Subject: Really Front-Loaded
Posted by PointSource on Fri, 15 Sep 2006 03:24:45 GMT
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Has anyone here tried mounting a midbass driver from the front side of a (midbass) conical horn? That is, flush-mounting it on a baffle inside the horn, without a throat? I've seen a couple of designs like this, but I don't really know what the acoustic result would be. Examples: Meyer Sound MSL-4 (with optional phase plug removed); a questionable-looking old Peavey design with a stacked 2x10 format. The MSL-4 crossover point is fairly low at 800Hz, and I know nothing about the Peavey other than a visual reference.Any input is appreciated!

Subject: Re: Really Front-Loaded
Posted by GM on Fri, 15 Sep 2006 13:32:11 GMT
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Greets!Most of the ~fullrange driver or tweeter WGs I've built have been this way since I didn't want any real throat pressure. BTW, a horn's or WG's throat (St) is the small end regardless of how big it is in relation to the driver's effective piston area (Sd). It just means that the compression ratio (CR) is < 1.0 when Sd is < St, so if a low CR works in your app, then it will work fine on a midbass too. GM

Subject: Re: Really Front-Loaded
Posted by PointSource on Sat, 16 Sep 2006 02:42:38 GMT
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Thanks for tossing in a reply, GM! Of course, other Q's follow: Does lower CR equal lower efficiency? Will directivity collapse sooner (without a diffractive throat geometry), resulting in a lower HF cutoff? Could that be why the MSL-4 uses such a low crossover point? I had the idea to mount a midbass driver (or two) in the aforementioned fashion, then affix some kind of throat or smoothing guide to the front of the driver. No rear chamber access panel, no double-walled horns! Then, I'd coax the HF horn in the midbass mouth. Have any experience in that direction?

Subject: Re: Really Front-Loaded
Posted by GM on Sat, 16 Sep 2006 19:15:34 GMT
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Greets!You're welcome!No, it means a lower HF corner (IOW less BW for a given Fc), less

acoustic power, ergo lower throat distortion which can actually increase efficiency down around Fc because it's not being 'squeezed' hard. Choosing XO point/slopes is a balancing act of trade-offs of which the horn's mass corner can be one of them. Not being familiar with MSL-4 beyond its published data, it's 800 Hz XO point doesn't seem all that low considering its 65 Hz F4.Not sure what you mean by 'smoothing guide' since with a

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Subject: Re: Really Front-Loaded
Posted by PointSource on Sat, 16 Sep 2006 23:44:34 GMT
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Hey, GM!I should mention that my interests tend toward pro audio/live sound applications.For want of a better phrase, the "smoothing guide" was a feature I noticed in an EV vertical line array. Two 8" cones were baffle-mounted at the back of a 90-degree conical wave guide, with a flat panel 15" driver on each 45-degree horn wall. A formed plastic or fiberglass device (not a phase plug) was mounted over the 8's with curved surfaces to smooth the transition from the rear panel to the horn walls. Most likely, it was intended to minimize reflections of the higher mids. So much for that!So, if the ol' brain sponge is soaking up terminology correctly, then the baffle-mounted (what's the official title?) driver will yield a lower cutoff due to beaming than other types of throats, yes? And, the wider the horn coverage pattern, the lower the cutoff becomes? In this case, the coaxial HF section would be a large format horn/compression driver combo (strictly active XO).Gotta finish this in another posting, time to pick up the Wife from work! Thanks, man!

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Subject: Re: Really Front-Loaded
Posted by PointSource on Sun, 17 Sep 2006 15:21:53 GMT
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I should clarify: I meant lower HF cutoff due to beaming (previous post). Then, in contrast, the narrower the horizontal coverage, the higher the HF cutoff (taking cone breakup modes into account). Am I on the right track? And, I'm assuming that pairs of like drivers sharing the same horn would be subject to the usual coupling rules when baffle-mounted, right?I'm trying to be careful with making intuitive assumptions about how a cone driver would work in a horn as opposed to a simple 4th or 2nd order box, hence all the Q's.

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Subject: Re: Really Front-Loaded
Posted by GM on Tue, 19 Sep 2006 04:18:23 GMT
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Greets!Right, the throat transition insert is to minimize reflections/standing waves at the throat that will make hash out of the driver's beaming BW, so is essential for wide BW apps.Hmm, 'baffle

mounted' = throat mounted maybe? Dunno, 'baffle mounted' works for me.The >the throat area, the lower the horn's/WG's HF cutoff, but it has nothing to do with the driver's beaming BW, which will set its power response HF corner. Ditto for wall angle. Consider a straight pipe, driver VC, whatever: its HF BW is governed by its perimeter WL equivalent, so a 4" diameter pipe's HF3 will be ~13560"/pi/4 = ~1079 Hz with a fundamental based on its 1/4 WL for a closed pipe and 1/2 WL for an open one. IOW a fundamental plus harmonics BW with its gain curve governed by its cross sectional area (CSA), so it will roll off below ~1079 Hz unless its length is proportional. Expanding one end of the pipe to a 4 ft diameter, it now has a ~1079 Hz HF3 - 89.92 Hz LF3 passband with its gain curve a function of its length and expansion profile. So a typical horn is only going to work over a relatively narrow 1/2 WL passband and as a rolled off 1/4 WL resonator on the low end, morphing into either a sealed or vented alignment and a rising on axis WG on the high end if not corrected somehow.Driver mutual coupling is a bit different in a horn since the baffle is folded up into a projector with some directivity control, though obviously at some point the drivers are beaming so much that the walls 'disappear' and the throat represents an acoustically large flat baffle with two or more discrete sources. GM