

---

Subject: Hi and a Few Questions

Posted by [Michaelzh](#) on Thu, 28 Feb 2013 21:39:43 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Hi Wayne!

It has been about 10 years since I last posted message on your board. Time does fly behind us. I feel excited to be here again.

I am kind of reentering into audio lately. I am thinking of putting together something in the fashion of your 7 PI speakers.

I have a pair of corner horns with JBL 2245 woofers (<http://audioroundtable.com/PiSpeakers/messages/8818.html>) and a pair of JBL 2123J 10" midrange drivers. I would like to use the 2123J in the PI midrange horn and JBL 2245 corner horn as in place of the 7 PI corner horn since I already have them. I would purchase H290Cs and B&C DE250s. I would build the midrange horn because I want to incorporate it in such a way that it "harmonizes" with the corner horn.

Here are my questions:

- 1) Are 2245 and 2123J usable in the current version of 7 PI speakers?
- 2) If the answer is yes to 1), will the crossover need to be modified? And
- 3) Would the relative placement positions between the tweeter horn and the mid horn stay the same as in 7 PI speaker?

Thanks!

---

---

Subject: Re: Hi and a Few Questions

Posted by [Wayne Parham](#) on Thu, 28 Feb 2013 22:18:22 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

I remember you Michael. Seems like you were considering various compression ratios for constant directivity cornerhorn bass bins at one time. Did you ever build any with higher compression back then? Is that what was in the photos on you link?

Answers by numbers:

1. The 2245 is an absolutely wonderful woofer. You can definitely put it in a constant directivity cornerhorn and use it just like you would the 2226. Scale it up though, to ~ 8ft3 tuned to 30Hz. It'll go lower, of course.

2245. Way back when that driver was still available, I used to make a version like that.

JBL 2012 though. My suggestion would be to use my crossover as a starting point, and to modify each of the available midrange drivers, so try each of those first. You'll also have to reduce the

3. The midhorn and tweeter should be positioned with their mouths flush, which puts their acoustic centers in the right position relative to each other. Put the tweeter in a little decorative box with about 2" baffle on each side and above the mouth of the tweeter. Also, check out the Pi Speakers FAQ. It has some good finishing information that you might find helpful in the "Miscellaneous" section.

Welcome back!

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Fri, 01 Mar 2013 20:40:25 GMT  
[View Forum Message](#) <> [Reply to Message](#)

Thanks for answering my questions.

I remembering talking about compression ratio. The corner horn is a cube one based on your idea of conical corner horn. I have been using these corner horns for the past ten years. The cubic shape is the reason I have to build the midrange horn on my own. I will keep the inner dimensions but will have to make it such that the midrange horn aesthetically "compatible" with the square corner horn.

Wayne, do you sell DE 250 compression drivers separate from your kits? I will need to get the crossovers, the tweeter horns, and the compression drivers.

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Fri, 01 Mar 2013 20:43:35 GMT  
[View Forum Message](#) <> [Reply to Message](#)

Wayne, could you please also send me the 7 PI speaker plan? I'd like to study the plan before I receive parts and start building.

---

Subject: Re: Hi and a Few Questions  
Posted by [Wayne Parham](#) on Fri, 01 Mar 2013 21:42:42 GMT  
[View Forum Message](#) <> [Reply to Message](#)

You've got mail!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Mon, 04 Mar 2013 02:13:35 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

I got the pdf file. Thank you!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Mon, 04 Mar 2013 15:52:11 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi Wayne,

After looking at the 7 PI plan, the bass bin for JBL 2245 may be of better WAF than my current cubic corner horn. Would you please send the bass bin plan if you can find it?

Thanks!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Wayne Parham](#) on Mon, 04 Mar 2013 17:40:44 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

You've got mail!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Tue, 05 Mar 2013 13:24:22 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Thank you!

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Wed, 17 Apr 2013 17:31:23 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Wayne,

Would you please explain "reduce the padding"? I assume this has to do with the resistors R4s and R5s in the crossover schematics. I used an online L pad calculator. It suggested to reduce the number of resistors, given their values in the schematics, by half. I would like to be sure this is what you meant by reducing the padding.

