
Subject: Reverse attenuation and HF comp. networks, active X-over

Posted by [Chris R.](#) on Tue, 21 May 2002 02:30:01 GMT

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Hi Wayne, I'm about 3/4 way done building an active crossover for bi-amping the 3677's I got from JBL. What I began thinking about is the HF comp network. Since it ends up being a bypassed voltage divider, I was trying to figure out what resistor values to use for a given compensation. If I need ~10dB of relative boost at 20KHz, starting above say 12KHz, it seems I'd need a divider with 10dB attenuation, then bypassed for a 3dB point around where I want the boost to kick in. Two questions. Using 10K ohms as the series resistor, what value goes to ground? If I'm feeding the output to the highpass filter, does it need another op-amp buffer between the HF comp and the HP filter? Thx, Chris

Subject: Re: Reverse attenuation and HF comp. networks, active X-over

Posted by [Wayne Parham](#) on Tue, 21 May 2002 03:34:46 GMT

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The formula is $\text{dB} = 20 \log V1/V2$, so you'll need approximately 1/3rd value shunt resistance for a 10dB attenuator. The thing is, you're doing more than just padding, so a resistive voltage divider isn't all there is to it. The crossover provides the traditional voltage splitter function and it also provides some response shaping. The HF filter should be slightly underdamped. Traditional 6dB/octave augmentation is provided for mass rolloff compensation, and the two transfer functions form a response curve that's flat up to about 4kHz, with 6dB/octave augmentation above that. I'd model your circuit with Spice, to verify it provides a transfer function that looks like this:

Subject: Re: Reverse attenuation and HF comp. networks, active X-over

Posted by [Chris R](#) on Thu, 23 May 2002 02:17:34 GMT

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Hi Wayne, I haven't decided if you're nuts or you deserve a medal :^). I posted the question pretty late PST and you still responded same night in a later time zone. Anyway, I'm not sure I understand the last comment about generating a shelving response before augmentation. I'm assuming that what we are attempting to do is produce a filter that has a mirror response to the published freq. response curves for the horns. To me, that means I need flat up to ~12K,

Subject: Re: Reverse attenuation and HF comp. networks, active X-over
Posted by [Wayne Parham](#) on Fri, 24 May 2002 04:01:12 GMT
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Adjust the Q of the high-pass filter, which would then allow you to adjust peaking slightly above 0.707, to around 1.0. Add a voltage divider with bypass capacitance. Then you'll be able to set the filter Q for a flat shelf followed by rising response.
