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Subject: Contemplating a change  
Posted by [SteveBrown](#) on Thu, 08 Sep 2011 19:33:53 GMT  
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Having moved to a much smaller listening room (not to mention new city), I've not been able to set up my speakers in a way that produces a distinct sound stage, and I think it has a lot to do with too much bouncing around the walls. My current room is about 12' x 14' x 8'. My back is against one wall, speakers on the long wall in front of me (7' apart, 18" from wall). Some here will know that my set up is rather 4-pi like in that I use a JBL 2226 on the bottom, similar size cabinet, etc, same kind of crossover (different attenuation) but on top I use GPA driver (299?) on an Edgar Tractrix horn (800hz, crossed about 1200). So.... I'm contemplating seeing what a more pi like setup would do by switching to the Eminence PSD2002 and H295 horn. Right now that represents a big investment due to demands of a new home so I'm hesitant and wanted to see what kind of thoughts this forum might contribute. Thanks!

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Subject: Re: Contemplating a change  
Posted by [Wayne Parham](#) on Thu, 08 Sep 2011 19:51:42 GMT  
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Don't use an H295, it's a spitty and nasty sounding. If you go from a tractrix horn to that thing, you'll think constant directivity is responsible and we'll lose you forever.

Get an H290. It's a radial horn, with nearly constant horizontal directivity and gradually collapsing vertical directivity. That's just what you want in a speaker like this. I might also suggest using a DE250 driver instead of the PSD2002. The PSD2002 is a great driver for the price, but the DE250 is so much smoother, it makes a better speaker. Not a lot more expensive either. I'll send plans if you're interested and you can get the parts on order, build the crossover and give it a go. High-Fidelity Uniform-Directivity Loudspeakers

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Subject: Re: Contemplating a change  
Posted by [SteveBrown](#) on Thu, 08 Sep 2011 21:32:49 GMT  
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Wayne, thanks, love to get a copy of the plans. I had crossover plans at one point, but no way I can find them in the dozens of still unopened boxes!

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Subject: Re: Contemplating a change  
Posted by [SteveBrown](#) on Thu, 08 Sep 2011 21:33:41 GMT  
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One other quick question, if I use the DE250, I would still use the H290 horn? No adaptors needed?

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Subject: Re: Contemplating a change  
Posted by [Matts](#) on Thu, 08 Sep 2011 23:01:45 GMT  
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When I switched to the B&C drivers, I only one speaker first, and A/B'd them for myself and some friends, and people couldn't believe the difference, mostly because they had all really liked the PSD2002's and couldn't believe it was the same. If cost is an issue, the Eminence is great value, and you'll be able to tell if you like them. The B&C is well worth the extra bucks if you can swing them. You might be able to find some used Eminence's to try easier than the B&C, as well, since they're used in pro sound a lot. H290 is a nice horn- nothing fancy, but very smooth & clear in this app.

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Subject: Re: Contemplating a change  
Posted by [Wayne Parham](#) on Thu, 08 Sep 2011 23:13:11 GMT  
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You've got mail!

The DE250 bolts right onto the H290, no adaptor needed. The crossover schematic (in the plans) shows what components to use with it. The driver-specific differences are shown in the notes section at the bottom of the schematic.

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Subject: Re: Contemplating a change  
Posted by [SteveBrown](#) on Fri, 09 Sep 2011 04:01:51 GMT  
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Thanks Matts and Wayne. I wonder if anyone can also speculate a guess about whether or not the different horns will work better than Tractrix in a smaller room.

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Subject: Re: Contemplating a change  
Posted by [Wayne Parham](#) on Fri, 09 Sep 2011 05:22:20 GMT  
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Well, I guess it's no surprised I'm biased, but then again, the trend towards uniform directivity among experts is clear. Controlled, uniform directivity is always welcomed, but in a small room, it's even more important because reflections are so much stonger. You need a balanced reverberent field, with spectral uniformity, and the only way to achieve this is flat power response combined with constant directivity.

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Subject: Re: Contemplating a change  
Posted by [Bill Epstein](#) on Fri, 09 Sep 2011 11:28:09 GMT  
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SteveBrown wrote on Thu, 08 September 2011 15:33 My current room is about 12' x 14' x 8'. My back is against one wall, speakers on the long wall in front of me (7' apart, 18" from wall).

