
Subject: 4pi's on the way!

Posted by [Ash R](#) on Tue, 23 Apr 2013 14:56:45 GMT

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Last weekend I had a chance to audition several models of Pi Speakers, including 3pi and 4pi models. I also heard 2pi and 2pi tower speakers.

These are easily the best speakers I have ever heard. I ordered 4pi kits on the spot, with 3pi subs (to be used flanking) and 2pi surrounds.

I am working with a wood shop right now to facilitate cabinet construction. I was initially planning on bubinga (because Wayne's bubinga 3pi's are truly droolworthy). Might go with mahogany or walnut instead though.

I'm stoked!

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Tue, 23 Apr 2013 15:19:07 GMT

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Thanks, Ash, it was a pleasure to meet you. Let me know if there's anything else I can do.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Wed, 01 May 2013 03:01:44 GMT

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The cabinet shop has my 4pi's nearly finished. Fast service! I'm excited as can be. I ended up going with walnut.

Pictures forthcoming, should be by the weekend.

They are asking about the insulation. I get the part about covering the top, side nearest the port and the rear. What I don't understand is the next part where it says span the cross section from side to side and front to back. Please explain.

Subject: Re: 4pi's on the way!

Posted by [justphil](#) on Wed, 01 May 2013 12:25:14 GMT

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I believe you just lay it across the bracing though I have never built 4 pis =(

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Wed, 01 May 2013 14:43:17 GMT

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That's right. Cut a piece of insulation the same size as the sheet that lines the top of the box. Then run a bead of white glue along the brace between woofer and tweeter. Set the insulation on that brace, with the front edge resting on the woofer frame, and drop a few dabs of white glue where the cross-section sheet and the back sheet meet. That will hold it in place nicely.

The end result creates two chambers separating the woofer and port. Bass will pass right through but midrange is highly attenuated.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Wed, 01 May 2013 18:38:25 GMT

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Thanks guys. I remember what that was for now. I must be having a senior moment.

Can't get the cabs yet. I misunderstood the boxes are built but not veneered.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Wed, 08 May 2013 18:57:39 GMT

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I am contemplating subwoofer amp options and trying to decide what to do.

Do you have a plate amp suggestion? Are those best or is it better to separate the crossover from the amp?

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Wed, 08 May 2013 19:33:11 GMT

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Plate amps are convenient, because they let you do everything in one box. The only problem with them is most do fourth-order slopes, some do third but I've only seen one that does second-order and I generally prefer that for flanking subs. We want a gentle low-pass rolloff that makes the flanking sub act like the helper woofer in a 2.5-way speaker, just detached so it can be placed in a different axis in all three planes.

The only plate amp I've seen that supports second-order slopes is the RBA CA-200. There may

be others out there, but I haven't seen them. And I haven't tested the RBA amp, so I can't comment on its quality, just the fact that it is advertised to provide second-order low-pass.

That's why I've always run separate amps and crossovers. It gives more flexibility to change low-pass frequency and slope. There are a handful I've used. Here are a list of some:

Rolls SX-45

Reckhorn F-1

Pyle PLXR2

Pyramid CR66

Legacy LXR1

Boss BX15 The last four are all the same unit, rebranded by different companies. It's actually a cheesy little car sub crossover, but when upgraded as shown in the "Pyle" link above, it is quite good. And of course, you can also use something like MiniDSP.

One last option, that may be worthwhile, are the RCA inline filters, with 100Hz and 120Hz second-order slopes. I haven't tried them though, and I am concerned that they may act differently with different source and load impedance values. So I hope to make time to check them out someday soon, because they would be convenient options if they worked well.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Thu, 09 May 2013 15:49:55 GMT

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Thank you. Any personal favorites? Which one do you use?

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Thu, 09 May 2013 16:29:12 GMT

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It matters more where you put the flanking subs than it does where you cross them or what you use to cross them with. They really need to be placed a few feet below, beside and behind the mains - not too far away and not too close. You need the distance to provide the smoothing, but not so far away they become apparent. The goal is to not be able to tell the subs are even on.

Crossover frequency and slope should be set high enough to smooth the upper midbass and even up into the very lowest midrange - the throaty part of a deep male voice - but it can't be set so high you can localize the subs. It's really a ballpark though, there's at least a half-octave of "wobble room" here. I don't usually recommend setting things by ear, but this is one you really can. Just listen to the subs up close and ensure they are running up into the bottom edge of the midrange, making male voices sound extremely muffled but you can definitely hear them, the very lowest part, at least. Then sit back in the listening area and check to make sure the subs "disappear". If you can tell the subs are on, then the crossover is set wrong or the subs are too loud.

If you do have measurement gear, what you should see is fairly deep (-10dB to -15dB) notches in the 80Hz to 160Hz with the flanking subs off, and those should be reduced to around -6dB with the flanking subs on. Other than that, there should be no noticeable change in the midbass and midrange with the subs on, except slightly higher SPL below about 100Hz, of course, and extension to whatever the subs provide.

As an aside, the SPL increase doesn't run all the way up to the subwoofer crossover frequency because coupling is reduced as frequency rises. In the region where the helper woofer blends with the mains for smoothing, the biggest influence is where self-interference from reflections completely notch out one source, and in those places, the other source is in a different position, having different path lengths to the listener. So where one source suffers a notch from self-interference and cannot be heard, the other source is not, and is able to be heard. It fills in the holes from self-interference.

The helper woofer should be blended with the mains through the 100-200Hz octave, with gentle rolloff, and that is best accomplished with something like 100Hz to 150Hz low-pass using second-order slope. That gives enough energy to be useful where the self-reflection notch from the wall behind the speakers occurs, and that's usually the biggest offender. It's usually around ~120Hz, but I've seen 'em a little higher and a little lower, depending on the proximity to the boundaries.

Subject: Re: 4pi's on the way!
Posted by [Ash R](#) on Sat, 01 Jun 2013 23:21:02 GMT
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My woodworker sent a snapshot of his progress =>

I am so pleased to be finally getting these done. They are the real deal, often imitated but never duplicated.

File Attachments

1) [4pi.cabinet.jpg](#), downloaded 2821 times

Subject: Re: 4pi's on the way!
Posted by [Nelson Bass](#) on Sun, 02 Jun 2013 06:19:15 GMT
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Looks stunning good!

The bracing attached to the sides is that a third one additional to the original design?

See this thread:

http://audioundtable.com/forum/index.php?t=msg&&th=15168&goto=63679#msg_63679

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Sun, 02 Jun 2013 06:30:57 GMT

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It does look a little lower than most people put it, but as long as the front-back brace is in there between woofer and tweeter and the side-to-side brace doesn't interfere with the woofer, it's fine. Just make sure to install the cross-section damping material between woofer and tweeter.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Sun, 02 Jun 2013 14:15:30 GMT

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Didn't Scott contact you about the braces? He asked me about them and I told him to email you directly.

Subject: Re: 4pi's on the way!

Posted by [Wayne Parham](#) on Mon, 03 Jun 2013 01:59:19 GMT

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Yes, Scott wrote to me asking if the front/back brace needed to be connected to the side/side brace. I replied essentially the same thing I wrote in my last post, that they could be separated a little bit, provided there was no interference with the woofer or tweeter and the sheet of insulation spanning the cross-section could be easily installed and supported by the brace.

Subject: Re: 4pi's on the way!

Posted by [Ash R](#) on Mon, 03 Jun 2013 15:47:35 GMT

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Ok great, that's how they are. Thanks!!
