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Subject: PP 845

Posted by [PakProtector](#) on Wed, 20 Apr 2005 16:19:36 GMT

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Hey-hey!!!, There are a few things I'd like to do with an amp like this. Adjustable B+. through a tapped primary on the plate TX. 300 mA at up to 1kVAC. L-C filter will take B+ to the high side of 800V. Check on PSUD for details. individual filament TX and hum balance pots for each of the 845 Finals. This allows fixed bias and individual current sensing. Very quiet, hum free operation with this method, yet still keep the simple AC heating for the cathodes/filaments. 10k a-a at 40-50W 20-20k cps for the output Iron. Taps at 10 and 20% for E-Linear drivers. This simplifies the PS construction, and valve count. keep it two stage. We will need  $\sim \pm 80V$  of grid swing to each 845. No biggie with more than 500V of B+ to deal with, and a linestage with adequate gain. Now it can be done three stage, and a power triode like the 2A3 can be the driver. 5687 ahead of it. resistive loading on the 2A3 of 5-10k Ohms should leave the valve well within limits even for old single plate. The new production ought to handle it with even more margin of safety. The bias supply will need to be  $\sim 120V$  negative. No big deal there. Might as well do it L-C as well. 50k linear pots are an easy score and quite adequate. Do the 2A3's with a cathode biased CCS and keep it a bit simpler, or do that stage fixed bias as well...the front end will be a differential pair, one grid grounded and one driven SE to do the phase splitting. Power ought to get near 30W, maybe more with higher B+ and remain Class A bias throughout. I have my doubts as to keeping it to \$800/channel if valves are included in that price (let alone NOS 845's). Rectifiers of parallel TV damper diodes are WAY cheap ( \$2 each for 12AX4's and a 4-pack ought to do for each amp ). There are of course others. Keep voltage in mind when looking at the basing, the 866 was built the way it was for a good reason. The 866 also clows in such a satisfying manner. there's more of course, but that's the skeleton. regards, Douglas

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Subject: Re: PP 845 (little theoretycal ramblings:-))

Posted by [Damir](#) on Wed, 20 Apr 2005 21:05:32 GMT

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With OP 800V/-120V,  $I_a = 60mA$  (60mA<sub>p</sub> or 42,4mA<sub>rms</sub> max. AC current "swing") and that limits PP A-class to about  $P_{aa} = I_a^2 \cdot R_{aa} = 0,04242^2 \cdot 10000 = 18W$ . And yes, we must "limit" our "input swing" to less than 80V<sub>p</sub> per output tube if we want to stay in A-class, let's say 54V<sub>rms</sub> per tube, then every tube "produce" AC anode voltage:  $U_a = \mu \cdot U_{gk} / (1 + r_p / R_a) = 5,3 \cdot 54 / (1 + 1700 / 5000) = 213,5V_{rms}$  And we have  $2 \cdot 213,5 = 427V_{rms}$  across primary, and  $P_{aa} = U_{aa}^2 / R_{aa} = 18,2W$ . Actually, my little formula gives  $R_a = U_{gk} \cdot \mu / I_a - r_p = 120 \cdot 5,3 / 0,06 - 1700 = 8,9k\Omega$  in SE, or  $R_{aa} = 2 \cdot R_a = 17,8k\Omega$ . Quick graphical load-line analysis gives about 9,3k $\Omega$  per tube in SE, or about  $R_{aa} = 2 \cdot R_a = 18,6k\Omega$  in PP A class. Then, with  $R_{aa} = 18k\Omega$  we have about  $P_{aa} = 32W$  in "pure" A-class. Of course,  $R_{aa} = 18k\Omega$  OPT is somewhat "impractical", haha... ("Lundahl" model LL1688 has  $R_{aa} = 20,5k\Omega$ ). IMO -it's hard to get more than 18-20W in A-class with 10k a-a OPT...but class AB1 on peaks are not a great sin I suppose?

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Subject: PP 845 (more theoretycal ramblings:-))  
Posted by [PakProtector](#) on Wed, 20 Apr 2005 23:02:19 GMT  
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Hey-Hey!!!!,I had in mind a high power OP of ~800V and 110 mA idle. Nearly 90 watts plate dissipation. Perhaps, 100 mA might be a better OP. Power would probably be more like 25 Watts unless we increase B+ to 900V. Insulation concerns begin to appear at this B+....Life expectancy of what is a fairly inexpensive new production valve ought to be acceptable. I haven't built this one, but I have heard some SE, low voltage 845 amps. Running 5k anode load. Stretching the OP a bit higher and hotter and adding a little NFB from the E-Linear connection ought to allow a 10k a-a and still manage impedance loopiness( or more accurately hilliness ).And now for the dogmatic part: Everybody knows that PP is better anyway...regards,Douglas

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Subject: Huh... :-)  
Posted by [Damir](#) on Thu, 21 Apr 2005 11:33:10 GMT  
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I was misguided with HV=800V and bias ~120V, I read 60mA from the curves...haha.Well, with 800V/100mA/-109V you certainly can get 30W in A class with Raa=10k.And in my view, GM70 is a great alternative, quad can be found for \$105 ("Anthony Welsh"), and even the sockets can be found ([www.roehretechnik.de](http://www.roehretechnik.de)) for about 10 Euros each, not too bad.No experience either :-).

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Subject: PP GM70  
Posted by [PakProtector](#) on Thu, 21 Apr 2005 22:40:28 GMT  
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Certainly a viable alternative to the 845. I think the PP circuit will take care of filament hum. I certainly have gotten nothing bad from advancing from 2.5 to 6 to 12 in my DH stuff. I don't think increasing to 20 will hurt much.6k6 a-a with U-L/E-Linear drivers and 813's at 750V/120 mA is another interesting prospect. I just need to get a good 6k6 OPTx. It remains to be seen if my 20W model is going to be properly scaled up.for filaments, a 22V/5A tx with a variac on its primary will allow powering 813's to the 20V Russian filaments with the twist of a knob.regards,Douglas

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Subject: Re: PP GM70  
Posted by [Manualblock](#) on Fri, 22 Apr 2005 00:09:23 GMT  
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Lay it out where you are going with the Trans for a possible PP amp if I may ask. Thanks J.R. We would like to follow down the rabbit hole.

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