Subject: Re: Bass Horn with & without Rubber Throat
Posted by Wayne Parham on Tue, 22 Apr 2008 18:59:49 GMT
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I think those are very good questions worth studying. I would suggest trying your proposed basshorn with various throat features to see what the differences are. You can do this with computer models, making simulations of various versions of your horn and using the following program to predict response.
HornrespYou can expect very good correlation between predictions from Hornresp and actual measurements of a physical horn. I have made many Hornresp models and built physical models to test, and measurements match models very closely for basshorns.

Pay attention to response and excursion. As excursion rises, so will distortion. If you have high amplitude peaks above the passband, distortion will rise also. So watch those two things. You want a nice flat response curve with low ripple and smooth rolloff and you also want low excursion through the passband. Ideally, excursion would remain low down to the lower cutoff and then rise; However, basshorns are acoustically small so they get reactive down low and usually have an area where excurson rises in the passband. Just try to minimize this as much as possible.

You'll probably find that there are some instances where response ripple is reduced at the expense of a little bit of increased excursion. As long as excursion within the desired passband is less than driver Xmax, I would choose flatter response over lowest excursion. If the added excursion were high - say above 10% difference - then I might choose otherwise but if I can reduce ripple by 3dB and only increase excursion by 5%, I would probably choose the alignment that reduced ripple. Nice thing about Hornresp is it lets you try several conditions before building a physical model.

Model the horn you're thinking about building in Horresp and play around with different initial expansions. You can also try different front and rear chamber sizes. Once you find a model you like, you can build it with confidence that your physical horn built like your model describes will measure very close to what your predictions show.