
Subject: Re: Awesome discussion!

Posted by [Thermionic](#) on Sat, 22 May 2004 13:46:53 GMT

[View Forum Message](#) <> [Reply to Message](#)

Sorry Wayne! I certainly didn't mean to make it look as if I was hurling a spear in yon Bottlehead direction! Or any other specific one. I was simply stating that the fact that the recovery spike will always be present to some degree, though much less in your Paramours' UF_____ series diodes. I also agree with your solution of paralleled small value capacitors to remove a lot of the hash and harmonics. I was merely stating that nothing switches more softly than a tube, and that with a tube rectifier and a L-C filter, you get the smoothest, cleanest, and most regulated juice. As for LED-based CCS circuits, the switching hash is directly present at the tube. Also keep in mind that the cause of hum in an amp may be totally unrelated to B+ ripple. It can be caused by an improper grounding scheme causing ground loops, inductively produced eddy currents in a steel chassis used as the circuit ground, very low level hum "piggybacked" on top of an ultrasonic oscillation and amplified, running signal lines too close and/or parallel to AC heater wires, and filament-to-cathode induced hum. I've built C-R-C filter amps with a modest amount of capacitive filtering that were dead silent, by using proper wire routing and a star point grounding system with the RCA jacks, volume pot, and negative speaker binding post all isolated from the chassis. Take a Dynaco FM3 tuner for example. FM3s always have a little hum. Their RCA outputs use the chassis as a ground. Running a jumper wire from the RCA jack to the ground buss on the multiplex board makes them dead silent. I know, I have one I'm repairing right now. Another cause of hum is what I'd bet the farm yours is....the filaments of directly heated triodes. The direct AC voltage present on the cathode is one cause. Signal modulation caused by the AC hum is another. The other is the fact that the filament minutely cools when the AC sine wave drops to zero and starts back up. I know that sounds nuts, but it's actually been proven! The minute thermal expansion and contraction causes a resonance in the filament (that perfectly coincides with the 60Hz hum to make matters worse) that makes it create more hum much the same way as the springs in a guitar amp's spring reverb unit produce reverb. Some megabuck DHT amps have proprietary filament hum reduction circuits. The AC filament voltage is tapped off, negative fullwave rectified (and purposely left unfiltered) and injected at the control grid, with an adjustment trimpot to adjust the phase so that the ripples in the DC will phase cancel the AC hum. Some other high dollar DHT amps may use a series of LC bandpass filters on the heater leads set at octaves of 60Hz to solve the problem by "filling in the gaps."Thermionic
