
Subject: Re: Nice Link on why SS may not work well with single driver

Posted by [Martin](#) on Thu, 05 Aug 2004 18:47:57 GMT

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akhilesh,"Given that tube amps will work well with some speakers and SS with other speakers, maybe it's the SPeaker/amp COMBO that makes the difference. In other words, the interaction effects between tube amps' low damping and the highish sensitivities and flat impedances of the speakers that work with them as a COMBINATION may produce better (meaning more realistic) sound than the SS amps / high Q speakers combo. In general that is. What do you think?"I agree that the COMBO is the key. Lets look at three speaker/amp combination examples.1) A SS friendly speaker with an efficiency of 88dB, $R_e = 8$ ohms, and a Q_{tc} (~ Q_{ec}) of about 0.7. The SS amp adds essentially no series resistance so the result is a maximally flat 88 dB response. But if a SET amp with an output impedance of 3 or 4 ohms is used, then the system Q_{tc} rises to approximately $(0.7 \times 12 / 8) 1.05$ which is an underdamped response. The efficiency also drops so the amp runs out of steam on loud passages. Not a good combination.2) A tube friendly speaker with an efficiency of 100 dB, $R_e = 8$ ohms, and a Q_{tc} (~ Q_{ec}) of about 0.3. The SS amp adds essentially no series resistance so the result is a very rolled off overdamped low end, screaming and shouty mid range, and an efficiency of 100 dB. But if a SET amp with an output impedance of 3 or 4 ohms is used, then the system Q_{tc} rises to approximately $(0.3 \times 12 / 8) 0.45$ which is almost a critically damped response. Add some cable resistance and it only get better. The efficiency also drops a little but probably is still near 95 dB so the low power amp is not such a concern. The tube amp is a good combination.3) A tube friendly speaker with an efficiency of 100 dB, $R_e = 8$ ohms, and a Q_{tc} (~ Q_{ec}) of about 0.3. The SS amp adds essentially no series resistance so a correction circuit is used in series with the driver. Much better result. The efficiency drops, but this is not a concern. The circuit allows adjustability, this is a nice advantage. I think that this is also a good combination and the path I have followed.After reading Nelson Pass's write up on his F1 amp, I think he is doing something similar to system 3, but if I understand correctly his current amp requires the correction circuit to be in parallel with the driver. So his individual circuit components play the opposite roll of the components used in my series correction circuit approach. This means that while in my series circuit the signal passes through the inductor at low frequencies, in the F1 configuration the inductor passes the high frequencies. I would not want to rely on an inductor at high frequencies. When I measure the impedance of inductors using LAUD I find that at high frequencies they become their own resonant LCR circuit due to capacitance build up between the turns. Maybe he has already thought of this and addressed it, or maybe his smaller inductors are not prone to this at audio frequencies. But I like his approach and do find it interesting and amusing that suddenly the AA HE forum seems to like this better than the circuits I have been proposing for a few years. Even Terry Cain seems to be excited!Martin