Subject: Re: Horn lens and SPL
Posted by Wayne Parham on Mon, 26 Sep 2005 04:13:31 GMT
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There are a few things that determine on-axis SPL from a horn. One is the conversion efficiency of the driver, itself. Another is the amount of loading from the horn, how effectively it is matched with the driver and how well it matches the driver's acoustic impedance with that of the environment. And the other is the radiating angle, how much sound is focused or spread out.

A horn has changing directivity with respect to frequency, so that's an important consideration too. If directivity narrows considerably at high frequencies, then on-axis SPL will rise at high frequency because HF energy is more tightly focused. But off-axis tonal balance will be non-uniform as a result.

You can model a horn with a program like Hornresp to get an idea of its performance. It also has a feature that will allow you to include directivity in your model. It assumes the diaphragm moves as a rigid piston, so it cannot include the additional response generated by the driver when the cone enters breakup modes. But it is a very useful modeling tool, nonetheless.