Subject: Going to build the 800a009dB X-over from scratch; need help with C5 and R3
Posted by BillEpstein on Sun, 19 Jan 2003 17:10:17 GMT
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2226J Le = 3.5 Re = 10C5 = Le/Re squared = .1225 How does this number correspond to a capacitor value? 12 or .12uF, or whatever?R3 = 1.25Re = 12.5 Ohms? Yes? No?The two inductors should be air core, yes? Do I need to change any part values to deal with 16 ohm woofer and Altec comp driver?Once I acquire the parts I'll lay them out and photograph them how I think they should be connected according to the schematic. Then I would appreciate everyones critiques and advice between gales of laughter. Thus I will learn to build from a schematic. I hope.

Subject: Correction to your formula
Posted by spkrman57 on Sun, 19 Jan 2003 18:26:00 GMT
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TillE, JBL 2226J/re = 12 ohms and your cap will be 15.5 ufd(14.7ufd will work fine) and 15 or 16 ohm resistor will be your zoebel figures. Ron

Subject: Zobel network - C5 and R3
Posted by Wayne Parham on Sun, 19 Jan 2003 18:52:22 GMT
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Here are formulas that will determine values for a Zobel that will work quite well:C5 = Zobel Capacitance = Le/Re2R3 = Zobel Resistance = 1.25 ReWhere Re is voice coil resistance and Le is voice coil inductance near the crossover frequencyLe = 3.5mH, which is 0.0035 HenriesRe = 10, so Re2 = 100.So C5 = 0.0035/100, which is 0.000035 Farads, or 35uFand R3 = 1.25 x 10, or 12.5 ohmsDon't be too concerned with trying to reach exact values calculated above. Zobels are very high tolerance filters and can use a fairly wide range of values to achieve the same thing. I'd say keep within about 25% of the calculated values and you'll be alright. I usually set R3 equal to the advertised impednace of the woofer, for example, even if the calculated value is slightly lower or higher. Then use a capacitor that's a standard value near what your calculations show.If you swap out an 8 ohm woofer with a 16 ohm woofer, then all the crossover values have to be recalculated. Not only will the coils and caps be different, but voltage sensitivity is different too, so you will probably have to change the R1/R2 values on the tweeter to match.About air core verses iron core coils, you have competing priorities here. One priority is to keep internal resistance low and the other priority is to reduce hysteresis loss and prevent saturation. I would place a premium on preventing saturation, because if an inductor core saturates it will introduce distortion. That's why I prefer air cores, they don't saturate. On the other hand, you don't want high DC resistance

because it introduces signal loss, killing efficiency and generating heat. This tends to shift the transfer function, affecting response. For that reason, I will often use a good quality laminated core coil if I need one larger than about 3mH or so.