Subject: Re: Webster's equation verses FEA / BEM
Posted by Martin on Tue, 25 Mar 2008 18:42:42 GMT
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"There has been some discussion over the years about how accurate the Webster's equation is at describing horns. It is a mathematical model, and with all models, it is accurate at some level but misses some of the details. It is a one-dimensional model for axisymmetric Salmon shapes: parabolic, conical, exponential and hyperbolic. It makes an assumption of equal cross-section pressure. All of these things are simplifications, as all models truly are."Wayne, very interesting post. I am at present working on my horn models again I did use Webster's 1D wave ion to derive my 1D acoustic element, I use many (sometimes 100's of) elements to model arbitrary expanding horn geometries. I am expecting brand new copies of Morse and Feshback's physics text in the mail this week. This is the reference used most often by Earl Geddes in his text so hopefully my understanding will increase into the limits of Webster's equation after a little "light" reading.I am also looking harder at the horn mouth impedance. For example calculating the actual pressure profile over the "surface" of the mouth and the impact of edge defraction around the mouth on this acoustic impedance are two of the things I am working through right now. I am also very interested in trying to couple 2D or 3D wave fields to more accurately model the air motions in the horn profile. Again the goal is to use a simple acoustic element with more degrees of freedom.I think modeling is really key to understanding horns and the skill at which you apply the approximations will be key to the accuracy of the results. I personally have done some FEM work on my geoemtries but never any BE modeling. Thanks for the links, I will study them to see what I can learn and apply to my own models.Gotta love a simple elegant model,Martin