Workshop I

Introduction to Soldering

SECTION I

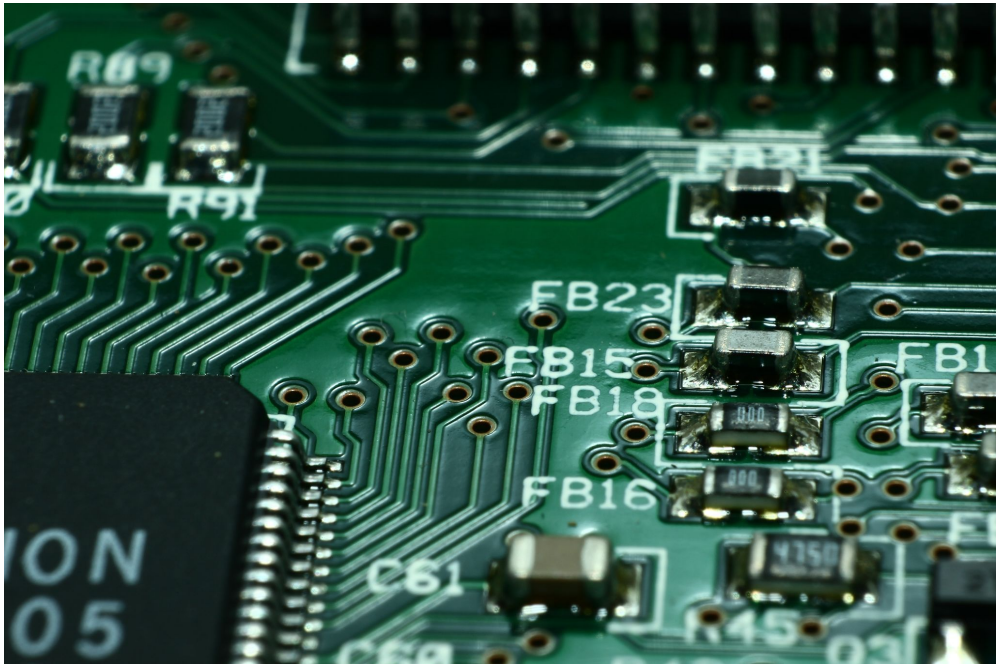
What is Soldering?

What is Soldering?

- The process of joining two metal/electrical components together
- Creates a reliable electrical connection without much special equipment

Why is Soldering Important?

- Used in everyday electronics
- Quick, durable connections
- Components can be easily built into circuit boards



