Subject: 4 Pi Build Progress
Posted by BobTahoe on Sun, 19 Jul 2015 04:04:55 GMT
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Finally got started on my build over a year later, more pics to come soon.

This picture is just a quick dry fit of the first of 3 boxes. I should have it mostly glued together soon. I started putting the first port together and realised it's all wrong so i need to recut the mdf for the ports.

More pics to come as progress continues.

Wayne if you see this any chance I can get a the plans for a 3 Pi subwoofer?

File Attachments
1) WP_20150718_17_35_35_Pro[1].jpg, downloaded 7098 times

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Sun, 19 Jul 2015 17:13:19 GMT
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Congrats on starting your build!

I'll send plans for the subs right away.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Mon, 20 Jul 2015 17:10:07 GMT
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Made some more progress yesterday after going to homedepot to pick up the rest of the MDF. Sadly their panel cutter wasn't working so i ending up having to get 14 2ft x 4ft MDF boards, which was good and bad, Good because it fit in my car and on my small table saw, Bad because i didn't get to use my cut sheet which would have made all the cutting much easier if i could have started with 25" wide sheets not 24"

4pi cut sheet"

3 pi Subwoofer cut sheet:

Finished all the major cuts for L C R and 2 flanking subs.

Panels with bracing, The bracing is glued and pined down using an 18gaugae pin gun with 1 1/4"
pins. I used this same method to put together the ports, I'll be gluing and clamping everything
together from this point.

needed to finish 3 4pi's and 2 3pi subwoofers.

Here's a dry fit with all the side bracing in place, will had cross support above the woofer when its
all together.

File Attachments
1) WP_20150719_12_58_34_Pro[1].jpg, downloaded 6754 times
2) WP_20150719_13_07_23_Pro[1].jpg, downloaded 6629 times
3) WP_20150719_17_16_24_Pro[1].jpg, downloaded 6691 times
4) 4x8_cutsheet.png, downloaded 6606 times
5) 4x8-Cut-Sheet-3-pi-subwoofer.png, downloaded 6613 times

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Tue, 21 Jul 2015 17:18:36 GMT
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What's the best cross over for the flanking subs, I've been searching on the forums and most the
links to products I find are old and no longer working.

Here are the options I've found so far:

2 Crown XLS 2000 - Bi-Amp 4pi and 3pi tower
    Issue is the cross over is too steep and it will cut off lows to the mains

Rolls SX45 active cross over - 12db Cross over so this is good, has lots of outputs, but if I use the
cross over it won't send the full signal to the mains. Unless there is away to use only the sub
outputs and leave the cross over Off? or set to 50hz

Dayton Audio Sub Plate amp - To Steep of cross over, High pass outputs don't receive full signal
only above the cross over point, I could maybe get by with this if I used the Speaker level out puts

from my AVR for the sub and keep the L R speakers on the amp they are on.

MiniDSP 2x4 This might be the best option, Only issue I have is it would have to go between my AVR and EMOTIVA Amp, but this would allow me to run any amp I want with the 3pi subs and give lots of control.

I feel like I'm missing something or thinking about this too much maybe.

How does everyone else get the signal to their flanking subs with out dropping all low frequency's to the mains?

Also I'm having and issue logging into the form, once I login to AudioRoundtable is there a know bug or anything? Basically once I logging with one browser after the session ends it won't let me log back in, even when I launch that same browser as Private/incognito It wont let me login. My work around has been to keep opening new brands of browsers and switching computers. I could try clearing my cache but Private/incongnito should do the same thing.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Tue, 21 Jul 2015 21:28:11 GMT
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Just to answer my own question, It looks like the Mini DSP 2x4 is really the best and most flexible option, It will allow me to set up stereo subs exactly how I want them, and I can power them with any amp I want another plus.

Now I'm torn between Plate amps, and something like a Crown XLS 2000 for the subs, I guess I just depends if I want to run speaker wire or RCA wires to the subs. I knew I should have ran and extra stereo pair last year when I was running all the other wires for the speakers.

Hopefully after work today I'll have some time to assemble more of the speakers.

Edit: Mini DSP 2x4 and Crown XLS 2000 it is, now all I have to do is finish the cabs before the rest of the parts arrive from Wayne!

Subject: Re: 4 Pi Build Progress
Posted by steve f on Wed, 22 Jul 2015 07:30:32 GMT
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I run a couple of Crown xls1500's. I absolutely love them for sub duties. I haven't seen the level of control from a plate amp.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Wed, 22 Jul 2015 14:30:53 GMT

Just to let you and anyone else looking know BHPhotovideo.com has the XLS 2000 for $250 right now, the XLS 1500 was $209 so I decided to stick to one amp instead of using 2 bridged amps.