I've got 12" on ya!

My 4Pis are tight up against the short wall is the other difference; the imaging and soundstage are pretty good.

If you go the full by-the-book 4Pi: box size, port, drivers, you'll wonder, as I did 3 years ago, why you screwed around so long with that other shit. The 299 with 511 horn is a great-sounding combo but I never liked the Edgar Horns. The smaller 4Pi box gives you a different perspective on bass reproduction and the new crossover makes a huuuge difference. Don't forget to cover the plastic horn in rope caulk.

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### File Attachments

1) [IMG\\_0683\\_1.JPG](#), downloaded 5027 times

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Subject: Re: Contemplating a change  
Posted by [SteveBrown](#) on Fri, 09 Sep 2011 13:27:33 GMT  
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I've been doing some measurments of my existing cabs and may need to make some tweaks. My volume is 3.9 ft and the 4pi plans call for 3.1. My port area is about 85 in<sup>2</sup> and 4pi is 210in<sup>2</sup>. Wayne, do I need to fix the cabinet size or will I be okay to just lengthen the port to match the volume of the 4pi plan?

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Subject: Re: Contemplating a change  
Posted by [Wayne Parham](#) on Fri, 09 Sep 2011 14:50:24 GMT  
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It's hard to say. On the one hand, I always tell folks contemplating mods to think twice, because these designs are mature and have been thoroughly tested. On the other hand, you've had those boxes for years, so I would assume you like the midbass/midrange from them. That leads me to believe the internal standing waves aren't mucking up the lower midrange. They really can in a box this size.

There are two things to consider:

First is the position of the forward lobe. This is established by the crossover and the positions of the drivers on the baffle. So be sure the tweeter is the same distance from the woofer as shown in the plans. It can be centered, but do not make it any further away. Keep the tweeter close to the woofer, like an inch edge-to-edge, just enough room to get a brace in between them. And do not adjust the fore/aft distance. Mount both the woofer and the horn on the baffle. You can mount both on the surface, or route a groove to mount both flush. But do them both the same way so the relative fore/aft position relationship is maintained.

Second thing is the internal standing waves, as I mentioned above. They line up in the lower midrange, so it is vitally important to mitigate anything that might cause ripples in response. The insulation inside helps, of course, but it is also beneficial to put the driver and port in positions where the influence of standing wave modes are reduced. I also suggest using a sheet of insulation spanning the cross-section of the cabinet, as it helps reduce midrange energy better than the sheets lining the walls. It should be placed between woofer and port. Bass goes right through but midrange is attenuated.

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Subject: Re: Contemplating a change  
Posted by [SteveBrown](#) on Fri, 09 Sep 2011 15:00:19 GMT  
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Thanks, Wayne! And I assume I should try to lengthen the port to get closer to the size you're using? On the way to work I was thinking my internal volume of the cabinet is going to be even more off because your design has the horn in the cabinet and mine sits on top. I may try to do a bit of cuttin' & drillin' to fit the horn in the cab and reposition the port. Any issue with port on the back if I have to go that route?

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Subject: Re: Contemplating a change  
Posted by [Wayne Parham](#) on Fri, 09 Sep 2011 16:07:11 GMT  
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I probably wouldn't change your box at all, except to cut a hole for the tweeter. Don't change port size or reposition it. If you have to do that, I'd start from scratch and build as shown in the plans.

As I said, the whole deal with cabinet dimensions and midwoofer/port placement is these determine where standing wave pressure nodes line up. You don't want them to be lining up in a way that causes ripples in response, which is a difficult problem because cabinets this size tend to have standing wave modes in the 100Hz to 200Hz region. This is low enough the insulation doesn't do a very good job of absorbing those waves. That's why I always put a sheet inside that spans the cross-section in addition to the sheets that line the walls.

My suggestion would be to either build new boxes as shown in the plans or leave your cabinets as

they are, and just cut a hole where the tweeter should go. Put it close to the woofer, just an inch above or so. At least that way, you'll have the same bass and lower midrange response you're used to. The difference will be from about 1kHz up. The new setup will be matched in the horizontal plane, and will limit the HF vertical dispersion at large angles, so you won't have any ceiling slap. It will put vertical nulls out about 20° above and below the speaker, outside the HF angle.

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