Subject: fs with horn flare... Bill Fitzmaurice???
Posted by DSM on Tue, 03 Aug 2004 02:29:08 GMT
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When we add a horn flare to cone drivers the fs drops right? I'm just wondering how much of a flare?? How about just a slot? Also what size mouth is ideal for 100hz open space? Can I just add a flare to existing boxes or, will they be the wrong tuning with the flare added?

Subject: Re: fs with horn flare... Bill Fitzmaurice???
Posted by Bill Fitzmaurice on Tue, 03 Aug 2004 15:33:57 GMT
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Yes, the Fs drops, but there are a number of factors involved. The flare rate, throat size, mouth size and path length all have an effect, and depending on the permutations can drop the Fs by a few Hz or by more than 50%. Also the fact of just restricting the baffle opening lowers Fs, as this creates a resonant chamber in the area between the cone and baffle. This is what happens in so called 'slot loading', which TOA used to use extensively. In reality what you get is a dual chamber box. With shorter horns this chamber has more effect on lowering Fs than the horn does. Ideally a 100 Hz horn in free space would have a mouth with the minimum distance across (diameter for a round mouth) of about 11.3 feet. This would not only ensure maximum loading but would also have the horn operating into half-space instead of free-space, which in itself is worth 6dB on axis. Obviously this ideal is seldom realized.You can add a horn to an existing cabinet, but when you do so the box Fb drops. This may or may not be a good thing, depending on all the other variables involved. If it's a reflex box the tuning would have to be redone to account for the lowered Fs.

Subject: Fts
Posted by Ralph on Tue, 03 Aug 2004 19:04:21 GMT
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Are you sure your measurements re Fts are correct? It seems like anything that stiffens driver movement would raise Fts, not lower it. I expect mounting to a closed baffle or one that has a hole much smaller than Sd would raise Fts. I'll have to measure one and see.

Subject: Re: Fts
Posted by Bill Fitzmaurice on Wed, 04 Aug 2004 18:14:09 GMT
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I'm quite positive, the result of having measured it on every cabinet I've built since I came across the effect a few years back. On my Tuba subs the throat impedance is quite high, on the order of a few ohms, and the Fs is dropped by a full octave. And yes, the driver movement is stiffened considerably, requiring very high Bl drivers to maintain cone control. When the driver fires into free air the driver Mms is the primary determinant of Fs; when firing into a restricted space the mass of the air it's pushing couples more effectively with the cone and in effect adds its mass to the Mms, and more mass means lower Fs. The higher the impedance load of the air mass the lower the Fs, and the more efficient the horn. This phenomena is part and parcel of how a horn works in the first place.

Subject: Re: Fts
Posted by Ralph on Wed, 04 Aug 2004 22:29:46 GMT
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You're right, I took some measurements.Since this is mostly related to horns, I wrote my reply in the high efficiency section.
http://www.audioroundtable.com/HighEfficiencySpeakers/messages/993.html

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