Subject: SevenPi Room Layout
Posted by dheflin44 on Mon, 24 Jun 2013 13:06:04 GMT
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Hi Wayne,

Thanks for the 7PI plans. I didn't want to keep cluttering up the Helper Woofer thread with more 7PI stuff, so I started a new one.

Here's what I ended up with for the room layout with the 7PIs. I think the scale is pretty close.

As you can see the screen blockage is pretty minimal and should only affect the seats on the right side of the room. I am a little worried about the desk on the left side though. It's only about 4' from the corner and is nearly 2' deep. I don't know if it's a problem for high or low frequencies, but I could cover the side closest to the speaker with some thick cotton batting if it helps.

I looked at the crossover diagram, and it seems like a very simple and elegant design. I'm surprised there's not even a high-pass needed for the mid-horn. Does the 2226H on the 7PI need the zobel?

Another thing that's helping me lean towards the 7PI is an idea I posted a couple of months back for changing its physical appearance slightly. This doctored photo shows where filler wings would be added (in black) to the sides of the bass bin.

The wings would consist of a simple L-shaped wood frame wrapped in fabric. It would fill-in underneath the front of the mid-horn and also extend down the sides of the mid-horn until the first 45deg corner. This change probably makes the 7PI look more like an 8PI which some may not like, but I like a more conventional look which also helps with WAF.

Thanks,
Darrell

File Attachments
1) Darrell_HT_room_layout.jpg, downloaded 4831 times
2) Cornerhorn_extension.jpg, downloaded 4716 times

Subject: Re: SevenPi Room Layout
Posted by Wayne Parham on Mon, 24 Jun 2013 13:28:48 GMT
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The room layout looks good. The desk won't hurt, at least not at bass frequencies. It will have more impact at higher frequencies, being a reflective surface. Not sure how much impact it will have, but I know it would be the same for any speaker you put in that same general area.

Zobels are really only needed when the crossover is second-order or higher. When the crossover is just a simple coil, there is no peaking, even without a Zobel. of course, the slope is still modified, which is why I call them pseudo-first-order filters, if no Zobel is used.
Speaker motors and passive crossover filters

Subject: Re: SevenPi Room Layout
Posted by petew on Mon, 24 Jun 2013 16:56:28 GMT
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with black grill cloth.

I love the wood horn. I wonder how hard it would be to build those.

Wayne, is the profile exactly the same as your plastic horn? I'd consider purchasing a plastic horn to use as a template in building wood horns if the profiles are exactly the same. I envision some sort of router template where the horn could be rough cut on the band saw and refined with the router and sandpaper.

Subject: Re: SevenPi Room Layout
Posted by Wayne Parham on Mon, 24 Jun 2013 17:49:13 GMT
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The wood horn/waveguide has the same flare profile most the way, but there is additional roundover at the mouth, since it was designed to be cradle mounted. This makes the vertical profile almost like a tractrix flare.

Subject: Re: SevenPi Room Layout
Posted by Michaelzh on Mon, 24 Jun 2013 22:11:34 GMT
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If only for the look, use black grill on the visible sides and two parts on the front to keep the corner horn flare.

Subject: Re: SevenPi Room Layout
Posted by dheflin44 on Tue, 25 Jun 2013 02:22:29 GMT

Wayne,

Have you had a chance to do any extended listening with the Definimax version of the 6PIs? I do a fair amount of low volume listening and I'm a little worried about running the 2226Hs without flanking subs. I've read several places that their low-end disappears at low levels. Also don't the 6PIs go lower in general?

Can I get the 6PI plans?

Thanks,
Darrell

Subject: Differences between woofers
Posted by Wayne Parham on Tue, 25 Jun 2013 05:17:14 GMT

probably five hours each weekend with them. So I'm starting to get a pretty good feel for them.

experience with them.

As for the reduction of bass amplitude at flea-power levels, let me be candid. But first, let me be clinical. Measurements confirm that very low power levels (like 1/10th watt) leave the system more overdamped than it is at higher power levels. So there is a measurable shift. That's the clinical part.

But let me be clear - This is the candid part - The alignment shift is a designed trait. It isn't an unintended consequence. It's an understood, designed feature that I don't even consider a compromise. The last thing I want is for a speaker to shift into an underdamped condition, so I always design all my loudspeakers this way. If they are able to handle a lot of power, then they are overdamped at low power levels because all speakers will shift towards less damping as power increases.

