Subject: Urgent Port Question
Posted by Adrian Mack on Wed, 06 Aug 2003 07:58:22 GMT
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Hi all,I have a quick question here. I know for the distance from port to any wall, it should be at least at diameter away at minimum. But how about from back of port to back wall? I mean, say if we had an enclosure that was 10" in depth internally. And the port is 6" long. That means theres only 4" from back of port to back of enclosure. Would this be enough? Is there any rule to follow? Thats not the specific numbers that I will be using, but the same question applies. I am wanting to use something like a 6" vent, but very small space from that to back wall, about 2" or 3". Please help if you can!Thanks!Adrian

Subject: Urgent answer attempt version 1.0
Posted by ToFo on Wed, 06 Aug 2003 13:04:24 GMT
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Hi Adrian,I think you have to look at the area of the duct too. A 4" distance would be a decent amount of space for a 3" diameter tube to flow through, but a 6" tube would be closer to the back wall than it is wide. Look at the space between the end of the port and the back wall as an exit orifice. Say your port was 4" away and 4" in diameter. That is a 50 sq inches of orifice between the end of the duct and the wall. The port has an area of 12.5 so you have some room. A 6" port would have an area of almost 30 so it might start to see 50 inches as a restriction. I don't know enough to go deeper into this and I am sure there are issues created by the velocities, masses and elasticities involved that I cannot figure, but you can see where I am going with this.Thomas

Subject: Re: Urgent answer attempt version 1.1
Posted by ToFo on Wed, 06 Aug 2003 13:07:43 GMT
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I think you will need a smaller duct. How much power are you using? What driver, box size, tuning?

Subject: Port issues
Posted by Wayne Parham on Wed, 06 Aug 2003 21:46:17 GMT

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What I've found is that the Helmholtz formulas are most accurate when the size of the box is large enough that the port can be placed where airflow is not disturbed. That's really all we're concerned about here, setting aside turbulence for a moment. Having the port placed near a cabinet wall doesn't change the fact that the system forms a Helmholtz resonator - It just makes the tuned frequency indicated by the formulas less reliable. But it is still a resonator, and it is still tuned to some frequency. And as long as the system is tuned to the frequency desired, the configuration, shape and location of the port is of little importance.But there are a couple other things to consider.In addition to forming a Helmholtz resonator, a port can form a waveguide if its dimensions are right. The cabinet can also act in a similar fashion, forming a transmission line. Either case can make standing wave phenonenon that add unexpected resonances. But these are usually only a problem is one dimension of the cabinet or the port is long in comparison to the others. A very tall cabinet or a very long port are examples of things that might develop audible standing waves in the passband.Another thing to avoid is excessive turbulence in the port or interface. If velocity is high through the port, then audible "chuffing" sounds can be produced. This can be caused by too small a port used in a high-pressure system having a high-excursion woofer. It can also be caused by interference in port airflow from a boundary or an object. Turbulence can even be introduced from objects outside the cabinet, by placing the speaker where the port is very near a wall, for example. Airflow restriction also modify filter damping, so the Helmholtz resonator's Q can be changed or even made to be asymmetric, like a partial rectification.So I've found it easiest to design systems that have a nice, large cabinet where port airflow is unimpeded. But I've built many systems where the cabinet dimensions were pretty tight. And as long as the Helmholtz frequency is right and the airflow in the port isn't so great as to create its own sounds, the port configuration is appropriate and you can expect performance to be good.

Subject: Re: Urgent answer attempt version 1.1
Posted by Adrian Mack on Thu, 07 Aug 2003 07:55:06 GMT
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Hey Thomas,Its for the JBL 2225H. The two ports I am using - is 3" wide each, and 5.67" long each. Its a PiAligned cabinet, so Vb is 47L and Fb is 53Hz. I have 3" distance from each wall which is port diameter - except from back wall to back of port.The depth of the cabinet is just 9.5" - and the port is 5.67" long, so thats 3.83" distance. It will have highpass filter, approximately 80 to 100Hz. And I've designed for about 400W maximum power input, but it wont be used like that all the time of course. Do you think this is enough distance? Thanks!Adrian

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Subject: Re: Port issues

Posted by Adrian Mack on Thu, 07 Aug 2003 08:01:56 GMT
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Hey Wayne,Interesting points. What I am using is JBL 2225H in PiAligned cabinet. So Vb=47L and Fb=53Hz. The port is placed a diameter away from surrounding walls.The cabinet is 9.5" deep - and I have two ports, 3" diameter each and 5.67" long each. So that means distance from back wall to back of port is 9.5-5.67 = 3.83". Does this sound like it is going to be a problem?Is there any difference at all between using the ports found by the formulas in the PiAlign.doc paper, and the ports I've selected above? (which tune to same frequency). The formulas in the PiAlign paper for the ports, really did not make any sense to me - only the cabinet ones did, so I selected my own ports to use. But is there a difference such as Qd?Thanks!Adrian

Subject: Re: Urgent answer attempt version 1.1
Posted by ToFo on Thu, 07 Aug 2003 11:48:30 GMT
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Yup! and the port area looks good for 400 watts as well. Cool!Have fun Adrian

Subject: Re: Port issues
Posted by Wayne Parham on Thu, 07 Aug 2003 15:50:12 GMT
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The formulas used are to set the Helmholtz frequency of the cabinet. Some are to know the frequency where the box should be tuned, others are to know what port size will result in that frequency.