Subject: Re: Horns, transmission lines and reflex cabinets
Posted by Wayne Parham on Thu, 18 Aug 2005 13:54:01 GMT
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I think the real measure of a horn is the impedance plot. If it is smooth and resistive, it is acting as a horn. If it is peaky and reactive, it is acting more like a tuned pipe. Cutoff frequency has very little to do with it, except that a higher cutoff frequency can be supported with a smaller mouth.Can't agree with you on bass-reflex either. To say bass-reflex sucks is like saying LC oscillators suck. They do just fine when tuned right and used in the right situation. I don't think I'd want a bass-reflex midrange or tweeter and I don't think I'd want a highly underdamped bass-reflex woofer either. But I think bass-reflex is perfect for high efficiency woofers where low extension and relatively small cabinet size is required.I think that back-loaded horns are a great idea for single driver speakers. But the thing I think is very important to make clear, is that size matters. If a backloaded horn is small, it acts very similarly to a transmission line. This can be seen in both the impedance plot and the frequency response. This also affects excursion, which limits maximum SPL on a single driver speaker.Where efficiency is concerned, backhorn loudspeakers generate midrange and treble from direct radiation, so that sets the limit. You would not want to build a horn that raised the bottom octaves above that of the midrange, so the average SPL of the driver itself is the average SPL of a good single driver loudspeaker. Speaker voicing is a different matter entirely.I understand what you and others are saying, that you would rather use the backhorn as an acoustic filter, to use it instead of a electrical network. But I've heard some very fine transmission line speakers that needed no electrical filter, so I consider the two issues separately. I've also heard some very nice bass-reflex single driver speakers that needed no electrical filter. So I would ask you to understand why I would suggest that the issue of electrical filters be separated from the rest of the discussion, and just look at the similarities and differences of the acoustic chambers themselves.Lastly, consider the amp driving these speakers. The electrical impedance becomes very important on amps with high output impedance. Loudspeaker impedance peaks cause response peaks when used with tube amps, the "First Watt" Pass Amp and others that act like constant current sources. Look at the impedance charts of all these loudspeakers in question and you'll see that some are more friendly than others in that situation. A moderate peak or two is much better than several notches, so it is important to the overall sound quality to pay attention to that when used with current sources. This is overlooked by many people, and ironically, it is probably more important than anything else when using some amps.