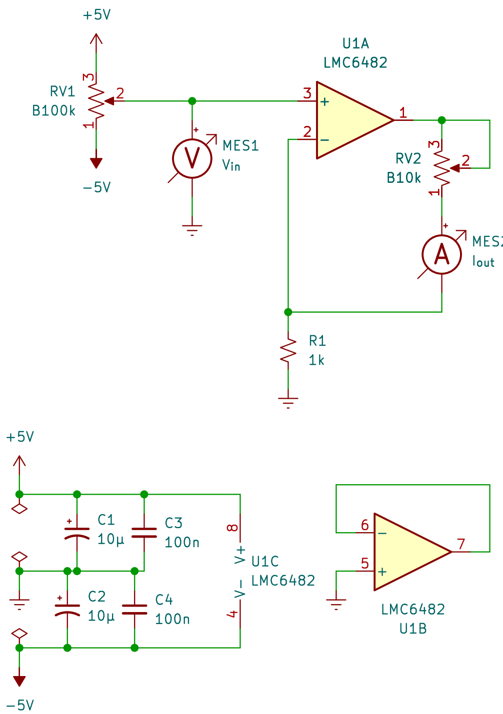
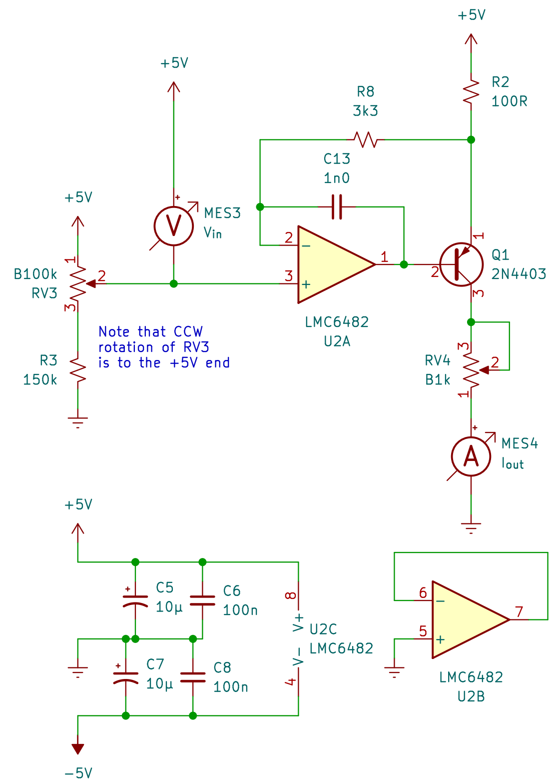
Example 1:
Floating Load



$I_{out} = V_{in}/R_1$
- Observe that small output currents are constant as load varies.
- Observe that power supply + R1 limit compliance.
- Observe that output current is NOT returned to ground.

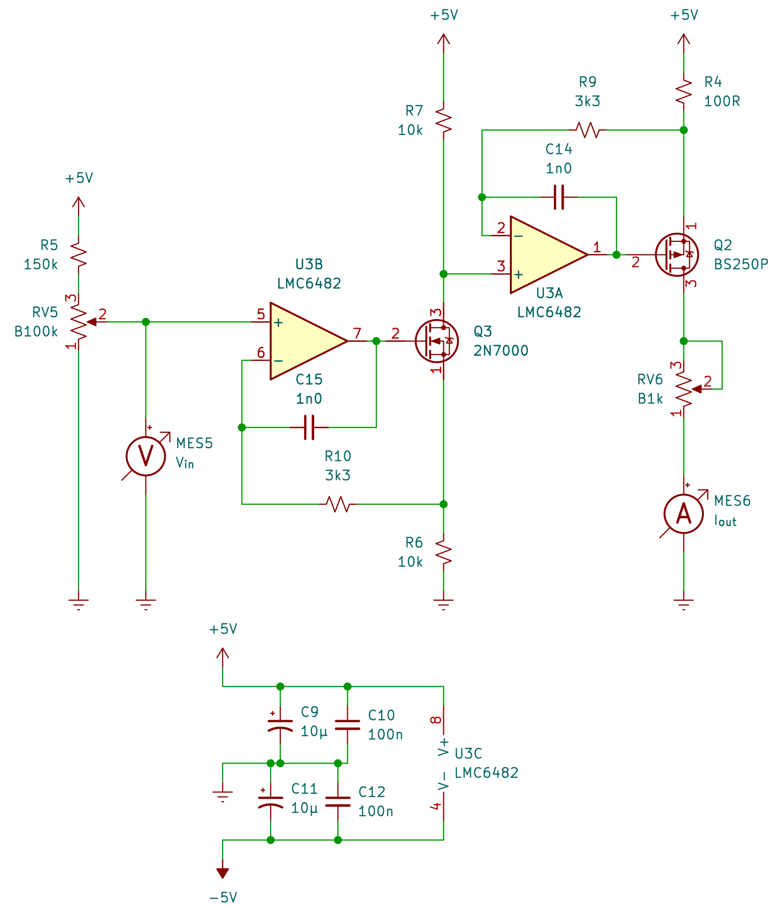
Example 2:
Load returned to ground



$I_{out} \approx (V_{cc}-V_{in})/R_2$
- Observe handling of larger load currents.
- Observe that power supply + R2 still limit compliance.
- Note base current error
- Mention Early effect
- Replace Q1 with BS250P MOSFET – same pinout:
  - Base current error goes away
  - No Early effect
  - Feedback network may be needed to prevent oscillation. Add R_8, C_{13} if needed. (R_8=0 otherwise)

Limited to 20 mA because pot has only 1/20W power dissipation
Driving the input could be a problem. RRIO is only nearly so.

Example 3:
Load and source both
referenced to ground



$I_{out} = V_{in} R_7/R_6R_4$
- Now Vin has a sensible range.
- Still only single ended.

open source
hardware

Op-Amp Basics
Episode 14 – Transcomductance Amplifiers 1
Kluidges from Kevin's Cave

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File: Transconductance1.kicad_sch

Title: Transconductance Amplifier Examples, part 1

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