Subject: Re: Large mid-high horns
Posted by Mike.e on Mon, 16 May 2005 03:46:03 GMT
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Hi peter if you look at a page somewhere linked,you can consider both throat distortion and IMD. Its certainly an idealistic view to have one driver cover the vast majority of the audio range-but in the home situation at lower SPLS its possible im told.In Reply to: horns+air non linearity equation posted by toxicport.e on October 11, 2003 at 04:21:33: Hi Mike, Borwick's book is in fact pretty good. The wonderful chapter on transducer drive mechanisms (by Stanley Kelly) and the even more wonderful chapter on electrostatic loudspeakers (by Peter J. Baxandall) alone are worth many times the price of the book. (My copy is the first edition; the 2nd edition contains only minor additions.) But even good books could sometimes be improved by careful proofreading. The formula you cited has become an "old rule of thumb", but the reason is mainly careless copying, not faulty physics. First, the intensity should be under a square root, as it was in Beranek's book (Equation (9.33), p. 275). However, the multiplier 1.72 (1.73 in Beranek (whether it's 1.72 or 1.73 could be explained by slightly different values having been used for the characteristic impedance of air)) is wrong--it should be 1.22. Apparently, Beranek while manipulating the equations accidentally dropped the the square root of two which correctly appears in the denominator of his Equation (9.31) (1.73/Sqrt(2) = 1.22). Beranek's slightly erroneus equation (9.33) has been copied to countless other places. The correct form is as follows: D2(%) = 1.22*f/fc*Sqrt(It)*10^-2 . This equation appears in slightly different but correct forms in Thuras et al., "Extraneous Frequencies Generated in Air Carrying Intense Sound Waves (JASA, Vol. VI, pp. 173-180 (January, 1935)), and also in Olson (Eq. (7.20), p. 224). It seems that the air overload phenomenon was first theoretically investigated by B. Riemann (1860) and Y. Rocard (1933). If one of the more serious enthusiasts on here (Dennis? Steve? Bruce? anyone?) happens to have copies of the papers by these early investigators, I would be very interested in getting a copy. Trad
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