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Subject: Discussion on waveguides / horns

Posted by [Maxjr](#) on Fri, 09 Sep 2011 20:11:32 GMT

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Wayne, with the new SEOS-15 (super elliptical oblate spheroid) waveguide coming out, can you describe how it will differ from the current H290 that you currently utilize in the 3 & 4PI?

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Subject: Re: Discussion on waveguides / horns

Posted by [Wayne Parham](#) on Fri, 09 Sep 2011 22:24:15 GMT

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I've asked them to send me a couple of them to work with. I like what they've done, looks like a great horn. But it's certainly not just a bolt-on swap, to be sure. You can design a horn to be that way, but it's not necessarily going to be a drop-in replacement, and in fact, I expect some crossover changes and maybe even cabinet changes will be required. So it's definitely not something that will happen overnight.

Also remember that the H290 does pretty much everything I want it to do. It's sort of a happy accident, I think. I'm not sure the folks at Eminence were really trying to make a horn with nearly constant horizontal directivity, but that's what this horn gives. It has some curvature in the side flares, but it functions a lot like the last opening in a CD horn, but with a graceful curve. So that's really pretty sweet.

I made my wood tweeter horn to be a statement part. It looks great and has the an oblate spheroidal flare profile, just like what the SEOS-15 is reported to have. So I expect the two horns to be very much the same, at least in the horizontal. In the vertical, I went with OS in the throat, but transition to more of a LeCleach flare profile at the mouth. This was done to ensure that the top and bottom edge don't cause an abrupt transition, but rather a gradual and graceful expansion of the pattern in the vertical as frequency drops. This makes it easier to work with. All this and I wanted it to be a horn that I could interchange with the H290. I would be so lucky if the SEOS horn could hit those same goals, or close. Time will tell.

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Subject: Re: Discussion on waveguides / horns

Posted by [Maxjr](#) on Fri, 09 Sep 2011 23:03:03 GMT

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You are full of so much knowledge. Thanks for that response. Do you foresee the SEOS-15 as a possible replacement / alternate to the H290 the future after testing? And, if so, what would be the longest lead time to a new design implementation?

The reason for these questions is that I am currently gathering parts for your awesome 4Pis and am trying to make decisions on the future build. Most of me is tending towards building them with the current cabinet, crossover, and horn and enjoy them. A small part of me is wondering if the SEOS-15 proves to be a great horn, will I be rebuilding everything in 6 months?

However, maybe that will be good as I'll be able to listen to them both. The only wasted components would be the H290 horn and time&materials to build the old cab.

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Subject: Re: Discussion on waveguides / horns

Posted by [Wayne Parham](#) on Sat, 10 Sep 2011 03:33:01 GMT

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I wouldn't wait. The H290 isn't lacking anything in this design.

I will definitely give the SEOS horns a proper evaluation but I won't be changing the line for at least two years, even if I should choose to do so. I can't see prioritizing this over other projects and more pressing matters, there's just no need. I think the SEOS horns are excellent, but they can't offer much advantage over what I am using now for this application, because there are no weaknesses in my current models that need to be addressed. My current speakers' measurements are impressive and they sound great.

I consider the fully upgraded models of my speakers to be the best implementation of a horn/waveguide loudspeaker on the market today, commercial or DIY. Whether they are the matched-directivity two-way speakers with flanking subs or the constant directivity cornerhorns, they are able to do everything I want in a speaker, without any compromises.

Changes at this point are mostly just to say "I have something new." The truth is, there isn't anything new about this kind of design. I've been building them this way for decades. The whole waveguide fad is something I've been doing since the 1980s. There have been incremental improvements in drivers over the past three decades, mostly thermal handling and flux control. The computer modeling and acoustic measurement systems have become better and cheaper, giving more visibility and allowing incremental improvements in crossover design. But the truth is, if you look at my crossover documents and Spice models through the years, or if you examine speakers I've made in the 1980s, 1990s and 2000s, you'll see nearly identical crossovers in cabinets that have the same configurations as they do now.

My speakers haven't changed much over the years. They do everything I want them to do. I've been doing this for a long time, and I haven't seen anything that made me say, "Eureka, that's what I've been missing!" There's nothing to chase, these speakers have been doing it right all along. So there's not really any point in waiting for the "next best thing." It's what we've been doing here the whole time.

High-Fidelity Uniform-Directivity Loudspeakers

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