Subject: crossover design... help....
Posted by Pilkar on Mon, 15 Apr 2002 11:46:56 GMT
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hi Wayne, i`m building a 2 way speaker (conventional bass reflex) and i want to build the crossovers myself... i will use this two drivers: Selenium WPU1205 and Selenium D405Ti on a Selenium HL14-50 horn... which data should i look for building the crossover? i plan to cross them at 2k2 with a 12dB/oct. slope... how can i know if i need a compensation network or the damper or both? i read the doc file that explains how to do it... but it is a little difficult for me to understand everything... do you have a simple way to calculate the crossover and compensation network components? i will build a 40 liter box and will be tuned to 55Hz... can you help me?thank you very muchMatias

Subject: Re: crossover design... help....
Posted by Wayne Parham on Mon, 15 Apr 2002 15:41:29 GMT
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Subject: Re: crossover design... help....
Posted by Pilkar on Mon, 15 Apr 2002 16:40:41 GMT
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hi Wayne, thank you very much for your reply... now, how do i know for which frecuency i should compensate? i must look at the response graph, don't i? if i place a l-pad to pad down the driver, the high octaves are padded as well? which data of the spec sheet i need to model the drivers in spice?a last thing... i was looking at your designs... they are excellent but, will they work with my speakers? i mean, are they optimized for one of your designs or it is OK to use them with another speaker?sorry... something else... it is too difficult wounding a coil myself? i have experience wounding transformers... is this much more difficult? do you know any program that can help me in this task, such as wire gauge, core diameter, number of turns, etc.?well, thats all for now... thank you very much again!Matias

Subject: did you mean the D205Ti driver?
Posted by Sam P. on Mon, 15 Apr 2002 19:38:42 GMT
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It is rated 108dB/watt/1m. The horn you specified is a 700Hz. exponential flare...the circular mouth is resonsible for the 45hx45v pattern...most horns here are 90x40 dispersion, FWIW. Taking the 95dB/watt spec of the woofer at face value, it seems you will need to pad the HF down about 13dB for the levels to match. Wayne's xover list shows a 12dB and 14dB configuration, they use a 0.47uF and 0.33uF cap respectively. If your chosen driver is similar to the eminence PSD2002 that Wayne specifes, one of those values should work. The padding is a crap shoot, pick 12dB to start. If the HF is too hot when listening, cut it another dB or 2. The woofer you have chosen has a very low Re, and a large Le. It is claimed as 8ohms impedance, so I guess you just need to pick a xover freq. You said 2.2kHz. Wayne uses 1.6kHz. Your motors will "handle" either one. Just BEWARE, YOU ARE NOT BUILDING A PROVEN DESIGN by using these components. I have no opinion about how what the results will sound like, but this ain't rocket science. Wayne uses a 3rd order HP filter that does a super job of protecting the HF driver from being blown. A 2nd order LP and Zobel will be needed for the woofer. Any online calculator will spit out the values if you want to build your own xovers, I assumed you are intending to use "store bought" ones at 2.2kHz? Eminence has them for a 1.6kHz. ready to install, you will still need to build the pad/comp for the HF. Now go cut some wood, and let us know how things turn out:) Sam

Subject: Re: crossover design... help....
Posted by Wayne Parham on Mon, 15 Apr 2002 20:00:08 GMT
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>> thank you very much for your reply... now, how do i know for which>> frequency i should compensate? i must look at the response graph,>> don`t i?That's right, yes.>> if i place a l-pad to pad down the driver, the high octaves are>> padded as well?That's right too.>> which data of the spec sheet i need to model the drivers in spice?Re and Le, and you'll need to determine the acoustic reactivity of the horn/diaphragm system.>> i was looking at your designs... they are excellent but, will they>> work with my speakers?Use the crossover version that matches the sensitivity of your HF subsystem to the LF subsystem. As an example, if your tweeter is 12dB

louder than the woofer then use the 1K6a012dB version. Be sure to find the sensitivity of the compression device on the horn - not measured at 1mW on a waveguide - when comparing sensititity to the woofer. Calculate the Zobel woofer damper using the formula shown at the bottom of the schematic.That's all you need to do. It will sound great.>> it is too difficult wounding a coil myself? i have experience>> wounding transformers... is this much more difficult? do you know>> any program that can help me in this task, such as wire gauge,>> core diameter, number of turns, etc.?Here's a formula that will calculate inductance of a air core coil:Single layer depth - Formula is good to 1% accuracy if wires are wound tightly and single layer insulation magnetic wire is used:uH = NR2/(6R + 9X)Multiple layers of windings on form - Formula provides 30% accuracy:uH = 0.8NR2/(6R + 9X + 10D)Where:uH is inductance in microhenriesR is radius of wire form (core center in the case of multiple layer form)N is number of turns or rotations in windingX is length of overall wire formD is depth (thickness) of layers of windings on core

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Subject: Re: crossover design... help....
Posted by Pilkar on Tue, 16 Apr 2002 09:51:50 GMT
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hi Wayne!thanks for your help! i will use one of your crossovers... one last question concerning this point... i want to build the speakers with the capability of being bi-amplified, so, it is OK if i wire the direct inputs straight to the drivers, with the crossover still conected? or i must disconnect the crossovers to avoid problems? (like burning components, etc.)thats all for now... i will post pictures once the project is completed...thank you very much again!Matias

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Subject: Re: did you mean the D205Ti driver?
Posted by Pilkar on Tue, 16 Apr 2002 10:11:33 GMT
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hi Sam!no no, i meant the D405Ti driver... (selenium.com.br/site2000/linha_profissional/titanio/pdfs/d405ti.pdf)it's a 2" throat driver... it is rated for 125W RMS with xover above 1200Hz... it's pretty big...and no... my intention is not to buy the xovers built, but building them myself, down to the coil... how do you think a single layer air core coil would perform? because that is what i will build... or what i want to build...well, thank you very much for your feedback!! i'll post pics when the speakers are completed...thank you very much!Matias

Subject: Re: crossover design... help....
Posted by Wayne Parham on Tue, 16 Apr 2002 14:34:40 GMT
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>> i want to build the speakers with the capability of being bi-amplified,>> so, it is OK if i wire the direct inputs straight to the drivers, with the>> crossover still conected? or i must disconnect the crossovers to avoid problems?Disconnect them. When using an active crossover and bi-amp, disconnect all reactive components from the speakers, and put them between the preamp and amp instead.

Subject: Re: crossover design... help....
Posted by Pilkar on Tue, 16 Apr 2002 16:42:25 GMT
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hi Wayne,a last thing... were can i find the schematics for the 1K6a12dB and 1K6a14dB crossovers?thank you very much!Matias

Subject: You have mail!
Posted by Wayne Parham on Tue, 16 Apr 2002 19:54:30 GMT
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