Subject: Cone/dome two-way
Posted by Wayne Parham on Thu, 01 Sep 2011 18:00:31 GMT
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I'd crossover at a lower frequency, but I'm not sure I'd go fourth-order, probably less, depending on what the tweeter could handle. You'll also probably want to make the woofer and tweeter crossover filters symmetrical, i.e. same frequency and slope. It's hard to know what slope to use and what frequency works best, definitely a balancing act. With matched-directivity two-ways, it's a little easier to know the general frequency range where crossover should happen, so the hard part is limited to getting the phasing right to make the best forward lobe. But with a garden-variety cone/dome speaker, we're not looking for a directivity match. As I said, it ends up being a balancing act of competing priorities.

What we're usually hoping for is best on-axis response and a generally wide pattern with fairly uniform off-axis response. Directivity won't be matched at the crossover point, but if power response is flat, then it usually sounds best. There are a few things to balance. Low-order slopes are usually good in terms of transients, and the wide overlap makes the directivities or the midwoofer and tweeter blend, sometimes making directivity actually pretty uniform. High-order slopes are usually better in terms of distortion and tweeter protection, but usually make transient response and directivity suffer. Likewise, a higher crossover usually easier on the tweeter, but directivity and consequently imaging aren't as good. A lower frequency crossover, especially with low-order slope is great for imaging, but greatly reduces power handling, increases distortion at moderate levels and ultimately usually kills dome tweeters. So it's kind of a balancing act.