SECTION II

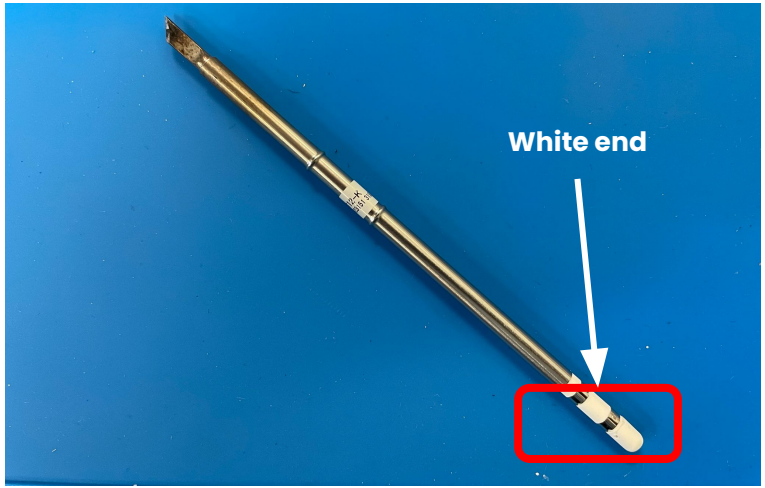
Basics of Soldering

Basics of Soldering - Soldering Iron

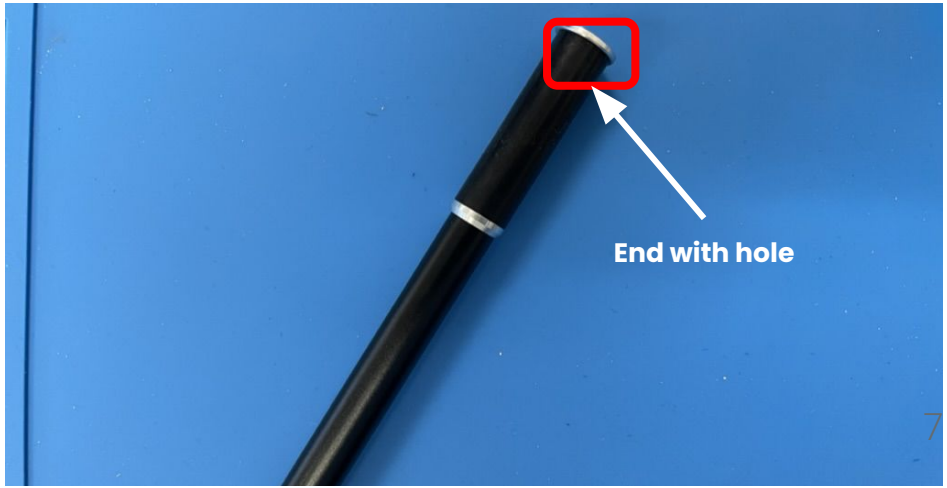
- Melts solder
- Hold like a pencil (on red rectangle)
- Do not hold the metal!
- Make sure the tip doesn’t touch anything flammable while it is on!

Basics of Soldering - Soldering Iron (continued)

- This is the iron tip
- Do not touch when heated!



- This is the iron handle
- The white end of the iron tip inserts into the hole of the iron body



SECTION III

How to Solder

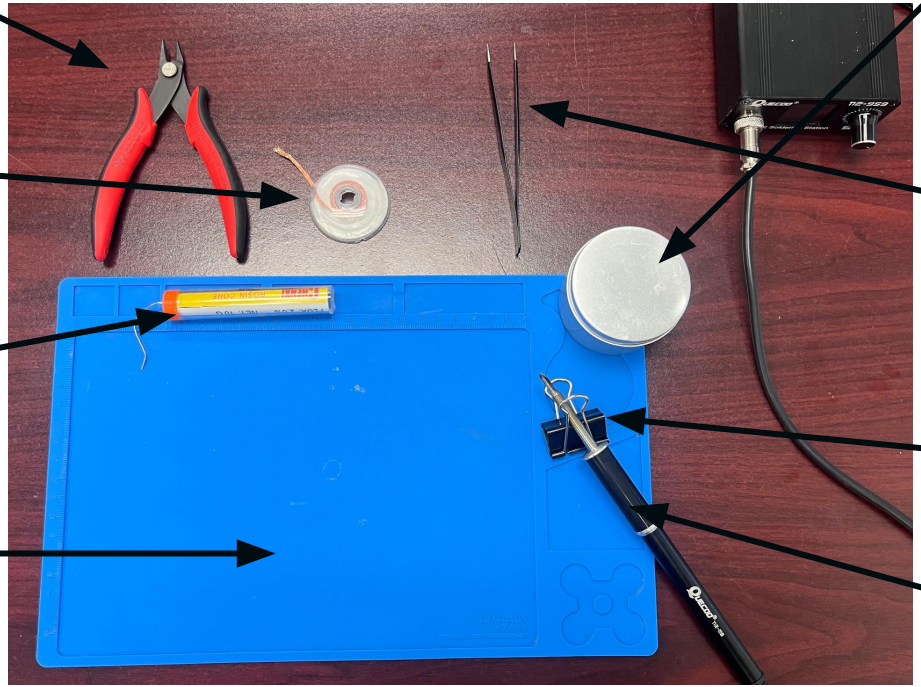
Station Layouts

Flush Cutters (Snips)
- Used to cut wires

Solder Wick
Cleans up excess solder and remove components

Solder Tube
- Dispenses the solder

Blue Silicone Mat -
Your working area, keep all wire clippings and tools on it!



