Subject: The "right" port distance
Posted by dB on Fri, 21 Jul 2006 11:01:15 GMT
View Forum Message <> Reply to Message

Hi,Is there a correct (theoretic) or maximum distance from the port center to the center of the woofer(?), in my case a 10" and a 3" port speaker I am designing myself.Best Regards

Subject: Re: The "right" port distance
Posted by Wayne Parham on Fri, 21 Jul 2006 13:34:01 GMT
View Forum Message <> Reply to Message

The position of the port in a Helmholtz resonator does not matter. However, in a transmission line it does because its behavior is wavelength related. A bass-reflex speaker is one that uses Helmholtz resonance as the tuning method, but if the cabinet is large enough then standing waves can be an issue. This can be bad, but it can also be used to advantage. You just have to check it and see. I suggest using Martin King's ported box cabinet spreadsheet on any cabinet that is large than a few cubic feet, or one that is tall and thin. If one or more cabinet dimensions is long enough that standing waves might develop in the woofer passband, analysis should be done to ensure no unusual or unexpected response peaks or dips develop.

Subject: Re: The "right" port distance
Posted by dB on Sat, 22 Jul 2006 10:07:13 GMT
View Forum Message <> Reply to Message

MANY THANKS WAYNE.I am going to study about the Quarter Wavelength Loudspeaker Design next as a new topic for the summer. There seems to be a lot of people exploring this issue and model speaker. It's amazing what the ressonances can do. They can amplify the sound many times up. I have a kitchen (4.3x6.2x8.5ftHeight) with room modes at 60/90/130Hz and it's crazy how it develops the sound from engines like the bus at the bus stop and some boats running close to the beach. I found this in the living room and it generates from the kitchen (and chimney). Just amazing, it's many times stronger than going to the window.Best Regards.
quarter wavelength loudspeaker design website by Martin J. King

Subject: Re: The "right" port distance
Posted by Wayne Parham on Sat, 22 Jul 2006 15:51:03 GMT
View Forum Message <> Reply to Message

Martin King has been a valuable contributor of research in audio and loudspeakers for years, and he's a great guy. While I don't build transmission line speakers, I do build horns which are quarter-wave devices too. I think many (most) basshorns straddle the fence between being a transmission line and a true horn. There is definitely a transition range of sizes/flares/shapes between quarter-wave pipe and horn. Martin and I have discussed this issue in depth over the years, and his work had been extremely valuable for understanding implementations of speakers that fall in this range - in between pipes and horns.I like transmission lines and horns. But I also like bass-reflex speakers, particularly when size is an issue. Martin King has a spreadsheet that calculates bass-reflex speaker response, and it shows any standing wave features in addition to Helmholtz resonance. That's why I suggest using it if a bass-reflex box is made large enough that a dimension reaches quarter-wave size. It will show you what effects standing waves will have on response.
