Subject: Re: Constant directivity tweeter horns and waveguides
Posted by Wayne Parham on Thu, 03 Apr 2008 17:42:50 GMT
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You're right, the H290 transitions smoothly from the throat expanding to the mouth without a diffraction slot. I like this horn, but it does beam in the top octave. No way around it in a horn like this without a diffraction slot.

Remember that we're only talking about the top octave here. Below 10kHz, the horn sets the radiation pattern. But above that, the exit features of a 1" compression driver set the pattern. That's why the pattern narrows, and why on-axis SPL increases. It does so at the expense of off-axis energy, which falls off.

Earlier I said, "this abrupt beaming boosts on-axis sound in the top octave", which is true for all horns and waveguides that don't have a diffraction slot. It's usually so high in frequency that nobody really notices, it just gives a bit more "air." But it is definitely a measureable increase above 10kHz on-axis, and you can also see the absense off-axis. For that reason, most speakers having constant directivity without a diffraction slot in the tweeter sound better to me 10-20° off-axis than they do straight on.

If you're familiar with my crossover, there is an optional component C1a. A small value capacitor there can be used to decrease output in the top octave. Capacitor C1 bypasses the padding to increase HF output, but if you're using a compression driver/horn combo that becomes too strident in the top octave, you can install C1a.