

PHY 440 LAB ZERO – CONNECTIVITY

Continuity checking

The multimeter on your bench has a continuity checker feature. It is part of the ohmmeter function of the multimeter. When the resistance between the probes is very small, no more than a few ohms, the ohmmeter produces an audible signal. Therefore, you can identify continuity with your ears while your eyes are on the contacts being probed.

1. *Wires*: Use wire strippers to bare both ends of a short piece of wire. Use the continuity checker to verify that the resistance of the wire is less than a few ohms.
2. *Toggle switches*: There are several toggle switches on your bench. Use the continuity checker to identify the connections made by the switches. Refer to Fig. 1 to identify the type of switch you have. [Type Code: SP=single pole, DP=double pole, ST=single throw, DT=double throw.] Draw two different switches in your lab notebook and indicate the types [10 pts].

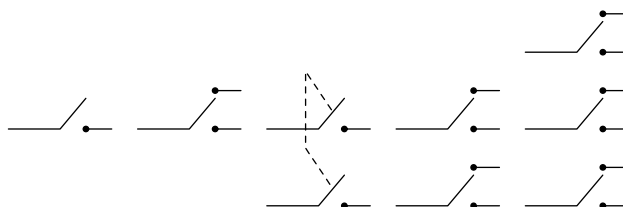


Figure 1: From left to right: SPST,SPDT,DPST,DPDT,3PDT. The dashed lines on the DPST indicate ganging, a mechanical linkage whereby both poles are switched together.

3. *Protoboard*: Throughout your experiences in the electronics lab you will use the protoboard to build circuits. Attach small lengths of wire to the multimeter probes using alligator clips. You will use those wires to make contact with the holes on the protoboard to identify which holes are connected.

Use a pencil to indicate the connections you find on the attached picture of the protoboard. Put a copy in your lab notebook [15 pts]. Remember these connections for the future.

Making connections

4. *Power receptacle*: On your bench you will find a standard American receptacle (or socket or outlet). Your task is to connect the socket correctly to a piece of Romex (a trade name for thermoplastic-sheathed cable). You will need wire strippers, long-nose pliers, and a screwdriver. The black wire is HOT. It is connected to the short slot on the socket through the brass colored screw terminal. The white wire is NEUTRAL. It is connected to the long

slot on the socket through the silver colored screw terminal. The bare wire is the earth GROUND. It is connected to the round hole on the socket through the green screw terminal.

Your connections should bend the wire around the screw before the screw is tightened. The wire should bend in the clockwise direction so that tightening the screw tends to tighten the bend. Show your connection to the instructor and get approval before you disassemble. [10 pts]

5. *Soldering*: Wear protective glasses before beginning this exercise. The soldering iron gets hot. Be careful not to burn yourself (or others). Use the soldering pencil and solder to connect stranded wire to two terminals of one of the toggle switches. Get your instructor's approval for the soldering [10 pts].

