Subject: Midhorn Input Data
Posted by Cuppa Joe on Sat, 11 Nov 2006 21:52:16 GMT
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Hi, Wayne! Since I'm playing around with HornResp for the first time ever, I thought it would be a good idea to have an accurate reference point against which I could compare my early modeling calculations. I would be honored if your Midhorn were that reference, as my focus of interest is in a conical midrange/midbass device. So, I was wondering if you still had the original HornResp Input Parameters for it?

Subject: Hornresp models
Posted by Wayne Parham on Sun, 12 Nov 2006 01:43:07 GMT
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using a JBL 2012 driver. You'll notice they correlate well, but at high frequencies, there are some peaks that don't show up in the model. That's because of cone breakup. The model calculates assuming a rigid piston cone, but at high frequencies, the cone starts to vibrate along its surface. That means parts of the surface are decoupled from others, effectively acting like several smaller

JBL 2012 driverIf you're studying Hornresp, you might model some folded basshorns. The folds tend to attenuate HF, so cone breakup is rolled off. Because of that, measurements of folded

Subject: Re: Hornresp models
Posted by Cuppa Joe on Sun, 12 Nov 2006 04:15:39 GMT
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Thanks, Wayne! I was close for much of the input, but I modeled the horn in free space, while merely guessing at the VTC. The T/S look more like the Delta 10, though (preferred for its availability). Does the VTC in your model include the 1/4" spacer, and does the axial length include the throat depth?Is there any universal advantage to modeling in 1/8th space? If a design is intended for live SR, I'm thinking that 4xPi would be more realistic, as it would be the worst-case scenario for any venue setup.I'm not up to trying a basshorn just yet! The Midhorn is challenge enough for a beginner, and the Input Parameter page still resembles a Greek crossword puzzle....

Subject: Re: Hornresp models
Posted by Wayne Parham on Sun, 12 Nov 2006 05:13:31 GMT
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The model includes the volume between the cone and the throat, including the spacer. The horn was designed to be used indoors on a cornerhorn, and that's what it was modeled in eighth-space. If you intend to use the horn outdoors, you'll want to model in freespace. Outdoors use requires a much larger horn.

Subject: Re: Hornresp models
Posted by Cuppa Joe on Sun, 12 Nov 2006 20:11:13 GMT
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Yes, I had played around with expanding the horn in an attempt to move the LF rolloff as close to 160Hz as possible (the highest compromise I'll tolerate for X-over to a dedicated sub), and wound up with a mouth of 30.5" x 15.5", but with only 13" of depth. Shouldn't I need 21.25" of depth for 1/4 WL of 160Hz? The trouble with a 90-degree horn is that the mouth widens 2" for every 1" of depth added. The rest of the fantasy was to coaxially mount the HF section inside the midhorn's mouth, using a pair of up-ended, trim'n'glue P.Audio PH2510 horns to create an unbroken vertical array to the next midhorn/high pak. Voila, vertical line array!

Subject: Re: Hornresp models
Posted by Wayne Parham on Mon, 13 Nov 2006 04:53:05 GMT
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Subject: Re: Hornresp models
Posted by Cuppa Joe on Tue, 14 Nov 2006 02:44:03 GMT
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Wuff! Does it come with its own plumbing? I'm guessing there's more to the system than the midbass horn. 12 Pi subs on the bottom, and ??? on the top.

Subject: Re: Hornresp models

Posted by Wayne Parham on Tue, 14 Nov 2006 04:03:03 GMT
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straight-sided 32" long horn having 28"x28" mouth, 7.5"x7.5" throat, 800in3 front chamber and 1200in3 rear chamber. It also has a 10" JBL 2012 or Delta 10 midrange driver on a straight-sided horn with 18"x18" mouth, 4.5"x4.5" throat, 33in3 front chamber and 80in3 rear chamber. The tweeter is a JBL 2446 2" exit compression driver on an 18"w x 11"h x 15"l horn.