If the XLS 1500s drop anymore I may add 2 and move the XLS 2000 to power the L R channels.

This will be my first time using Pro Audio Amps, read such great things about crowns XLS line I can't wait to test it out.

As for progress, started cutting front baffles last night, using a dremel, it kind of works but I'm going to switch to a router. Just need to finish the baffles and recut 2 of the ports then I can start assembling.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Thu, 23 Jul 2015 16:55:58 GMT

Third time's the charm when it came to cutting the boards for the ports. Luckily the smaller cuts where my last cuts, because somewhere between my last large cut and cutting the boards for the ports the rail on the contractor table saw I'm using jumped a tooth and was completely off. Lesson here cheap contractor saws suck. Need a real table saw soon.

Here are the ports, pinned and glued together.

Now that I have all the bottoms and side ready I'm going to start gluing the boxes together with out fronts and backs as I'm waiting on a router to cut the baffles.

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File Attachments
1) WP_20150723_08_22_48_Pro[1].jpg, downloaded 6358 times
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Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Thu, 23 Jul 2015 19:34:34 GMT

Moving right along! Good going!

Sorry for my late response. I've been slammed. Tons of kits in the queue, so sorry for my delay getting those out too. I'm running about 30 days behind. Order today, ship 30 days later. I prefer shipping within a week, but there are just too many orders these days.

As for the subs, most people run plate amps. I see you've gone that route also. Some folks use a MiniDSP, and some use one of the crossovers mentioned in various threads on this forum. But

most use plate amps, which kill two birds with one stone: Amp and crossover.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Thu, 23 Jul 2015 20:19:34 GMT
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Thanks for the update Wayne, I understand it could take some time to get the finally parts for this build. That gives me time to get these cabs painted up nicely (I Hope).

To power the subs I ended up going the MiniDSP plus rackmount amp, When I ordered it this week I assumed the 3Pi subs were 6ohm Lab12s but latter realized they are 4ohm. The Crown XLS 2000 amp I purchased should be good for 650 watts per channel @ 4 ohm. So I imagine it's a bit more then the 3 pi's need.

Also been considering using a router to round the edges of the cabinets, is there any reason not to do this? My plan is to use a router and corner rounding bit.

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Thu, 23 Jul 2015 20:39:23 GMT
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Rounding the corners is always OK.

an approximation, if even that.

impedance steadily rises, doubling approximately every 1.5 octaves or so.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Thu, 23 Jul 2015 20:56:52 GMT
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Thanks for the info that's very helpful. This amps should handle that just fine, it's stable down to 2ohm, and will still push 525watts at 6ohms.

I can't wait to get this build done so I can start geeking out while getting everything dialed in.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Fri, 24 Jul 2015 16:49:23 GMT
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Gluing and clamping is a slow process, I'm hoping to have the sides and back on all the boxes this weekend, but we'll see.

Since I only have 6 clamps I can only do 1 box at a time here the fist one tops and sides:

This morning before work managed to get the back on it fits! It's far from perfect but nothing some bondo cant fix.

File Attachments
1) WP_20150723_17_38_40_Pro[1].jpg, downloaded 5406 times
2) WP_20150723_17_43_35_Pro[1].jpg, downloaded 5364 times
3) WP_20150724_09_16_38_Pro[1].jpg, downloaded 5398 times

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Fri, 24 Jul 2015 17:39:35 GMT
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Moving right along!

Won't be too long now!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Sun, 26 Jul 2015 05:11:48 GMT
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Made some progress today, My first baffle on the left is fairly messed up and will need to be re done, but the other one is pretty spot on according to the plans.

One questions, if I wanted to flush mount the waveguide, how deep and how much wider, from what I can tell it's something like 1/4" wider by 1/4" deep?

Subject: Re: 4 Pi Build Progress
Posted by johnnycamp5 on Sun, 26 Jul 2015 13:32:46 GMT
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I'm looking to do the same thing in preparation of my waveguides.

I have found that the supposed depth of the waveguide flange is said to be 1/4".
I have also found that the supposed dimensions for the outer flare of the face of the waveguide is said to be 11-5/8" wide x 6-9/16" tall.

Whats wrong with the baffle on the left?
It looks good in the pics .

