Subject: Crossover Values and Impedance 2nd & 3rd order
Posted by Paul C. on Sat, 04 Nov 2006 21:18:44 GMT
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Wayne, we had discussed a while back how for 12 db/oct (2nd order) crossovers, that the driver impedance could vary somewhat without changing crossover frequency. The coil pulling one way, while the value of the capacitor pulled the other, a sort of "self compensating" circuit.I have seen 2nd order crossovers that were usable with either 8 or 16 ohm drivers. For one impedance the network acted more as a Butterworth, for the other impedance the network acted more as a Linkwitz-Reilly.Is the same also true for 3rd order / 18 db/oct networks? How does changing impedance affect the crossover frequency in a 3rd order high pass network?

Subject: Crossovers and complex reactive/resistive loads
Posted by Wayne Parham on Sat, 04 Nov 2006 21:40:46 GMT
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Best bet is to plot response using Spice. That will let you represent the drivers much more accurately with voice coil inductance as well as DC resistance instead of just using an advertised impedance value. You can also include cabinet and/or horn resonances if you want to go to that level of detail.

The reason why this is important is that loudspeakers present a complex load to the crossover, and that modifies the response curve. You may be surprised at the response generated when a filter is in the presence of reactive loads. A purely resistive load will provide damping for the filter to provide the smooth rolloff you expect. But a complex load having both resistive and reactive components will modify the filter, sometimes substantially. So you really need to analyze the circuit in some detail to know its response.
Spice
Crossover Document
Crossover Electronics 101 Handout