Subject: Re: Efficiency of backhorns
Posted by DMoore on Thu, 17 Apr 2008 03:02:14 GMT
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Daniel Plach worked for Jensen in the 50's. Authored a famous paper in JAES covering horns, which is what I was referring to.The increase in bandwidth is due to less acoustic resistance being applied to the driver because typically the front of the cone is radiating into atmospheric pressure (the horn presents higher pressure to the rear of the driver than the front which is atmospheric). That also tends to reduce the overall efficiency of the horn/driver combination compared to a sealed back chamber typical of front-loaded horn.So the trade off is higher bandwidth with a lower efficiency, that is, what is gained in one aspect is lost to the other. It also follows that a higher amount of IM distortion may be present, too, due to driver excursion being less limited in the forward direction compared to the rear, but careful back chamber/throat area/reactance adjustments can provide some ability to balance that for lower distortion, within the imposed limitations, of course. The best method of balancing this would be a front-horn AND a back horn feeding from the same driver.Most of this is a moot point from what I see because like Martin said, most small footprint rear-loaded "horns" are not true LF horns but are more likely to act like a 1/4 wave transmission line at best or at worse, a somewhat wide-band resonating column. Peaky response at best, but covered up somewhat by the directly radiating driver output, hence their seeming popularity.DM