I thought I would run by you now that I have more time.

I did play with speaker design s/w and varing the size slightly didn't seem to make much difference. So what I did was to add some additional bracing and to counter that size decrease, I went with R30 insulation on the back and one side with the bottom and middle using R11. In theory more insulation makes box seem larger. Hopefully the added bracing and insulation just about cancel. I know you can't tell me if they cancel well but can you tell me if the thinking was correct about the two effects being opposed? Would be possible to undo variation if needed.

Do know that I really like the sound I am getting.

Thank you,  
Greg

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Subject: Re: Speaker stuffing

Posted by [steve f](#) on Tue, 04 Feb 2014 23:19:33 GMT

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Hi Greg,

I have built several Pi speakers, and even a few variants. ( One PI towers, and 3 PI's built sidewise. ) If you can , stick to Wayne's plans. They are mature designs, have been in production for a while, and they sound great. I think it's more important to stick to dimension volume in the smaller boxes than the larger ones. Size gives you a little bit of wiggle room. I don't think an extra brace is going to hurt anything. I'm more worried about vent placement, and too much stuffing in the enclosure. You may have standing wave problems if you deviate too far from box dimensions, and vent placement. When you add extra stuffing to vented boxes, transients often lose their edge and sound dull. Experimenting is fun though. And my fire pit always seems to have one of my projects in it.

Steve

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Subject: Re: Speaker stuffing

Posted by [grindstone](#) on Thu, 06 Feb 2014 03:24:49 GMT

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Yup to both following the mature design and having fun experimenting. My 2c is to listen a while and, if you didn't or staple everything down, take one of the "end" R11 batts and apply it in the middle-ish cross-batt position and listen to that, too.

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Subject: Re: Speaker stuffing  
Posted by [gstarey66](#) on Fri, 07 Feb 2014 14:05:38 GMT  
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Yes, I do agree the design is well done. I did not make any major changes to it as I changed only two things which hopefully came close to cancelling each other out. Note: Size of the box was done exactly according to the plans.

1. Additional bracing.

2. Some thicker insulation at two spots of the four spots Wayne recommended insulation. I have been told this is equal to adding a bit of size to the box. Note again - other two insulation spots were R11 and are there.

So, I decreased the available space (size) somewhat by adding a brace and then increased the effective space by adding some additional insulation. I did make sure the port was clear and not impeded by the additional insulation.

What I had actually asked was if this reasoning made sense to someone who knows more about speaker design than I do.

Still hoping for some feedback.

Regards,  
Greg

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Subject: Re: Speaker stuffing  
Posted by [Wayne Parham](#) on Fri, 07 Feb 2014 18:08:00 GMT  
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You know, the virtual size increase is really a Helmholtz thing. It's measurable, and it happens, but I don't care about that part nearly as much as I do the internal standing waves. As long as the changes you made don't cause ripple in the upper midbass to lower midrange, I'd say you're golden.

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Subject: Re: Speaker stuffing  
Posted by [grindstone](#) on Sat, 08 Feb 2014 04:25:56 GMT  
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I'll baldly say that bracing is always good if you've offset for it. Bracing is Really-Good.

I "get" your question and I admire your inquisitiveness. You're right -- there's a bit more "there" to be had -- it's just that people are silent because only You can decide. The down-side is that it

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actually sorts to a bunch of work. Personally, I found my way, I'm completely happy, and I have ZERO doubts that I left anything on the table.

Keep-going, and keep-pushing. And please, please share your results (and reasons).

Many of us have done the same. We just don't hear things the same and we allow for the same (which is why your thread might seem like "crickets" to you).

Good-hunting and please share what you might choose-to. It's okay to report how anything comes-off to you--Wayne has created this amazing environment where data might be simply exchanged...as data.

Thanks for that, btw, Wayne!

Really, this stuff becomes about what you want and how much you're willing to put into it.

Okay, I'll step-up. Knowing mostly zero about your rig or preferences or gear or challenges, here's one experiment for consideration.

Listen for a week to...whatever you have as it is -- limit it to say 5 releases that you know well. Do that. Heavy-rotation.

Now, for a new week, stick a cross-batt of the thick-stuff atop the braces and repeat.

If you've already done that, please forgive my challenge and my comprehension--I don't have much time at all for "boards" these years.

This is not a test, and I ask for Nothing regarding reports -- I'm only here to incite, to invoke, to "egg-on".

Follow your ears.

Always.

Just (always) keep two pieces of gear. Do not "advance" until you can beat your last piece.

You will be able to measure at any time. The dream would be to always keep all pieces of all gear. It's just, well, there's only been about a 15 year span in my life when i could keep Everything and measure Everything.

Well, it's not a good system (let-alone a Perfect System), but it's the system i could afford at the time.

Please share experiences.

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Subject: Re: Speaker stuffing

Posted by [gstarey66](#) on Thu, 13 Feb 2014 17:07:08 GMT

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Thank you wayne and guys for the feedback.

I did try to keep the size exactly the same as the standing waves / nodes thing worried me. Believe adding to the bracing would move the frequency of the nodes up and decrease the level some, which seemed reasonable. I did play with a node estimator that is available on the web to try to see what changes might result.

Wish I had been able to make a super pretty box but my basic shiny black box isn't too bad and sure sounds good. Did add couple of pounds of clay to the outside of the horns and then coated them with sealant to make sure clay did not dry out or fall off in future years.

Thanks again for the great design and published info on building these. I did use your latest horns and while I can't compare them they do sound quite good and smooth.

Regards,  
Greg Starkey  
Ann Arbor, MI

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**Subject: Re: Speaker stuffing**

Posted by [BFP](#) on Mon, 17 Feb 2014 11:08:04 GMT

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It sounds like you have carefully considered any changes you have made. I kept to the internal dimensions that Wayne specified in my 3 build. I am very happy with the box performance. I added a lot of bracing and I cannot yet hear any colouration or resonances coming from the box. I did not add any mass to the horns. I'm wondering if it's really needed. I was going to use electrical putty which is clay like and not supposed to dry out but I thought it might come loose and end up causing a problem. When you tap the horn it seems to have quite a low resonance, certainly below it's cut off frequency. Has anyone done the damping afterwards and heard any differences?

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