Some Tips for ECE2274 Lab

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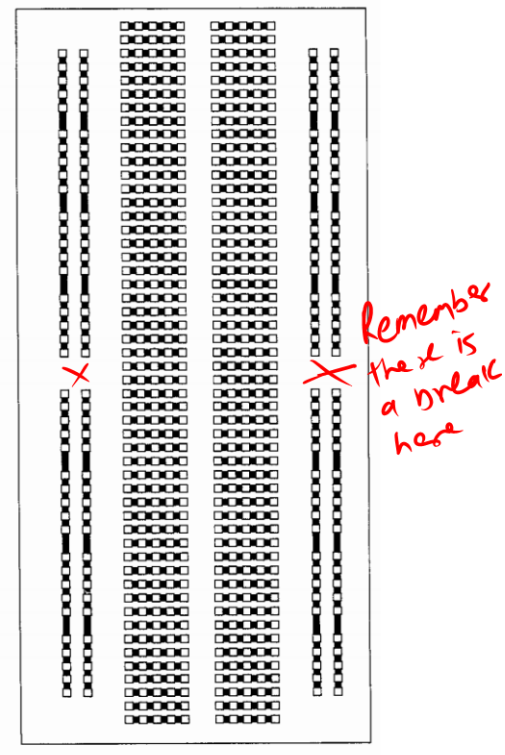
Here are some basic tips that can be useful in preventing blunders during the lab. These tips are by no means exhaustive, and is meant to only aid in doing the lab correctly.

1 Some tips while building and testing the circuit

- Know your bread board. Lots of time people miss the break in continuity at the top 2 and bottom 2 rows.



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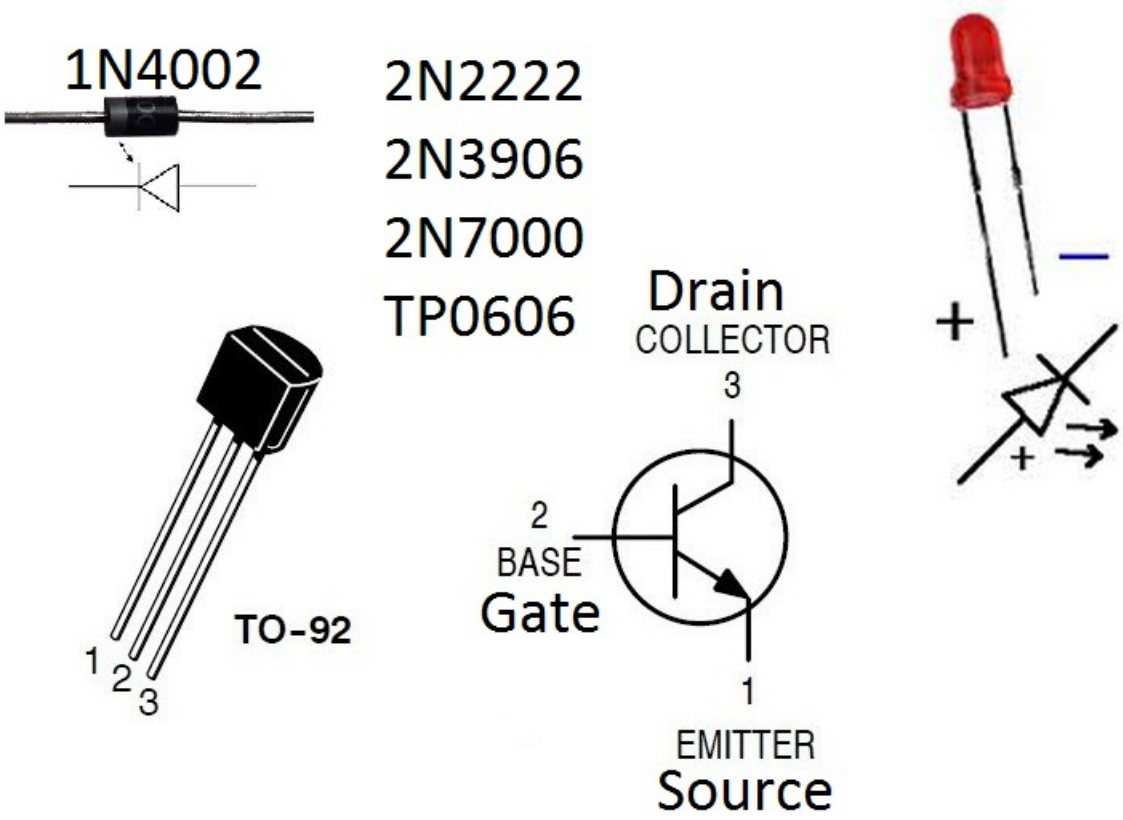
- Check if your circuit matches the schematic diagram you are building. Check again!
- Double check if the pins of the components are really on the columns they are supposed to be. Meticulously check every pin, literally every.
- For Leds, Diodes, Transistors and Mosfets, you have to place them not only on proper place, but also proper way. Understand which pin is which.
  - For LEDs the longer Leads are the anode.



