Subject: Wayne and crossover guys; a little help?
Posted by BillEpstein on Thu, 16 Jan 2003 21:21:00 GMT
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So I've got these 8 ohm Altec 811/806A's sitting on the 16 ohm JBL 2226J's and the Altecs are kinda "hot" sounding with Wayne's 4 Pi Pro Eminence crossover.And I want to cross at 800 Hz like God and Altec intended. So I get the Eminence PXB 2 800 boards, which is rated at 8 ohms.But my Bud says 8 ohm cross is bad and needs another 16 ohms in parallel with the horn. Okay, I can do that.So now I add maybe 30 (?) ohms to the attenuation coming from the tweeter positive, bypassed by, what, .33, .47 uF to tame the highs?And do I remove the 10uF cap like I did for the Pro?Or should I do something entirely different?Please don't suggest I use Spice; it's me, the dummy, Till.

Subject: Altec 811
Posted by Wayne Parham on Fri, 17 Jan 2003 05:30:07 GMT
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schematic, because this is the response curve you can expect to get with a PSD2002:Altec 811

response is nearly perfect. Probably as perfect as you can get from a 1" compression device on a horn, really. You can also see that 6kHz to 14kHz is up 2dB from the 1kHz to 6kHz level, so you could use a 1K6a006dB crossover and expect excellent results. If you must use more attenuation, such as is provided by the 10, 12 or 14dB units, then you will probably want to use a slightly smaller value for C1. I expect that 0.22uF or 0.33uF will be better than 0.47uF on the Altec horns using the PSD2002. Then again, with other compresison horns, you might want to leave capacitor C1 as it is.When moving to the 800Hz crossover, compensation begins earlier. I see that you're using an Altec compression driver, so we can discuss this frequency for them. But I want to remind everyone that I wouldn't recommend an 800Hz crossover point with the

compresion devices and tuned a little differently. I understand that you don't want to use Spice, but it would really be great - Just a little bit of "tweaking" on the drawing board would put you right in the driver's seat. But if you want to do a "seat of the pants" thing, my gut feel is that you'll want to use the 800a009db or 800a012db crossover for the 806 on 811, and I think you can expect acceptable results using a C1 value that's 1/3rd to 1/4th the size of what's shown on the chart for the 800a009db or 800a012db crossover schematics. I also think that I'd leave all the other component values and their configuration in the circuit as shown on the schematic and value charts.

Subject: This is mainly my fault here, so let me clarify what is needed!
Posted by spkrman57 on Fri, 17 Jan 2003 11:16:45 GMT
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Wayne, TillE has 806A Altec compression drivers which are 16 ohm, and JBL 2226J's which are 16 ohm. TillE will be driving with Paramour and Ella tubed amps, so power handling is not a issue. What IS needed is a 800 hz crossover made for 16 ohm drivers not 8 ohm like parts express makes. I know compensation/attenuation would be R2 = 28 ohms and R1 = 60 ohms with .33 ufd compensation cap. The problem arises because I ran the same system with 1.6khz crossover and 2mh on 2226J, R1 and R2 were 30 ohm and 14 ohm. So the woofer was taken care of at 16 ohm no problem(should have been 1.4 mh, but close for me) and the voltage division on the horn(even being 16 ohm) still worked out okay using the 8 ohm 1.6 khz hi pass(parts express again). But TillE needs the schematic for the 16 ohm crossover which will also include a zoebel of 16 ufd and 15 ohm resistor. So this is really my fault since I got TillE started with the Altec horns/ and drivers, It's the 16 ohm deal that is the problem here. I have recommended 2nd order butterworth for hi and low pass as Altec used that with most of their classic Voice of the Theatre line and I have heard that it meshes best with the 811B/511B horns. Ron

Subject: back to back BW filters
Posted by Sam P. on Fri, 17 Jan 2003 12:46:28 GMT
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for 16 ohms drivers at 800Hz. would take 4.5mH coils and 8.8uF caps. At 1600Hz. use 2.25mH/4.39uF values. The values are not set in stone.. Hey, a while back I snagged a pair of 4.25mH 18ga. coils at the ratshack on clearance, if you can come up with 4 of those you could just cross a little higher, and use a different cap value to match the coils. In lieu of a fixed pad, you might want to TEMPORARILY use mcm's 16 ohm lpads so you can vary the levels while listening.. Once you find the sweet spot for overall tonal balance, measure the ACTUAL relative difference between the HF and LF, then work out the fixed pad values. Samremember, altec clones are different animals than pi speakers:)

Subject: Re: back to back BW filters
Posted by spkrman57 on Fri, 17 Jan 2003 12:53:16 GMT
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"remember, altec clones are different animals than pi speakers"Yes, that is true. Ron

Subject: something to try
Posted by Sam P. on Fri, 17 Jan 2003 17:26:57 GMT
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when you are bored is a series xover. The altecs can handle the shallow rolloff if you cross them at 1.6kHz., like Wayne does in the 4 Pi Pro. When I tried it with the jbl/altec systems, subjectively the clarity and dynamics were a hair better than with the 600 Hz. BW's I had previuosly used. Other web references will give you the benefits of series xovers (AND their pitfalls), but to do it only takes a single coil and cap per speaker. My 8 ohm values were a 0.8mH 14 ga. air coil and 12uF solen cap. Padded with resistors, sounded good.. The 4648a-8 acts like one BIG 8 ohm driver, run "pseudo-1st" and xover at 1.6kHz. like in the 4 Pi Pro, fed thru the coil. The HF is fed 1st order thru the cap. Not much to screw up the sound. The resistors present a nice even load to the HF portion of the series circuit. Sam

