Subject: A Few Answers
Posted by Jim Griffin on Mon, 19 Jul 2004 01:54:38 GMT
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Allan,A few answers to your qquestions:1) I can go with either 16 or 20 drivers per side. IF I go with 20, my ear height will be lower than the center of the array. Is there any disadavantage to having the center of the array above your listening height?Answer: I suggest that you try to center the woofer array about the ear height at the listening position. I would use 8 Pt2 tweeters per side so that you can cover both sitting and standing listening positions plus nearly equalize the power responses from the two lines. 2) If I go with 16 drivers, I'll plan on using 4 tweeters per side. Wiring both the 4 inchers and the tweeters for 8 ohms each, I'll have a ~4ohm load if I run the tweeters parallel to the 'woofers'. Theoretically, I'll have approximately the same efficiency (~98db/1/w/m) from both arrays so they should match up pretty well. XO point will be wherever they sound right, but I thought I'd start with ~10Khz and work down. I know, comb effects should start screwing everything up after ~3.4Khz, but the 4 inch drivers should have reasonable response out to 10khz and I want to use the wide-range aspects as much as possible. I've got the components to play with the XO point, so at worst, it's no more than a waste of my time (which I have plenty of:-) So, the second question I have is about the placement of the tweeters relative to the woofers. My instinct is to locate them centered on the woofer array, and placed as close to both themselves and the 4 inchers as possible. The other option is to place them centered on groups of 4 woofers, with an obvious gap between the tweeters themselves. It would look balanced, but would it cause more problems than if they were placed immediately adjacent to each other? The center to center distance of the tweeters would of course at least be doubled if not tripled.Answer: You will need a crossover so your amplifier will see a nominal load of 8 ohms in each band--not a 4 ohms load.On efficiency you will lose a little of that 98 dB SPL--say 3-4 dB to baffle step reduction if you go with a sealed box. More bad news on the tweeters in that you will likely have no array gain with them--their sound fields don't overlap enough to add efficiency. You can only gain sensitivity by reducing the nominal impedance--a reduction of array nominal impedance from 8 to 4 ohms would yield 3 dB sensitivity. Hence, that 92 dB SPL 8 ohms planar tweeter would still be 92 dB if the nominal array impedance is 8 ohms in the array. Read my white paper on this subject.Bottom line on the woofer and tweeter sensitivity issues is that it is usually better to have a little higher sensitivity tweeter line so that you can attenuate the tweeters to match the woofer line sensitivity. You need to look up the frequency response graphs on the Parts Express site to help you make a decision on the woofer line crossover frequency. Also above a wavelength spacing center to center you'll start losing sensitivity (the comb line effects shows up as a reduction in the array's gain as you frequency goes up--above 3.4 kHz in your case). I'd shoot for a lower crossover than what you are thinking. 3)Dipole vs sealed: I can go OB or sealed with them. Any experience and opinions of one vs the other? The PE drivers have the qts (.77) to make them doable in an OB.Answer: These are very small drivers to work successfully on an OB baffle plus the baffle size will have to be large to attempt to push the dipole rolloff frequency down low enough to hand off to subwoofers. OB may still need equalization compensation to counteract the low end roll off. I like sealed boxes as they are easier to design/implement/smaller size and yield acceptable performance. 4) BSC circuits: In general, a line array is going to be pretty tall and skinny - it's sorta the nature of the beast. I'll have mine pretty close to a back wall so it may be a moot question, but, do you guys normally try and apply a BSC circuit, or is there something about the array that makes it unnecessary? I'd rather not mess with the efficiency of the array, so I'd like to avoid any series resistance if possible. Just wondering

what your thoughts/experiences have been with baffle step issues.Answer: Addressed above.Answer: Space the tweeters as close together as possible so that you will achieve a constant wavefront from them. Any separation or gaps are bad in this respect. Again see the white paper to understand why sseparations are bad for the tweeter line. 5) If I go with a sealed box arrangement, I was thinking of building the array in compartments - groups of four drivers each in separate boxes that can be stacked. Any adavantage/disadavantage to a single, large sealed box? Answer: I might suggest internal partitions (braces that separate the larger box into compartments) to break up any enclosure's pipe modes. Four woofer drivers to a partition would be just fine. Compartments like this will strengthen the box without resorting to double walls or other methods to prevent flexing the box walls. This would result in a stack of effectively small boxes inside the large enclosure but the external walls would carry all of the loads to the floor.Good luck. Let us hear how it turns out.Jim

Near Field Line Array White Paper