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- Make sure you are using proper component, like not using an PNP transistor when you were supposed to use an NFET.
- Check if you forgot to turn on the power supply.
- Make sure to connect all the grounds together.
- If your circuit doesn't work even though you seem to have proper wiring, sometimes, you might be having a damaged component. If you suspect something to be damaged, swap the suspect with a new one.

2 Some tips with Scope Capture and Sweeps

1. If all you need to do is capture a signal to the computer use BasicScopeCapture.seproj
   - Make sure your signal is not getting clipped off. Ensure large enough Range.
   - See if the voltage you are getting is reasonable. Are you getting 45 volts in 5v circuit?
   - Check probe attenuation. If you are not using attenuated probe, you must make probe attenuation 1.
   - Adjust Timer per record, to suitable fit the signal
   - Make sure you have correct trigger level and source setup.
2. If you need to run the DC sweep use BasicDCSweep.seproj and configure it.
   - You NEED to use a DMM to measure your output. If you don't use any multimeter you won't get anything.
   - By Default Lower Left Multimeter (channel 2) and the Lower Left Power supply will be used. Remember to hookup the multimeter probes to whatever output voltage you want to measure.
   - There is no role of the Function Generator or the Oscilloscope in DC sweep.

3. If you need to run the AC sweep, use BasicACsweep.seproj and configure it.

   - You will NEED to use the Function Generator, and two multimeters. One multimeter should measure the input voltage and the other should measure the output voltage.
   - By Default, Lower Left Multimeter is used for measuring Input, and Lower Right is used for measuring output.
   - The output from the function Generator must be connected to the input

3 Using Equipments directly

1. DMM

   - When measuring Resistance, make sure you are one 2WR mode and not in 4WR mode. Press the Ω button to switch between modes. Use probes between the VΩ... point and the ground point
   - Measure current by measuring the voltage across a resistor and dividing manually by its measured (not color code value) resistance.
   - Use Auto range

2. Oscilloscope

   - Adjust the trigger source and level such that the source signal cuts through the trigger level.
   - If you have recently used BasicScopeCapture through the computer, you might have inadvertently changed the probe attenuation. Check, and rectify it if necessary.
   - Sometimes, you may need to manually change the vertical (voltage) scale and horizontal (time) scale if the 'Autoset' doesn't work.

3. Function Generator

   - Don't forget to turn on the output by pressing the 'Output1' or 'Output2' button.
   - Make sure it is set at 'High-Z' setting, unless you specifically want it to be not at 'High-Z'.

4. Power Supply

   - Don't forget to turn on the output by pressing the On/off button.
   - Check if your current limit is too low (less than 0.2A)
   - Make sure you are using the proper terminals. Each Chanel has its own limitation on maximum voltage.

4 Submitting your work

- Write your Name
- Make sure your graphs are of adequate size and print quality. Don't use two papers, when you could have fit both of the graphs in one.
- Any graph you submit must have labels for X-axis, the Y-axis, their units, and also the title for the graph.
- If you are asked some information which you need to extract from the graph, in addition to answering the question, you also need to mark the associated points/regions in the graph and label it.
- Answer every question raised. And try to write complete and descriptive answers.