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Subject: Re: Multisubs for pi7

Posted by [Wayne Parham](#) on Sun, 22 Jan 2023 02:43:29 GMT

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You are correct that subwoofer phase in a small room isn't terribly important. The phase response of the subwoofer is swamped by room response below the Schroeder frequency, around 200Hz.

I don't care if you use sealed or vented direct-radiators, or those with passive radiators, or a bandpass, transmission line or any sort of horn. The reason it isn't important is the room reflections and modes will modify everything. The reflections and modes are - by far - the biggest contributors to overall room response.

I suppose even having a little response ripple in a sub is probably OK since the woofer response will be swamped by the room response. But don't go too far with that. Don't choose a sub if you see measurements that show +/-10dB swings. You'll find that from some horns that are too small.

And that makes for a nice segue into a discussion about a truncated horn. When I think of "truncated," I think of something that's too short. But where horns are concerned, the length is one thing, the mouth area is another, the horn profile is another and the rear chamber is yet another. And of course, one must also consider the electro-mechanical properties of the driver. All have an effect on the horn's characteristics.

Leaving out the profile and the rear-chamber for simplicity's sake, a horn has a best length and a best mouth area for a given low-frequency cutoff and passband. Too long will shift the horn's passband downward and too short will shift its passband upward. A mouth that's too large is much better than one that's too small, but it generally still adversely affects performance. But too small is the real offender, 'cause it will make the horn peaky.

And since the length and mouth area are intertwined with the profile - which I said I would avoid for simplicity's sake - you really cannot overlook that, or the rear-chamber or the driver, for that matter. But the length/area/profile interaction is one that makes a horn with too small a mouth always seem to make for a device that has big peaks and dips in response. One could also see that as being a horn that's too long, but again, it's easiest to see the length as being a function of the passband, 'cause that fundamentally sets it. Set the length by the desired passband, and then set the mouth to suit.

I've also seen it go the other way, where the length was too short for its mouth area, but I see that more often in HF horns. When a horn is really short for its mouth, for one thing, it doesn't provide a good acoustic load. It starts to act more like a curved baffle than a horn. And for another thing, it can create response ripple with peaks at multiples of quarter-wavelengths set by its length.

To summarize, peaks at multiples of a quarter-wavelength is something I often see in basshorns with too little mouth area, and I also see it occasionally in tweeter horns that are too short for their mouth area.