Subject: Update
Posted by Adrian Mack on Tue, 16 Dec 2003 01:10:48 GMT
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Was thinking about reflections screwing up my measurement graphs today, the area I had been testing in did not have any walls or fences etc around the front or back of the horn, however there was a wall and a fence pretty near on each side. I flipped the horn the other way to do the measurements to reduce reflections off these surfaces (by reducing the horizontal dispersion by flipping it). However today I thought to myself to go out and get some cable instead. I had to buy 20 meters of speaker cable and another 20 meters of RCA cable so I could do the measurements way out where theres no surrounding fences, walls, or anything else. The results I got changed for the better! I have two response graphs here, one is of the first conical horn I built which had a small throat of 27cm^2, and the second graph is of the second conical horn I built with 50cm^2 throat. Other than throat size differences both horns were the same length, mouth area, etc. Horn with 27cm^2 throat, ~1.5L back chamber with liningAnd here is the horn with larger throat, 50cm^2 with ~1.5L back chamber with lining. Concerning ~500Hz to 1.6KHz usage, which one would you say is more smooth/less amplitude deviation? I think that the one with large throat is better for a higher xover point say 2KHz (pretty obvious), however regarding the peaks/dips and shelves at the low end, am not sure which one to choose. Any comments/guidance on which graph is "better" is much appreciated. Adrian

Subject: Re: Update
Posted by Wayne Parham on Tue, 16 Dec 2003 02:03:28 GMT
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Looks to me like you may have found it. That's great! When making acoustic measurements, the lower you go in frequency, the harder it is to avoid picking up reflections and interference from large objects and boundaries in measurements. That's why it's best to measure outdoors in a wide open space.It would appear that the second horn is flatter, and more extended on both ends. Are you getting repeatable measurements from each of them? In other words, if you run ten bursts, will at least seven of them look like the graphs you've shown? Do these measurements confirm what your models predict? If so, I think I'd probably go with the second horn. Response looks good, and one would expect distortion to be low.Were you able to remove the phase plug? It sure would be simpler that way, and since you'll crossover to a tweeter, you don't need to push the limits of HF extension. I don't use one in mine, it just has an open square throat, but upper band frequency response is pretty good.Let's tie together the threads about your midrange horn, shall we:Conical Midrange Horns, November 27, 2003 Conical horn pics, December 8, 2003Hmmmm, December 10, 2003Big day of measurements and stuff, December 13, 2003Update, December 15, 2003

Subject: Re: Update
Posted by Adrian Mack on Tue, 16 Dec 2003 02:32:16 GMT

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Hi WayneSure am, the graphs remain the same after 10 re-tests. Those graphs were both with the phase plug removed, seems like I won't really need it for the range I am going to use the horn in. + I get to see the nice cone looking at me now from the throat rather than a stupid piece of wood :P (although I wood have made a nice neater phase plug without nails sticking out if I had to use it, but still). What do you think about a 300Hz xover point on the 2nd horn? Its kinda of 6db "valley" between 300Hz and 750Hz. Do you think 300Hz xover is acceptable or should I run the 2225's higher to say 500-600Hz? (had originally wanted it 300Hz, well, 200 to be honest but that wasn't gonna happen in a horn the length 1/4wl of 300Hz). I want to put the horn to best use without sacrificing performance. The results are somewhat what Hornresp predicts. The 2nd graph is pretty accurate of what Hornresp thought, except that real world the upper rolloff slope was much steeper, and the 300Hz peak isn't as pronounced as what Hornresp predicts. Hornresp predicts a more pronounced 300Hz peak, then the same valley, but bandwidth from 750Hz (end of valley) to 2KHz is at a lower level, so Hornresp did not really predict a valley, but more of a 300Hz peak (the flare cutoff). Part of the reason may be because you cant really estimate a cross sectional area of the front chamber, as its a cone shape (being the air in front of the cone), but thats not the whole reason after plugging in a few different numbers for the xsection area, the above difference is still what happened. The 1st graph on the other hand, Hornresp did not predict that "shelf" on the low end, it predicted a valley between 300Hz cutoff and 750Hz (kinda like the measured valley on 2nd horn just less amplitude), but again what was measured was the shelf. The top end extension was accurate, the real world had a much steeper cutoff though, which isn't actually a bad thing. Tom Danley reccomended an ultra small 0.65L back chamber, so I am going to slap togethor one of those while I still got all my measuring gear and tools stuff out. You can expect another graph or two here in a few hours or so.... Adrian

