Subject: Svelte 3pi
Posted by go94022 on Tue, 30 Sep 2014 04:19:11 GMT
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Hi Wayne,
Been thinking about this for a long time, so apologies if the post gets over-long. Posting this to gather ideas from you and others in this forum, and also hope to get a copy of the 3pi plans/crossover as a starting point.

I would to like to build a narrow (and smaller) 3pi tower. Also thinking about making a shallow enclosure with the front of the box slanted, toed-in. In a dual purpose HT setup, the front speakers are typically near the front-wall alongside the screen. Shallow box means the drivers can be closer to the front wall and push front-wall comb filtering above the midrange. No BSC would be needed for this placement, do your crossovers include it?

There were Carlsson speakers that were mounted at an angle adjacent to the front wall to approach 2pi-space loading.
http://www.carlssonplanet.com/downloads_old/uploads/carlsson_ortho.pdf

Willing to trade some efficiency and extension for a smaller box. The SEOS-12 kits are about 2 cu. ft., while the 4pi is almost 3 cu. ft. and the 3pi is almost 4 cu. ft. The SEOS-12 Alpha kit (no longer offered) used the same Eminence Definimax 4012HO in a 2 cu. ft. box.

My svelte version could be a box about 10" deep on average (slanted), 13" wide, and 36" tall. The slant could be 6" on the inner side and 14" on the outer side, about 30 deg. toe-in built-in.

The pipe modes along the long dimension are a big concern. And with a shallow cabinet, the front-to-back modes will be higher frequency and maybe leak through the cone. Any thoughts on how to mitigate bad resonances would be appreciated. Maybe a slanted, preforated resistance panel could divide the interior into 2 long triangular prisms?

Assuming near or against front-wall placement, and assuming a vented cabinet, the port needs to be at the front or side (not rear). Near the bottom will enhance floor boundary reinforcement. Is a slot at the bottom of the cabinet for a port a bad idea?

So why do this when the shape/size and port placement of the 3pi is all worked out? Partially room layout and partially WAF - unfortunately the 3pi box is just too bulky and intrusive.

Some wilder ideas - a typical 2-way CD design sees a fairly rapid loss of directivity below crossover. A more radical approach would be to create a cardioid resistance box and push the woofer directivity an octave (or more) lower. Some very solid results from Kimmo Saunisto.
http://kimmosaunisto.net/KS-1804/KS-1804mk2.html

Kimmo's design does cardioid bass, and needs significant equalization and power to make that fly. It would be interesting to get cardioid behavior only to just above Schroeder, say 300-400Hz. Maybe smaller resistance panels? Below that, let the speaker go omni and work like a standard sealed/vented enclosure. Though enclosure Q will be hurt with resistance panels.

I saw the thread on H290C vs. SEOS-12 and understand the concerns you have about the depth of the WG and HOMs. The PE PH612 JBL PT clone is ~1" deeper than the SEOS-12 at 4.4". The PE clone of the QSC HPR152i is 5.5" deep. I don't see dimensions for the H290C on the Web site, but the Eminence H290B is 5.9" deep, assume the H290C similar? At any rate, is the PH612 still too short to keep HOMs at bay? The QSC clone may be similar to the H290C in depth, but it is physically quite large. So it seems the H290C still wins.

Not directly related to these project ideas, but was wondering that the 4pi has a bigger driver, so for directivity matching the crossover frequency should be lower based on sqrt(Sd). Yet a lower crossover frequency for a 1" CD would work against the higher headroom of the 15 in. driver in the 4pi. So how does the xover frequency compare for 3pi vs. 4pi?

Finally, I realize that Pi Speakers is both a business and a labor of love. If you feel that any of this would not be appropriate to discuss in public, that is fine. I am nonetheless very glad there is so much material available from you.

And so, would love to get a copy of the DE250 version of the 3pi crossover with Definimax and Delta 12LF as options. Leaning towards the Definimax, but not sure the price/performance is there. From everything I have seen, though, the DE250 is a great driver and worth the upgrade.

Thanks, Glen