

ECE-301-204

Lab10 Counter Design

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## Objective:

Understand the design and operation of clocked sequential circuits to implement a 3-bit counter from discrete logic.

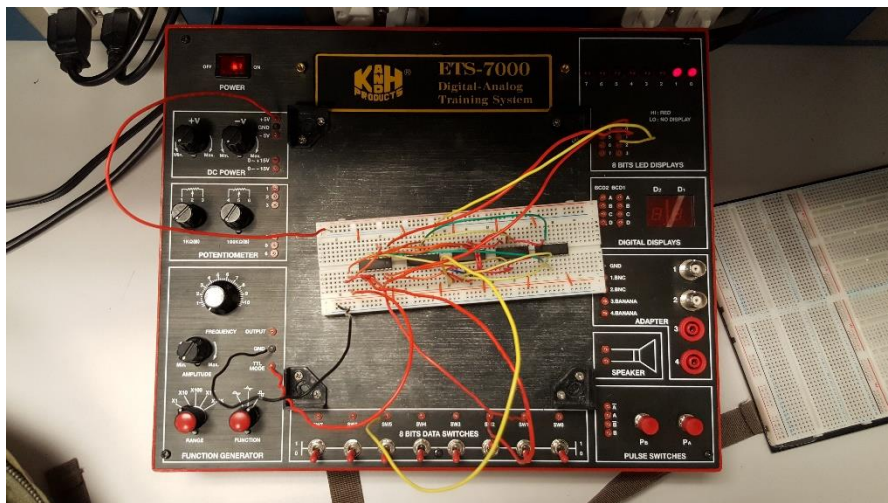
## Preparation:

U	Q0	Q1	J0	J1	J2	K0	K1	K2
0	0	0	1	1	1	1	1	1
0	0	1	1	1	0	1	1	0
0	1	0	1	0	0	1	0	0
0	1	1	1	0	0	1	0	0
1	0	0	1	0	0	1	0	0
1	0	1	1	0	0	1	0	0
1	1	0	1	1	0	1	1	0
1	1	1	1	1	1	1	1	1

## Materials and Equipment:

- ET-1000 Trainer
- Wires
- Breadboard
- JK flip-flop ICs

## Laboratory Data:



		U	
		0	1
Q0Q1	00	1	1
	01	1	1
	11	1	1
	10	1	1

		U	
		0	1
Q0Q1	00	1	1
	01	1	1
	11	1	1
	10	1	1

		U	
		0	1
Q0Q1	00	1	1
	01	0	0
	11	1	1
	10	0	0

		U	
		0	1
Q0Q1	00	1	1
	01	0	0
	11	1	1
	10	0	0

		U	
		0	1
Q0Q1	00	1	0
	01	0	0
	11	0	1
	10	0	0

		U	
		0	1
Q0Q1	00	1	0
	01	0	0
	11	0	1
	10	0	0

**Comments and Conclusion:**

This lab was pretty neat using JK flip-flops to count up from 0 to 7 or count down from 7 to 0. Either way it kept a continuous loop counting through the numbers both ways. Another thing I noticed is that even though you turn the power supply off it takes about half a second to a second for the current to go all the way through all the JK flip-flops and then turn off the LED lights. Seems like a simple implementation of a counter of some sort for timing device. And it also seems that the more JK flip-flops you add the more numbers you can count through.