Subject: Re: Bass Horn with & without Rubber Throat
Posted by DMoore on Thu, 24 Apr 2008 03:31:01 GMT
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I think that it was Paul Klipsch who coined the phrase "rubber throat", but I could be wrong.First, all horns are simply acoustic impedance transformers by nature, even in short sections. They can be designed to increase or decrease the impedance by flare rate and channel volume/cross-section between sections of the horn. The use of a differing flare rate (from the rest of the horn) section of horn AT THE THROAT is referred to as PWK called it a "rubber" throat, implying that it changes its impedance based on frequency, another characteristic of any horn. In this case, it is the horn throat section. Having such a throat horn section allows for greater control over the overall efficiency, distortion characteristics, and operational bandwidth of the horn, along with allowing for the desired selection of the throat cavity opening size (the main determiner of throat reactance as far as the driver is concerned). This allows for the "targeting" of a particular crossover point, a desired crossover slope, a particular driver, etc.The "rubber" throat is a method used to transfer or alter acoustic impedance. It is typically used to LESSEN the throat reactance experienced by the driver by employing a more rapid flare rate than the subsequent horn sections which usually use a less rapid flare (lower Fc) rate. I think the so-called "rubber" effect is a misnomer.The throat of rapid flare compared to the rest of the horn does not act as a chamber, it is a full-fledged horn (section) in its own right and operates exactly the way a "normal" horn does, and it will NOT effect the overall low Fc of the horn within reason, of course(that is determined by the terminal section of the horn).The goal (usually) is to provide a reduced (i.e., less acoustically restrictive) throat cavity opening/throat cross-section as compared to a single-flare rate horn of a lower Fc, yet retain the overall low Fc of the horn.Therefore, a wider operational bandpass with lower distortion is made possible by the "rubber" throat when the acoustic impedance is smoothly transfered between the differing sections. Take note that PWK typically used folds for his impedance matching, often associated with non-expanding "pipe" sections to achieve an adequate impedance match between the different flare sections. The Khorn, LaScala, and Jubilee all use different flare rates throughout. The LS is an interesting standout in that it uses a 60 Hz flare throat section and a 125 Hz terminal (mouth) section for an overall Fc of approx. 70 Hz.Not the usual configuration, and was likely done to allow the use of the same driver, throat opening, and crossover/slope as the Khorn, an economic decision, I presume.DM