Subject: BW of rear loaded horns
Posted by roncla on Wed, 12 May 2004 01:51:08 GMT
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The volume of air that exists between the back of the driver and the horn throat is called the cavity of the horn. Any enclosed volume of air with a port (in this case, the throat of the horn) will act as a 1st order low-pass filter where: Upper cut-off frequency = c * At / (2 * p * V)Where:V = Volume of cavityAt = area of port, i.e. horn throat areac = Speed of soundIn two-way horn systems where the front of the driver loads a mid-horn, and the back loads the bass horn, it is of great importance that the dimensions of this cavity be calculated correctly. This is to ensure that there is a mechanical crossover between the two horns. However, in a back-loaded-only system such as this, it is really not that critical. The cavity's only mission here is to create a roll-off from a frequency where wavelength = an odd multiply of the horn's length, to avoid annulling when the out-of-phase waves from the back of the driver meets the in-phase waves from the originating at the front of the driver. We want to load ca 3 octaves into the horn (40Hz-320Hz). Theory then prescribes a relatively small cavity (ca 1,5 litres, space taken up by driver included) which also ensures good coupling of the cone's movements to the horn. This was taken from the designer of the All Fun Horn. I was reading on the high effeciecny forum where someone stated that a rear loaded horn would not go above 100 hz, my present design is for a roll off at 300 hz at which time the OB action of the baffle picks up the gain.This is the same math i use.This info is for all you future horn designers and builders.Thanksron