

ECE-301-204

Lab9 Flip-Flops and Frequency Dividers

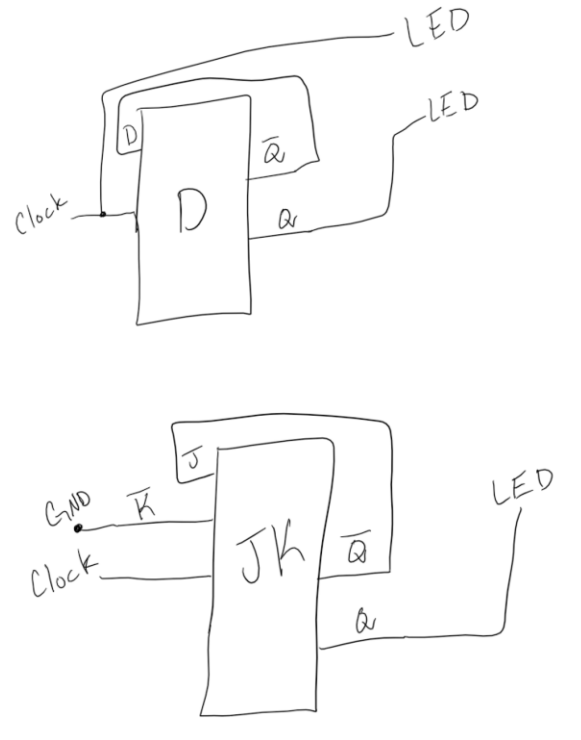
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Objective:

To understand the operation of D and JK Flip-flops.

To understand the usage of a flip-flop as clock signal dividers.

Preparation:**Materials and Equipment:**

- ET-1000 Trainer
- Wires
- Breadboard
- D flip-flop IC and JK flip-flop IC

Laboratory Data:

We hooked up the D flip-flop first by putting in the clock and putting $\sim Q$ output back into the input D1 so we divided the frequency by 2. This caused the clock LED to blink twice as fast as the Q output LED.

For the JK flip-flop there were two ways to accomplish the goal. One way is to ground $\sim K$ and send $\sim Q$ output through J. The second way is to tie J and $\sim K$ together and send $\sim Q$ through both of them. This accomplishes the same thing as the D flip-flop by dividing the frequency by two. The JK just shows it is a more versatile flip-flop.

Comments and Conclusion:

So as said above from this lab we learned how to divide the frequency by two just by rerouting $\sim Q$ output back through as an input to the flip-flop. Also the JK flip-flop shows that it can be versatile depending on what the need/use of the flip-flop is.