Subject: Horn throat size
Posted by Ralph on Fri, 20 Aug 2004 21:36:55 GMT
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If reducing throat size increases compression ratio, efficiency and overall horn size, why not make the throat as small as possible? I can understand that there would be some point where the throat would be so small it would set up a sort of squeeze effect and might make turbulence noises too. There should be a best size though, and it seems like that would be small. Is there an advantage to making the throat larger?

Subject: Re: Horn throat size
Posted by wunhuanglo on Fri, 20 Aug 2004 22:51:53 GMT
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The best way to answer that question is for you to download McBean and play with it.

http://www.dmcbean.bigblog.com.au

Subject: Re: Horn throat size
Posted by Mike.e on Sat, 21 Aug 2004 06:15:06 GMT
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Compression ratio is regarded as being safe at 2:1 but after 3:1 problems can easily occur with loudspeaker cones.The mcbean program will show you responses but wont tell you if distortion will result from your miniature too small horn throatBut with a little knowledge applied to the program,meaningful results happen.http://www.volvotreter.de/ >downloads > dinsdale horn articlehttp://www.volvotreter.de/downloads/Dinsdale_Horns_1.pdf

Subject: - Applied to basshorns -nt-
Posted by Mike.e on Sat, 21 Aug 2004 06:15:36 GMT
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nt

Subject: Re: Horn throat size
Posted by Bill Fitzmaurice on Sat, 21 Aug 2004 13:02:05 GMT

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There are some things that McBean can't tell you. Foremost is throat distortion and power compression, which is a product of throat size/compression ratio, horn impedance, driver excursion(as a function of frequency x power input) and driver Bl product. McBean predicts linear response irrespective of power input; in reality that is not the case. The other factor McBean doesn't accurately predict is HF response. Best case it's off by at least an octave; worst case a lot more than that. While it does predict (inaccurately but within reason)the increased HF loading achieved by a smaller throat size it doesn't predict the phase cancellation resulting from pathway differentials from the various segments of the driver cone to the throat as the throat is made smaller, nor can it predict the effects of a phase plug intended to alleviate this problem. The bottom line is that while horn programs are very useful they are also incomplete, and the art of horn design remains at least 50% empirical.

Subject: Re: Horn throat size
Posted by Ralph on Sun, 22 Aug 2004 22:38:22 GMT
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Thanks everyone. Looks like throat distortion goes up as throat size goes down so that's the tradeoff.

Subject: Yes, but
Posted by Bill Fitzmaurice on Mon, 23 Aug 2004 13:06:37 GMT
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assuming that you don't care about high-frequency extension (as in a sub horn) you can overcome the throat distortion problem. The majority of the distortion occurs at the power level beyond which the driver motor is unable to overcome the acoustic impedance load of the horn; as more power is applied instead of that power resulting in higher cone excursion the cone motion is clipped, resulting in classic square wave nastyness. The cure is to go with a higher driver Bl, which allows the motor to maintain control over the cone at higher power levels. There is a downside, and that is in the lowered Qts that accompanies higher Bl. The lowered Qts results in a loss of sensitivity at lower frequencies at low power, so there is a choice to be made- maximum LF extension/sensitivity at low power or maximum output/minimal distortion at high power.

Subject: issue
Posted by Mike.e on Wed, 25 Aug 2004 03:57:32 GMT
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Is this a common occurance? 'lightweight' or 'weak' higher Qts drivers in horns with high acoustic loud end up with this problem?High compression ratio,high BL driver