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Subject: Re: Update
Posted by Bill Martinelli on Tue, 16 Dec 2003 02:42:14 GMT
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Nice work. I agree with Wayne. The second horn is the better of the two. Draw a line through the middle of the highest spots and the lowest spots. Then measure what you have in deviation. Up and down will be the same since your line is in the middle. Your at plus or minus 3db with that graph from 300-2000. Thats good ground to be covering. Nice going.Bill

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Subject: Re: Update
Posted by Bill Martinelli on Tue, 16 Dec 2003 02:51:15 GMT
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0.65 liter? That's like an enclosed basket for a back chamber.

Subject: Re: Update
Posted by Wayne Parham on Tue, 16 Dec 2003 03:48:12 GMT
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I like horns like this - Simple and effective. So I wouldn't use the phase plug either. For your purpose, it seems to be an unnecessary complexity. A properly implemented phase plug will extend the top end, but you'll have a tweeter so that isn't terribly important.As for crossover, I'd try to avoid crossover between 400Hz and 1600Hz. That's the vocal fundamental region, and your horn should cover the range very well.

Subject: Yep, but check this out !
Posted by Adrian Mack on Tue, 16 Dec 2003 06:10:02 GMT
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Hey guysWell, I tried that tiny 0.7L rear chamber today, and its even better now!That 300-750Hz valley is now not not so deep, and also the bottom end now has a nice steep rolloff just like the top end. I did some offaxis measurements as well, and its remarkably smooth in most off axis positions too. Sure was a "squeeze" to get the back volume 0.7L, used quite a few blocks to take up room around the driver. Above two show the rear chamberPerfect fit! Am very happy with the horn. Thanks for the nice comments and suggestions Bill and Wayne. Adrian

Subject: Re: Yep, but check this out !
Posted by Wayne Parham on Tue, 16 Dec 2003 08:37:14 GMT
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You can see why a 0.7 liter motor chamber drops all low frequencies and brings up the energy between 350Hz and 700Hz - It's a sealed cabinet tuned to 450Hz and peaking 6dB.Eminence Alpha 6 in 0.7 liter box

Subject: Re: Yep, but check this out !
Posted by Adrian Mack on Tue, 16 Dec 2003 09:52:00 GMT
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Hi WayneMakes sense, thats kind of what people do on basshorns to below flare cutoff freq. Perhaps Mike will do this on his LAB12 basshorn, I guess the efficiency of the sealed cab contribution would be less than the horn though.

Subject: Motor chamber peaking
Posted by Wayne Parham on Tue, 16 Dec 2003 16:08:13 GMT
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Motor chamber peaking done like this is also called reactance annulling. I think there is some merit in doing it on a basshorn, even a midbass horn. But I generally try to avoid it on a midrange horn. Tends to give the horn a throaty sound. I prefer a smoother, slower LF rolloff.

Subject: Re: Motor chamber peaking
Posted by stupid newbie on Tue, 16 Dec 2003 18:42:17 GMT
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These are the best posts I've ever read on any forum anywhere, thanks a million!!

Subject: Look! Update
Posted by Mike.e on Wed, 17 Dec 2003 01:36:14 GMT
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good newsmodeled the labhorn upthe rear chamber is too large,but i can reduce it..+ i get slightly longer horn path length.AlsoI HAVE A JOBfulltime at 10$.hr (nz $) the minimum wage is 8$ so im fortunate.i just have to work from 10pm -4am 5nitse a week :P with my first pay check=SPL meter 20watt car ampDIgital camera so u can see my projects properly.and lab12+ 320L 30hz horn.... :-)

homepage with 30hz expo