

ECE 320 - Homework #8

Boolean Logic, DTL, TTL Logic. Due Monday, Marth 8th

Boolean Logic

1) Implement the following function using NAND gates (i.e. circle the ones)

f(A,B,C,D)		CD			
		00	01	11	10
AB	00	1	0	0	0
	01	1	1	0	1
	11	x	x	x	x
	10	1	1	x	x

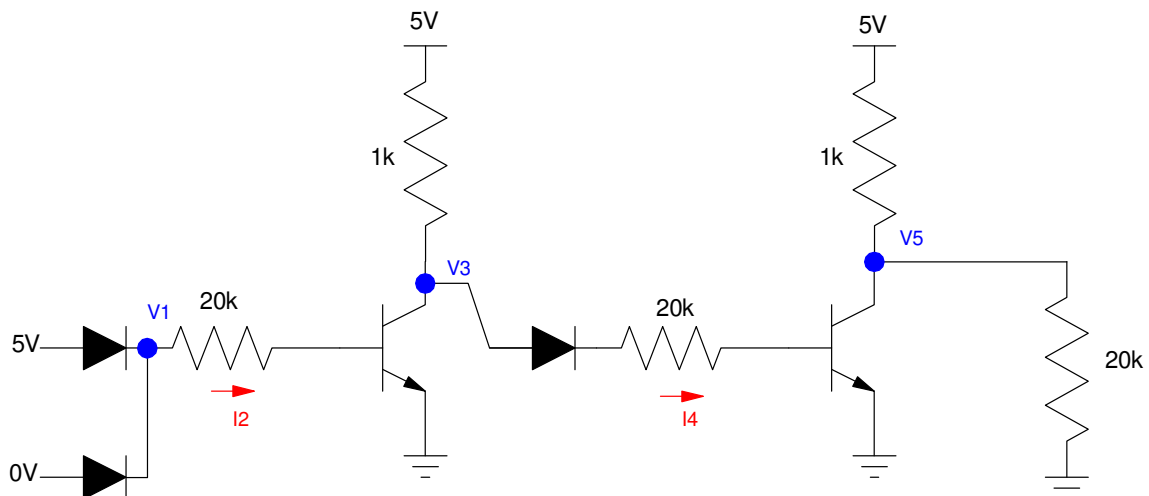
2) Implement the following function using NOR gates (i.e. circle the zeros)

f(A,B,C,D)		CD			
		00	01	11	10
AB	00	1	0	0	0
	01	1	1	0	1
	11	x	x	x	x
	10	1	1	x	x

DTL Logic

3) Determine the voltages and currents for the following DTL OR gate

4) Simulate this circuit in CircuitLab to verify your answers for problem #3



The circuit below uses a DTL NAND gate to drive the speaker when

- The 555 timer outputs 5V, and
- The comparator outputs 5V,.

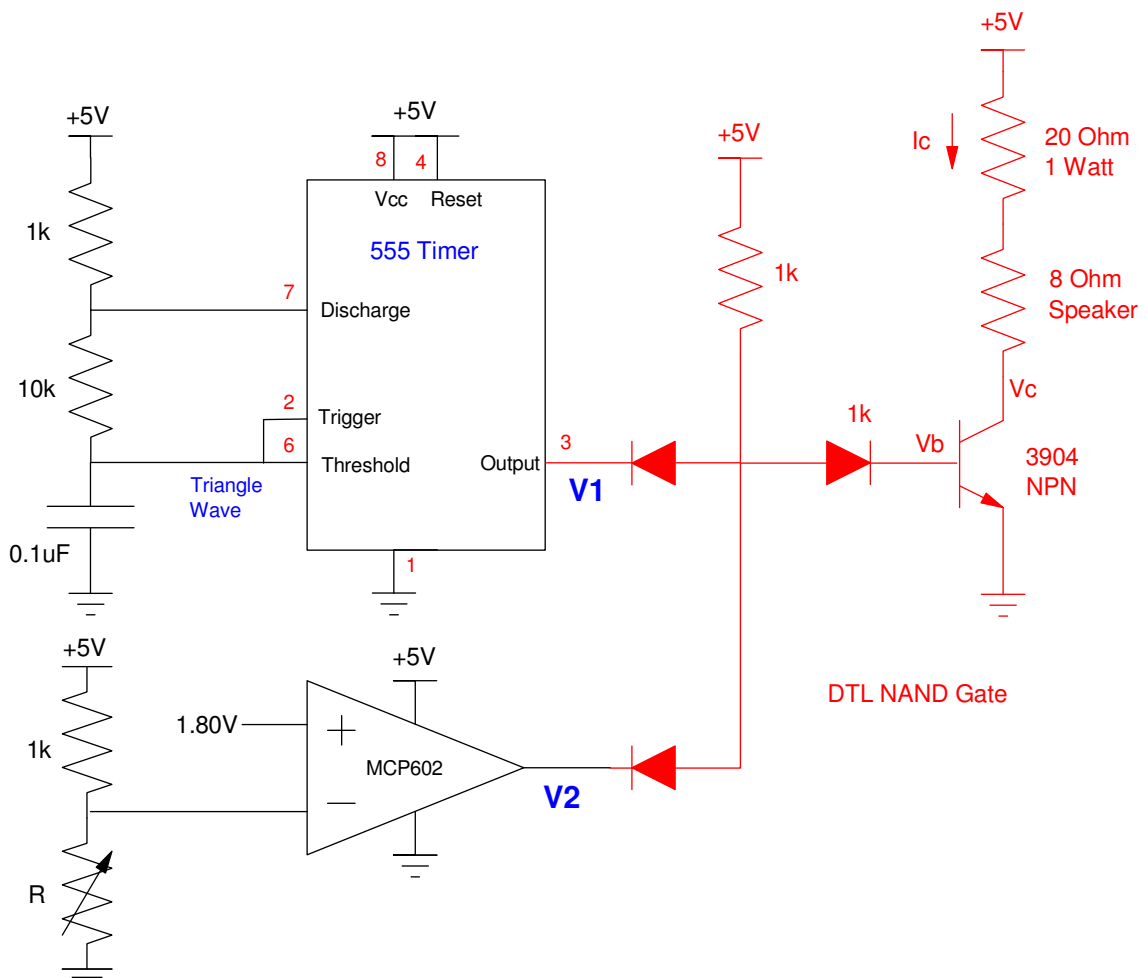
5) Determine the voltages when

- $V_1 = V_2 = 0V$
- $V_1 = V_2 = 5V$
- $V_1 = 0V, V_2 = 5V$

6) Verify your design using CircuitiLab.

Lab: 7) (20pt): Verify your design in hardware (build and test the circuit with your lab kit).

- note: Use a potentiometer to simulate the temperature sensor.



TTL Logic

- 8) Determine the voltages for the following TTL inverter. Assume 3904 transistors.
- 9) Simulate these circuits in CircuitLab and determine the voltage and currents

