Subject: Pi 4.5 possible?
Posted by Infrasonic on Sat, 17 Jul 2010 03:54:23 GMT
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Hi Wayne!

I was lucky enough to acquire three JBL 4648a's from someone in Kentucky.

http://www.jblpro.com/catalog/general/Product.aspx?PId=74&MId=1

I will have them shipped to me in a week or two. I got them cause it was a sick deal on six 8ohm 2226H's. The Pi4 project has been on my to-do list all year so that's why I got them.

I was wondering if there was a way to make a Pi4.5 with a 2nd 2226H in the mix. Basically the bottom woofer would get a 150hz 1st order lowpass while the upper 2226H get fullrange up to the crossover of yours. Now I know this would be a 4ohm load now and that your crossover is made for a single 2226H at 8ohms.

Is there a way I could make this work for me? I want to have dual woofers used cause I love bass and want all the sensitivity and impact I can get. Btw, this is for my HT so I definitely want that cinema sound. I really want this:
http://www.jblpro.com/catalog/general/Product.aspx?PId=84&MId=1 but with your crossover and CD/lens combo. I'd love to have all the bass capability I can get for my mains.

What are your thoughts on this, Wayne?

EDIT: After further pondering I wonder... maybe it would still work with your xover the way I imagine it. It's really late at night and I've had a long week so I am probably wrong but would the xover itself see the full 4ohm load or would just the amp? I figure I make a slightly extended version of your cab (the Pi4) to allow room for the 2nd 2226H. Above that the speaker is a normal Pi4. Now it will have a 2nd underneath this time with just a 1st or xover @ 150hz-ish. Same baffle shared, same amp. Two woofers, two xovers. I sounds like it could work but I am pretty sleepy too. Heh. Just brainstorming.

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Sat, 17 Jul 2010 13:24:04 GMT
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We've discussed this approach several times, and I think it's a good idea but I think the multisub approach is even better. Of course, you can employ both approaches but if you have to chose one, I'd go multisubs. Take those "helper" woofers out of the main loudspeaker cabinets and place them somewhere else in the room.
2.5 way using two JBL 2226
Upon further investigation...
Multisubs

Subject: Re: Pi 4.5 possible?
Posted by Bill Epstein on Sun, 18 Jul 2010 00:30:02 GMT
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The 4648s a lot of us got during the tent Sale had 2226Js, 16 ohm drivers, and I suspect that's what you'll find. If so, it's a good thing; the combined 8 ohm load is more benign to an amp, especially a tube amp.

I played around a bit with the old 4Pi crossover and 2 -2226Js back then. The resulting bass seemed way more solid than the 3dB arithmetic boost would indicate.

You say you got 3- 4648As. Well then, use 2 as is for subwoofer duty and take the woofers from the third to build conventional 4Pis. Then play the opening of Lord Of The Rings, the battle at the Black gate. better yet, cut 22 and on of the Boston Concert side of the Police Live SACD. Turn it ALL the way up.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Sun, 18 Jul 2010 08:19:47 GMT
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Wayne Parham wrote on Sat, 17 July 2010 08:24
We've discussed this approach several times, and I think it's a good idea but I think the multisub approach is even better. Of course, you can employ both approaches but if you have to chose one, I'd go multisubs. Take those "helper" woofers out of the main loudspeaker cabinets and place them somewhere else in the room.
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Upon further investigation...
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Hi, Wayne.
 I was originally going to build the Pi4 as is as my next DIY project. These would replace my current left, center and right speakers. I also run a twin vented 18" subwoofer system with two more 18" drivers in storage. I plan to make them into a qual sealed subwoofer system. I will have the multisub configuration in addition to having a trio of Pi4's.

I was hoping I could have a working 2.5way version of your Pi4 with dual 2226H's. The link about the 2.5way is a good resource, thank you. I may have questions about your crossover and the 2.5 approach from that thread though. That guy had 16ohm versions of the JBL 2226.

