Lab 6
Transistor Switch, Current Source

Transistor Switch

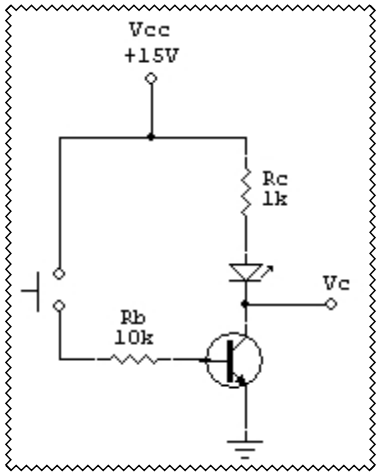

Fig. 1

1. Assemble the circuit in Fig. 1:

2. Assume that the circuit is in Fig. 1 is in saturation due to the 10 to 1 relation between R_B and R_C. Then what should be the value of V_C?

V_C = _____

3. Again assuming saturation, calculate I_C.

I_C = _____

4. Measure the following values:

I_C = _____

V_C = _____

V_{LED} = _____ (Hint: the voltage drop across the LED.)

5. Select a new value for R_C so that the current through the LED is 30mA. Use the value of V_{LED} from step 4 in your calculations.

6. Modify the circuit and measure the current through the LED:

I_{LED} = _____ (Hint: same as collector current, I_C)

Current Source

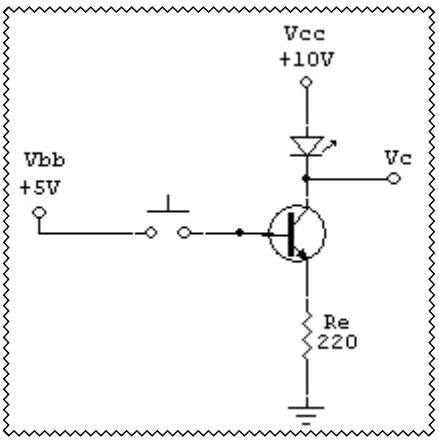

Fig. 2

7. Assemble the circuit in Fig. 2:

8. Calculate the following:

V_B = _____

V_E = _____

I_C = _____

V_C = _____

V_{CE} = _____

V_{BC} = _____ (To determine if transistor is active)

9. Measure the following values:

V_B = _____

V_E = _____

I_C = _____

V_C = _____

V_{BC} = _____

10. Select a new value for R_E so the LED current is 30mA. (Use the value of V_{LED} from step 4 in your calculations.)

11. Modify the circuit and once again measure the current through the LED.

I_{LED} = _____

12. In both circuits how do the calculated and measured values compare?