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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  $mc/4$   $c$  = velocity of sound. Should the "c" in the first equation be an "e" and should the second equation be "4pi"?

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