
Subject: 6EM7 amp PSU question
Posted by [Shane](#) on Sun, 22 Jan 2006 05:14:43 GMT
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Ok, I'm going to start getting everything together over the next couple of months to make a 6EM7 SE amp. I've got 6EM7 and 13EM7 tubes a plenty. I've looked at lots of schematics and decided I'd like to run the B+ at around 220V. I've seen these tubes ran everywhere from 175V to 325V. 220V seems to be a good middle range for about 1 watt. I've been playing with PSUD2 and came up with the following PSU. It is just for one side, as the channels would separate after the first 10uF cap after the rectifier. I basically copied this from Gary Kaufman's design with a slightly lower power trafo and added a RC filter at the end (1.8k on the resistor). Total mA needed for both tubes would be around 104mA. Trafo is the Hammond 370FX, but I don't have any other specs than the voltage/amps so I guessed on the source impedance. If anyone has any other suggestions or can point out what I'm doing wrong I'd appreciate it.

Subject: Re: 6EM7 amp PSU question
Posted by [Damir](#) on Sun, 22 Jan 2006 10:18:28 GMT
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See this variant - choke input filter (10H/100 Ohms/200mA) with "tuning" C1=1,5μF/600V (MKP, MKT...), then C2=220μF/450V electrolytic. Bypass C2 with "bleeder" resistor, Rb=27kOhms/5W (it draws 8mA). Then split for two channels - L2/C3 + R1/C4 for the L channel, and identical LC+RC filter for the R ch. You'd get about 213V for the output stage, and 207V for the driver. Of course, Rtr is a guess, and maybe you'd need to adjust the value of C1. Caps C3 and C4 can be "motor run", or MKP/MKT, 400Vdc ratings. BTW - if you choose to build it, you can post on "Group Build" (Tube DIY) forum...

Subject: Re: 6EM7 amp PSU question
Posted by [Shane](#) on Sun, 22 Jan 2006 17:29:47 GMT
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I tried a very similar PS design with two chokes, but I never could get the ringing on the initial voltage rise completely gone. Thanks a heap.

Subject: Damir--help!

Posted by [Shane](#) on Sun, 22 Jan 2006 21:43:48 GMT

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I put in the parameters showing on your PSUD pic and it's not working for me. It's giving me a current is pulling voltage below zero error. What part of the parameters might I be missing? Also, I understand the current tap for 50mA and 2mA as the tube requirements would be about 104mA at the extreme end of operation, but what is the 60mA for? Thanks.

Subject: Re: Damir--help!

Posted by [PakProtector](#) on Sun, 22 Jan 2006 22:07:16 GMT

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Hey-Hey!!!, Don't worry about the warning, it's an artifact of the electrical FEA. It wouldn't happen in real life, the CCS would just saturate at low voltages. Also, the overshoot is a result of turning the system 'ON' with the tubes heated up (it's valid for SS and Hg-vapour models). With a slowly heating cathode, there is none of that sort of overshoot with L-C filters. cheers, Douglas

Subject: Re: Damir--help!

Posted by [Damir](#) on Mon, 23 Jan 2006 06:05:38 GMT

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You can "stack" many RC and LC filters in series, but in this program you can't build "splitting" PS. In other words, after the L1/C2 filter, we have a "split", one ch shown (L2/C3 + R1/C4), and other ch is the same (parallel), but "expressed" only like current tap, 60mA. It's about 50mA for output tube, 2mA for the driver, and 8mA for the "bleeder" R=27k, not shown - but recommendable bypass of C2. Shown ch "pulls" 50+2 mA. "Voltage below zero error" - probably you made a mistake, see my picture and try it again...

Subject: Thanks !

Posted by [Shane](#) on Wed, 25 Jan 2006 00:53:03 GMT

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I put the values in 3 times before I got it to work! Never changed a thing between any of them. Weird.

Subject: Thanks- question about D1 current
Posted by [Shane](#) on Mon, 30 Jan 2006 03:57:59 GMT
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I was told by another individual that I should look at the peaks of the the current at D1. They shouldn't be too steep or peaky. When I do a close up of this simulation they don't look anything like the one's he had me look at. Could you give me a clue as to what I should be looking for here if it's not too much trouble?

Subject: Re: Thanks- question about D1 current
Posted by [Damir](#) on Mon, 30 Jan 2006 12:43:21 GMT
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Basically, C-input PS has a disadvantage that charging current "on the capacitor" is in the form of sharp peaks, with peak value many times the load current. This current flows through D1 & T1, you can see it graphically if you look on the little time segment, for example see the link. Choke input filter has much better "behaviour", it "draws" more or less constant current. Our example (small, 1,5 μ F cap input) is something in between, "almost" L-input, with small charging current peaks. To be on the safe side, and have some "room" for experiments - use the 275-0-275V PT with 160mA rms current capacity. For "pure" L-input $I_{tr} \sim I_{load}$.
<http://audioroundtable.com/GroupBuild/messages/1314.html>

Subject: Re: Thanks !
Posted by [PakProtector](#) on Tue, 07 Feb 2006 00:15:28 GMT
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You'll love this one then...I tried some very small input cap Pi(or CLC) filters. Started small and worked my way up. I got some errors related to allowable time step size which went away and re-appeared as I increased the size of the cap. Good old finite-element numeric methods and all the stability problems which can crop up if the proper math and approximations aren't used. For a system composed of masses and springs and forcing functions, the results are pretty close to what real stuff does in the continuous world. cheers, Douglas

Subject: Interesting (nt)
Posted by [Shane](#) on Tue, 07 Feb 2006 17:06:17 GMT
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nt