Subject: 7Pi Build 2014
Posted by compaddict on Fri, 20 Jun 2014 22:54:07 GMT
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Parts ordered June 2nd 2014 from Pi Speakers.
All optioned out and with shipping under 2k for the pair.
Parts should ship 1st week of July.
I picked up a pair of used JBL 2226H for the mockup and will more than likely use for a pair of 4Pi for the garage when finished with the 7s.
Wood is bought along with some large clamps. I also bought my builder a nice Biscuit Joiner.

File Attachments
1) 7Pi wood cut.jpg, downloaded 16457 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 20 Jun 2014 22:55:09 GMT
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1st bottom box mocked up.

File Attachments
1) 7Pi mock up.jpg, downloaded 15885 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 20 Jun 2014 22:56:56 GMT
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1st bottom box glued and clamped.
The lines on the joints indicate biscuits!

File Attachments
1) 7Pi glued up.jpg, downloaded 16022 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 21 Jun 2014 04:13:10 GMT
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Parts not in kit.

Screws for 15"
http://www.boltdepot.com/Product-Details.aspx?product=4410

Adhesive for T-Nuts
http://www.amazon.com/gp/product/B001E3VQBE/ref=oh_details_o00_s00_i01?ie=UTF8&psc=1

T-Nuts
http://www.amazon.com/gp/product/B0002ZPEU4/ref=oh_details_o01_s00_i00?ie=UTF8&psc=1

Subject: Re: 7Pi Build 2014
Posted by compaddict on Tue, 24 Jun 2014 19:46:17 GMT
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More parts..

Black screws:
http://www.parts-express.com/6-x-3-4-deep-thread-pan-head-screws-black-100-pcs--081-435

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Tue, 24 Jun 2014 20:46:52 GMT
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Lookin' good so far!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Thu, 24 Jul 2014 20:25:43 GMT
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Got my box of parts today.

File Attachments
1) 7pi parts.jpg, downloaded 15272 times

Subject: Re: 7Pi Build 2014
Posted by petew on Fri, 25 Jul 2014 00:51:57 GMT

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Oh man that looks nice. I am so looking forward to getting started on mine.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 25 Jul 2014 18:47:31 GMT
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More parts for my build:
12 Neutrik cable ends for boxes and crossover.
http://www.parts-express.com/neutrik-nl2fx-speakon-connector-2-pole-cable-mount--092-198
8 Neutrik for boxes
http://www.parts-express.com/neutrik-nl2mp-speakon-connector-2-pole-panel-mount--092-059

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 01 Aug 2014 20:56:46 GMT
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I am having Gene do my midrange horn/cab at:
http://www.gkellyenterprises.com
350.00 each

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 10 Aug 2014 03:10:12 GMT
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Mid Cabs are done.

File Attachments
1) MidCabs.JPG, downloaded 8296 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 10 Aug 2014 21:36:33 GMT
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MidCabs in my possession!

File Attachments
1) MidCabsBack.JPG, downloaded 8343 times
2) MidCabsBackOpen.JPG, downloaded 8396 times
3) MidCabsBackRight.JPG, downloaded 8272 times
4) MidCabsFlare.JPG, downloaded 8364 times
5) MidCabsFlareSide.JPG, downloaded 8284 times

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 11 Aug 2014 13:02:02 GMT
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Those look great!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Tue, 26 Aug 2014 23:20:22 GMT
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The bass box needs to be sealed up a bit.
I decided on "3M Marine 05220 Fast Cure Adhesive Sealant, White, 3 oz".
Other than that, just doing some sanding and prep for paint.
Decided on Automotive Matte(ish) black. Epoxy primer and two part paint.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 29 Aug 2014 22:27:10 GMT
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Mock up before paint.

File Attachments
1) pi7 whole.jpg, downloaded 7797 times

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Sat, 30 Aug 2014 00:54:18 GMT
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That's just looking soooo good!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 01 Sep 2014 19:01:50 GMT
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First two coats primer in my home made paint booth. I am pulling each piece out one by one for sanding today, then one final coat of primer...

