Subject: SE 300B Project, Part 12 - C3g driver
Posted by Damir on Sun, 21 May 2006 13:10:20 GMT
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The similar schematic, and similar characteristics like E180F, E280F, D3a drivers from part 9. Supressor grid, g3, can be connected to the anode, cathode, or the ground. It seems to me that anode connection has «warmer» sound, the specs listed triode connection with g3=0V or connected at cathode, and I grounded it (cathode connected on the schematic, I didn`t hear the difference between cathode and ground connected g3).The value, type and quality of cathode bypass capacitor C2 is critical, too. I tried 470µF electrolitic, and the sound was «rolled off», warm, and mid-bass accentuated. Then I tried 4 x 22µF MKT caps in parallel (88µF total), and the sound balance changed a little. Bass «bloat» dissapeared, and highs «opened». This, 88µF cap gives the –3dB frequency about 6,5Hz – good thing to «balance» possible (grid choke) resonance on those «few Hertz» frequencies.All four «Siemens» tubes I have tested very closely, but interestingly – I measured µ=50…51, that`s larger then specs (µ=40).The usuall grid stoppers precautions and input pot

Subject: Re: SE 300B Project, Part 12 - C3g driver
Posted by Wayne Parham on Mon, 22 May 2006 20:47:49 GMT
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Excellent!

Subject: Why would C2 be so "critical"?
Posted by Old Brown Eyes on Tue, 23 May 2006 12:56:13 GMT
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With a CCS I would have thought there would be no need for the cathode bypass cap at all.Russ

Subject: Re: Why would C2 be so "critical"?
Posted by Damir on Tue, 23 May 2006 16:18:01 GMT
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I thought it, too - especially when I used Mu-out, not anode out. But, in the listening test I found the sound without bypass cap somehow soft, warm, compressed, rolled-off and uninteresting. With 470µ electrolitic I heard some mid-bass coloration, and rolled-off top end. MKT bypass of 88µF (4x22µF "Epcos") sounded more dinamic, live, presenter, more highs and high-mids, more punch...but, somehow this "edge" isn`t 100% natural... The best sound so far I get when I

bypassed those MKT caps with 1µF "Mundorf" M-Cap + 0,12µF MP "Ero" capacitors. It seems to "smoothed out" this "plastic", sharp edge... Of course, I`m talking about very small differences, in my system (speakers) and with my ears - totally subjective judgement. Although small, I`m pretty sure that this is audible - and everyone can try this ...

Subject: Do you think it is possible...
Posted by Old Brown Eyes on Tue, 23 May 2006 17:32:07 GMT
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that you could have the CCS dropping out at max voltage swing? I ask this because to my understanding there shouldn't be anything to travel through that cap unless you are no longer running a constant current.I am not doubting what you ears are hearing....just trying to put it together with my understanding of the circuit.One of these days I suppose I should build a SET:)Russ

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Subject: Re: Do you think it is possible...
Posted by Damir on Tue, 23 May 2006 19:28:51 GMT
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IMO - no, the voltage "swing" is only +/- 70Vp maximum, B1+ = 400-410V and Ua=190V. Lacking the scope, I can`t see the waveshape at the CCS output, I can only tell what I heard. The sound is very clean and direct - not a sight of distortion.I think that Pete Millett measured about 0,04% THD with CCS-ed D3a in triode with 10Vrms out...It is about 0,2% with 50Vrms out, pretty good.The load is high-impedance grid choke.Again, I don`t have a THD meter...huh. But, Russ - I lose the interest about theoretical speculations a bit - this empiric (trying different things and listening test) phase is even more interesting.  I`d also like to know why the tube with lower rp sounds "softer" then similar, higher rp one? Then sound of capacitors and resistors, PS...Yes, I have various theories...based mostly on theory - but again, without proper measurements I can have just the part of the picture, for now.Anyway, the amp sounds fine - I think that I`ll use E180F for the driver...huh, I have only two....for now...

Subject: C3g driver update
Posted by Damir on Sat, 03 Jun 2006 16:41:20 GMT
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I experimented with various cathode capacitors, but in the end I used two series connected red LEDs – the sound was brighter, cleaner and more linear, but can be a little «grainy» on the

HF.On the top of this, g3 connection seems to have some impact on sound, as well as on the operating point – with cathode (or ground) connected g3, Ua is higher about 6-7 V then with anode connection, the same Ia=11mA (CCS) and LED bias of 3,22V. It seems to me that ground connection has «sharper» sound, and anode connection somewhat softer and more natural, «organic» sound.Of course, add to this possible anode out or Mu-out from CCS load and we have many combinations for the listening tests… And I listen the same 4-5 songs in all cases and compared…huh… In the end, I choosed LED bias with anode out and anode connected g3, as shown on the picture. The sound is still direct and a little sharp, not too much bass , but more natural then other combinations, IMO. Of course, it is reccomendable that potential builder try those combinations for yourself on his speakers and music material. As I mentioned before, rel. low Rout of the driver (in this, anode out case little over 3kOhms), with grid choke load made possible to go a little «in red» («class A2»), without noticeable compression and distortion.
In fact, my low-eff. speakers needs those «extra» 2-4 dB I used on peaks.Just the two tube design means directness and preserved phase of the input signal.I just punched two holes for the loctal C3g sockets on the chasis…

Subject: Forgot to add...
Posted by Damir on Sun, 18 Jun 2006 22:42:34 GMT
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...that I tried a resistive load, too. With B1+ of 400-410V and Ra=22k (25W Dale wirewound), C3g tube "draws" about 10,1mA (with Rk=280 Ohms, bypassed), and A=44,4 times.That means rp=3,27 kOhms for the tube with μ=51 in this OP, and Rout = Ra//rp = 2,85kOhms.With 2x red LED bias, Ia was about 9,8mA and A=43,4 times.Similar sound then CCS version, a little "warmer" - can be usable, for sure, but I prefered CCS... Currently working on the final (in chasis) version...