Thanks

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Wayne Parham](#) on Wed, 17 Apr 2013 18:08:26 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

will produce less sound pressure at a given drive voltage. So the level of padding required will be reduced as a result.

the same attenuation.

verify. As I said earlier, you may be able to remove the padding altogether.

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Wed, 17 Apr 2013 19:25:42 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Got it.

Thanks!

---

---

Subject: Re: Hi and a Few Questions

Posted by [Michaelzh](#) on Tue, 21 May 2013 15:44:32 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

I finally put together the mid horn and mounted the 290C horn. I used drivers mentioned in my first post.

I would recommend any one without good woodworking skills to buy the mid horn flat pack from Wayne as the mid horn, while very simple from the look, is very hard to make right. The ones I made even though usable are far from being geometrically perfect.

The corner horns I built 10 years ago was a result of Wayne's inspiration. I used his corner conical horn formula and corner horn idea. It provides the same function as the current 7 PI corner horn in this set up.

Right now the crossover is without R4 and R5. I will have to spend more time to get to know the sound before I make changes that Wayne suggested in order to be able to compare later. I'll have to find my sound level meter to do some measurement.

Anyway, here is my first impression: the sound is much sweeter than I expected from such "large" speakers; It can be quite delicate, has a great depth and large background; great ease with tiny and big sound; shows well the personality and skill of the performers of the music. I have some uneasy feeling in regard to tonal balance. It could be due to the crossover without R4 and R5 or it could be just me being used to fullrange single driver speakers which tend to emphasize the upper mid and highs.

---

#### File Attachments

- 1) [IMG\\_0255.JPG](#), downloaded 4818 times
  - 2) [IMG\\_0259.JPG](#), downloaded 4894 times
  - 3) [IMG\\_0258.JPG](#), downloaded 4942 times
- 

---

Subject: Re: Hi and a Few Questions

Posted by [Wayne Parham](#) on Tue, 21 May 2013 18:00:11 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Very cool, Michael! I like your implementation of the constant directivity cornerhorn approach. Nice work!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Thu, 23 May 2013 20:27:50 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Wayne,

Thanks for the nice words!

I installed R5 and R4 with values you specified. Had a brief moment of listening. Everything appears to fall into place. Really nice!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Mon, 24 Feb 2014 18:52:50 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi Wayne,

I brought up this old thread for reference purpose.

I got a new question.

Using JBL2123J in the mid horn does not give me the large stable "sweet spot" I hoped for even though the sweet spot is larger than my previous stereo had. I have tried to use the crossover with the inductor L2 with value of 2.0 mh or without. I like it without the L2. But these did almost nothing to increase the size of sweet spot. I wonder if you could enlighten me as to where the problem is and what the correct approach is to tackle this problem. I am also inclined to take the easy way out by purchasing a pair of Delta 10A and follow your crossover schematics without any modification. But I like the JBL2123J drivers a lot and really am hopeful that somehow I can keep them in the corner horns.

Thank you for any insight!

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Wayne Parham](#) on Mon, 24 Feb 2014 19:22:40 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

I agree with you on the quality of the JBL drivers, but I also found what you did, that the upper end response was a little subdued. That's why the L2 coil is jumpered on the JBL 2012H. You'll also inclined to remove the attenuation resistors entirely.

This should get you where you want to be. It's wide open, basically a full-ranger, but then again the horn itself creates an acoustic filter. That prevents it from reaching above 2kHz or so.

Also note that the polarity is reversed in some cases. So be sure to check that too. And if

memory serves, the 2123 doesn't reach quite as high as the 2012 in the midhorn, so you may want to shift the tweeter crossover down a smidge.

---

---

Subject: Re: Hi and a Few Questions

Posted by [Michaelzh](#) on Tue, 25 Feb 2014 01:13:08 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Thank you Wayne for the prompt answer!

I removed L2 and R4, R5 resistors and jumped where the inductor and resistors left in order to see how this will affect directivity. But this made the class D digital amp that I use to shut itself down. I assume this happens when the speaker impedance is too low for the digital amp. What is the impedance of a "regular" seven PI speaker? What could the speaker impedance be in my current scenario?

