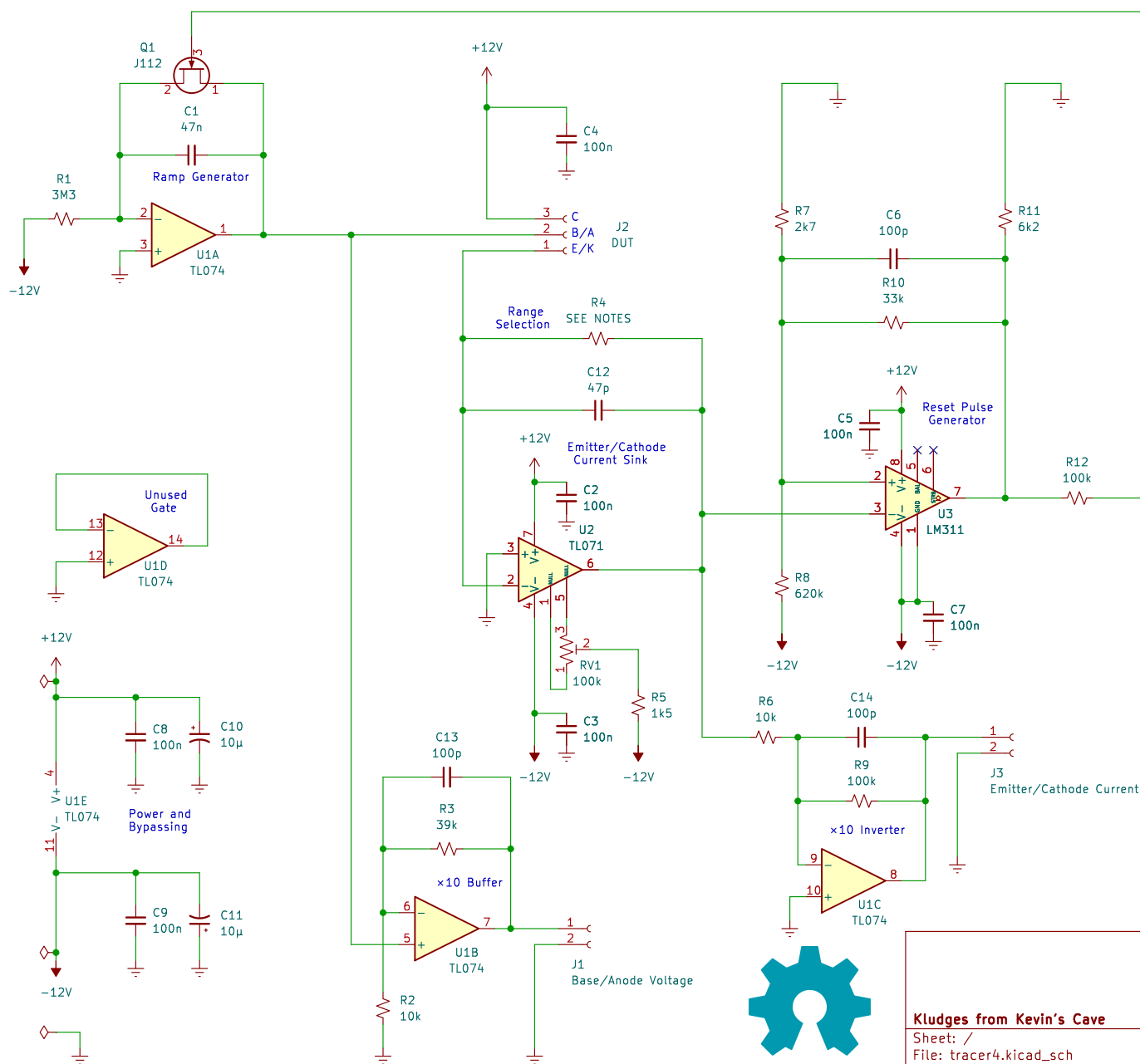


NOTE: Verify which J112 JFET you have. ON Semiconductor and Philips versions have the pins in opposite orders, according to the respective data sheets



R1 and C1 set slope of voltage ramp:
77.4 V/s with values shown.

R4 sets scale for reading out
emitter or cathode current.

R4	Scale
100R	1 V = 1 mA; 10 mA full scale
1k	1 V = 100 μ A; 1 mA full-scale
10k	1 V = 10 μ A; 100 μ A full scale
100k	1 V = 1 μ A; 10 μ A full scale
1M	1 V = 100 nA; 1 μ A full scale
10M	1 V = 10 nA; 100 nA full scale

Adjustment procedure:

1. Remove Device Under Test, and connect a 1k resistor from the emitter/cathode terminal to ground. Use the 100k resistor at R4. Monitor U2, pin 6 with a voltmeter and adjust RV1 to bring it as close to 0V as possible.
2. Remove the 1k resistor. Connect a signal generator to the emitter/cathode terminal. Set the signal generator to a triangle wave, 0.1 Vpp, +0.5V offset. Select the 10k resistor for R4. Connect a scope probe to the U2, pin 6 and another probe to U3, pin 7. Verify that U3 pin 7 switches from -12V to ground at roughly -1 V on U3 pin 6, and back to -12V at -0.05V on U3 pin 6. (If noise considerations make this measurement difficult could monitor J3 instead.)
3. Disconnect the signal generator. Install a device under test. Verify by observing U1, pin 7, that a sawtooth wave is present.
4. Emmitter or cathode current can now be measured by selecting R4 and using an oscilloscope to monitor U1, pin 7 for voltage and U1, pin 8 for the corresponding current.

NOTE: This is a quick-and-dirty setup. Results would be improved by using chopper-stabilized op amps and U1A, U1B and U2. The cheap op-amps in use and the janky breadboard setup result in measurement offsets and noise.



Kludges from Kevin's Cave

Sheet: /
File: tracer4.kicad_sch

Title: Quick-and-dirty I/V curve tracer

Size: USLetter Date: 2024-09-12

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