Subject: Crossover help: more confused than ever!
Posted by BillEpstein on Sat, 22 Dec 2001 02:15:10 GMT
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This series/parallel thing is making me crazy. The archived posts between Wayne and Jeff and Mike with Wayne having an "Happy Gilmore" moment, yikes! I got the new crossover schematic for the Theatre 4's, thanks Wayne, and understand the woofer zobel thing. But the tweeter network is beyond me. See "Happy Gilmore" above.Once again, I currently have a 16 ohm resistor between the + and - posts of the tweeter output of the crossover and another 16 ohm joined to a .47uF cap between the + tweeter crossover output and the + tweeter. At this point I don't even know whether I have an R2! Could somebody maybe post a drawing showing the positions and values for an idiot like me? Or at least a "thigh bone is connected to the knee bone" type thing. Thanks and Happy Holidays to all.

Subject: Re: Crossover help: more confused than ever!
Posted by Wayne Parham on Sat, 22 Dec 2001 05:06:30 GMT
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OK. Let's roll our sleeves up. First of all, the 16 ohm resistor across the crossover's tweeter output is exactly right. That's your R2 resistor. But now that one takes the full power of the amplifier across it from 2kHz up, so let's refresh ourselves on the "Happy Gilmore" ohms law thing. But this time without the Bob Barker scene.Resistors in series are simply added to calculate total resistance.Two identical resistors in parallel equal 1/2 the resistance value of either. The actual formula is:Rt = 1/(1/R1 + 1/R2 ...)You don't have to connect networks of resistors together to form a single resistance, as I often suggest. I make this suggestion just so people can obtain the proper value resistors having the necessary power requirements. But a person can use a single resistor just as well, and it's much easier.Since music content is weighted towards the frequencies below 2kHz, you probably won't have full power across this resistor - but you could have. Still, you probably can consider that 1/10th power is sufficient for this part, for various reasons. If you're running a 100 watt amp, then a single 10 watt part is probably plenty in this location. If you're running a SET, you could put a little 1/2 watt part here. But just remember that this one takes the load.The 0.47uF capacitor C1 is connected in parallel with the 16 ohm resistor R1. These are placed in series with the compression driver. If you cannot remember how series and parallel connections are made, it might be worth your time to search for a book or another reference to show you. You can probably even find a "thigh bone is connected to the knee bone" type thing on the internet. The schematic shows C1 and R1 connected in parallel, and the actual, physical connections are just like they are shown on the schematic. An example of a series connection is shown as R3 and C5. These are two devices that have been connected in series with one another, and they are also connected physically exactly as they are represented on the schematic.I hope this helps. If not, I would suggest that you go to a television repair shop in your area and ask for assistance. Certainly you can find someone there that will solder your crossover together, and ensure that it is done right.

Subject: abandon hope all ye who enter.....!
Posted by BillEpstein on Sat, 22 Dec 2001 10:50:40 GMT
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O.K., 2- 32 ohm 10 watt resistors joined in parallel form 1- 16 ohm 20 watt, errrr thingy. 2 thingy's joined in parallel make 40 watts power handling but only 8 ohms. So there must be a formula for joining 4 resistors into 2 parallel thingys that are then connected in series that sums the wattage but maintains the ohmage? i.e.,1- 32 ohm 10 watt parallel pairs + 1- 32 ohm 10 watt parallel pair connected to each other in series equals 1- 16 ohm 40 watt network?Can I infer that while parallel circuits halve the resistance and sum the wattage, series circuits maintain the resistance and also sum the wattage? That would make sense out of using 4 resistors of 32 ohms 10 watts each to achieve a circuit resistance of 16 ohms with 40 watts power handling. Am I getting warm?Now, highly verbal lowly math person that I am, let me try this parallel/series thing with the nicely visual drawing in front of me. I imagine schematics have been around a long time and I really should learn to read one before I die. After all, I managed to read and understand the discourse between Newton, Linus and Hook in the "Transactions of the Royal Society" in the original script where all the S's looked like F's! I feel like Linus, unable to understand that Newton has invented a new branch of physics to explain the refraction of the light into it's spectrum so I fall back on what I do know and posit a little guy, a "homonculous" that does the job.But I digress.It looks as though parallel in the schematic represented by R1 and C1 is joining their respective leads to each other with the bodies of both elements lying side-by-side. 2 resistors are lying on the sand at the beach with their feet and hands joined. Kinky, yes?That's what I did with my 1- 16 ohm resistor and 1- .47uF Cap. Conversely, then, connecting two elements in series would be like links in a chain, verdad? Now the beach blanket resistors are joined at the hands only with their feet stretched out in other directions, who knows where.I would imagine also that if the schematic shows R2 across the + and -leads of the tweeter output then the upper line coming from the tweeter must be the positive side of the circuit and the lower line the negative. Correct? Now I seem to remember something being written about the relationship between R1 and R2. One leg of the R1 is joined to a leg of R2. The other leg of R1 connects to the other leg of R2 through D1 (whatever that is) so are R1 and R2 connected in parallel?If so would'nt that make the circuit at C3 8 ohms?Another way of looking at R1 and R2 (this empirical stuff is great, you have no idea whether or not your right or wrong, but you can talk about it anyway) is that one lead of R1 is joined to one lead of R2 and the other lead of R2 continues down the negative side of the circuit to the woofer. Ignoring that the other R1 lead runs through D1, this looks like a series connection: the current flows through R1 and then R2.So which is right? Are R1 and R2 joined in series or in parallel? Or is there a third relationship?R3 and C5 are within the boundaries of the + - legs so they have to be in series even though one lead of C5 joins with R3 by going through D2. Does that mean that the positive and negative sides of the schematic keep series from becoming parallel? That the local junction of R1 and R2 being on the positive side and the other junction occuring on the negative means that the connection is in series? Is anybody suffering vertigo yet? Wayne, can I seriously propose that you build a great big crossover with great big parts on a 4X8 sheet of plywood, get in front of a camera and make a video explaining all this? I wonder what the break-even would be on the production costs? An initial run of 1,000 would probably sell out on the Asylum and at parts Express in a few weeks!The going rate for How-To videos I'm familiar with from Taunton Press is $29.95 to 39.95. Let's say a pro cameraman gets $1000 for a day's work; the lab get's another $1,000 and it costs $10 to package each video. Then you wholesale them with a 50% discount and net $11,500.I'd buy one. Make it a series and create an annuity for yourself.

