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Subject: Re: xover answer

Posted by [Wayne Parham](#) on Tue, 15 Jan 2008 18:54:32 GMT

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The DE250 works very well as a drop-in replacement for the PSD2002. It is slightly smoother above 8kHz. Impedance and sensitivity are slightly different, but not so much to make them incompatible with one another. That makes the DE250 work pretty well without any crossover changes. The DE250 is slightly louder than the PSD2002 with the same input voltage though. Not much, just a smidge, about 1.5dB. That's not much, but if you want to attenuate it to match,

know, I developed this crossover using Spice. The drivers were modeled using voice coil inductance and resistance, and parallel tank circuits were used to model resonances in the woofer/box and in the horn flare. It's a very good model. However, I've recently been playing around with Keith Larson's Speaker Tester system. He has made an extension to Spice that allows measured driver impedance to be used. This makes the model even better because it uses actual impedance, even where nonlinearities change it from what an LRC model could

system. The only modifications I had to make to the models were to include the impedance ZMA files for the drivers and to remove whitespace, leaving just one space between component designator and node. So I could easily build off what I had with the Smith & Larson system, making it another step up the ladder, so to speak. I was happy that the system pretty much just confirmed the original (pure) Spice models. As they are, they're very, very good. But with the improved visibility this system gives me, I can probably optimize the circuit even further. For one thing, I found that the 8.0uF capacitor can be slightly decreased to 6.8uF or 7.5uF. There's some wiggle room in that component which is good because 6.8uF is a more common value. We want some peaking there, but we could use a little bit less, so the smaller value is fine. Another part of what prompted me to do this is I get tired of making all those cable assemblies and wanted to etch circuit boards that included them. So I've had a couple hundred boards made that have room for a lot more components, allowing me to put everything on the board instead of having R1, R2 and C1 in the cable assembly. That will be a welcome change too. In a couple of months, we'll have new crossover boards available and there may be some minor changes in component values as well.