A03.01

Summary:

Students will practice soldering components onto printed circuit boards. Students will learn the visible characteristics of a properly soldered connection and how to inspect printed circuit connections.

Expected Outcomes:

Students should become proficient in making electrically and mechanically sound solder connections without taking so much time, or applying so much solder, as to overheat the components or form solder bridges.

Materials:

Each student(s) should have the following materials, equipment, and supplies:
(*) indicates materials supplied as part of LaACES kit

1. Soldering iron or temperature-controlled solder station
2. Solder
3. Through-hole soldering kit
4. Flush-cutting wire nippers
5. Wire stripper or hobby knife
6. Solder sucker
7. **SAFETY GLASSES or GOGGLES**

The laboratory should also be equipped with the following:

1. Flat work tables sufficient to seat all students with plenty of work space.
2. Sufficient light for soldering.

Procedure:

Students will start with through-hole soldering and move onto surface mount soldering. There is no rush, practice makes perfect. It cannot be emphasized enough that one must wear SAFETY GLASSES. Molten solder can splash and clipped wires can fly. Also, solder can contain up to 40% lead so wash your hands well after this activity. Most beginning solderers use too much solder and not enough heat. It is stressed that the **SOLDER PAD** melts the solder, not the iron tip. Only enough solder should be applied to flow onto the pad. Finally, when soldering insulated wire or shielded cable, take care not to overheat the insulation, which will cause it to soften and distort.

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1. PUT ON YOUR SAFETY GLASSES

2. Prepare soldering iron. Allow it to heat up to operating temperature, then use a *slightly* damp sponge to clean the tip. "Tin the tip" by applying a small amount of solder and then clean again with the sponge. ***Repeat this cleaning and tinning operation before every joint***.

3. Students should follow the instructions in the soldering kit, completing all of the practice sections and constructing the blinking circuit. It is recommended to use a rosin core leaded solder as opposed to the lead free solder that comes in the kit.