Subject: Zobels on Tweeters
Posted by Wayne Parham on Mon, 01 Sep 2003 19:13:37 GMT
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If the horn proves to still be too hot, you might use a Zobel or maybe just shunt resistance. When padding a voice-coil driven loudspeaker, using a Zobel for the shunt leg of the circuit will ensure that the output from the crossover remains flat. It will also provide damping so that there is no

rearrange the circuit a bit, having series attenuation resistance before a Zobel placed in shunt across the tweeter. You can play with the Zobel values of R and C to generate the top-octave response curve that you want, and can play with the ratio of Zobel resistance to attenuation resistance to set the amount of damping, which will modify the response near the crossover

was with compression horns that had a characteristic negative slope in their response curves, and

so that the system is flat. It provides attenuation for level matching, top-octave compensation for the tweeter's inherent rolloff and damping of the voice-coil/crossover interaction so that it doesn't peak near the crossover frequency. But if your tweeter is already hot in the top octave, then this is not what you want.If you want the crossover to give flat response - or less of a rising response - then a different attenuation and damping mechanism may be in order. Any time there is series resistance, this will introduce some positive slope because the voice-coil is partually inductive. Since the load is inductive, a series resistance will generate rising response. Putting shunt resistance across the tweeter will tend to reduce the slope and make the circuit have less rising response, and adding some shunt capacitance can bring slope to zero, making the circuit flat. That's what a Zobel does. Or the design can go the other way, having series bypass capacitance

for top-octave rolloff of compression horn devices. So using less than a half dozen components in various configurations, you can provide a wide variety of response curves.The point I'm making is that if you've padded a compression tweeter, then you've added some amount of rising response.

series attenuation resistor. But if you don't want rising response, then the shunt leg should have series capacitance to act as a Zobel. Adding pure resistance in shunt will reduce rising response to some degree, and it will serve to damp the circuit too. But adding a Zobel damper will bring the top octave down to match midband response, and you can completely eliminate any rising response with it too.