Subject: Sam, I would like to try that
Posted by spkrman57 on Fri, 17 Jan 2003 18:35:51 GMT
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Sam, What are the power handling issues regarding 6db series crossover networks? Could you figure out the values for a 1.6khz series crossover using a 16ohm JBL 2226J and 16ohm Altec compression driver (L and C that is)? I can figure the attenuation/compensation component values I need with no problem, if fact, I will probably experiment with that anyways. I have not wanted to venture in the series crossover realm because I worried about power handling issues, but this definitely piques my interest. Please elaborate if you would. Regards, Ron

Subject: power handling
Posted by Sam P. on Fri, 17 Jan 2003 20:43:22 GMT
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is safe at LR levels, especially since the altecs can cross as low as 500 or 800Hz. 2nd order. Remember, a 12dB pad means only 1/16 the available power can get to the voice coil.. So, nominal values for 16 ohms series xover at 1.6kHz. are 1.6mH and 6.21uF, again not written in stone. Minimize the DCR of the coil. Try to get your pad values so the total Z in that portion of the series circuit is 16 ohms.. Weems suggested multiplying the L by 1.25 and the C by 0.83 for maximum flat response from each driver (2.0mH/5.15uF). Using the raw values I mentioned above provides the flattest Z back to the amp, obviously hooked to 16ohm taps for tubers.. Since PE has no 14ga. 1.6mh coils, using 1.8 or 2.0mH, and playing with the cap value (between 5 and 6uF) will be needed. For those small partial values, throw on a dayton film/foil bypass of 0.22uF across the main cap. Under $40 in parts, plus your pad resistors.. I found the sound "quicker" using the series xover, but with the dual 15's I figured running out to 1.6kHz. was too high. Using

a single 2226J is perfect, and the series coil should be plenty of attenuation for the woofer. Wayne suggested 1.4mH I believe for "pseudo-BW" as in the 4 Pi Pro's...this circuit is very close.. Some guys have run the altecs down to 500 and 800 with just a single cap, at moderate volumes. So taking it up 2X higher than normal, and crossing it 1st order is "safe". At least under 100dB:) And the simplicity of a single cap feeding the HF. Try it, you will like it... Sam.I'm tempted to pull the 2035's from my quasi-4 Pi Pro's and install 2226J's, with altec HF drivers on the H290's, and follow my own advice:) nope, too hard to pull those damn port tubes loose from the rtv and retune:(

Subject: Re: power handling
Posted by spkrman57 on Fri, 17 Jan 2003 22:03:13 GMT
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Thanks Sam, I hope to get time this weekend and try out this venture, using Dynaco ST-70 amp (35 watts/chnl) should be safe for normal volume in house. Regards, Ron

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Subject: Re: Wayne and crossover guys; a little help? Relax, guys.But read carefully.LOL
Posted by BillEpstein on Fri, 17 Jan 2003 23:13:35 GMT
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Wayne already sent me the 800 Hz schematic with values of R1, R2, and C1 for various rolloffs: 6, 9, 12, etc.What I need is to figure out how to hook up this thing. I thought Ron's idea of getting the Eminence cross and changing the 3 values would be good 'cause I've done that before.Would it be safe to say (as in live nude resistors) that everywhere a part crosses the line of another part that is a connection?For example: the line that goes East from the bottom input crosses a line that says C4 so a 20uF 250 V cap connects to that wire, right?There is also a resistor R3 that makes the same conection with one end and the other connecting toin series to a Cap C5 which connects to the woofer positive(?) terminal.And the the wire from the neg side of R3 connects to the neg woofer terminal. Yes? No?Why is there a bumpy line across both driver symbols? The same bumpy line that signifies an inductor?Anyone care to annotate the Pi Speakers Crossover Diagram with " now put tab 'A' in slot 'B'?"Alternatively, has anyone drilled out the rivets holding the Masonite to the Eminence crossover PCB. Is there glue also? or would they come apart so I could "read" those connections?

Subject: Schematic symbols and stuff
Posted by Wayne Parham on Sun, 19 Jan 2003 04:33:20 GMT
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On the schematic diagrams for my crossovers, yes, this is true. They are simple enough that I can draw a schematic with no wires crossing. But reading schematics is a little like reading handwriting. There are some standard symbols, but there is a little room for "flair." To tell the truth, electronics schematics are probably a little more standarized than handwriting, but the same idea applies - Some do 'em a little differently than others.For example, some schematics show every connection with an obvious dot. The lines don't just cross - There is a black dot that sort of highlights the connection. And in some schematics, you'll see a curved line where lines cross that indicates no connection is made. It sort of looks like the wire "jumps" over the other wire, and that, in fact, is exactly what this symbol is meant to show.I use both of these techniques on schematics of any complexity. If a connection is made, the node is exaggerated with the dot. And if two lines cross that aren't connected, I use the curved "jump over" section. But the crossovers are so simple that none of this is needed. So in this case, a connection is shown by two lines meeting, and you could literally wire the circuit exactly as the lines show and expect the circuit to work. In a sense, the schematic also forms a circuit layout and you could etch conductors having this pattern on a single-sided board and it would work perfectly.The "bumpy line" is the inductor symbol. The symbol having two parallel lines that don't touch is the capacitor symbol. And the wavy line that is peaked like little triangles is the resistor symbol. I draw the voice-coil of electrodynamic drivers as inductors with a little horn looking thing to represent the diaphragm. And I draw piezoelectric drivers as capacitors with the same diaphragm horn shaped thing.