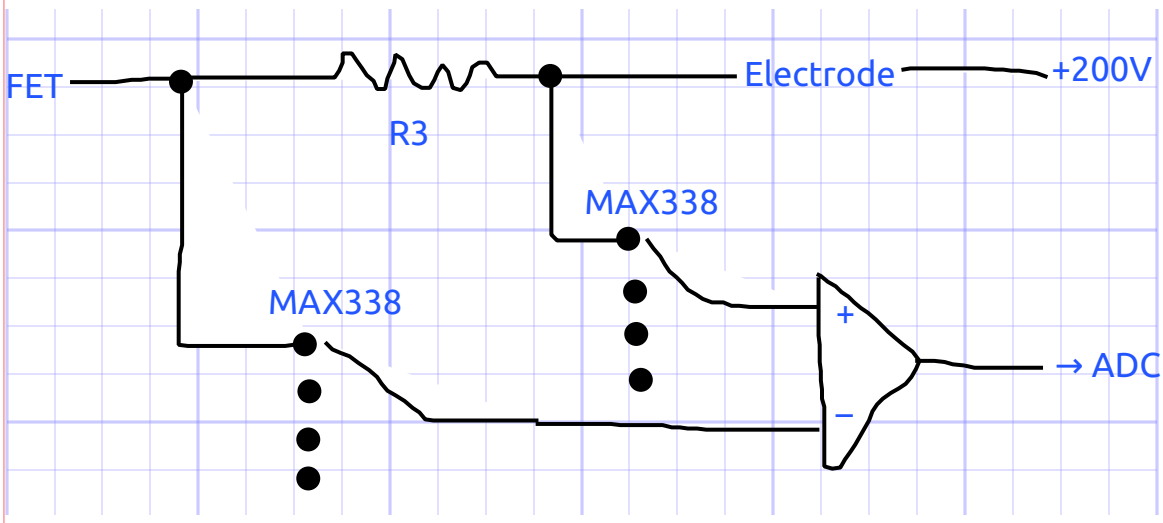
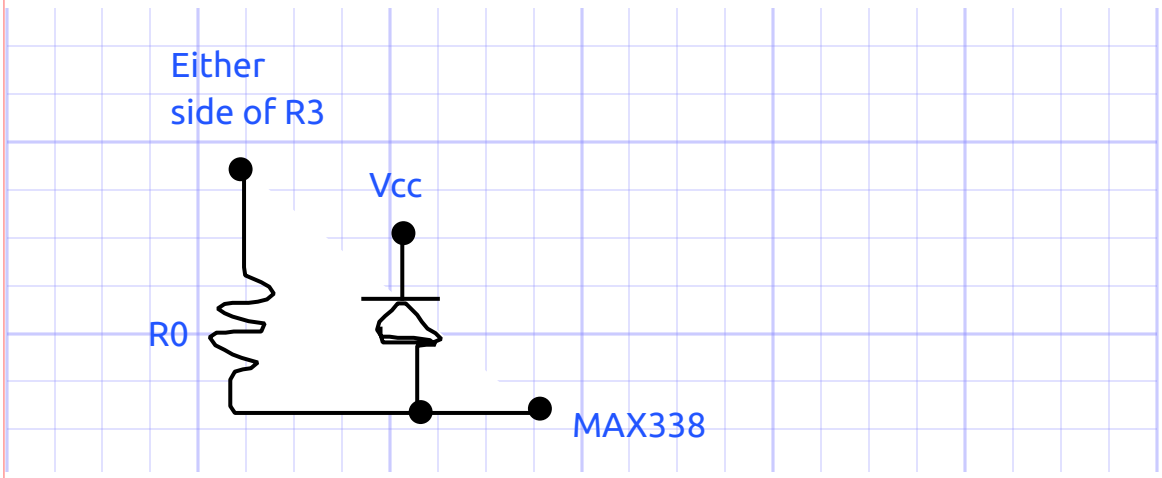
Job 055 – Fly shocker – Hong (Tom O'Connell) (cont'd)

Protecting against high voltages across R3 is critical. If you simply hook up something like this:



then a shorted electrode would cause 200V to develop across R3 and hence be sent to the MAX338, which the MAX338 would not survive. Placing a diode across R3 is insufficient protection, since that would still send 200V to the MAX338s, and also make the FET overheat. Instead, each of the paths to the MAX338s should contain something like this:



That way, the 200V would drop across R0. (Vcc can be whatever the max voltage is that the MAX338 can handle.)

Note that $P = I\,V = V^2 / R$, so power dissipation can be

> considerable. R0 must be low compared to the input impedance of the MAX338 and the DAC and also low enough to make diode leakage be irrelevant, but high enough to prevent overheating. For a P = 0.25 W resistor and V = 200 V, we'd have R ≥ 160 kΩ.