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Subject: Wayne, all this crossover stuff lately...(sorry, long)

Posted by ToFo on Thu, 17 Apr 2003 17:35:14 GMT

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prompts me to get into one other point that I wish to put out there. I have limited knowledge, and hope to either have this confirmed or corrected. either way I want to understand this more. I have found a number of devices with similar traits, but decided on JBL because you know it, and because I knew a lesser driver might get the response of "use a better tweeter" from some folks. This driver is quite popular even with audiophiles and is used on many a "high end" horn, often with "purist" crossovers. JBL's 2426 has impedance of about 6 ohms with peaks of 10 ohms at 1200 and 25 ohms at 450 Hz. A 13.25 cap is great for first order at 2000 Hz (6 ohms), but if you check you will note that it well within spec to use 13.25 uF at the other 2 frequencies and their associated impedances. This seems like a weird thing to me, but I checked it twice. So wouldn't all three of the listed frequencies get 1/2 power? When you take into account the drivers 2 dB peak at 1000 Hz and the caps 3 dB down at 1200, you are still within spec to call it flat down to just below 1000 Hz. This seems highly undesirable. This cannot be what people are intending to do with purist filters. It seems that many drivers have just what they need to compensate for the capacitors intended effect and confound the "cut and try" tweaker. I know I am preaching to the choir here, but there is more. The idea that the acoustic equivalent of high order filtering being rendered with a cap and natural horn unloading seems to favor unpredictable and poor crossover function, and the presence of harmonic distortion, intermodulation and resonances over the "ringing" and bigger phase angle rotations inherent in high order filters. Wouldn't running a horn through its resonance and cutoff sound awful? It does at my house. What exactly is this ringing, and why don't I hear anything bad with my Pi 1K6 X-overs. I know why the phase is no big deal, and how to deal with it, thanks to you. As for protecting the device with a series cap, 1/2 power at 450 Hz is over 4 times the excursion of 1/2 power at 2000, Yes? I realize that suspension stiffness and the amplifier seeing a 25 ohm loads negates some of this, but I can't see how it would be good for distortion figures or structural integrity to let a driver meant for 1200 and up get good juice at 450 whether you can hear it at 450 or not (intermodulation?). Are the relationships demonstrated above as cut and dry as they look? Is my understanding correct. Now for the biggie. With the above example in mind, I wonder what is really happening at these impedance peaks with higher order filters. say an 8 ohm driver with a peak at 800 of 16 ohms was used with your 1K6 x-over. At the 800 Hz 16 ohm peak the capacitor values are perfect for crossing at 800 but the inductor is now 1/4 of what 800 Hz at 16 ohms calls for. So at 800 hz what does the attenuation curve look like? What happens to filter Q? I am sure that the crossover is effected by a doubling of impedance only an octave away. I assume that it is less of an effect with high order, but I feel like the effect would be less effective attenuation and a drastic change in Q. Am I crazy, or just lost? Thomas