File Attachments
1) 7pi base primer back.jpg, downloaded 7724 times
2) 7pi base primer.jpg, downloaded 7733 times
3) 7pi mid primer.jpg, downloaded 7699 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Tue, 02 Sep 2014 02:44:38 GMT
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All day sanding.. Ready for final primer!

File Attachments
1) 7pi base primer sanded base top.jpg, downloaded 7657 times
2) 7pi base primer sanded mids.jpg, downloaded 7702 times
3) 7pi base primer sanded paint booth 1.jpg, downloaded 7674

times
4) 7pi base primer sanded paint booth 2.jpg, downloaded 7687 times

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Tue, 02 Sep 2014 05:00:47 GMT
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Wow, those look great!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 05 Sep 2014 22:56:51 GMT
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Final primer!

File Attachments
1) 7pi base final primer.jpg, downloaded 7479 times
2) 7pi base1 final primer.jpg, downloaded 7467 times
3) 7pi mid1 final primer.jpg, downloaded 7442 times
4) 7pi mid2 final primer.jpg, downloaded 7446 times
5) 7pi tweeter final primer.jpg, downloaded 7474 times

Subject: Re: 7Pi Build 2014
Posted by blvdre on Sat, 06 Sep 2014 11:30:05 GMT
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I love this show

Subject: Re: 7Pi Build 2014
Posted by petew on Sat, 06 Sep 2014 16:14:35 GMT
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Can't wait for your review!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 06 Sep 2014 20:12:57 GMT
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Final matte black, two coats. These pictures are twenty minutes after paint so they will matte out more and even out.

File Attachments
1) 7pi base1 black.jpg, downloaded 8308 times
2) 7pi base2 black.jpg, downloaded 8228 times
3) 7pi mid1 black.jpg, downloaded 8160 times
4) 7pi mid2 black.jpg, downloaded 8230 times
5) 7pi tweeter black.jpg, downloaded 8189 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 07 Sep 2014 20:39:52 GMT
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They did indeed need one more coat of paint. At 100.00 a quart I went back and forth many times thinking I could live with it.
After a trip to the paint store and a quick shoot I am much happier now.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 08 Sep 2014 15:22:00 GMT
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Stunning!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Tue, 09 Sep 2014 00:21:10 GMT
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Tweeter horn with added damping. Why not!

File Attachments
1) 7pi tweeter damping.jpg, downloaded 8059 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 10 Sep 2014 04:19:03 GMT
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Almost done. Have to go fishing in the morning!

File Attachments
1) 7pi Done2.jpg, downloaded 8045 times
2) 7pi Done1.jpg, downloaded 7889 times

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Wed, 10 Sep 2014 20:31:25 GMT
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Gorgeous! Those look really great!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Thu, 11 Sep 2014 22:23:40 GMT

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And done!
Just have to make six short cables.

File Attachments
1) 7pi Done Pair1.jpg, downloaded 7838 times
2) 7pi Done Pair2.jpg, downloaded 7835 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 12 Sep 2014 14:59:55 GMT
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The midrange was very distorted so we went back into the mid cabs and added an extra gasket and tightened them down less.
They got better but the midrange is still not very good. Not very clear at all.
My wife came home late last night and noticed how hard it was to hear what people were saying on TV.

Subject: Re: 7Pi Build 2014
Posted by rkeman on Fri, 12 Sep 2014 20:02:37 GMT
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Check everything! Crossovers, wiring, insulation, drivers, driver gaskets, back panel bracing, amplifier... If both speakers have the problem it is probably a crossover or construction issue because simultaneously defective drivers or channels of amplification are very unlikely. The build is fairly complicated and it is very easy to miss something. When assembling a 3PI, the insulation in one speaker came loose and fell against the back of the woofer cone and it sounded very bad indeed!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 12 Sep 2014 20:10:42 GMT
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On a scale from 1 - 10 I would rate the voice quality a 5.
Everything is hooked up with Neutrik so I can test things one driver at a time.
I triple checked all polarities and wiring before assembly...
2226h black to 3+, Mid red to 2+ and de250 black to 1+

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 12 Sep 2014 22:11:24 GMT
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Not the problem, but one resister was rattling around in the XO box. Nothing close to touching it. A mystery. I soldered it back on and they still sound bad.