I'd rather have smooth rolloff characteristic of an overdamped alignment than an underdamped peak. So all my designs are overdamped at low power levels, and they shift away from this condition as power is increased, but never enough to create a peak. That's why they have less bass at flea-power levels, in order to make sure they don't start getting thrummy at moderate power levels. And yet, even at low levels, they don't sound like they lack bass.

You heard them in Dallas. Did you think they lacked bass? We rarely reached power levels of even one watt, so they were always in that flea-power mode. I think we turned the subs off while you were there at some point, didn't we? Many people ask for that, and most everyone is surprised that they almost cannot tell the difference. The subs are there for smoothing as much or

more than they're there for extension. They're barely audible, just there for subtle fill.

apartment in Arkansas right now. I am running a little bitty tube amp. And I don't have subs. They have plenty of bass, even at less than a watt. I'd like to have subs for modal smoothing, but it's not like I miss them. The speakers sound great without them. I'd have smoother response around ~120Hz with flanking subs, and I'd have smoother response around 60Hz with distributed multisubs, but unless I throttled the subs strictly and kept the volume way down, I'd most likely

speakers sound great and have plenty of bass, even at really low volume levels.

So don't get too analytical about the low power damping and the shift to high power levels. You can easily offset this with a "loudness contour" if you want to. I don't even bother with that, it sounds great without any tone controls or loudness countour even at 1/10th watt. Don't make too much about the alignment shift from flea power to moderate power.

Now to get even more candid. There are some people that talk about drivers with light cones, a decidedly 1950s thought process. I remember having this argument on messageboards about ten years ago, mostly in respect to horn loading but it was still the same basic argument. And it was decidedly smashed, old thinking, wrong thinking. When we talk about mass, we must also talk about motor strength or we aren't seeing the whole picture. Who cares whether we double from 20 grams to 40 grams, if we have a motor with ten times the power?

And then there is an even more important aspect, which is how the cone flexes, its rigidity and its internal damping. You are much better served with a cone that has enough internal damping to damp flex modes than a light rigid cone. Light and rigid is exactly the worst thing to do for a midwoofer. It ensures huge breakup modes, making it completely unusable as a midwoofer. So its not surprising that the boutique woofers with cones like that aren't documented with response charts. Because you'd see 10-15dB dips, and even with smoothing, they'd still show up as having at least 5dB valleys. Not good.

So as far as low-level detail is concerned, my preference has always been for drivers with cones / diaphragms that have a good amount of internal damping. I also prefer that the motor structure use some mechanism for flux stabilization. Both of these techniques are slightly lossy, in that they require some energy be removed from the system to do their job. Just like a shock absorber removes energy from the bouncing suspension springs. Without damping, you have uncontrolled resonance, and that is not good for low-level detail, in any way, shape or form.

I hope I've made myself clear without being too over the top. You'll be pleased with the

evaluation using tough hi-res measurement systems. They sound great and they measure great too, even when measured using a high-resolution system that is brutal and exposes every nook and cranny. There are a lot of other designers that wax on poetically about the musical nuances in their design choices using boutique low-production drivers, but I promise you don't want to measure them. It's an Emperors New Clothes thing.

I'm not saying there aren't other good designs out there - there are, obviously. But I am saying

that I don't think you should overthink the alignment shift, nor do I think you should consider the "light mass" arguments some have proffered around the internet. They come and go. And they're wrong. So don't be swayed by minutia, and understand the reasons for these design choices. A well-damped cone in a cabinet that provides a slightly overdamped alignment provides the smoothest and best response in all conditions.

Subject: Re: SevenPi Room Layout
Posted by dheflin44 on Wed, 26 Jun 2013 00:56:35 GMT
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Wayne,
Thanks for addressing my concerns. I'm going to stay with the 7PIs.

petew,
I forgot to point out the side wings need to be as acoustically transparent as possible. Wayne designed the bass bin with a narrow waist to allow enough sound from the woofer's upper range to get around to the front and blend with the mid-horns. My wings will be made from an open wood frame wrapped in acoustically transparent fabric. Also if you're interested in the wooden upper waveguide shown in the pic, Wayne sells it here.
