Subject: Coupling cap/grid choke, etc.
Posted by Damir on Tue, 14 Feb 2006 12:51:22 GMT
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My grid chokes are 1700H/8k amorphous "C"-core devices. The "Q" of the RCL circuit (choke model - inductor in series with resistor, and paralelled by winding capacitance) is Q=[(L/C)^0,5]/Rw. If we (simplified) observe L as a constant, and Rw=8k constant, too, then we can lower the Q (and avoid subsonic resonance) by enlarging the coupling cap, or by adding external resistance. Series external resistance Rout of the driver "dampens" the Q, and parallel R can also help a bit.I simply used 4,7µF Mundorf Supreme coupling cap, "good compromise" between the cost/dimensions and value.In the next couple of days I`ll post about this experiments on "Group Build" forum, but in short:-E182CC cascode with ~20mA and Ra=15k has output impedance Rout=Ra`=Rin//Ra ~14kOhms. Amplification is A=gm*Ra`, and with gm~4ma/V and very large (infinity) loading impedance (grid choke, Zgch=2Pi*f*L) our amplification is A=4*14=56 times. We can say that we aproach this on high frequencies, say 10kHz, where Zgch=106,8MOhms theoretically and simplified. On larger frequencies, say 20kHz and up, Cw "comes into play" and with Rout of the driver forms low-pass filter. On the lowest frequency of interest, say 20Hz, our Zgch is "just" 213,6kOhms. In parallel with Ra`=14k, we have Ra``=14//213,6 = 13,139kOhms, and amplification is "only" 52,55 times. But, when we express this in dB, it`s a difference of only 0,55dB.Is this negligible? In my listening tests these days I found that  high Rout cascode in combination with grid choke isn`t really the best solution. Sound was bright, and bass was "anemic".When I used the CCS parallel with Ra, and used Mu-out, then I got the "right" sound, from "bottom to top". Unfortunatelly, I don`t have measuring devices for objective evaluation of the circuit, just the subjective sound" results :-).I didn`t notice bass boost / subsonic resonances, although Mu-out has low Rout (no ext. damping). As I said, good sound, bass "punch" returnes, and amplification is ~55.
http://audioroundtable.com/GroupBuild/messages/1489.html