Picture of XO and wiring. Wires with black shrink wrap are negative all the way back to the drivers.

File Attachments
1) 7pi XO.jpg, downloaded 9763 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 13 Sep 2014 17:52:45 GMT
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And something sounds out of phase. Kind of like some of the old school sound enhancement programs like "Stadium". Not as bad but noticeable. At first, I used a popsicle stick between the mid cone and the MDF and that's about how much clearance I had. Now, three popsicle sticks.

Subject: Re: 7Pi Build 2014
Posted by my0x on Sun, 14 Sep 2014 00:34:57 GMT
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It appears you have resistors R1b and R1d touching the trace from L1. I think they should not touch this trace and only touch at the pad below. Double check all traces against the schematic

Matt

File Attachments
1) pi7 xover markup.jpg, downloaded 9529 times

Subject: Re: 7Pi Build 2014
Posted by tubemax on Sun, 14 Sep 2014 09:03:10 GMT
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It looks like 15Ohm damping resistor is also not connected to the ground?

Max

File Attachments

1) 7pi+XO II.jpg, downloaded 316 times

Subject: Re: 7Pi Build 2014
Posted by tubemax on Sun, 14 Sep 2014 09:42:56 GMT
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Hmmm, there is also a missing coil on your crossover which you connected only with jumper wire?
Please have a look at the picture of finished crossover form Wayne, there is a extra coil being soldered for mid horn (I think 1mH)!

Max

File Attachments

1) Pi7_Crossover.jpg, downloaded 369 times

Subject: Re: 7Pi Build 2014
Posted by tubemax on Sun, 14 Sep 2014 10:27:56 GMT
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Just one more thing... there is also a missing resistor in the voltage divider part of mid horn (resistor between coil and small blue capacitor), supposed to be two 16 Ohm resistors in parallel (for desired 8 Ohm resistance) connected with another four of 16 Ohm resistors in parallel (for desired 4 Ohm series resistance) to form correct low-end response of the horn (4 Ohm series resistor followed by 8 Ohm shunt).
If you have only one 16 Ohm resistor then is your midrange response probably double louder in the lower-end of spectrum...
Also you used 15 ohm instead of 16 ohm resistors, this could change somewhat impedance of crossover, not the attenuation, Wayne can give as input on that.

Max

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Sun, 14 Sep 2014 15:38:02 GMT
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I can see that resistor R5a is missing, so I'd suggest putting that back. And I agree with Matt, I would check to make sure the leads from R1b and R1d are not bent, touching the trace from L1.

But to tell the truth, crossover problems usually present as missing or over-represented portions of the frequency spectrum. Examples would be too much bass or bass that's too thin, missing treble or too much. Vocals can sound too throaty or hollow. When there's something wrong with the crossover, it usually sounds like the response curve is off, because it usually is.

When people complain of distortion in a new speaker, it's most often caused by something rubbing or buzzing. So look for things that may be rubbing against the cone. Make sure the gasket isn't in contact with the cone or surround, and make sure it's sealed. No gaps. Check the wiring too, making sure the wire isn't resting on the cone, which will make a buzzing sound. And finally, make sure the back panel is secure and doesn't vibrate. See the post about Midhorn bracing. You'll probably want to do the "rubber ball brace" for the back panel.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 14 Sep 2014 16:15:58 GMT
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First thing, it seems that 2226h are wired "black to + forces positive displacement". Good to know. I will fix that in the XO box as well as the other suggestions.
The resistor came off by itself inside the XO box. It's a mystery because nothing could have knocked it off.
How much clearance is optimal between the mid cone and the panel it's mounted to?
Mid horn bracing is not an issue.. The back panel seal is not perfect now but I will fix that once I determine the proper clearance for the mid driver.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 15 Sep 2014 00:16:06 GMT
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That's true. The 2226H is wired with black positive. Connection polarity is shown in the notes on the crossover sheet.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 15 Sep 2014 00:22:12 GMT
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So I had it right the first time.
What about the clearance question?