EDIT: Actually, I do have a question about your response to his thread. In there you mentioned, "Run the bottom woofer off the midwoofer crossover output, but add a large coil in series to limit its output to the bass range.". Just to be clear on this, he can get away with having both woofers hooked to the lowend output of your Pi4 crossover (with an extra filter for the bottom woofer in series for that output) and not have to modify your crossover? It looks like I couldn't do this simply like he did as the final load would be 4ohm. Everything else I can make work. I know the cabinet stuff and all that but the way I handle the crossover always goes over my head. What am I to do? I want to use your crossover network and have two 2226H's.

Would I be able to have the the top woofer run off the crossover and the bottom just with a 1st order filter around 150hz or would that not work?

Bill Epstein wrote on Sat, 17 July 2010 19:30The 4648s a lot of us got during the tent Sale had 2226Js, 16 ohm drivers, and I suspect that's what you'll find. If so, it's a good thing; the combined 8 ohm load is more benign to an amp, especially a tube amp.

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The guy who sold them to me had two versions for sale and I requested the 4648A and not the 4648A-8. This one came with two 2226H's. I wanted this because I knew I was going to build a Pi4. I haven't received them yet so I cannot confirm but I should have them soon.

Also, I don't use tube amps at all. I have a regular home theater receiver but may upgrade to external pro amps later. I like your advice though. Talk about rock the house audio! That's what I am trying to do but with even more speakers.

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Sun, 18 Jul 2010 14:20:06 GMT
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Infrasonic wrote on Sun, 18 July 2010 03:19I do have a question about your response to his thread. In there you mentioned, "Run the bottom woofer off the midwoofer crossover output, but add a large coil in series to limit its output to the bass range.". Just to be clear on this, he can get away with having both woofers hooked to the lowend output of your Pi4 crossover (with an extra filter for the bottom woofer in series for that output) and not have to modify your crossover? It looks like I couldn't do this simply like he did as the final load would be 4ohm. Everything else I can make work. I know the cabinet stuff and all that but the way I handle the crossover always goes over my head. What am I to do? I want to use your crossover network and have two 2226H's.

PCB, and tie another using a large value coil in series. The first woofer is the midwoofer, outputs connetced directly. It is the only load "seen" by the crossover, because the "helper" woofer is isolated by the coil, and the impedance of that branch becomes very high in the crossover region, sort of taking it out of circuit. At low frequencies, the coil impedance becomes low enough that

the deepest bass range. But that's OK, most amps can handle that load. All speakers have some impedance fluctuation.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Sun, 18 Jul 2010 20:26:24 GMT
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No problems regarding load on the amp. Right now the amps in my AVR are quite robust and powerful for it's class. It's good for a 3ohm load if required. I may even upgrade to a pro amp down the road so loads down to 2ohm pose no real issues at the moment.

So if I read your reply correctly I can hook both woofers to the lowend output of your crossover but with a inductor in series between the bottom woofer and the output of the crossover? Is that right? Or do I just hook the midwoofer to the network and have just the inductor on the bottom woofer?

Sorry, just want to be sure.

Thanks a ton!

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Mon, 19 Jul 2010 02:59:37 GMT
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Infrasonic wrote on Sun, 18 July 2010 15:26So if I read your reply correctly I can hook both woofers to the lowend output of your crossover but with a inductor in series between the bottom woofer and the output of the crossover?
That's right, exactly.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Mon, 19 Jul 2010 03:43:22 GMT
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Wayne Parham wrote on Sun, 18 July 2010 21:59
Infrasonic wrote on Sun, 18 July 2010 15:26So if I read your reply correctly I can hook both woofers to the lowend output of your crossover but with a inductor in series between the bottom woofer and the output of the crossover?
That's right, exactly.

Perfect! Which size inductor do you recommend, a 5mH or a 2.5mH inductor? Also, would there

be a specific one that you would recommend for this situation? Would this type be prefered?

http://www.parts-express.com/14-gauge-c-core-toroidal-inductors.cfm

This one maybe?

http://www.parts-express.com/pe/showdetl.cfm?Partnumber=255-820

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Mon, 19 Jul 2010 15:27:27 GMT
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Sure, those are very good. I'd go with a 5mH coil (or the 4.7mH coil from your link). You could go a little larger, say to the 5.6mH coil. You definitely don't want the second woofer to have any midrange output. A smooth LP rolloff is desirable, but we don't want the mids overlapping because it will start to comb filter. So 5-7mH is just about right.

