

Lab 1: Breadboarding a mystery circuit

This first lab session involved the assembly of a mystery circuit whose function, I am told, will be progressively analysed in subsequent lab sessions.

I began by reading the complete lab outline and reviewed the slides to get a feeling for what was involved. I assembled the components on the breadboard in the given order, sketching them into a circuit diagram Figure.1 as the assembly progressed.

The resistor leads needed to be shortened so that they will not cause unwanted connections . I guess it will also make the circuit easier to analyse without all the leads sticking up and in the way.

To determine a desirable length for the resistor leads, I took a resistor and progressively cut and inserted it into the breadboard holes until it was nearly flush. I then used that length as reference for the other resistors.

During the probe assembly, the LED did not light up when R7 was grounded. I checked that the power module was on, still no go. Then I swapped the LED leads, and it lit.

With the assembly steps completed, I turned on the power and no flashing LED! I checked the circuit and after some time found that the capacitor (-) lead was connected to +5V instead of 0V.

A quick fix and ... Success!

I took a picture of the breadboard circuit for posterity and placed it in Figure.3.

I reviewed the Figure.1 sketch and rearranged some components so that they are more organized and there are a single +5V and 0V rails. I also used proper symbols for the NPN transistors and LED, whose type and orientation I discovered with the component tester. The revision is Fig.2 and included is a parts list of all the circuit components used and their nominal values.

The resistors and capacitor were measured with the component tester and recorded in Table.1. There was no error estimate given for the component tester; should I have used for the resistor error the 5% tolerance? Or perhaps a least significant digit of the given value? Cap has a tolerance also? Does the tester error vary with the component type?

Overall, a satisfying experience. I can't wait to see what comes next!

R1	R2	R3	R4	R5	R6	R7	R8	C
4669	4688	4712	22178	22210	4625	253	4723	10.12E-6

Table.1: measured values, without error estimates, resistors in Ohms, capacitor in microFarads

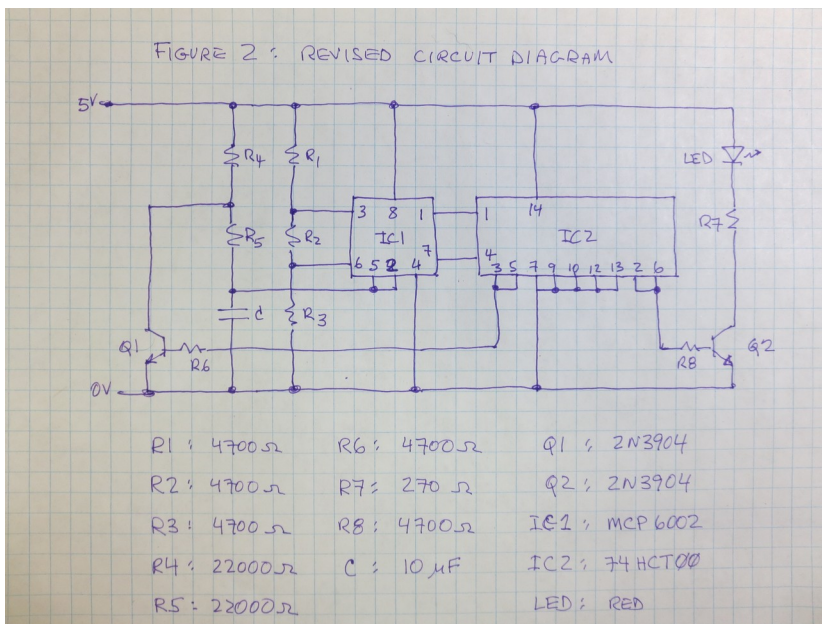
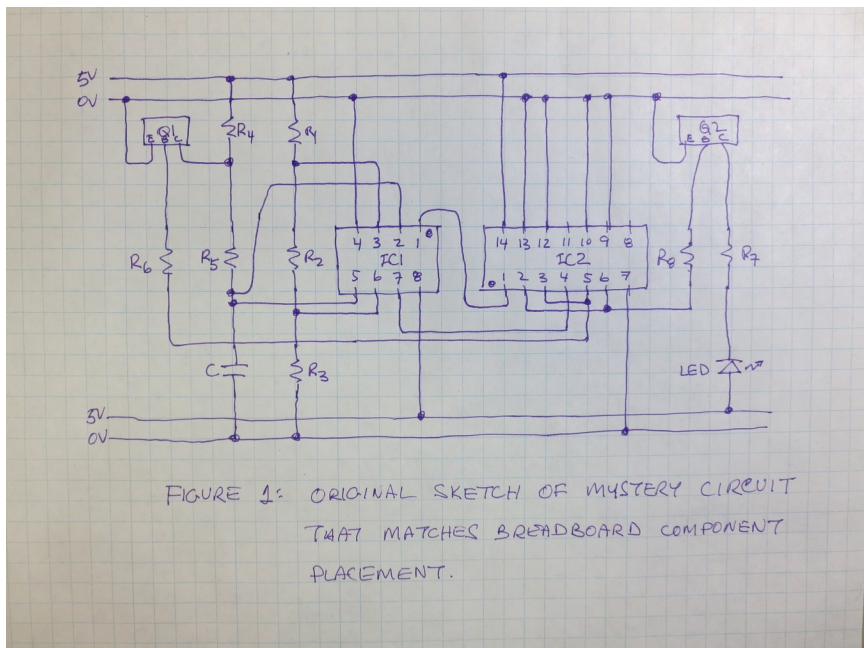


Figure.3 completed mystery circuit