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 15 Sep 2014 02:30:37 GMT
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The two resistor leads were separated from the trace. Still sound terrible.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 15 Sep 2014 03:20:51 GMT
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I don't think it's a crossover problem. But I do wonder if there's a bracing issue, like the back panel perhaps. Or maybe something else in there is buzzing, like the gasket or even a loose wire touching the cone.

Try the sound with the midhorn disconnected. You'll lose vocals, and it will sound unnatural, sort of muffled. But if there's something buzzing in the midhorn, it will stop. If that works, then take the driver out of the midhorn and listen to it by itself. See if you can isolate the problem by a process of elimination.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 15 Sep 2014 04:43:47 GMT
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Will try that.
What is the proper clearance for the midrange driver and the panel it is mounted to?

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 15 Sep 2014 13:10:45 GMT
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It's a zero-clearance fit. The gasket and the plate must fit snug. It's just that the cone cannot rub against anything. All panels must be braced too.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 15 Sep 2014 15:54:13 GMT
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So how much clearance between cone (at rest) and plate would be ideal?
And I have a mic and mic pre-amp coming today if that helps.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 15 Sep 2014 17:02:43 GMT
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We just don't want the cone to touch the mounting plate, or anything else for that matter. There is enough clearance between cone and mounting plate to prevent them from touching, as long as the gasket isn't excessively compressed or removed. The xmax is around 2mm-3mm (depending on the driver chosen), but the gasket is larger than that.

As an aside, the mechanical limit is much greater than that, so if you were going to throw a hundred watts at these speakers, the cone could strike the plate. So you can add a second gasket in front of the built-on one, if you want to. We sell them for that purpose. But really, these are hifi speakers, and probably wouldn't ever be pushed that hard. They'd be way over xmax, and that's not what you ever want to do.

My guess is your problem isn't from cone-to-plate interference. That would only happen at very high volume levels. It's more likely something else, like bracing or something inside the cabinet rubbing against the cone.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 15 Sep 2014 17:29:55 GMT
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The seal for the access panel is not optimum at the moment.. But it was before I tore into it because of the sound quality.
I'll pull the drivers and have a listen outside the box like you said.
Imaging is very bad as well. Something with phase I think. I switched back to some CL B&W BM330 so we could watch TV and all was back to normal.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 15 Sep 2014 21:23:18 GMT
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heard, due in part to the horn loading and part due to its close proximity to the corner apex, which prevents self-interference. So whatever is going wrong must be severe.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 17 Sep 2014 05:06:02 GMT
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I can hear voices better now but something is still very wrong.
Something out of phase. When I switch to mono I hear a reverb or out of phase distortion.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Wed, 17 Sep 2014 12:14:04 GMT
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A misconnected driver will sound subtly wrong. It won't take the whole power response off, it will simply shift the nulls to being in front of the speaker instead of outside the speaker's radiating pattern. That's bad, and you don't want it. And it's noticeable. But rather subtle, really.

Any chance of making measurements? That will tell us what's going on.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 17 Sep 2014 13:32:14 GMT
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Thursday we are pulling the mid drivers and having a listen as well as taking measurements.
Going to learn REW.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Wed, 17 Sep 2014 15:23:11 GMT
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Excellent. Once we have hard data, I think we'll be able to locate the problem.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 17 Sep 2014 15:44:32 GMT
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A gentleman at diyaudio mentioned that L2 should have a 1.0mH instead of a jumper?
It was also mentioned on this site as well as a few other posts and suggestions.

Can you offer any clarity?
I ordered two new Delta 10's just in case I tightened them down to much.. A possibility.

Subject: Re: 7Pi Build 2014
Posted by tom-m on Wed, 17 Sep 2014 19:45:10 GMT
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Look at the crossover diagram in the pdf file for the 7pi. On that page, the notes in the lower left corner talks about L2. The coil is needed for the Delta 10. Or use jumper for Alpha 10 or JBL mid. Also, when L2 installed, reverse tweeter polarity. For more info, see the notes in the pdf file.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Wed, 17 Sep 2014 21:12:19 GMT
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That is correct. The board was built for use with an Alpha 10.

