Subject: Experiment, Insights pls?
Posted by Barry on Fri, 22 Feb 2008 00:28:59 GMT
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Any insights would be helpful.Placed Delta 12LF in 5.1cu ft. Tuned 40Hz. Supposed f3 35Hz.Near identical twin.Place Delta 12LF in 5.1cu ft. Made pathway with just a little expansion from driver to near port area (but not too close).Sounded best when tuned to 35Hz. Perhaps -3 at 30Hz.Beginning of pathway on 13 inch width interior was set 6.25 inches back so no real compression there IMO. Purpose of experiment was to see if lower -3 was possible by reducing Fs of driver by having a pathway inside (but open to full width prior to port. Observations:It sounds pretty good I think. Seems to have reduced fs of driver by 5Hz. Seems to go lower but less punchy. Making it sound just a little less loud. Did try tuning the one without the pathway a little lower and then it did not sound good. No increase of volume from "inside of speaker horn" at least not with the size of port chosen. Questions:Should this not have produced some possible phase problems?Maybe there is an I'm not hearing it yet?Maybe what I hear as punchy in the one without pathway is the way is should be and the other is a phase issue on the one with the pathway?Is there a better way to reduce fs and get a speaker to go lower in a given size box? (one that does not infringe on the patents of others)Any input would be appreciated.Barry

Subject: Re: Experiment, Insights pls?
Posted by Wayne Parham on Fri, 22 Feb 2008 17:53:40 GMT
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My experience is either you have Helmholtz resonation or you have standing wave resonation, or sometimes a combination of the two. Quarter-wave pipes act like Helmholtz resonators in that they provide narrow bandwidth resonant phenomenon. They are different in that a Helmholtz resonator works at one frequency where a tuned pipe works at the fundamental and harmonics. Horns are expanding pipes that act like resonators over a wider range, up to two or sometimes even three octaves. But they require a lot more space.The way this relates to what you're seeing is my guess it is a narrow band resonance, probably Helmholtz. That makes it pretty easy to get your arms around its behavior. If you measure the impedance to find the fl and fh frequencies and you know the electro-mechanical specs of the speaker, you can know how the system will act, at least at low power levels. That will let you do some modeling of its behavior when the resonant frequency is varied. You can also measure amplitude response and phase, but you'll really need to do it outdoors to capture the behavior of the speaker without having it swamped from influence of the room.

Subject: Re: Experiment, Insights pls?
Posted by Barry on Tue, 26 Feb 2008 06:02:41 GMT
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Hi Wayne, (and everyone)Thanks for the input Wayne.I don't have much test equipment yet. The original idea was to have interior pathway that would lower Fs to allow for a little lower F3 for the same given size box. Did 2 more experiments. The original experiment had a 6'6" pathway.Box tuning went down from 40 hz [identical box with no pathway] to 35 hz for a 5.1 cu ft box. The sound was "OK". Next was a little larger box and 8'5" pathway. Port tuning sounded best at 28 hz but did not like the sound.Next was another box of 5.1 cu ft and shorter pathway of 4.5 feet. Port is tuned to 37hz. So it does offer a slight improvement in low frequency response over box with no interior pathway. I really like this one.IMO is sounds better than an identical box with no pathway and it goes just a little lower.The bass is clean and well defined. So apparently with a certain size box a reflex speaker can reach a little lower by using a small interior pathway to lower its Fs just a little. I think that the pathway is mostly inaudible as the small size of the port would be a barrier to hear any volume increase from it.I really cannot hear much of any other affect from the pathway other than a slightly lower Fs and a tiny reduction in volume. This I think is because the impedance has shifted to closer to 9 ohms or so because of the pathway. Think that the bass is a little more controlled and clean.I plan on doing some more of these experiments with smaller and larger woofers this spring. Any thoughts or comments welcome.Barry