Subject: Re: L pad
Posted by Wayne Parham on Sat, 20 Feb 2021 17:22:46 GMT
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That's right, exactly. A series resistor will attenuate overall SPL but will create a peak at resonance.

Look at the impedance curve of the driver. Better still, if you can, look at the impedance curve of the driver in the box, horn or whatever you have it installed in.

Wherever you see an impedance rise, SPL will be louder. So since the impedance usually has a pretty big peak at resonance - or in some installations, resonances - those will have corresponding peaks in response. It's because the voltage division changes due to the resistance

see that the proportions change. The driver's impedance is 10x greater than the series attenuation, so the attenuation is almost nothing.

This is even more pronounced because of the crossover reactivity. What I said above holds true if you just had the driver installed without a crossover. But the crossover itself has reactive components that are damped by the load so that they do not become resonant. But if the load is decreased, e.g. resistance is increased, then the crossover itself will become resonant. I've seen 15dB peaks from this. Midwoofers without a Zobel sometimes have huge peaks near the crossover frequency. Horn tweeters with series resistors can have similarly large peaks near the horn's flare frequency, often times two or three of them.

Check out this document I did about 20 years ago. It shows this very well.
Crossover document
Some years at the Lone Star AudioFest, I do a seminar that shows this issue, illustrated with crossover diagrams and response charts. I then hook up a physical circuit and let the audience hear it, switching between a crossover that is improperly damped and another that has proper damping. It lets you actually hear this peak. I encourage you to duplicate these experiments. It's quite interesting.
Crossover Electronics 101 Handout