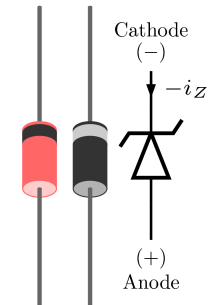


## Sound Difference Between Cathode Bias and Fixed Bias

With 6L84s the tonal difference between cathode and fixed bias is really small. But if you want to eek every bit of volume and headroom you can then go ahead and do it. This will increase the plate voltage. Well, not really, it decreases the cathode voltage. But it's the same thing to the tube. So if the Crate runs a high plate voltage (close to or just over 400 volts) and more importantly, highish screens (anything over 350 volts) then you may not want to do this.

But you can still have fixed bias without placing the 6L84 cathodes at 0 volts. You can just measure the voltage on the top of the cathode R. Lets say you measure 11 volts. Get a pair of 5 watt 6 volt zener diodes and solder them in series across the cathode resistor with the cathodes toward the voltage (instead of ground that is). Your amp will be just like it is now at idle. But now there can be no voltage rise at the cathode when current increases. This voltage rise in cathode bias amps cools the bias and creates that cathode bias sag. Your amp would now be fixed bias.



The '11 volts, two 6 volt zeners' used above is an example. If you measured 10 volts you would use a pair of 5 volt zeners, for 13 volts use a pair of 7 volt zeners. You want the zener string voltage to be right at or just above the cathode voltage.

This is much easier and less expensive than building a bias supply and trying to mod on a PCB. Plus you can easily put it on a switch so you can decide which you like best. It's easily reversed and does no damage to the board.

Chuck

Zener on Rk to "fix" bias

I want to try using a zener across Rk on my cathode biased amp to help tame the crossover fizz at full dime. With 9.5 volts on top of Rk at idle and 18 volts at full output, I find a 13 volt zener gives good clean compression attack but snugs up nice and tight when cranked and helps a bit with crossover distortion.

My trouble is that I don't know how to figure the power rating for the zener. The whole avalanche thing and current rising while voltage is stable thing is confusing me. The "calculators" I find on line are all for a typical resistor/zener series regulator, not an absolute shunt as in this application.

I'm using a 3 watt 13 volt zener now because that's what I have on hand. It hasn't blown up yet but I fear it's very close to it's rating.

Thanks

Chuck