Subject: Pre Compensation Load on X-OVERS and L-Pads
Posted by dB on Tue, 03 Jan 2006 20:28:35 GMT
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Hi to everybody on this great Forum (website) and to Wayne Parham in particular, from Portugal.After reading your great paper on Speaker Motors and passive crossover filters, from http://www.pispeakers.com/Speaker_Crossover.doc, I have a few questions to pose. But most important is about the Pre Compensation Load on X-OVERS and L-Pads you use.1. What is a pre-compensation load? Is it the same as the R2 on a L-Pad (R1/R2)? 2. Is it possible to have a pre-compensation without the main R1 attenuation? Or is it just a reactance adjustment for the motor? (in some PA speakers I have no R1 and a R2=16.5 Ohms in shunt with the motor / X-over C=3.3uF series and I=0.72mH shunt / What x-over freq. is this and how to find if HF/Motor is of 8 Ohm impedance?)3. Are the designs you show for L-Pads correct, since they do not show the same connections as for other (standard) L-Pads? As an example from pag.60 a 12dB attenuation R1=25, R2=16, C1=0.47 and from pag.63 a 14dB attenuation R1=30, R2=14, C1=0.33. I am used to see R2 in shunt with the Motor and "after" R1. As an example from another site: http://www.lalena.com/audio/calculator/lpad/ For an LPad (Driver Attenuation Circuit) with Att=-12 db and Z=8 Ohms => ResistorsR1 = 5.99 OhmsR2 = 2.68 OhmsOr for an LPad with Att=-14 db and Z=8 Ohms => ResistorsR1 = 6.4 OhmsR2 = 1.99 OhmsHow can your design deliver 10.8 Ohm in the HF/Motor side on the first case and 10.2 Ohms on the HF/Motor side of the X-over for the second case? Is this right? Are the BIG resistor values you use better -- as in table of page 23 -- than say the small values for 'other' L-Pads as in Lalena.com. What is the difference, are they of the same effect after all?Congratulations and Happy New Year.da Bastos

Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by Wayne Parham on Tue, 03 Jan 2006 21:15:23 GMT
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The load on the crossover is a complex reactance. Since the loudspeaker itself is a reactive load,

R2 and C1 that modifies the load as well as providing attenuation and top-octave augmentation. The components chosen set the Q of the crossover filter so that there is a flat region just above the crossover frequency before HF augmentation begins (as shown below). If you would like, you

crossover

Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by dB on Fri, 06 Jan 2006 10:50:24 GMT
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Hi and thank you very much to take from your time to answer my questions. First, I would like to ask you what are the advantages of using the compensation circuit on the “right side” of R2 instead of the ones on the left side like the L-Pads from lalena.com and others. They seem to deliver less wattage to the speaker trough the process and to “burn more energy to the air”, if I have my two pages of numbers right and not taking in consideration reactances from the capacitor for the break frequency and the one´s from the main circuit.Example LPad – Driver Attenuation Circuit for –2.4 dBR1=1.93 Ohm, R2=25.14 Ohm, Speaker=8 OhmFor a Total of 300Watts: R1=72.4 Watt, R2=172.7 W, Speaker-54.9 WWith and after compensation on R1: R2=227.6 W, Speaker-72.4 WWith your Compensation+precompensation Circuit for –2.4 dBR1=2.5 Ohm, R2=34 Ohm, Speaker=8 Ohm (Attenuators from page 23 of your Paper)For a Total of 300Watts: R1=16.8 Watt, R2=229.2 W, Speaker-54 WWith and after compensation on R1: R2=243 W, Speaker-57 WI just happened to find a site to - Calculate the resonant frequency of a capacitor and inductor - http://www.mhsoft.nl/Mysystem/Reactance.asp - that I was asking for in my first question to you. Do you think this is good/right for Hi-Fi filter calculation. Does a resistor, like the one’s on attenuations, change this (the resonant frequency) or not? I am learning on how to work w/ SPICE. Is there a website for Speaker File Spice Databases? Thanks again.Best Regardsda Bastos

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Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by Wayne Parham on Fri, 06 Jan 2006 14:48:53 GMT
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The components work together to form the overall response curve. A simple speaker crossover calculator like what you might find on a website doesn't do very much, and doesn't take reactive loads into consideration. Best to keep studying AC circuits, and you'll gain a real appreciation of Spice.

Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by dB on Tue, 10 Jan 2006 23:04:16 GMT
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Dear Mr. (Wayne) Parham,Hi. It his a pleasure to be able to ask you a question and having you ‘in person’ to answer to them. First I am learning how to work with Spice software and what a difference from 20 years ago with/when my only book (that) was >PHILIPS Building Hi-Fi Speaker Systems. Thanks to all of you guys from Berkeley. I am making such great improvements that I feel pity that I am only an unemployed architect and not a technologist engineer to find a job in this area. It seems that now everybody has a position open for engineers. At least I have time for what I like and what I can do…Second I wanted to take in consideration that how more times I read your paper ‘Speaker motors and passive crossover filters’ there is something that doesn’t add up. Since my first question that I couldn’t find an answer.1. On page 33 you show:R1 3 1 5.5R12 1 0 3.7If the speaker is 1 – 0 your R1 should be 3 – 0 (not 3 – 1)

and R12 3 – 1 and not 1 – 0. (Or Spice is right and the drawing is wrong?)2. Again on page 35 you show:!L2 5 6 0.6mHC2 5 3 16Uf!R1 3 1 5.5R12 1 0 3.7C1 3 1 5uFIf the speaker is 1 – 0, R1=> 3 – 0, R12=> should be 3 – 1 (from C2-1.st order?) and not 1 – 0. (Or the drawing is not right…)What is confusing me is that the Pre-compensation can be connected to 1 (Motor-Speaker) or to 3 (C2 from 1.st order x-over).Again on page 37 and page 52:! series/parallel compensationR1 3 1 25R12 1 0 16C1 3 1 0.47uFIf you noticed R1 IS OK, C1 IS OK AND R2 IS WRONG AGAIN. Should it be R2 1 – 0 ? Or R2 3 – 0 ? With L1 from 2nd order x-over. All connections from Spice seem to be right and the x-overs drawings wrong.If L1 is 1 – 0 (page 51) then, when you introduce a !series parallel compensation on the circuit (from page 52) 1 becomes, then, 3 from C2 (C2 => 5 – 3), C1 =>3 – 1 AND R1=> 3 – 1 (Speaker 1 – 0).R2 is then 1 – 0 (parallel with the speaker 1 – 0). But the drawing is not showing that. What it's showing is R2 (from)3 –(to)0 (in series with C2 (of 2nd order x-over) . Thanks again Mr. Wayne and thank you for your time.Best RegardsFrom da Bastos

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Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by Wayne Parham on Wed, 11 Jan 2006 02:28:20 GMT
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There are lots of different complexities of models and many different crossovers shown in that document. Some model the loudspeaker as a simple series coil and resistor, others go a step further and model the mechanical resonance with a tank circuit. I'm sure with your familiarity with Spice you can tell what is what, it just takes a minute to follow it through.

Subject: Re: Pre Compensation Load on X-OVERS and L-Pads
Posted by dB on Wed, 11 Jan 2006 18:29:12 GMT
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Hi and thanks Wayne,…Now we can turn the lights on, with the Power from your PISPEAKERS voice coil.Best Regardsda Bastos

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