Subject: Slot loaded woofers
Posted by Bellini on Fri, 16 Oct 2009 06:56:44 GMT
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I am working on a three way design to be used with subs for band PA purposes. I want the box to be as compact as possible. Each cabinet will contain 2x Eminence Kappalite 3015 woofers, 2x Eminence Delta pro 8B Midrange drivers, and a 1 inch compression driver on a small 60x40 horn. My desired crossover frequencies are: 400Hz between the lows and mids, and 3KHz between the mids and the highs. The enclosure will be vented, and I will need it to play down to just 70Hz. I realized that I could make the cabinet fairly short and narrow by slot loading the woofers. I would use two slots, one at the top, and the other at the bottom of the cabinet, similar to what Renkus-Heinz did with some of the cabinets in the CT line.
http://www.renkus-heinz.com/loudspeakers/series/Legacy_Loudspeakers/ct_install/images/hi_res/ct7215_photo.jpg

Does anyone see any possible problems with this arrangement for the woofers that would make it not worth trying?

Thanks,
Bellini

Subject: Re: Slot loaded woofers
Posted by Wayne Parham on Sat, 17 Oct 2009 01:25:58 GMT
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Will you be running push-pull drive to reduce distortion? I would, if you can get it to fit right, because I think it's one of the best ways to reduce distortion at VLF frequencies. Of course, the distance of the slots may reduce the frequency where the distortion cancellation takes place, making it less effective at higher frequencies. But I certainly think it's worth doing. This is one of those things that measurements would tell the tale best.

Subject: Re: Slot loaded woofers
Posted by Bellini on Sat, 17 Oct 2009 04:12:03 GMT
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Actually, I was thinking about doing a push-pull setup to help reduce distortion. I am looking at 20 inches between the slots. I think the slots are still close enough where I can reap some of the benefits of push-pull loading. I'm excited about the design because it should be able to generate hefty output from a moderate sized box.

Subject: Re: Slot loaded woofers
Posted by Wayne Parham on Sat, 17 Oct 2009 04:41:58 GMT
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I agree with you. I built a push-pull hornsub and the summing is in the throat, so very close acoustically. Naturally the reduction of distortion is excellent in this configuration.

I considered also building a smaller version of the same horn, basically 1/2 of the push-pull model. My thought was to make two versions, one with the throat driven by the cone face and another with the throat driven by the cone back. Each would have identical front chamber volumes, rear chamber volumes and flare. By stacking the mouths together, it would also be push-pull, but coupled at the mouth, which is acoustically distant through most of the passband.

I would expect distortion reduction to possibly be as good at the lowest frequencies, but maybe not as good as frequency went up. My expectation is there would be some degradation of performance but the advantage in the trade is it would make a smaller package, easier to move around. I really would like to know how much difference there is, so one of these days, I'll probably get around to building it. But the hornsub I did already was a very ambitious project with a lot of R&D over a long period of time. It's not a trivial design, certainly not a weekend project.