I'm so sorry about that! I just noticed it. Been a busy time for us, what with the move and all.

So to resolve, you can either send back the boards and we'll install the 1.0mH coils or I can ship some to you. If you go the latter route, I'll throw in a tube of silicon adhesive, because you will want to put some under each coil as a cushion/mount for them.

Just let me know, we'll do it either way. So sorry, I can't believe I just noticed that.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 28 Sep 2014 16:37:08 GMT
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Soldered in the coil and they sound much better now. The speakers were fine as well. Head to head outside the box against new the originals sounded better than the new.
I have to seal up the access panels a bit still but they sound much better.
I would not call them audiophile quality but I think I can get used to them for home theater.
Been playing with Yamahas YPAO and DSP a bit and that helps a bunch.

Subject: Re: 7Pi Build 2014
Posted by rkeman on Sun, 28 Sep 2014 17:11:53 GMT
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The midrange of the 7 and 6Pi cornerhorns is definitely "audiophile" quality. Have all of the crossover and construction issues been resolved? If so, are they placed in appropriate corners with the listening axis crossing a foot or so in front of the listening position? How do they sound with no equalization and run full-range? You've been through a lot with the build and it would be a shame not to get the most out of a design capable of superb performance.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 04 Oct 2014 15:22:01 GMT
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REW flat.

File Attachments
1) flat.jpg, downloaded 10017 times

Subject: Re: 7Pi Build 2014
Posted by skywave-rider on Sat, 04 Oct 2014 18:52:04 GMT
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Is this a measurement of one speaker, the other muted? Pease give the measurement details, equipment, distance, etc..

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 04 Oct 2014 19:15:39 GMT
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Both speaker driven, 14 feet from each, MIC at listening level, Behringer MIC800 and preamp.
Yamaha RX-A840 and Outlaw 2200 mono amps.
Yamaha set flat.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Sun, 05 Oct 2014 13:51:04 GMT
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If the measurements are right, it looks to me like there are at least three things happening.

First is the midrange doesn't look attenuated to match the other drivers. So I would look at the R4/R5 resistors. Make sure they're installed correctly and not shorted. That's a kind of easy problem to solve because it's just attenuation.

Second, the 300Hz peak. Something is going on there, probably a panel resonance. You might want to damp panels one at a time with a pillow or your hand and see if you can identify the cause. That one could be a measuring artifact too, so move the speakers and microphone and measure again. Best to measure outside. But I suspect that one is a panel resonance.

Third, the lack of treble, and the overall downward sloping trend. I see that a lot with measurement problems. Sometimes I see it with microphones overdriving the input amplifier. One would think the extra harmonics would artificially show excess HF, but I often see that problem cause a downward slope. Or it could be something else in the measurement system. But this could be confirmed by measuring something else and seeing if the downward trend existed there too. If it's truly the speakers, then the tweeter circuit or compression driver is off.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 05 Oct 2014 15:53:43 GMT
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The 300 peak was a bad SC cal file. Disregard.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 05 Oct 2014 21:52:28 GMT
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http://ge.tt/3ko77f02/v/1?c

Whole set of new files with corrected SC file.
Both speakers tested 1M and flat as well as some B&W DM 330 cheapies for reference.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 13:37:04 GMT
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I didn't find any image files in your archive, so I can't see your response curves. I run WTPro and LMS, so the REW data files aren't useful for me. But even if there is no real 300Hz anomaly, there is still something way off. The midrange is much higher than the treble, telling me either the compression driver or the crossover is at fault. If you would like, send the crossovers to me and I'll check them out. We'll get to the bottom of it.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 06 Oct 2014 17:12:55 GMT
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http://ge.tt/3ko77f02?c
Whole set of new files with corrected SC file.
Both speakers tested 1M and flat as well as some B&W DM 330 cheapies for reference.
Two files renamed for clarity.
REW is the SW used.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 19:00:20 GMT
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Again, we see that there is a huge rolloff up high. It looks like the compression driver tweeter isn't even connected. That's where we need to focus, I think. Concentrate on what may be causing the lack of HF output, whether it be bad crossover, wiring or compression driver.

