

## BIAS LESSON

Some like them hot some cold. Without getting too heavy with maths and algebra.

6L6 30W, 5881 26W EL34 25W EL84 12W

The maximum output from an EL34 is about 25 watts. So measure the anode voltage of the amp, for this exercise we will assume that to be 445 volts. Divide the 25 by the 445 then multiply by 0.7 the answer in ma. is the 70% plate load bias setting required for that amplifier.

Multiply by 0.5 and that will be for an average class Ab1 Marshall style amplifier.

The 0.7 means 70% Hot anode / plate dissipation. Therefore you can use 0.5 (50%) as a Cool AB setting, 0.6 (60%) as a Warmer AB setting the one I would prefer. Or go for the 0.7 or even 0.75 (70 - 75%) if you like it hot.

Example:  $25 / 445 \times 0.7 = 39.3$  ma. Bias

The bias figure will depend on the anode voltage which will vary according to the current drawn by the valve. More current less volts, less current more volts. So you may need to do the calculation several times if large adjustments are made.

Example 2.  $25 / 480 \times 0.7 = 36.4$  ma. Bias

Example 3.  $25 / 410 \times 0.7 = 42.6$  ma. Bias

If looking for the Class A requirement, that's 100% plate dissipation. The figure to multiply by would be 1 but check the valve is operating within recommended plate voltages. Here is an EL34 example with 300 volts on the plate / anode.

25 watts max o/p of the valve divide by plate volts 300 multiply by 1 = bias current requirement for class A operation. Example.  $25 / 300 \times 1 = 0.083 = 83$ ma. or  $25 / 350 \times 1 = 0.071 = 71$ ma.

Not rocket science - dead easy elementary stuff.

If you have a cathode biased amp, you can measure the bias current drawn by dividing the voltage drop across the cathode resistor, by its resistance. Example Cathode resistor 470 ohms voltage measured across it 25 volts.

$$25 / 470 = 0.053 = 53\text{ma}$$

53 ma flowing through the cathode resistor is the sum of the anode and the screen grid currents together. Deduct about 5% screen current 2.65 subtracted = 50.35ma anode current.

I will talk more about cathode bias later, but as a general rule a bigger value resistor the valve will draw less current, but the plate voltage will rise. Lower value resistor the valve will draw more current, the plate voltage will drop.

OR

A mixture of both methods for mixed bias.