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Subject: Questions on some mid horn alternatives...  
Posted by [Greggo](#) on Sun, 19 Sep 2004 11:34:50 GMT  
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I notice that many posters here are liking the idea of a cone driven mid horn but concerned about upper end response. Would the Fostex FE168E Sigma be a candidate here? I know it is not a "pro" driver but it seems to have good sensitivity (94dB) and range 4-8 khz being the first point that things start to look a bit funky on the response graph. I have been wondering about this driver and something like the Visaton TL16H tweeter as a nice combo to put on a cornerhorn system and possibly get some very good performance for the money (both the 6" mid and the tweeter can be had for a total of \$320 per channel). Does this direction show any promise on paper, or have there already been good points discussed in supporting the JBL 10" mid as a much superior option??? Would love to hear your thoughts...

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Subject: Re: Questions on some mid horn alternatives...  
Posted by [Wayne Parham](#) on Sun, 19 Sep 2004 19:17:57 GMT  
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Sounds like a great idea. Adrian Mack did something like this, making a smaller horn for a 6" driver. I think he used the Eminence Alpha 6, but there are no doubt other suitable drivers. Fostex seems a likely high quality candidate. Personally, my goal was to have a midrange horn that could crossover very low, so to cover the entire midrange band. The note C below middle C is 130Hz, so you can easily see that male voice has a lot of energy in this range. Wavelengths are long at this frequency too, so spacing and overlap are not nearly as critical. I felt I could use a larger horn and crossover lower with a shallow first-order slope for a seamless transition down low and keep all the vocals and midrange in one driver. With a 1.6kHz upper crossover frequency, I didn't really need to reach very high with the midrange horn. That's where I spent most of my time, working on the aspects of the subsystem at this frequency. I am pleased with the transition between mid and tweeter horns, truly the most critical part. But anyway, I think it would also make sense to use a smaller midrange and push the crossover points up an octave or so. You could probably get a smaller 6" driver to go up to 3kHz, and maybe even further with a phase plug. That would then allow other choices for tweeters, so the idea certainly has merit in my opinion.

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Subject: Re: Questions on some mid horn alternatives...  
Posted by [Adrian Mack](#) on Mon, 20 Sep 2004 01:16:34 GMT  
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Hi Greggo noticed you say 'others are concerned about upper end response' - are you actually concerned with top end response yourself? What frequency did you want the crossover at for the upper end? As Wayne mentioned, I did a smaller conical midrange horn for the Alpha 6 with

internal mouth dimensions 38.5cm\*28.5cm (width\*height). The upper -3db point is 2KHz. My design efforts were targeted for a 300Hz low-end cutoff and a top end cutoff around 1.6KHz or 2KHz, with steep acoustic rolloff at both ends. Generally choose smaller drivers with low cone mass and low inductance if you want it to go high. Graham (Centauri Audio) also built midrange horns with the Alpha 6 and got them going to about 2.5KHz without a phase plug. With a phase plug he made himself, I think he got it going close to 4KHz at the top end - a substantial increase. The horn itself is going to be the other factor determining upper end response. Smaller throats will load to a higher frequency so potentially higher cutoff. Phase cancellations in the front chamber (ie: path length differentials from different locations of the cone to the throat cancelling each other out) become the major factor which will stop you from getting as high as you should, unless you use a carefully designed phase plug. Without a phase plug though, you'll likely find a slightly larger throat than suggested by computer will work out best in reality rather than a smaller throat, as phase cancellations from path length differences are reduced, extending your top end range. A phase plug will also reduce the volume of your front chamber, raising the point where the front chamber (acts as a lowpass filter) starts to rolloff the high frequencies. Once the driver starts to enter breakup modes, on-axis HF response may be quite extended but off-axis will be poor. Various horn flares can also extend on-axis HF response (eg: radial horn with very narrow vertical dispersion) at the expense of off-axis response. Adrian  
My Audio DIY Homepage - Horns, subwoofers, spreadsheets, plans, more

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Subject: Thanks for the feedback...

Posted by [Greggo](#) on Mon, 20 Sep 2004 02:17:45 GMT

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Thank you very much for the comments, it is much appreciated. Yes, I am thinking that I would like a cone driven mid horn to cover roughly 250Hz to 4kHz because I would like to keep the crossover out of the 300-3k range as much as possible. Given my lack of expertise, I am sure that my pipe dreams are far exceeding the reality of a second project, but we all have to dream. I know that many speakers can be designed completely counter to these ideas and end up smoking anything I build because the designer really knows how to build a good sounding speaker. But until I get there, here is what I have for a "speaker philosophy" if you will based on some crude experimentation with a couple of projects and mostly reading and thinking from the net: 15-30Hz is awesome if done right, but better to go without than screw it up (and if I ever attempt this range it will be infinite baffle) 30-300Hz contains an awfull lot of musical energy and low distortion drivers pay big dividends here. Dipole is very attractive as is front horn loading so as to minimize the room effects that play havoc in the 50-200Hz range. Since most creative loading ideas for either seem to run into problems around 200 Hz (lab sub, phoenix woofer, etc...) it looks like around 250Hz is my take on the upper limit of a woofer system and the starting point of the midrange. 300hz-4kHz this is the mid for me, from my limited point of view, and again I am drawn to either open baffle dipoles or front horn loading, but I like the "jump factor" or "liveliness" of a high efficiency horn. Since many good tweeters and even some super-tweeters are finally more than comfortable at 4kHz and above, I would just look for a good value self-contained unit (driver & horn) and place it as correctly as possible and be done with it. I have stuggled through many issues, some in practice and most on paper concerning what kind of project I would be willing to invest the most of myself into and where I think I would be happiest with the results, and the pi

corner horns seem to be getting awfully close to where I personally would like to go...Oh well, nobody actually asked to hear all this crap from the likes of me, I guess I am just in the mood to do some typing....Regards,Greggo

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