Subject: Four Pi Frequency Response
Posted by timhowell01 on Sun, 08 Mar 2015 03:38:49 GMT
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I finished building a pair of Four Pis last weekend. I've only got a couple of hours time listening to them, but I'm a little underwhelmed with the sound at this point. They sound a little muddy and the bass response isn't as good as I expected. I've attached a graph showing a measurement with FuzzMeasure (admittedly using the built-in microphone in my laptop).

Does this look right? It looks to me like the lower frequency drop off is steeper than expected. I purchased my JBL 2226Hs used. Maybe they need to be reconed? Anything else that might be causing this?

I'd definitely appreciate any advice.

--TWH

File Attachments
1) Four Pi Frequency.png, downloaded 4220 times

Subject: Re: Four Pi Frequency Response
Posted by Wayne Parham on Sun, 08 Mar 2015 04:11:02 GMT
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That looks good until you get down below 150Hz or so. What you're seeing is definitely less bass than normal. These kinds of (high-efficiency) speakers don't have the deepest bass response and are generally better with subs, but they have more output than that.

It could be that your microphone is responsible for the rolloff. It isn't a calibrated microphone, and so that might be what's causing it. Or it could be the environment or a combination of the two. But if that's the true measurement, then bass response is lacking and something is amiss.

To be honest, I usually see problems in the upper midrange when there's a qualitative problem with the cone. Cheap recones usually show up as having reduced output above 800Hz, which makes a hole in response. Since I'm not seeing that, I think the drivers are OK, but it's hard to say for sure. The bass output on your speaker is definitely not measuring right.

Subject: Re: Four Pi Frequency Response
Posted by timhowell01 on Sun, 08 Mar 2015 04:17:14 GMT

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I'll try another measurement tomorrow with a different microphone (still not calibrated, but may give a better result) and see what that shows.

Could there be a problem with the cabinet causing the rolloff? The only thing I can think of is that I didn't use gaskets around the woofer and the waveguide, but I think they're pretty well sealed even so. If they're not, would that be sufficient to explain the drop off?

I built the crossovers myself, but I quadruple checked them, so I don't think that is the problem.

--TWH

Subject: Re: Four Pi Frequency
Posted by timhowell01 on Sun, 08 Mar 2015 06:06:37 GMT
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I made another measurement tonight using a USB microphone. How does this look? Are they measuring correctly now?

--TWH

File Attachments
1) Four Pi Frequency Response w USB Mic.png, downloaded 3984 times

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Subject: Re: Four Pi Frequency Response
Posted by Wayne Parham on Sun, 08 Mar 2015 15:42:04 GMT
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That looks like a measurement made indoors. We're seeing room modes and self-interference. The dips around 100Hz to 150Hz look like self-interference from the nearest boundary, which are precisely what flanking subs correct.

You'll notice your first measurement shows this dip too, which was probably also an indoor measurement. But in your first measurement, the microphone rolls off heavily under 100Hz, so we don't see any output below the notches. It looks like sharp rolloff below 150Hz but that's just because you can't see the output below the 100-150Hz self-interference notches.

I'd say the speakers are fine, and probably what you want to do is to add flanking subs to mitigate the self-interference anomaly. It's pretty normal, and all speakers suffer from that because it's a room issue, not a loudspeaker issue.

Subject: Re: Four Pi Frequency Response
Posted by jshupe on Thu, 12 Mar 2015 02:04:42 GMT
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I wouldn't know anything about muddy, as mine are crystal clear, but when I first built mine I was worried about the bass response being abnormal. They didn't produce the "oomph" I expected, but I added a pair of 3pi subs to the mix and haven't looked back.

Subject: Re: Four Pi Frequency Response
Posted by timhowell01 on Thu, 12 Mar 2015 05:39:24 GMT
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I'm actually finding that the more I listen to them the more I like them. I also prefer them with a SET amp than with the tube PP amp I had driving them initially.

I'm going to need to look into building some Three Pi subs now...