Subject: Re: 7Pi Build 2014
Posted by JCDC on Mon, 06 Oct 2014 19:01:53 GMT
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I think he played them without the extra (or any?) front gaskets.

Could the driver 'bottom' in such a situation? And then affect freq resp?

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 19:09:49 GMT
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JCDC wrote on Mon, 06 October 2014 14:01I think he played them without the extra (or any?) front gaskets.

Could the driver 'bottom' in such a situation? And then affect freq resp?
The midhorn gaskets aren't needed unless output is really high. And by "high" - I mean way past the level anyone would feel comfortable listening.

If pushed that hard, then the driver is pushed past its limits. One can go past xmax with those drivers without damage, but the sound quality plummets. So for hifi applications, an extra gasket

isn't needed.

Besides, what we're seeing is a lack of HF content. I think that's where we need to concentrate.

At first, I thought we might have some sort of midhorn panel resonance because initial reports were that voices sounded distorted. I didn't even think the crossover was suspect, because I thought we were dealing with a buzz or something like that.

But after seeing measurements, I think just the opposite. I now think the problem is the compression driver or tweeter circuit. Measurements are showing that there just isn't any tweeter output.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 19:30:35 GMT
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I think I see the problem. If this is it, I owe you a big old bottle of your favorite adult beverage.

Look at the crossover photo you sent earlier. See the area I've circled in red:

If those resistors are touching the land in the circled area, then the tweeter circuit is shorted and it has no output. Pull the resistors up away from there - so they touch only the line going to the (+) lug - and see if you don't have nice tweeter output.

If that's it, I apologize not only for sending the boards out that way but also for not looking closer at the photo you posted. I have someone building boards for me, and they may not have tested their work as thouroughly as we should have.

And let me know what you drink.

File Attachments
1) bad_xo.jpg, downloaded 8947 times

Subject: Re: 7Pi Build 2014
Posted by my0x on Mon, 06 Oct 2014 19:46:31 GMT
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Yeah, that's what I saw touching per my previous post. Whatever it is, I hope you get it right and you'll know what all the fuss is about!

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 19:47:57 GMT
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I just re-read this thread and saw your post on September 13th where you suggested checking exactly that. Good catch!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 06 Oct 2014 19:54:23 GMT
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Yea, I fixed that a long time ago. The other XO was just fine.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 20:00:44 GMT
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I think we've narrowed our focus to the tweeter circuit. If you'd like, send the crossovers back to me, and possibly the compression drivers too.

From the measurements, it is evident that the compression driver is not providing any output.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 06 Oct 2014 20:13:30 GMT
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Not much you can do that I can't do here.
In the file I posted I have separate readings from each driver all taken 1M from Mid axis. Just for information.
I'll tear into the XO today check the specs on everything.
Wayne, if you want you can send me a set of known good XOs.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 20:24:45 GMT
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Well, that's probably true. It's a simple circuit and you can easily troubleshoot it there. I just didn't want to see you get stuck, so the deal always stands.

One thing you might do is to put a single series capacitor inline with the compression driver instead of using the crossover. Run the woofer and midrange directly off the amp, and the tweeter having just a series cap, value in the 5-10uF range.

What you would see when measuring that is the midhorn would be about 6dB hotter than the bass and the tweeter would be another 3dB hotter than that. So this would let you see the tweeter output, and would help isolate that huge rolloff.

If you see this - and I expect you would - then you could trace the signal through the tweeter circuit. It's pretty simple, with the signal going first through the 6.8uF capacitor and then shunted by the 1.0mH coil, passing then through the 20uF capacitor and onto the R1/R2 padding network. My guess is either somewhere the signal is shorted, possibly by one of the leads under a coil where it is siliconed to the board, or one of the series components is misconnected. It pretty much has to be one of those things, because there just isn't that much in the signal path.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 06 Oct 2014 20:38:17 GMT
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Have an extra set of known good XO you can spare?