Regards!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Sun, 26 Jul 2015 14:43:09 GMT
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The baffle on the left, has a few issues, it was the first time cutting with a router. I accidently cut the wave guide cut out to 11" not 10.5" and the cut out for the woofer isn't center its off by a 1/2" to the left.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Mon, 27 Jul 2015 01:25:49 GMT
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Getting close to closing up the cabinets for the 4pis, and started on one of the 3pi subs.

Here's one with bracing just waiting for the baffle and port:

Here's a pic of everything - Off to the left is the top and bottom for a 3Pi sub, then the 3 4pi's.
Should have these all glued up this week.

I've decided not to flush mount either the JBL woofer or the wave guide. From what I've it's only
for cosmetic reasons.

Going to have to think about how I'm going to finish these soon. Needs to be something other than
black, and can't be too shiny since they'll be in front of my projector....but not behind the screen.
Also all of this is in the Great room of the house so it will all be visible.

Subject: Re: 4 Pi Build Progress
Posted by johnnycamp5 on Mon, 27 Jul 2015 12:11:27 GMT
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Coming along nicely.

I installed cherry veneer on mine, since they will be visible, and it was one of the easier things I've
done (especially compared to a painted, fine finish).

I had never done it before, so I was nervous.
When I read some of the "how to's" on line, many of them seem to make a mountain out of a
mole hill.

Mounting your drivers flush might be a good idea, with helping get back some of the internal air
volume you used in all your extra/inside corner bracing.

Also, if you plan to build cloth covers, you will not see the front baffle anyway.

Subject: Re: 4 Pi Build Progress
Posted by johnnycamp5 on Mon, 27 Jul 2015 12:22:55 GMT
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About your finish being too shiny-

 I had the same concerns.

For me, after applying several coats of clear lacquer (gloss), I used "0000" steel wool, and then "Johnsons paste wax".

What a nice "satin" finish it turned out to be. Not too shiny at all.

Don't worry about applying the "gloss" lacquer, it contains no clouding agents (for creating a satin or semi gloss) and mats down just right after the "0000" sell wool.

This was my experience.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Tue, 28 Jul 2015 03:15:32 GMT
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Progress continues, all of the ports a glued to the baffles, all of the cabinets have the bracing in. just need to glue baffles in, with only six camps I can only glue so much at a time.

One 3 Pi subwoofer is together just need to cut baffle, the other subwoofer should be together tonight.

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File Attachments
1) WP_20150727_20_07_16_Pro[1].jpg, downloaded 5240 times
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Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Wed, 29 Jul 2015 01:16:08 GMT
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Does this look right for insulation?

I glued down the back piece and my binding posts aren't in yet, still waiting on a delivery from Parts express. Which also has the hurricane nuts for the baffles.

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File Attachments
1) WP_20150728_16_59_29_Pro[1].jpg, downloaded 5136 times
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Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Wed, 29 Jul 2015 19:46:08 GMT
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Yes, that looks just fine. I actually don't use quite as much as you do above the brace, but what you have will be good too. I usually just lay a sheet on top of the brace, spanning the cross-section. It sort of separates the cabinet into two sections, top and bottom.

Subject: Re: 4 Pi Build Progress
Posted by johnnycamp5 on Wed, 29 Jul 2015 22:27:21 GMT
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Your cabinets look great so far!

Subject: Re: 4 Pi Build Progress
Posted by johnnycamp5 on Fri, 31 Jul 2015 11:31:27 GMT
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Any updates/progress?   .

Just an observation-
If you're trying to build these exactly as the plans direct you, you may want to remove the piece of insulation on the bottom of the boxes, as it's not supposed to be there.

Regards!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Fri, 31 Jul 2015 14:39:16 GMT
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Hmm I didn't realize it wasn't supposed to be there seen it in a few other builds, I'll remove it most likely then when I mount the cross over.

More progress, The 3 Pi Subwoofers got their final hole cut with a 4" hole saw, since my router couldn't make a 4" hole and my dermal didn't like cutting MDF. I also bondoed around the edges and sanded, The subs are almost ready for paint. As of this morning before work the last baffle has been glued on to the 4 Pis.

To finish the 4 Pis I'm thinking about doing a 1" round over up the front sides with my router then bondo and primer. While I figure how what color I really want to paint them.

If all goes well I hope to have everything primed this weekend.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Sat, 01 Aug 2015 20:06:06 GMT
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Round overs done, hope to finish Bondoing the edges of all the boxes tomorrow, then a bunch of sanding and I'll hit them all with some primer.

You can see the 3/8" round over on the top sides, and the 1" round over on the front sides, I think I'm leaving everything else square.

