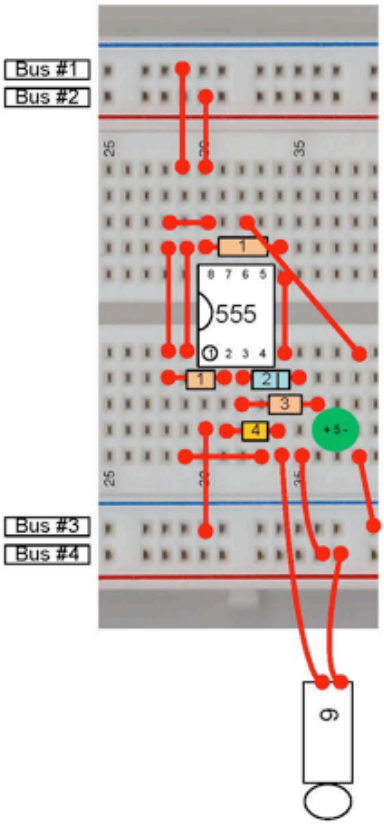
Jeopardy! Student Handout

Department of Electrical and Computer Engineering

QUIZ GAME CIRCUIT



#1 – 10000Ω Resistor
#2 – 4148 Diode (dark black line oriented on right)
#3 – 470Ω Resistor
#4 – 0.1 μF (microfarad) Capacitor
#5 – Colored LED
#6 – Push Button

Bus #1 : Reset
Bus #2 : +5 V
Bus #3 : Ground
Bus #4 : Trigger Line

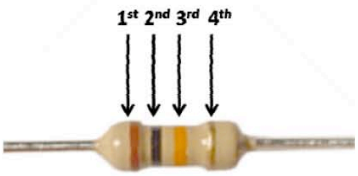
COMPONENT OVERVIEW

LED		Emits light when an electric current is applied in one direction
Diode		Allows electric current to flow in only one direction
Capacitors		Stores energy (like a charged battery)
Resistors		Prohibits the amount of electric current
555 Timer		Synchronizes the digital logic

For LEDs and Capacitors:

- Long lead is positive (anode)
- Short lead is negative (cathode)

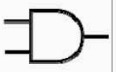
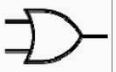
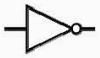
RESISTOR COLOR CHART



Note: We are ignoring the 4th band for this experiment.

Color	1st band	2nd band	3rd band (multiplier)
Black	0	0	$\times 10^0$
Brown	1	1	$\times 10^1$
Red	2	2	$\times 10^2$
Orange	3	3	$\times 10^3$
Yellow	4	4	$\times 10^4$
Green	5	5	$\times 10^5$
Blue	6	6	$\times 10^6$
Violet	7	7	$\times 10^7$
Gray	8	8	$\times 10^8$
White	9	9	$\times 10^9$

DIGITAL LOGIC OVERVIEW

Logic	Symbol	Boolean algebra	Truth table
AND		A·B	INPUT A B / OUTPUT A AND B: 0 0 → 0; 0 1 → 0; 1 0 → 0; 1 1 → 1
OR		A+B	INPUT A B / OUTPUT A OR B: 0 0 → 0; 0 1 → 1; 1 0 → 1; 1 1 → 1
NOT		$\bar{A}$	INPUT A / OUTPUT NOT A: 0 → 1; 1 → 0

For this experiment:

- Ground is represented by logic 0
- 5 Volts is represented by logic 1