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 06 Oct 2014 21:17:03 GMT
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We build crossovers to order. With all the options available for each model, it just makes more sense for us to assemble the crossovers at the time of order. So we maintain a large stock of unstuffed crossover boards and all the components for each model and option. But we do not stock completed crossovers.

If all else fails, I'll build up a board and send it to you for a baseline.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 06 Oct 2014 21:32:36 GMT

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This what I can see and the values written on the parts. Four resistors I can not see because of how and where I mounted L2.

File Attachments
1) xo.jpg, downloaded 8455 times

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Tue, 07 Oct 2014 13:18:53 GMT
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Those are all the correct values in the right places. I think I'd probably look more for things like we saw in the resistors touching the trace connected to L1. Look for shorts.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Tue, 07 Oct 2014 17:21:36 GMT
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I still need to bypass the XO to confirm..
Do you have some testing points with known values?

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Tue, 07 Oct 2014 19:08:36 GMT
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Yes, I'd definitely test the tweeter with just a 5-10uF series capacitor. That will illustrate what the driver acts like without attenuation or compensation. It's a good sanity check.

the compression driver disconnected. Not much else can be checked with an ohmmeter, because capacitors look open and coils look like shorts when presented with DC.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 10 Oct 2014 00:09:15 GMT
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I'll do that.. Need a break.
I figured out Yamahas PEQ!
Dumptruck clued me in at looking at Octaves.
Nicer for now.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Thu, 16 Oct 2014 19:53:26 GMT
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I was pretty good at tuning carburetors and mechanical/vacuum advance distributers..
Then came EFI and I never looked back.
MiniDSP 4X10 and an Outlaw 7075 (7x75w) on the way.
Might keep the two mono 200w for the 2226h.. Don't know yet.
Sorry for not troubleshooting the XOs.

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Thu, 16 Oct 2014 21:21:58 GMT
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I'm with you on the carburetors and distributors. Back in the 1970s, I used to tell my hotrod buddies that we could do a lot with microcontrollers. And now, of course, everyone does. But just for fun, my own personal ride has a Holley and and distributor. Even has points, but I cheat a little bit 'cause I use the points to drive a power transistor, and that's what energizes the coil. Never pits the points that way.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 19 Oct 2014 23:14:38 GMT
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I thought I read somewhere here your suggested xo points and slopes for DSP xo.. I cant find them.
Save me some time please!
What xo points and slopes?

Subject: Re: 7Pi Build 2014

Posted by Wayne Parham on Mon, 20 Oct 2014 14:28:47 GMT
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The woofer-to-mid crossover is a pretty simple first-order low-pass on the woofer. I use a 5.6mH coil, so crossover is around 250Hz. The midhorn has no electrical high-pass, so the two overlap in the upper-midbass / lower-midrange which helps smooth the top octave of the modal region. However, the mid-to-tweeter crossover isn't as simple. The transfer function is pretty complex. Best to look over the "Crossover" and "Simulations and Measurements" sections of the Pi Speakers FAQ.

In particular, study the information in the link called "Crossover optimization for DI-matched two-way speakers." Even though that document is about a two-way design, it's the exact same process I use to dial-in the upper crossover in a three-way design. So if you can duplicate that process, you can duplicate the crossover. I essentially design a digital crossover using the Spice models in WTPro, and then implement the crossover with passive parts.

Subject: Re: 7Pi Build 2014
Posted by Nelson Bass on Tue, 21 Oct 2014 06:04:36 GMT
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Hi Wayne,

My schematic calls for a 5.0mH not 5.6mH?

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Tue, 21 Oct 2014 12:50:04 GMT
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The woofer coil should be 5.0mH to 6.0mH. The span is only about a 15% difference and is within tolerance. This is especially true in first-order filters, and even more so in this case with so much overlap between sound sources. We're looking for blending between woofer and midhorn, and any value between 5.0mH and 6.0mH is fine.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 05 Nov 2014 16:42:00 GMT
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MiniDSP 4x10 installed crossed at 250 and 1600 with 12db slopes. Mid/high down 11db for basic

matching by ear.
Much better sound right off the bat. Weird phasing distortion is gone.
I ended up with an Outlaw Audio 7075 (7x75w) using just two channels for the mid/high and two Outlaw 2200 (200w)monos for the lows.
More later!

