Subject: How do you calculate the optimal back chamber size for a frontloaded bass horn?
Posted by Peter Krojgaard on Thu, 03 Jun 2004 07:16:27 GMT
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Using McBeans HornResp program (and with the generous aid of others!), I am about to build a pair of large, straight 29 Hz bass horn. I use two 15" woofers (Precision Devices PD.158)for each horn in order to get the horn shorter. The throat size for the dual woofers is 720 cm2 wich is a little less than 1:2 (throat size:cone area).In McBeans program you can see how the predicted output varies using different sizes of back chambers. Now, for my particular horn, I get almost identical predicted outputs from McBeans program using back chambers between 100 and 140 liters for both woofers. Does this mean that I just need to get the size of the back chamber within this interval, or can I get a more precise 'quess' regarding optimal back chamber size based on 'reactance annulling' (which I unfortunately do not know about)?If the latter is the case, I would really appreciate if someone could tell me how to achieve 'reactance annuling'!I thank you a lot in anticipation! RegardsPeter Krojgaard

Subject: Re: How do you calculate the optimal back chamber size for a frontloaded bass horn?
Posted by Bill Fitzmaurice on Thu, 03 Jun 2004 10:31:02 GMT
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You have to be able to measure impedance. After the horn is complete mount the driver but leave the cabinet back off and run an impedance plot; there will be a peak at about 1/2 the driver Fs, which is the Fs(h). Put the cabinet back on and run another plot; that peak will ideally move up to the horn Fc. If it doesn't go up to the Fc the chamber is too big. If it goes above the Fc the chamber is too small.

Subject: Thanks a lot and a few more questions!
Posted by Peter Krojgaard on Thu, 03 Jun 2004 15:36:02 GMT
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Hi Bill,Thanks a lot for your answer. You just know it all!McBeans program actually display impedance based on the T/S parameters of the driver(s)and the actual horn, of course, so I hope I can use these program facilities as a rule of thump.However, the program displays both Acoustical and Electrical impedance. Question 1:Please correct me if I am wrong, but is it the Electrical impedance you refer to in your reply?If it is the Electrical impedance you refer to, then I would like to know how critical 'reactance annulling' is soundwise (Unfortunately, I have already ordered the cabinets that might be too small, so it may be an expensive lesson - at least to me!).The cabinets ordered have a back chamber volume of 120 liters, which gives an Electrical

impedance peak at about 32 Hz, while the Fc = 29.11 Hz. According to your answer, this indicates that the cabinet is too small!!With your added knowledge I have now been changing the numbers in the program, and these simulations indicate that I have to increase the back chamber volume to 160 liter in order to push the electrical impedance peak from 32 Hz down to 29 Hz.Question 2:Would such a change (pushing the impedance peak from 32 Hz to 29 Hz)make a large difference soundwise?I thank you a lot in anticipation and look forward to hear your answer!RegardsPeter Krojgaard

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Subject: Re: Thanks a lot and a few more questions!
Posted by Bill Fitzmaurice on Thu, 03 Jun 2004 16:35:14 GMT
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First, remember that McBean is a simulation, and is not perfect; that's why you have to measure the completed box and adjust the rear chamber accordingly. I've personally found that predictions almost always end up with a rear chamber too large.The impedance testing I refer to is electrical.Usually backchambers prove too large and you end up filling them with bricks.A deviation of 5 Hz or less isn't going to be critical, but 10 Hz high would give a response bump above the Fc with rolloff below it and 10 Hz low would give a more severe response loss at Fc.

Subject: Re: Thanks a lot and a few more questions!
Posted by Peter Krojgaard on Thu, 03 Jun 2004 17:58:47 GMT
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Hi Bill,Thanks a lot for your time and expertise, I really appreciate it!RegardsPeter Krojgaard

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