
Subject: Jim's dirty little secret..... Help from the master...

Posted by [Marlboro](#) on Thu, 07 Sep 2006 03:16:31 GMT

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"The dirty little secret of line arrays is that the woofer line amplitude response starts rolling off at a frequency that is about 1/2 wavelength spacing center to center. In other words I lied when I said that the crossover could be at one WL spacing in my white paper. Measurements of the array would tell the truth. Hence, you'll need a cross under 2,000 Hz for sure."What are the parameters of the secret?How many line arrays are designed with bi-or tri-amping, active constant Q equalizers, and electronic crossovers(digital or analog)? And....does this secret more effect the passive cross than the active with bi multi-amping and equalization, via room mic-ing?Is it affected by the slope of the crossover? So that, would a cross of 48 db or 24 db electronically show less impact than one with all the "stuff" in a passive one?And if one is aware of this phenom, then would it not behoove the individual builder to choose a mid/woof with a natural or available rise in amplitude in the crossover region, in a circumstance where the C-to-c is not optimal for 1/2 a wave length and is more like 3/4 a wavelength?Marlboro

Subject: Re: Jim's dirty little secret..... Help from the master...

Posted by [Jim Griffin](#) on Thu, 07 Sep 2006 19:45:19 GMT

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Marlboro,My change of mind is based on measurements that I have taken and observed on several woofer lines. What happens is that for most of these cases the on axis amplitude starts to decline before a frequency equal to a wavelength center to center spacing. Despite using wideband woofers, when you place them in an array they just don't have the upper frequency capability that a single driver has. Now you may be able to live with the amplitude roll off of the array, in many cases as you can cross to the tweeters in a little earlier. But I would emphasize that one should measure their woofer line and decide if the amplitude roll off near crossover is satisfactory for their goals. I'm finding that crossing over below a wavelength c-t-c spacing works better for me. A target of half wavelength is what I'm suggesting but I really hope that one measures to discern their situation vs. just using a rule of thumb guideline.

Subject: re: Jim's great explanation to the "secret"

Posted by [Marlboro](#) on Thu, 07 Sep 2006 22:51:23 GMT

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Jim,This certainly makes sense. It also suggests, but you didn't say it, that you are talking about woofer lines as opposed to smaller speakers such as 3-4 inchers, which are not woofer lines, and require a sub to give them the bass they need.These speakers would have enough at the top end of their range to not be affected by the woofer measurements that you made. My 3.5 inch

sammi's do not seem to exhibit what you measured. But to be sure I would have to look up the measurements for them, although they were made in the room as a whole rather than the array in an anechoic chamber or outside. And of course, with tri-amping, electronic crossovers, and constant Q equalization, all of this is less of a problem for me than someone who is stuck with whatever they might have developed with passive crosses. I would hope that most people who go to the extent of building arrays would also buy the measuring equipment the need to at least develop a full sweep frequency response, especially since other than the microphone and its phantom power supply it's usually just software programming for their laptop. I know that's often too much to ask, but.....Thanks for your explanation. I am always enormously appreciative of your willingness to assist my questions here and those by email with my real name, as you did recently. And I'm not the only one you do that for. You must have some kind of university teaching position somewhere considering your patient teaching responses. You have a busy life I'm sure, and I have no problems about a delay in your responses since I know that eventually you will have time to respond and will do so. Marlboro

Subject: CTC spacing probably isn't the reason
Posted by [Bill Fitzmaurice](#) on Fri, 08 Sep 2006 12:40:26 GMT
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In all likelihood the amplitude drop off is due to the lowered region of flat power response that always accompanies mutual coupling, at a rate of $.7f$ with every doubling of drivers.

Subject: Re: CTC spacing probably isn't the reason
Posted by [Rick Craig](#) on Sat, 09 Sep 2006 02:55:28 GMT
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I also think that the cone profile is part of the issue. This is one of the reasons why I advise against using the small dome tweeters that won't cross very low.

Subject: Re: CTC spacing probably isn't the reason
Posted by [Marlboro](#) on Mon, 11 Sep 2006 14:52:42 GMT
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Rick, Could you elaborate on what you mean by "the cone profile"? Marlboro

Subject: Re: CTC spacing probably isn't the reason
Posted by [Rick Craig](#) on Tue, 12 Sep 2006 02:24:58 GMT
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The shape (profile) of the cone will alter the off-axis response as well as voice coil inductance has an effect as well.