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Sat, 08 Nov 2014 16:07:36 GMT
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Please send me the passive crossovers and let me go over them for you. Even though you've gone digital/active, I'd like the passive setup to work for you too. Sorry for the inconvenience. I hope it has been a fun ride, and that the speakers sound good to you.

Subject: Re: 7Pi Build 2014
Posted by Nelson Bass on Wed, 12 Nov 2014 21:57:58 GMT
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Have you ever heard the 7pi before your build? If not I suggest that you get the crossovers fixed by Wayne so you have a reference to compare with your current solution.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Wed, 12 Nov 2014 22:07:37 GMT
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No I have not. I do have some very talented people at my disposal and pretty good ears though! After playing with MiniDSP I can't imagine going back to passive. I just installed a pair of Nolte Audio 4X10" (per pair)175Lbs subs and I now have BASS!

File Attachments
1) Nolte Bass 50.jpg, downloaded 7411 times

Subject: Re: 7Pi Build 2014
Posted by blvdre on Sat, 15 Nov 2014 20:25:47 GMT
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compaddict wrote on Wed, 12 November 2014 16:07No I have not. I do have some very talented

people at my disposal and pretty good ears though!
After playing with MiniDSP I can't imagine going back to passive. I just installed a pair of Nolte Audio 4X10" (per pair)175Lbs subs and I now have BASS!

...but you've yet to hear the passive set up properly, so maybe you would prefer it to the DSP. In any event, since you're not using the passives, send them on to Wayne.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sun, 16 Nov 2014 20:50:27 GMT
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Success!
John Nolte of Nolte Audio came over and set up the MiniDSP crossover driver by driver. He used the same XO points as WP and measured and set thing up from there.
Spent all day tweeking, went out to dinner then sat down and listened for a while.
These are indeed very nice speakers.
Because of the design of the subs, we had to lay them down on the front wall. They don't seem to do anything bad in that position. The sealed subs are flat to 24Hz and make crazy amounts of bass.
We have not done any EQ at all and could walk away right now and be 100% satisfied.

File Attachments
1) Nolte Bass1 SM.jpg, downloaded 7314 times
2) Nolte Bass2 SM.jpg, downloaded 7312 times

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 21 Nov 2014 05:45:06 GMT
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I measured the distance between voice coils between the subs and the the drivers in the 7Pi cornerhorns and added delay accordingly. The main speakers were 4.xx ms away. Amazing difference! The subs disappeared and I can no longer pinpoint the mid and high drivers with my ears. I now have stereo bass and very nice resolution on the mid/top!

Very nice speakers indeed.

Subject: Re: 7Pi Build 2014
Posted by compaddict on Mon, 01 Dec 2014 18:35:35 GMT

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In the end my goals have been met. Nothing lacking. On a scale of one through ten..
Soundstage: 7
Soundstage anywhere on my couch: 10
Articulation: 8
Dynamics: 8
The ability to play loud: 10
Lack of harshness: 9
Natural sound: 8

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Mon, 01 Dec 2014 19:54:30 GMT
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Very good. Glad they're sounding good to you now. Thanks for reporting back!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Fri, 10 Jun 2016 18:30:10 GMT
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I just bought a pair of NOS JBL 2012H midrange speakers off of ebay!475.00 for the pair. I have been looking for two years.
We will see how that goes. More later!

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Fri, 10 Jun 2016 22:19:01 GMT
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Nice!

Subject: Re: 7Pi Build 2014
Posted by compaddict on Sat, 08 Dec 2018 16:22:11 GMT
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I just ordered a DDRC_88A + BM option to play with Dirac.

Should be interesting!

Subject: Re: 7Pi Build 2014
Posted by Wayne Parham on Sun, 09 Dec 2018 16:28:13 GMT
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Definitely a great product. It will take you to the "Nth degree." :)