Subject: Choose a match loudspeaker and x-over question.
Posted by Gabriel on Sun, 20 Jul 2003 16:12:28 GMT
View Forum Message <> Reply to Message

Hi,I'm a beginner in loudspeaker building, and have some question. I already have a Carvin DCM 2000 amplifier with power rating 1000watts /channel in 2ohms and a pair of woofer dual voice coil rated 250watts/voice coil (@4ohms), all are RMS. Now I'm lookin for the mid and high speaker to match. I prefer to operate the system in 2 ohms mode to get the max of the amp, so with the woofer that work until 400Hz with 500 watts/2ohms:1. I need to know the ideal power rating for the mid and high loudspeaker. I have lookin around, but the most ideal mid that I like is only rating around 70-100 watts/speaker in 4 ohms, and the high around 70-100 watts/speaker in 4 ohms too, i will use 2 each to make the impedance 2 ohms, it's OK to use it? How to calculate or determine the power rating of the speaker to match?2. For the x-over, if I use zobel in DVC, do I need to make a circuit for each voice coil or can I calculate the Le and Re in parrarel, and use only 1 circuit?3. The resistor in Zobel circuit, for the 250 watts speaker, it's OK to use 25 watts wire wound resistor(the biggest power rated that I can find)? If not, how to calculate the the rating power of the resistor in Zobel network?Any reply will be appreciated. Sorry if my language is bad, I'm from Indonesia. Thank's in advance Regards,Gabriel Temmy.

Subject: Crossovers, damping and matching subsystems.
Posted by Wayne Parham on Sun, 20 Jul 2003 17:29:17 GMT
View Forum Message <> Reply to Message

I prefer to design loudspeakers with subsystems that nearly match. This isn't always practical, and in the case where one system handles less power than the others, it is going to obviously make the system able to handle more power without damage over some frequency ranges than others. Also sometimes you'll work with subsystems that need EQ, like CD horns, and this changes the balance.It is worth noting that if one subsystem is 10dB more efficient but handles 10 times less power, then you really have matched dynamic range even though input requirements are different. At maximum power, both subsystems will generate about the same SPL. Simply attenuate the higher-efficiency subsystem by 10dB, or raise the power of the lower-efficiency subsystem to match. This also gives an opportunity for 10dB response shaping, as is required for CD equalization.As for the Zobel, if you have two drivers in parallel, you can use a single Zobel shared by both. Calculate the value by knowing the Le and Re values in parallel, halved if they're the same model driver.To calculate the power dissipated by the Zobel resistor, you have to know

Crossover Document. Page 66 shows the power transfer curve of a Zobel resistor. Of course, different filters and components will have different frequencies of interest, but the general shape of the curve will be the same. You may want to model your circuit with Spice, which is what was used to generate the graphs in the crossover document.

Subject: Thank's Mr. Wayne, but need some more explanation.
Posted by Gabriel on Sun, 20 Jul 2003 23:32:56 GMT
View Forum Message <> Reply to Message

Dear Wayne,Thank's for your explanation. But I still confused with your explanation. You said : "However, if one subsystem is 10dB more efficient but handles 10 times less power, then you really have a matched system even though power requirements are different. At maximum power, both subsystems will generate about the same SPL. Simply attenuate the higher-efficiency subsystem by 10dB, or raise the power of the lower-efficiency subsystem to match."*Do you mean I need to buy another amp for high freq? Or I still can make it with one amp, but lookin for the mid and high loudspeaker that the sensitivity is 10dB lower (I think I must use an attenuator or L-pad here) than my woofer, and power handling around 50watts is match with my woofer? *And for the passive filter, do I need to make sub with 2way (with low frequency overlap) filter or build a three way filter?Thank's in advance.Regards,Gabriel Temmy

Subject: System possibilities
Posted by Wayne Parham on Mon, 21 Jul 2003 00:12:46 GMT
View Forum Message <> Reply to Message

You can use an attenuator to bring down an efficient subsystem to match other less-efficient subsystems. This is a solution that will work with a single amplifier. But it obviously means that overall system sensitivity is set to that of the lowest rated component.If you choose to bi-amp or tri-amp, you can use more gain and power for a subsystem that is less efficient instead of attenuating. But this requires multiple amplifiers and more hardware.

Subject: Thank's again.
Posted by Gabriel on Mon, 21 Jul 2003 01:21:53 GMT
View Forum Message <> Reply to Message

Dear Mr. WayneThank's for the explanation, I will start to buy and build the system, hope I will do it right. And just for the information, I build the speaker for my bass guitar cabinet, I didn't find the available bass cabinet on the market is satisfying me (especially with the low end). I will post again after my project done, and share my experience with the other enthusiast.Thank you again.Regards,Gabriel Temmy.