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ECE 401

Section 5

9/28





Laboratory #2 (Pre-Lab)

Objective:

The first objective is to learn to identify and describe some of the electrical and electronic components used in design. A second objective is to learn to properly solder components on a printed circuit card (PCB).

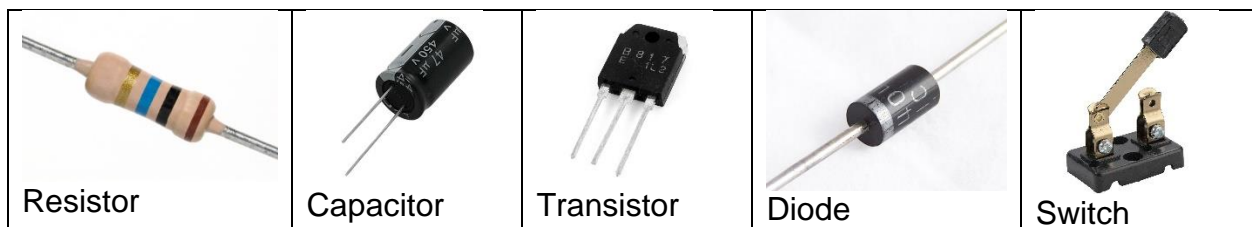
Equipment Required: (brief desc. and proper use) + pics

- Tool kit
 - Common tools like the ones used in the previous lab (screwdrivers, diagonal cutter, etc.)
- Soldering Iron
 - Hand tool used to melt and solder electrical components by touching hot metal tip against solder and component joint
- 60/40 Rosin Core Solder
 - Soft metal wire with organic compound in the center. Used by melting to component joint and forms a good electrical connection
- “Helping Hands” part holder
 - Adjustable jig used to hold PCBs. Commonly has two alligator clips and magnifying glass
- Electronic soldering Kit
 - Damp sponge, soldering iron mount, and power station. These are all attached and allow for holding an iron when not in use, cleaning the tip of the iron, and selecting a specific temperature to heat the tip up to

				
Tool Kit	Soldering Iron	60/40 Core Solder	Helping Hands	Electronic Soldering Kit

Electrical Components: (brief desc. about elec. and phys. attributes) + pics

- Resistor
 - Very small cylinder that resists an electrical circuit
- Capacitor
 - Tall cylinder that stores electrical energy
- Transistor
 - A semiconductor device that can amplify or switch electronic signals. Usually seen as a small black box with three electrical leads
- Diode
 - Very small cylinder that conducts current only one way
- Switch
 - Component that can open or close a circuit. Can also change the path of current



Procedure:

1. Turn on soldering station and wait for iron to heat up to specified temperature
2. Clean surface where you plan to add solder
3. Press the tip of the soldering iron on the joint between the PCB and the component
4. After heating up the connection area, carefully add 60/40 solder to the connection to join the two while still holding the tip on the connection
5. After solder is covering the connection area, move the iron away to let the connection cool
6. Clean tip of iron by pressing it into brass coils or wet sponge
7. Add a slight coating of solder to the tip of the iron to prevent corrosion

Expected Results:

I expect that by the end of this lab I will be able to identify basic electrical components and learn the proper technique of soldering.

Questions:

1. Why must all parts be clean and free from dirt and grease?
 - Dirty parts will cause a bad connection
2. Why should you secure the work firmly?

- Securing the work in helping hands prevents many shifts and lessen the risk of burning you as well as other components
- 3. What does "Tin" the iron tip mean and when do you do this?
 - You tin the tip to clean the tip which heats up parts
- 4. Why should I clean the tip of the hot soldering iron on a damp sponge?
 - A clean tip is the easiest to work with and will heat up parts better
- 5. Why should I add a tiny amount of fresh solder to the cleansed tip?
 - It will prevent corrosion when not in use
- 6. Why must I heat all parts of the joint with the iron before I add more solder?
 - All parts must be heated evenly to ensure a good connection
- 7. How do I know when enough solder is enough to form an adequate joint?
 - Solder will form a pyramid shape around the lead
- 8. What may happen if I leave the solder iron on a component for too long a time?
 - You may burn and damage the board or other components
- 9. Why must I not move the soldered parts until the solder has had a chance to cool?
 - The solder may not be fully set and may result in bad connection if moved