

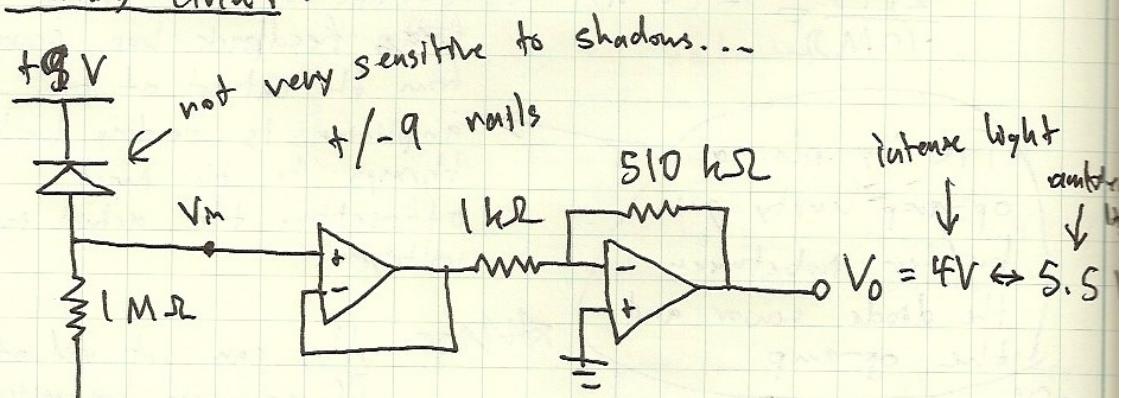
9/19/2011

LED Experiment Trial 2

- Built above circuit, but it did not work
- upon close inspection, it seemed the voltage across the $1\text{ M}\Omega$ resistor was smaller than expected (by a factor of 10), therefore, the G_m was increased to -200 and then once more to -510 (Replaced RF with a $200\text{ k}\Omega$ and then again with a $510\text{ k}\Omega$ resistor)

Photos of
circuit was
taken as well

I used the EXTREMELY bright LED on my iPhone and pointed it directly at the LED which gave some very promising results (Oscilloscope photo was taken).
- The output voltage after a gain of -510, spiked ~~spikes~~ from $\sim 5.5 \text{ V}$ down to as low as 4 V .

Working circuit:

I'm making the assumption right now that the LEDs given in the lab kit are not the best candidates for what we are trying to do.

Also, on another note, the oscilloscope probe (Ch. 2) was initially connected to the non-inverting input of the unity gain buffer. After connecting it to the output instead, the output voltage jumped up to ~~6.17 V~~ 6.17 V

Also, after connecting the output of the ~~non-inverting~~ inverting gain op-amp, very small differences in voltage were noticed using the DMM when a hand passed over blocking the light (6.17 V to 6.2 V)

Ambient light \approx 6.17 V

Hand passing over = 6.2 V (more like cupping my hand over it)

Very intense LED light = 4.6 V (distance between transmitter and sensor \approx 1.5 cm)

Tried the same thing with a signal diode, but better results were acquired with the LED.

Also tried adding another amplifier with a DC bias offset. but got some signal oscillations, would need a transistor push-pull pair to fix this or an inverting stage with unity gain connected to another amplifying stage with a noninverting gain.

