
Subject: Basic Horn Questions

Posted by [Dean Kukral](#) on Thu, 22 Jan 2004 13:41:41 GMT

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I understand that an "exponential horn" has its cross-sectional area grow exponentially with the distance from the throat. Also, a "cone horn" has its cross-sectional area grow quadratically with the distance from the throat. What about "hyperbolic horn"? Does the area grow hyperbolically with the distance? Or, is there a hyperbolic cross-section? What is a "Tractrix horn"? Does a "biradial horn" have sides that are cylindrical sections, one radius on top and bottom and another on sides, or something else? Is there a good online source to read about the above topics? Is most of the knowledge base on horns from experimental evidence, or are they well understood mathematically? On page 174 of Martin Colloms' paperback, "High Performance Loudspeakers" (the 5th edition - "corrected"), he says that on exponential horns the cross-sectional area grows as, c^{mx} where $**$ is exponentiation as in FORTRAN and later says that the cutoff frequency should be $mc/4$ $c = \text{velocity of sound}$ Should the "c" in the first equation be an "e" and should the second equation be "4pi"?

Subject: Re: Basic Horn Questions

Posted by [Dean Kukral](#) on Thu, 22 Jan 2004 13:50:16 GMT

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Thinking again, I am not sure what I meant by "grows hyperbolically." Duh. I guess that I mean "grows inversely as (constant - distance from the cone)." That would make sense. The question, "What is a hyperbolic horn," still applies in any case.

Subject: Links

Posted by [Mike.e](#) on Thu, 22 Jan 2004 15:19:46 GMT

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search here <http://www.f16.parsimony.net/forum27133/search>
here <http://www.audioundtable.com/PiSpeakers/> for exponents use \wedge eg 1.5^4a well thought out search will give good results. <http://www.f16.parsimony.net/forum27133/messages/2291.htm> Cheers!

Subject: Re: Basic Horn Answers

Posted by [Adrian Mack](#) on Fri, 23 Jan 2004 00:23:37 GMT

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Hi DeanThe "Quadratic Throat Waveguide" paper published by Peavy will answer almost all the questions you asked. Please download <http://www.peavey.com/media/pdf/aa/qwp1.pdf>Another reference which may be of interest to you is the post "Characteristics of various horn flares" online at <http://www.audioundtable.com/PiSpeakers/messages/1623.html>Adrian

Subject: Re: Basic Horn Questions
Posted by [GraemeG](#) on Fri, 23 Jan 2004 12:27:02 GMT
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<< Is most of the knowledge base on horns from experimental evidence, or are they well understood mathematically? >>Actual horns are pretty much understood mathematically, however the behaviour of real-world speakers in these horns isn't. Result: experimentation to achieve best results.Cheers

Subject: Thanks For Your Responses!
Posted by [Dean Kukral](#) on Fri, 23 Jan 2004 13:37:27 GMT
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Thanks to all of you who have (or will) responded to my post. I don't have all the answers yet, but I know a lot more than I did a few days ago!

Subject: BuST - A - post!
Posted by [Mike.e](#) on Fri, 23 Jan 2004 14:50:25 GMT
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I knew you had some trick links up ur sleeve ;-) i cant find mine :(

Subject: Re: BuST - A - post!
Posted by [Wayne Parham](#) on Fri, 23 Jan 2004 22:21:24 GMT
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Is that server deal still acting up? Maybe we should tell Sheri? If there are posts that are missing, find a post from her and tell her or send word to me and I'll pass it on to her.Also, you might want

to ask your ISP when was the last time they updated their copy of the DNS. Sheri told me that the reason some people were connected to the old server after the upgrade was because their local ISP's were slow to update their nameservers.

Subject: Re: BuST - A - post!
Posted by [Mike.e](#) on Sat, 24 Jan 2004 08:30:46 GMT
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no, sorry wayne misunderstandingnot LOST posts,but LOST favourites!:-)cheers!
<http://homepages.paradise.net.nz/quadroph/bs/jbl2.jpg>

Subject: Re: BuST - A - post!
Posted by [Wayne Parham](#) on Sat, 24 Jan 2004 09:00:20 GMT
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Now that's a car stereo! What a sub! Is that the 40Hz horn you made and had in your room?

Subject: Re: BuST - A - sub
Posted by [Mike.e](#) on Sat, 24 Jan 2004 09:05:30 GMT
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yeh thats it! i have room to spare alsoive just been decided how to build a sub for DD2012 (12" car audio sub) ... it hax 10x the power handling so perhaps ~10db more output... 132db with 250watts if im lucky...i was hoping for 142db im just wondering if i shud rush build it,just for spl comp,or not...its on Feb 8th,i can buy the woofer off the guy im borrowing off if i want it afterwards too! i jsut need to find 250watts!you can estimate105db eff20db amp13db car gain=138db.....my car booms at 50-55hz by about 7db relative to 80hz,so i thought id load the cone there and burp it around that freq as to save the woofer from moving too far and BL compression? also im unsure of exact xmax so this helps too.Im estimating im ~8db down from expected and hoped performance with current 8" with 25watt rms Pe and 3.5mm xmax! Cheers!Cheers!

Subject: Re: BuST - A - sub
Posted by [Wayne Parham](#) on Sat, 24 Jan 2004 09:22:19 GMT
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The driver handles 10x more power, hmm? That should put it at about 5-7dB louder. I'll bet you've already done the Hornresp simulation. What does response look like? Or will you run this one as a direct radiator? Interesting to think about, being in such a constrained space. The horn will gain the pipe modes, but you can't really consider directivity issues when you're pumping into a car. One loud mama any way you slice it!

You need to post this stuff on the car audio forum. When that place gets kickin', it will be funny to go through the archives and see a massive horn in the trunk. It's kinda like how do you top that?!!

Subject: Re: BuST - An- eardrum
Posted by [Mike.e](#) on Sat, 24 Jan 2004 14:45:14 GMT
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The driver handles 10x more power, hmm? That should put it at about 5-7dB louder. Maybe more, as the 9\$ woofer was ultimate cheap no brand.. Also this horn models slightly higher efficiency... I'll bet you've already done the Hornresp simulation it's already CADed up! the moment i saw those DDs, i thoht id give them a try! Wgeiger apparently used some 18"s ,or was going to..of theirs. High BL high mass beasties, like big lab12s