Here's a shot of all 5 cabinets

Now off to pick up some Primer.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Mon, 03 Aug 2015 04:33:39 GMT
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Bondo done, Primer almost done.

Nothing a little Bondo couldn't clean up

First coat of high fill primer done, more primer and sanding to come.

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Mon, 03 Aug 2015 19:50:45 GMT
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Getting closer!...

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Thu, 06 Aug 2015 21:50:18 GMT
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Sanding sanding sanding....so the first primer I put on needed a lot of sanding, I have the 3 pi subwoofers done! They are finished with Rustolem Hammered Black spray paint. It's a pretty nice look for the subs.

One 4pi is fully primed ready for more sanding before I start the stone gray enamel. the other 2 have the first primer put on and need a lot more sanding. The primer is basically the same color as the stone gray I'll be painting them.

I'll be out of town for work all of this weekend and and most of next week. My goal is to have all the paint on minus a the clear coat before I go. another 4 hours of sanding with some painting in between and I might be there.

File Attachments
1) WP_20150806_14_38_27_Pro[1].jpg, downloaded 4678 times

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Sat, 08 Aug 2015 02:26:41 GMT
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Well the paint on the 4pis isn't perfect but should be pretty good after a wet sand.

Just need to finish installing the hurricane nuts for the woofers and put in the binding posts.

File Attachments
1) WP_20150807_15_59_18_Pro[1].jpg, downloaded 5382 times

Subject: Re: 4 Pi Build Progress

Posted by Wayne Parham on Sat, 08 Aug 2015 13:23:47 GMT
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They look great!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Tue, 01 Sep 2015 14:44:23 GMT
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Painting is coming out better this time third times the charm.

I have finished and moved one 4pi to the living room to make sure I like the look of it. It's not perfect but it's 100x better then the first 2 rounds of paint, good enough to live with at this point.

The 4 Pi's will most likely sit on top of my 3Pi subs for a while until I build stands for them. All in all I think they've turned out pretty well and I think I like the gray.

Now to finish painting the last 2, then I can redo the r13 inside since it's all covered in Paint at this point.

I started getting everything setup to test my JBL woofers, hopefully they are turn out fine either way I'll post the results here.

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Wed, 02 Sep 2015 04:00:06 GMT
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Those cabinets look great!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Fri, 04 Sep 2015 16:43:03 GMT
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Got the rest of the 4pi's painted only a bit of overspray and some dust to clean up but all in all the look pretty good.

I picked up some Foam gasket tape for the speakers and waveguides. Will this also be ok for the cross over? Could I just mount the cross over on cork? or with a bead of silicon under it?

Only other thing to do is to test my 2226h's this weekend just to make sure they are original cones as was descried when I purchased them. Was going to do it outdoors but it's been so windy lately the noise from all the trees and everything has been too much. I might try and indoor test hopefully it will yield ok results.

Should have this all finished up soon just waiting on my delivery from Wayne .

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Fri, 04 Sep 2015 20:17:09 GMT
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You can use just about anything as a gasket under the crossover PCB. I personally use PVC liner, like what contractors put underneath shower tile. But you can use a sheet of cardboard, foam or pretty much anything that acts as a cushion. All we want to do is to prevent vibration.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Sun, 13 Sep 2015 01:05:46 GMT
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I think finally the paint on the 4pis is acceptable. My wife agrees which is good since they'll be in the living room.

Still need to redo the r13 and put in the binding posts. Rest of the parts should be here next week!!

Glossy paint is the enemy, I'm not even sure I really won the battle here, but I've at least accepted a truce.

The 3 Pi's got cleaned up and a fresh coat of paint, I need to add the binding posts and hurricane nuts to them still. Does anyone know if the Lab12 shares the same screw hold pattern as the delta-12LF? I have of the deltas laying around I could use to measure the holes for the hurricane nuts or I could just wait until the Lab 12's get here.

Now I still have to run the wires for the 3pis.

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File Attachments
1) WP_20150912_17_45_44_Pro[1].jpg, downloaded 4619 times
2) WP_20150912_17_45_35_Pro[1].jpg, downloaded 4604 times
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Subject: Re: 4 Pi Build Progress
Posted by rvsixer on Sun, 13 Sep 2015 03:55:27 GMT
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BobTahoe wrote on Sat, 12 September 2015 18:05Glossy paint is the enemy...

Good job on a formidable challenge, they look great! Can't wait to hear your listening impressions.

Myself...everything I have control over gets light color/satin/matte finishes. I am lazy LOL   .

Subject: Re: 4 Pi Build Progress
Posted by Wayne Parham on Mon, 14 Sep 2015 16:27:05 GMT
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Wow, those look great!