Personally, I've had good luck with Erse Super Q coils for these larger values. They're reasonably priced and work well. But those Jantzen toroids are very nice. Go for it.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Tue, 20 Jul 2010 22:29:49 GMT
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Great. I think I will go with this one:
http://www.parts-express.com/pe/showdetl.cfm?Partnumber=255-828

I believe I have enough info to work with to design this 2.5way version of the 4Pi. I still have to wait til I get the shipment though so it will be a little while before I get to really dive into this project.

Thanks a ton for all the help, Wayne!

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Wed, 21 Jul 2010 03:20:21 GMT
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Very good. Keep us posted on your progress!

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Fri, 30 Jul 2010 00:17:44 GMT
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Bad news. I got my speakers today and read on the back that they are 4648a-8's and not 4648a's which means I have six 16ohm drivers instead of six 8ohm drivers like I had thought I ordered.

Now what do I do, Wayne? I want to tear my hair out.

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Fri, 30 Jul 2010 01:03:36 GMT
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Calculating the values for the woofer circuit is easier than it is for the tweeter circuit, because the tweeter circuit has the added complexity of R1/R2 proportions. The tweeter circuit has to balance not only voltage sensitivity matching but also filter Q and the conjugation of mass rolloff. We've

circuit can be.

Basically, for the woofer circuit, you can just double the inductance and resiatnce values and

tweeter circuit (R1/R2) values 3dB lower than you would when using a 2226H woofer.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Fri, 30 Jul 2010 01:23:05 GMT
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So it looks like I can't just order your crossover anymore. I'll have to build one myself, if that's correct?

Man... what a bummer.

EDIT: Could I instead of making a 2.5 4pi make it a MTM 4pi with the 2226J's in parallel?

Subject: Re: Pi 4.5 possible?
Posted by Wayne Parham on Fri, 30 Jul 2010 05:33:37 GMT
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The more you deviate, the less I can say with certainty how it will act. You can do an MTM, I'm sure, but it's a different animal. The MTM approach has the same goals, but the distance between midwoofers of this size seems prohibitively large to me. At any rate, you'll have to do the analysis and design work to know what you have.

As for the crossover, yes, you'll have to build it yourself. We sell the unpopulated PCB and you can solder the parts on it.

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Fri, 30 Jul 2010 17:05:43 GMT
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You do also sell them assembled as well, yeah?

Posted by Wayne Parham on Fri, 30 Jul 2010 18:09:25 GMT
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We sell complete crossovers in a variety of options:

Subject: Re: Pi 4.5 possible?
Posted by Infrasonic on Fri, 30 Jul 2010 21:42:40 GMT
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Cool. To be honest, I want to nip this thing in the bud and get things finalized. I really just want to order your crossover for my project instead of building one or going active.

I am thinking of trying this out as an MTM with your crossover. It's a lil' different and sounds interesting. I know you haven't tested this out fully but do you think there is any reason why it would sound bad and unlistenable? For me going this way is the best solution, I think.

I'd like to add..

I really appreciate all the assitance you have provided to me, Wayne. I also appreciate the patience you show us. I know there are many of us that come around asking all sorts of questions and expect you to know it all. You're doing a great service to the community. Thank you.

Subject: Re: Pi 4.5 possible?

Posted by Wayne Parham on Fri, 30 Jul 2010 23:29:00 GMT
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Personally, I think the 2.5-way will probably work better than an MTM for a loudspeaker like this. Remember that the "M" in "MTM" stands for midrange, and it is best done with small drivers, keeping the driver spacing tight. You can understand how a 1" dome tweeter flanked by a couple 6" midranges can all be packed into a foot or 15" of vertical spacing. With crossover in the right frequency range, the vertical nulls can be pretty far apart. That's the goal.

If your midwoofers are large, they can't possibly be clustered close together. A couple 12" or 15" midwoofers can't be less than a foot apart, even without the tweeter. Then add to that the height of the horn, and you have a lot of vertical spacing. I just don't see that working well. Better to go with the DI-matched two-way approach, or maybe a 2.5-way with the bottom woofer crossed-in around the Schroeder frequency.