

the baffle isn't circular with the driver in the center, transition is staggered and more gradual. Defining an effective diameter for any baffle shape other than circular is a simplification. If you consider the shortest dimension then you'll probably have a little more bass energy than you expect and if you average area, you'll probably have a little less.

Subject: Re: alignments

Posted by [hitsware](#) on Mon, 06 Dec 2004 15:38:11 GMT

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Ok. For now let's consider driver in the center of a round baffle. Call F_c the lowest frequency before rolloff begins. Free space. As I understand it (not that that means much The 2 schools of thought..... Say we have a 1' diameter baffle: 1) the circumference must = $1w$ so..... $cir = \pi * dia = \pi F_c = 1130 / \pi = 360\text{Hz}$ 2) the distance front to rear of driver must = $w/2$ so $F_c = 1130 / (2 * dia) = 565\text{Hz}$ #1 is certainly more attractive and seems to work, but what about the 'rear wave cancellation' of #2. ????????????

Subject: Re: alignments

Posted by [Wayne Parham](#) on Mon, 06 Dec 2004 20:15:16 GMT

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The event at 565Hz is what I'd be most concerned with. I would expect this speaker to work well down to ~500Hz and roll off rapidly below that.

Subject: Re: alignments

Posted by [hitsware](#) on Mon, 06 Dec 2004 22:03:24 GMT

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>Defining an effective diameter for any baffle>shape other than circular is a simplification. That's what I need ! So say a 3' x 5' baffle on the floor..... $a = \text{area} = 15 \text{ sq.ft.}$ $r = \text{radius} = (15/\pi)^{0.5} = \sim 2.19'$ $d = 2 \times r = \sim 4.37'$ $F_c = 565/4.37 = \sim 130\text{Hz}$ Since it's on the floor $F_c = .707 * 130 = \sim 92\text{Hz}$ -3db = $.707 * 92 = \sim 65\text{Hz}$ Sound reasonable ?

Subject: Re: alignments

Posted by [Wayne Parham](#) on Mon, 06 Dec 2004 23:01:28 GMT

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I'd use the shortest dimension as my place of interest. That would put it around 100Hz. Then rolloff will probably be slower than if the baffle were circular with the speaker in the middle. Instead of an abrupt rolloff, you'll probably have more energy below 100Hz than if the baffle were a 3' circle. It might be interesting to measure several baffle shapes and develop a mathematical model to describe the response. It would be easy to do with cardboard and could help you make a spreadsheet to predict response.

Subject: Re: alignments

Posted by [hitsware](#) on Tue, 07 Dec 2004 00:16:35 GMT

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>Instead of an abrupt rolloff, you'll >probably have more energy below 100Hz >than if the baffle were a 3' circle. Yea But Here's my (tentative) plan: Use a widerange driver to get down to say 100Hz. So a 100Hz driver with a Q of 1 will give a flat response ($Q \approx .7$) on a 100Hz baffle. Then add a 'helper woofer' to extend down an octave. (rolled off on the high end with a 12db/octave passive network) (a driver with a Q of 2 @ 50Hz on a 100Hz baffle is flat down to 50Hz) Thus the need for a fairly good definition of baffle cutoff since the baffle is used as a crossover element.

Subject: Re: alignments

Posted by [Wayne Parham](#) on Tue, 07 Dec 2004 06:16:56 GMT

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That sounds like a good plan. I'm reasonably confident that the fastest and most well defined rolloff will be on a circular baffle with the driver in the center. You might make some test baffles with cardboard of different shapes and configurations and do some measurements to test everything out. I'd experiment with smaller baffle sizes to shift the frequency up so measurements would be easier. Maybe try 9 inches to a foot, using a small midrange driver. The higher in frequency you go, the smaller the distances involved and the easier it is to gate out reflections from walls and stuff. Once you have defined properties, you could scale up to the size you want and go with a larger driver for your 100Hz model.

Subject: Re: alignments

Posted by [hitsware](#) on Wed, 08 Dec 2004 01:08:24 GMT

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Thank You !Think I'll modify my present system

Subject: Re: alignments

Posted by [Wayne Parham](#) on Wed, 08 Dec 2004 04:17:05 GMT

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Neat! Might look cool to make the baffle oval to match the drivers.

Subject: Re: alignments

Posted by [hitsware](#) on Wed, 08 Dec 2004 14:00:41 GMT

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Thanks ! And thanks for the help with the math. (though I find myself fi-niggling the theory to fit what I want to happen)An elliptical baffle supposedly helps spread out the interference patterns also. Though 1 of my best efforts was a small round driver in the same baffle (plastic xmas tree drain pans). Maybe I like 'comb filtering' (or whatever it is that happens) mike
