Subject: 2 Pi port tuning
Posted by AudioLapDance on Mon, 18 Apr 2005 13:35:16 GMT
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Hi Wayne, hope the spring is finding you well!I'm trying to figure out what the port of the 2 pi is tuned to. I'm using a spreadsheet with the equations from your Pi Align program. I can thus set the volume of the cabinet and then play with the port length and width to calculate different tuning frequencies.Working backwards from your 2 Pi plans, I calculated an internal volume of around 1.44 cu ft. Problem is I'm not sure how much you subtracted from this (volume of drivers and ports etc) to get the actual volume. If I set the volume at 1.25 cu ft then your 1.91" diam x 1.875" port is tuned for 42 Hz. If I set the volume at 1.0 cu ft then your port tunes for 47 Hz. I assume that you calculated the actual volume as around 1.1 cu ft and thus your port is tuned for 45Hz. Is this correct?As well, given a certain volume I know that different port diameters can be tuned to the same frequency but with different Q. I assume this means that the resonant peak will have steeper or shallower slopes. Did you calculate the port for the 2 pi with this in mind or did you experiment with different diam ports ... or did you just use what you had at hand?Thanks for the help,Jeff

Subject: Re: 2 Pi port tuning
Posted by Wayne Parham on Mon, 18 Apr 2005 20:54:25 GMT
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The port is tuned for 40Hz. Don't forget that the stuffing reduces the Helmholtz frequency a bit. But there is a little tolerance in the Helmholtz frequency so that gives you some wiggle room.

Subject: Re: 2 Pi port tuning
Posted by AudioLapDance on Mon, 18 Apr 2005 21:25:30 GMT
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Hey Wayne,Maybe I should come at this from another direction. I have a 2 cuft cabinet I'm going to put an Alpha 10 into. What port should I use? The 1.91" diam x 1.875" port tunes a 1.375 cuft to 40 Hz with a Qe of 1.23. Should I try to get the same Qe when selecting my port? How much volume offset should I allow for the drivers, port etc?Thanks,Jeff

Subject: Re: 2 Pi port tuning
Posted by Wayne Parham on Tue, 19 Apr 2005 02:43:31 GMT
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For a 2.0ft3 cabinet, I would want a 2.75" diameter port that's 2.75" long. It might be easier to find a 2.5" diameter port and make it 2" long. If you use a cardboard mailing tube, it will actually be 2.4" inside diameter, but that will work very well.A good way to estimate displacement volume is to calculate each part as a composite of simple primitive shapes. For example, a speaker's magnet can be described as a cylinder and its cone as a cone. Calculate their volumes and subtract that from the cabinet internal volume. There is a program in the PiAlign distribution called "volume.exe" that will calculate volumes of basic primitive shapes.

Subject: Re: 2 Pi port tuning
Posted by AudioLapDance on Thu, 21 Apr 2005 18:09:59 GMT
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Hey Wayne, thanks for the help!You've suggested a port of 2.75" diam x 2.75" long to tune a 2.0 cuft to 40 Hz (with a Qe = 1.3)The port sizes I have available are 2.67" diam and 3" diam. In a 2 cuft cabinet the 2.67" diam port needs to be 2.625" long to tune to 39 Hz with a Qe of 1.2 . The 3" diam port needs to be 3" long to tune to 41 Hz with a Qe of 1.3 .Which would you suggest and why?And one last thing, looking at the document that comes with Pi Align you suggest that for bass reflex enclosures the port should be a woofers' diameter away from the center of the woofer. Is this critical? Why? The port is also located in the corner of the cabinet. Is this critical? Why?Thanks again for the help,Jeff

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Subject: Re: 2 Pi port tuning
Posted by Wayne Parham on Thu, 21 Apr 2005 20:48:54 GMT
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Both ports you have described will work well. The larger duct will obviously have a little less venturi effect and lower airspeed. But the difference is practically nothing, so you might go with the one that looks the best.As for the placement of the port, it really matters more in larger cabinets where standing waves come into play. The whole thing with the port of a bass-reflex box is that you want bass to enter, but not midrange. You also don't want the port to be in a position where standing waves are at a high pressure node of any bass frequency. That way the Helmholtz frequency is the only significant mechanism in play. Spacing the port as shown in the PiAlign document generally does a pretty good job of that.