Subject: some component calculators
Posted by bmar on Sat, 22 Dec 2001 13:32:26 GMT
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Hi Till,This page has some online calculator that you are able to enter the values and presto chango, your math problems are solved.Hope this helps you outBill

http://www.citlink.net/~bhamre/A_Electron/Electronic_Calc.htm

Subject: Kama Sutra Series/Parallel
Posted by Wayne Parham on Sat, 22 Dec 2001 16:48:34 GMT
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When two equal value resistors are connected in parallel, the resistance is halved and the power handling is doubled. This is largely because there is now two current paths, and power dissipation is split between them so capacity is doubled. When equal values are connected in series, current is now reduced - cut in half. This also means that the voltage across each resistor is made 1/2. So combining these effects, you now get 1/4th power across each series component that you would have had if the component were connected by itself.

Subject: LIVE NUDE PARALLEL GIRLS! GIRLS! GIRLS!
Posted by BillEpstein on Sat, 22 Dec 2001 20:50:18 GMT
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I understand now. 2- 16 ohm 10 watt resistors joined in parallel equals 8 ohms 20 watts. 2 sets of these parallel pairs joined IN SERIES equals 16 ohms 40 watts. Parallel halves the resistance and series doubles it. Both sum the wattage. This so cool.Now for the crux of the issue, the main event, the big deal: aside from power handling, does 8 resistors comprising R1 and R2 sound any different than 2 resistors? Are we doing anything besides enriching the people that wind the wires and pour the ceramics?After tomorrow night, I hope, the Theatre 4's will see a maximum 3 1/2 watts with the newly constructed Paramours running flat out.The construction is done and tomorrow I will be breathing solder fumes non-stop! Something like Annie Lennox or Los Fabulosos Cadillacs might push that many watts. Can't wait to see the blue glow of those great big 2A3's.Wayne, this has been great fun, this old dog thanks you for the new tricks. Series-ely!

Subject: Re: LIVE NUDE PARALLEL GIRLS! GIRLS! GIRLS!
Posted by Wayne Parham on Sat, 22 Dec 2001 21:42:17 GMT

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At very low power levels, I wouldn't expect any difference. But as power levels are increased, the smaller resistors will get hotter which can cause their values to shift at the least. When they reach their limit, they can start to make thermal noise and eventually burn open, possibly damaging other nearby components. I've seen heat from power resistors burn through a fiberglass circuit board.

Subject: Re: LIVE NUDE PARALLEL GIRLS! GIRLS! GIRLS!
Posted by Garland on Sun, 23 Dec 2001 18:35:44 GMT
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Till, Solder, Solder, Solder; Listen, Listen, Listen; Sleep; Listen again; then post initial review!!! I'll be waiting!Garland

Subject: Hey Garland! Cut me some slack!!!!
Posted by BillEpstein on Sun, 23 Dec 2001 22:56:50 GMT
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There's 2 of these suckers. 2 bases, two plates to paint, double all the parts with those itzy little screws and washers. I'm on page 27. Just finished connecting the 2 green wires; one to B4 and 5, the other to B9. Sound familiar?And except for the ground plane, all the wire is stranded, all those little bits wanting to head off in some other direction than what you intended. Jeepers!It's looking like Wednesday to finish. Maybe I'll stretch out the fun for the 12 days of X-mas.