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Subject: Re: Svelte 3pi

Posted by [Wayne Parham](#) on Tue, 30 Sep 2014 16:13:31 GMT

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You are focused on the right things.

One main thing you have to watch out for in these larger full-range cabinets with midwoofers run high is the internal standing wave modes. You can't put a sound source where a pressure node lies or it will manifest as a nasty blip in the response curve. And it sounds even worse than it looks on a response chart - They seem to always make the speaker sound really hollow or nasal. So driver and port placement are important, as is the position of the damping material. A sheet of insulation that spans the cross-section often works wonders.

Also important is the size and shape of the waveguide. Not just for directivity but also for acoustic loading. Seems the quest towards improved directivity sometimes leaves acoustic loading in the dust. A waveguide isn't going to provide as good loading as an exponential horn, but it doesn't have to be bad either. The best waveguides balance these two competing priorities, and provide both uniform directivity and adequate acoustic load. They can be made to have smooth response without notch filters, as is evidenced by the performance of the H290C waveguide.

And of course, the crossover is the heart of the speaker, and ties it all together. The DI-matched two-way approach is a good staple design, in my opinion. It allows uniform directivity in a convenient package. I think it's best used with flanking subs though, which mitigate the anomalies caused by reflections from the nearest boundaries and vertical modes. Sometimes, one or two more distant distributed mutisubs also help, by smoothing lower frequency room modes.

and more is discussed in detail there.