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Mon, 21 Sep 2015 15:08:42 GMT
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Finally Finished!!!

Last photo before buttoning them all up:

Here's they are in room finished!

As you can see my old speakers are currently being used as stands.

I'll post more on sound later, but these are by far the best speakers I've ever heard in a living room. I've watched a few Blu-Rays of Live shows from Umphrey's McGee (check them out) and I can honestly say it sounds better in my living room then it did when I was there. They are extremely easy to listen too. They play details extremely well. I'm very happy.

My 3pi's aren't getting full power yet waiting on one more thing so I can hook up the pro audio amp I picked up to power them. Then I'll post some measurements.

Thank you Wayne for all the work you do.

File Attachments
1) WP_20150919_12_50_24_Pro[1].jpg, downloaded 4278 times
2) WP_20150919_15_16_20_Pro[1].jpg, downloaded 4427 times

Subject: Re: 4 Pi Build Progress
Posted by rvsixer on Mon, 21 Sep 2015 15:23:54 GMT
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That setup looks AWESOME, and thanks for the initial listening report.

I didn't know you where also building 3pi's. When they are finished please share your thoughts 3pi vs 4pi. I have all the parts for 3pi's, but the 4pi's keep calling my name (only the price of the 2226's keeps me away)   .

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Mon, 21 Sep 2015 15:59:00 GMT
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Woops, I should have said 3pi subs.

Although though the woofers in those old speakers are the Delta-12LF which I believe is the base 3pi woofer. First I have to get/build proper speaker stands.

I bought my 2226h's on ebay. picked up 2 pairs, 1 out of four was a very obvious recone. 2 of them looked original and older but sound fine and the center channel is a 2226hpl which from what I understand is a 2226h oem meaning it originally came in a JBL Cab, which matches the story. In the end I paid about $600 for all 4 and was able to use 3. Eventually I'll use the Spare and get it rebuild. If buying new I'm almost positive Wayne has the best deal. Unless you catch a good sale at parts-express which is how I picked up the B&C DE250s.

Subject: Re: 4 Pi Build Progress
Posted by rvsixer on Tue, 22 Sep 2015 13:37:09 GMT
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Okay I see now...I should have noticed those were 3pi subs in the pic.

I found a pair of 2226HPL on CL yesterday, trying to work a deal on them.

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Wed, 23 Sep 2015 20:37:54 GMT
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Ok I'm pretty sure I'm doing something wrong here either taking the measurements or I wired all the DE250's out of phase maybe?

This is the Left, then Right Speaker. The mic was several feet further from one speaker then another due to USB wire length.

Here are my measurements. This is in room of course.

File Attachments
1) 4pi test 1.png, downloaded 4021 times

Subject: Re: 4 Pi Build Progress
Posted by BobTahoe on Wed, 23 Sep 2015 20:56:42 GMT
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I've tested them both ways and the graph doesn't look much better.

I'm suspicious of the measurement system. If you had a driver mis-wired, you'd see a hole around 1.2kHz. So it's not that.

I see a big hole around 5kHz, and it's pretty much the same in both traces. However, if that were a compression driver problem, I'd expect it to be in one but not the other. So I doubt it's the driver.

It looks like one measurement trace one is shifted in frequency with respect to the other by about 10%. Where one shows a feature at say 5kHz, the other shows the same feature at 5.5kHz. Where one shows something at 42Hz, the other shows the same thing at 47Hz. So the anomalies appear to be the same in both traces, but for some reason, they're shifted in frequency by 10%. That's an odd set of symptoms.

I think the anomalies are probably caused by the measurement system. It's the only thing I can see that would cause this.

Irrespective of the anomalous frequency shift Wayne mentioned, the only time I have gotten issues like this was when I was running both speakers simultaneously and taking measurements. The only way that works is if the microphone is just about exactly between the monitors. As you've stated, your microphone was significantly off. Do you think it was possible you had both running, or one only partially reduced in volume? In my attempts to center the mic I found that the further off center, the lower the frequency of cancellation. This may not be your problem but check it if you haven't.

Yeah I believe I did have them both on. I'll try to redo the tests soon and see if I can get the sound card on the computer I'm using calibrated too.

I just had one of the 2226h's give out on me (it just started sounding scratchy) and had to swap it out with the one I was trying not to use because it was clearly rebuilt and possible with non JBL parts. So I want to test that woofer anywise while I send the blown one out to get rebuilt.

Thanks for your help. I'll post some more results soon I hope.