---

---

Subject: Re: Hi and a Few Questions

Posted by [Wayne Parham](#) on Tue, 25 Feb 2014 01:55:43 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Sounds like you may have jumpered across R5, which would then create a short across the amplifier. You want to jumper L2 and L3 (or R4), but not R5.

---

---

Subject: Re: Hi and a Few Questions

Posted by [Michaelzh](#) on Tue, 25 Feb 2014 02:09:03 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Looking at the schematics, I think I should not have jumped R5 which created a short circuit.

---

---

Subject: Re: Hi and a Few Questions

Posted by [Michaelzh](#) on Tue, 25 Feb 2014 03:39:34 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

You are right. I removed jumper at R5 and the amp works. The "sweet spot" seems expands a bit but not much.

---

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Tue, 25 Feb 2014 14:58:15 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

I pulled the plug on a pair of Delta 10A.

I will try to "shift the tweeter crossover down a smidge" with JBL 2123J in place. I need to go back to do some reading for this.

I checked the polarity according to the schematics and "reversed" polarity marks of the JBL drivers in use. Everything appears correct in that aspect.

On another note, I really enjoy my current set up with the TPA3116 digital amp. I used to use a 300B tube amp. I notice one interesting difference: with the tube amp. when the volume is low, the details and expression of the sound seem subdued, but with the digital amp, they are still there, making low volume listening much more enjoyable.

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Wed, 26 Feb 2014 02:51:19 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

I checked polarities of connections again tonight and found that one channel had tweeter connected wrong. I have to say that making all connections right is as hard as math for me. After the correction, the sweet spot increased considerably. I am waiting for the Delta 10A woofers and will see how they compare to JBL2123J in directivity department. I probably would not have ordered them had I found the error early enough. I also realized that the 300B tubes are in use for over 11 years. They probably ran out juice and do not do drive low volume well.

I can't help feeling what a wonderful design Wayne made free for us. I am so very grateful for your help and generosity!

---

Subject: Re: Hi and a Few Questions  
Posted by [Michaelzh](#) on Tue, 11 Mar 2014 00:49:38 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

I finally replaced JBL 2123Js with Eminence Delta 10As and added resistors and inductors to the crossover boards so that the crossovers are exactly the same as specified by Wayne's plan and connected the speakers according to Wayne's plan as well. I discovered that I have to move my seat 2 feet and maybe and half further away from the front wall to get a much larger sweet spot. The sound is more relaxed than before which I like a lot. Maybe this is what Wayne meant when describing the corner horn sound with Delta 10 as creamy?



Wayne, do Delta 10As require break in at all?

---

---

Subject: Re: Hi and a Few Questions

Posted by [Wayne Parham](#) on Tue, 11 Mar 2014 15:47:04 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

I hate using adjectives to describe sound, being more of a models and measurements kind of guy. Bill Epstein is breaking me of that hangup though, what with his descriptions over the years. (Look 'em up, you'll see what I mean.) Anyway, adjective objections notwithstanding, it does sound kind of creamy, doesn't it? Sort of has a SET sound.

As for break-in, that Delta 10 has a stiff suspension that doesn't loosen up. I see no real change over time. And it isn't like some other drivers that change electro-mechanical properties dramatically at various power levels. Well, I mean, it does - all of 'em do - but this one is so stiff that it just goes from super-stiff to very stiff. Always stays in the same ballpark.

---

---

Subject: Re: Hi and a Few Questions

Posted by [Michaelzh](#) on Wed, 12 Mar 2014 12:56:57 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

I read some of Bill's posts and found his posts can be quite fun to read. I like the immediacy in his use of words and descriptions or storytelling. Let me know if he has written any books.

The biggest difference brought by the use of Delta 10A is everything becomes just right: very smooth, natural, expressive and quiet. The loud part and quiet part are all very expressive, making one feel here is the stop - no need for tweaking anymore.

I used to doubt when I read you saying loudspeaker is the most important part of audio chain. Now I agree with you.

---