Subject: Re: First speakers - a little ambitious - curved array
Posted by darkmoebius2 on Sat, 22 Aug 2009 05:57:17 GMT
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Villain3g wrote on Fri, 21 August 2009 13:58I'll whip up some strait enclosures to compare. Just follow Dr Griffin's white paper and they'll turn out great. Since you are using fullrange drivers which will be covering HF's all the way up, too, the driver flanges should probably be as close to touching each other as possibleQuote:Near field. Urban, et al [1] derives a more restrictive criterion of no more than a half wavelength separation between drivers at their highest operating frequency...Wavelength is equal to the velocity of sound (344 m/s or 1130 feet/s) divided by the frequency.

For the tweeter line very close center-to-center spacing is difficult to attain as very small circular drivers would be necessitated for either the one wavelength or especially the half wavelength criteria. Consider operation to 20 kHz where one wavelength is 17.2 mm (0.68") and a half wavelength is only 8.6 mm (0.34"). Without regard to their surrounding flanges, dome tweeters are available in 25 mm (1"), 19 mm (0.75") and 13 mm (0.5") diameters. Hence, with any mounting flange allowance at all, the one or half wavelength c-t-c criteria are very difficult--if not impossible--to satisfy at 20 kHz. But, if we relax the c-t-c criterion, more secondary lobes would appear in the 10 to 20 kHz frequency range. Fortunately, in this octave the ear is less sensitive (per Fletcher-Munson curves) so any secondary lobes likely would be less audible to the listener. Thus, if one wavelength spacing at 10 kHz is adopted as a compromise, then tweeter spacing would need to be 34.4 mm (1.35") c-t-c apart. While more off axis secondary lobes would be generated in the far field, small flange tweeters are available to meet this dimension. The tradeoff is possible sound degradation from comb lines near 20 kHz.
Experts out there, do I have that right?