Subject: Pi 3 or 4?
Posted by BFP on Tue, 10 Dec 2013 17:15:52 GMT
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Hi again Wayne. This is probably a common question.

I have been considering the Pi 4. However, the price and availability of JBL2226 woofers in Canada is giving me second thoughts.
I'm wondering if the Pi3 would be a better fit. I can get the 4012 woofers in Canada at a reasonable cost, so parts wise it would be easier and less expensive. My room is about 12.5 x 20 so I don't really need the extra output of the 4. The sensitivity is lower but the response looks like it extends a little further in the bass. Are there any big differences in the 2 models that I'm not seeing? Could you send me the 3Pi plans so I can take a closer look.

Thanks again
Brian

Subject: Re: Pi 3 or 4?
Posted by Wayne Parham on Tue, 10 Dec 2013 18:17:01 GMT
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It is a pretty common question, you're right. And my answer is always that what you're really doing is choosing the midwoofer family more than anything else. Thes two speakers have very similar spectral balance. They are very much alike. This is even more true between the upgraded

rolls off in the lower midbass. I prefer the speakers when used with flanking subs, both for extension and for smoothing. Flanking subs mitigate the self-interference anomalies from reflections from the nearest boundaries, the wall behind the speakers being the most troublesome. Flanking subs also provide additional bass extension.

But that doesn't answer your question about differences. Measurements show little differences, really. There are some minor response differences, but overall, response is similar, that gentle

speaker has slightly lower distortion at the lowest frequencies.

All in all, I think the biggest difference is probably the efficiency though. The speakers sound very much the same, both offer the same uniform directivity, the same pristine wavefront launch from the same waveguide/horn, both have a slightly overdamped alignment that is immune to

parameter shifts and has gradual rolloff. So they're very similar in most aspects, with just a slight difference in efficiency between the two models.

Subject: Re: Pi 3 or 4?
Posted by BFP on Tue, 10 Dec 2013 21:19:21 GMT
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Thanks Wayne. I'll make the decision on 3/4 when I get a look at the 3 Pi plans. The cabinet is actually a bit larger and I'm sure there are some differences in the xover.

Brian

Subject: Re: Pi 3 or 4?
Posted by BFP on Thu, 12 Dec 2013 16:30:07 GMT
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Thanks for the plans Wayne. One thing I notice is that the port is quite small on the 3 pi. Is there an issue with compression due to the small size? It looks like the alignment is EBS like with a lower than typical tuning. Does this help keep port velocities low?
  Given the tuning frequency it would be difficult to make the port much bigger without running into port length issue.

Subject: Re: Pi 3 or 4?
Posted by Wayne Parham on Thu, 12 Dec 2013 17:20:41 GMT
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It is an EBS alignment essentially. And port airspeed is not an issue. The displacement is rather limited because this isn't a subwoofer, and its limited excursion keeps IMD low as as well.

Subject: Re: Pi 3 or 4?
Posted by BFP on Sun, 15 Dec 2013 22:19:06 GMT
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Thanks for the info. Wayne. 3 Pi it is then. I've ordered the horn flares from your site and have the

parts for the crossover. I'm starting to plan the box construction. I have a couple of nice plastic flared ports that are 2-5/8" diameter and are long enough to cut down to the correct length. I'll start the boxes sometime early in the new year and intend to document the build here.

Subject: Re: Pi 3 or 4?
Posted by Wayne Parham on Mon, 16 Dec 2013 05:54:31 GMT
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Excellent. Please do keep us posted with your build progress. Threads with pics are always most popular!

Subject: Re: Pi 3 or 4?
Posted by BFP on Thu, 09 Jan 2014 16:06:25 GMT
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I have almost all the parts for my PI 3 build including the PI 290 horn flares from Wayne and DE 250/ 4012HO drivers which I sourced in Canada from the Eminence/B&C distributer.
I am still gathering up all the hardware and am having trouble finding #10 T nuts. I see that a 1/4 20 Allen head bolt will fit snugly into the bolt head recess on the 290 so could I enlarge the holes and use those? I'm still trying to round up the #10 stuff but HD who normally carries them is sold out.
I'll be starting a build thread soon!

Subject: Re: Pi 3 or 4?
Posted by Wayne Parham on Thu, 09 Jan 2014 16:40:43 GMT
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I really like the look of Allen head fasteners, especially those with a button (rounded) top. I almost always use those for my best builds.

As for T-Nuts, do be sure to get a good quality part. Some are better than others, and these T-Nuts will be in your speakers for a lifetime. They won't probably be opened and closed a lot, but still, we want those fasteners to last. You don't want to ever have to drill one out.

What I've done (several times) when testing a new fastener is to use a few sacrificial parts to see

how they hold up. I wish I could just count on one brand being always available, but it seems like sometimes, vendors change suppliers and I have to inspect them again. So what I do is to get a handful of screws and a handful of nuts and I put them through several tighten/release cycles. What I'm essentially doing is testing their yield, seeing how they act when they go plastic. It's not what my mechanical engineering friends would call a good stress test, but it is good enough for me to see if the threads deform easily or not. Some brands of T-Nuts are definitely better than others; Some will take several cycles before deforming threads, others are like tighten-to-yield parts after a single cycle at a mere 15 foot pounds.

On a similar subject, when you install them in your cabinets - which is hopefully a permanent installation - be sure to install them gently. The proceedure I use and suggest for you is in the link below.
T-Nut Installation Tips

Subject: Re: Pi 3 or 4?
Posted by BFP on Fri, 10 Jan 2014 16:30:07 GMT
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Thanks for the tips on T nuts. I agree that they require some special care during installation. I've used them in the past and had no issues with them coming out. I use a different method of installation that you do. The T nuts I use come from Lee Valley in the 1/4 and 3/8" sizes. I normally use the largest size I can to get more strength. I will use 1/4" for the woofer mount. I use 3/8" only for spikes or foot installation.

To install them what I have done in the past is this. I drill the body hole as recommended. I then put the nut in position and give it a little tap to make marks where the prongs will go. I then pre drill small pilot holes for the prongs. This keeps the prongs from bending. I then use a drill press with a piece of 5/8" round in the chuck and press them into the wood. You could also use a bolt to pull them in. I apply some Weldbond or PL Premium to the barrel of the nut and the prongs. This method seems to work well and doesn't put a lot of stress on the threads or the nut itself. Baltic Birch is a hard material for installing T Nuts. The pilot holes help ease the installation considerably. In MDF the pilot holes prevent the MDF from swelling around the prongs.

I haven't had any trouble with rotation when using this method. You need to make sure you don't over torque them as the thin wall of the nut isn't as robust as a regular grade 5 nut would be.

Subject: Re: Pi 3 or 4?
Posted by Wayne Parham on Fri, 10 Jan 2014 17:26:55 GMT
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That sounds like an excellent method to me.

Subject: Re: Pi 3 or 4?
Posted by BFP on Sat, 11 Jan 2014 02:15:34 GMT
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It is a bit time consuming but I like to make a sturdy cabinet and the T nuts are just a better way to attach the drivers. I bent a few of those prongs when I first started using them and developed this method of installation to deal with that problem.

For those who are near a Lee Valley Tools store they have the 1/4 and larger T nuts in bags of 100 for a good price. They also have a variety of types from ones with no prongs all the way to a 6 prong model. The different styles are for different wood types. I usually get the 4 prong style.