Subject: Re: Hornresp models
Posted by Cuppa Joe on Fri, 17 Nov 2006 05:37:25 GMT
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I don't see the 9Pi on your website. Is it not yet ready to unveil?I was curious about the true upper cutoff of the 15" midbass horn, since HornResp tends to graph an earlier rolloff (or so I'm told). Is there a set ratio between HornResp and real-world measurements, or is the difference more design specific?

Subject: Re: Hornresp models
Posted by Wayne Parham on Sat, 18 Nov 2006 16:18:28 GMT
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differences between Hornresp models and measured response, the biggest difference is caused by cone breakup modes. Folded basshorns have close agreement with measurements because their folds and large front chambers attenuate output from breakup modes. Smaller midbass and midrange horns don't have these features, so output from breakup modes passes through them. In most cases, a crossover is used to prevent frequencies that would excite a speaker's breakup modes. In other cases, a speaker is chosen with damped and well behaved breakup modes to extend response.Hornresp models assume rigid piston motion from the driver. When the cone enters breakup, regions of the cone vibrate independently of the rest of the cone. Ripples develop along its surface and each part acts like a smaller, lighter membrane with a stiff suspension between it and an adjacent node. So it sort of acts like an array of lightweight cones driving the horn. This creates extended response, but since the nodes are formed like ripples on a pond, their position moves with respect to frequency. Standing wave patterns develop along the cone, with some frequencies much louder than others. The net effect is that breakup mode output is usually pretty ragged and peaky. Sometimes it's usable, sometimes not.Midrange horn - Hornresp model and actual measurement

Subject: Re: Hornresp models, 0.5pi vs 1pi?
Posted by swett on Wed, 29 Nov 2006 04:25:14 GMT
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Do you find that the experimental results for the midhorn correspond better to a 0.5pi space or 1pi? Since the midhorn is a substantial distance from the floor and ceiling, I would expect the loading to be 1pi, not 0.5pi.The efficiency numbers seem to match up a bit better in 1pi space, at around 104db vs 107db, but besides that there aren't huge differences.

Subject: Re: Hornresp models, 0.5pi vs 1pi?
Posted by Wayne Parham on Wed, 29 Nov 2006 05:34:04 GMT
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particular reference value, so don't take its SPL as a 1W/1M or 2.83v/1M figure. The measurement was done in a relatively small room with reflections gated out. The horn and microphone were placed on the ground and pulled away from all walls. The microphone distance and power level used was arbitrary; I was really just looking for response curve shape, not

generate similar response curve shape, with the only real difference being on-axis SPL. When the radiating angle is increased to half-space or more, response becomes more peaky that I would want, so I wouldn't recommend using this horn as a single midhorn outdoors. Indoors, in a small to medium size room, consider it as eighth-space when used in corners, even though it is several feet above the ground. In a very large room, consider it as quarter-space.The radiation angle modeled in Hornresp is really only a perfectly accurate description of speakers used

boundaries would have to be open for the model to truly describe the radiating angle. There would have to be no ceiling or opposing walls, not enclosed in a room.The intended application of

So in a purely eighth-space environment (outdoors with speaker sitting in a trihedral corner facing outwards), the midhorn is high enough off the ground for it to be radiating into quarter-space through its passband. The horn's LF cutoff combines with a null from ground reflection to rolloff the lower midrange, setting its crosover point acoustically.However, indoors, you have a sort of fractional space that isn't exactly any of the "pie slice" spherical angles described above. Depending on the wavelengths and the size of the room, it can actually act as a smaller radiating angle than eighth-space. This of course also brings room modes into play, but most of the midhorn's passband is above the modal range. At the lowest frequencies, room modes are an issue, but complex summing between the midhorn and bass bin actually mitigates room modes and smoothes response as a result. That's one of the benefits of having such a large midhorn,

intended, I'd consider a small to medium sized room to act like eighth-space even though the horn is several feet off the ground. Only in a very large room or outdoors does it act like it is radiating

into quarter-space.