Brass Wool
- Cleans tip of iron w/ rosin of oxidation and solder

Tweezers -
Hold components and secure in place

Binder Clip -
Holds the hot iron

Soldering Iron
- Heats the solder

Safety

- Never touch iron tip directly
- Always assume tip is hot
- Stow iron safely when not in use
- Don’t lick your hands (Flux and solder aren’t edible)
- Don’t touch your face
- Components will be hot from soldering

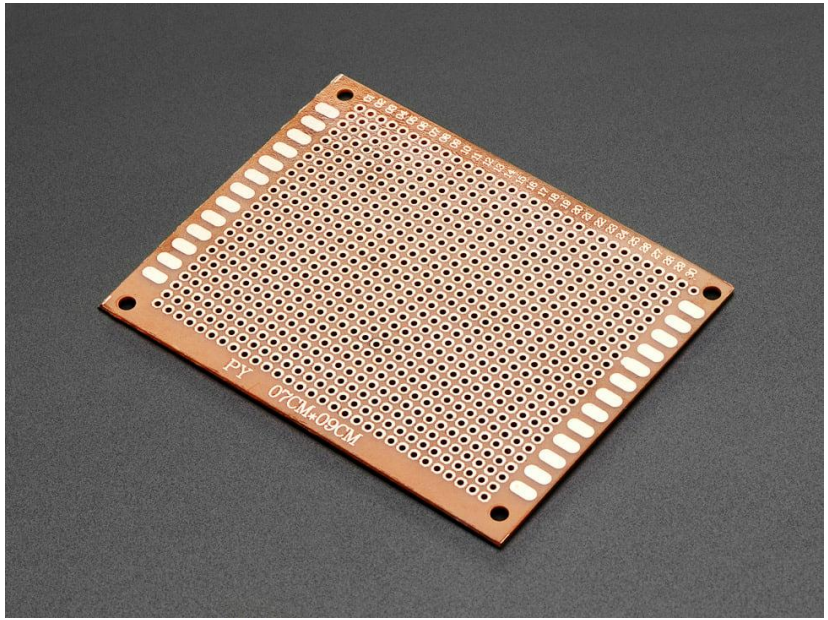
Do not follow these images!

Safety Pt. 2

- Wear safety glasses (if not already wearing eye protection)
- Should be dressed in standard lab uniform (pants, shirt, closed toed shoes)
- For those with long hair, tie it back (so you don’t lose it!)

What is a perfboard?

We use a perfboard as it makes soldering and prototyping electronic circuits easier and more organized, perfect for DIY projects with fewer risks of errors.

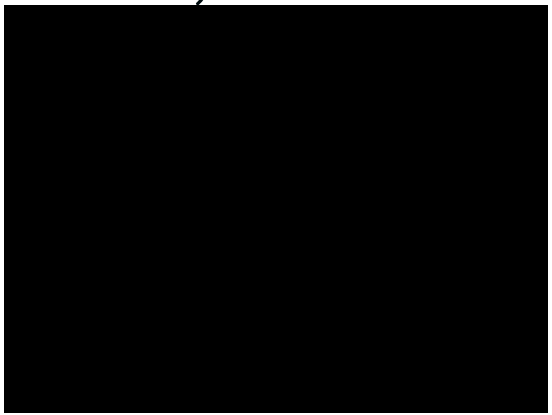


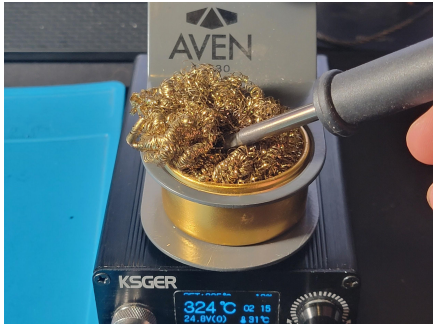
How To - Tin Tip

Tin the Tip to prepare and protect from Oxidation

- Heat iron to 325℃
- Rotate iron tip to clean (Brass Wool)
- Apply solder to tip

(for better heat transfer)





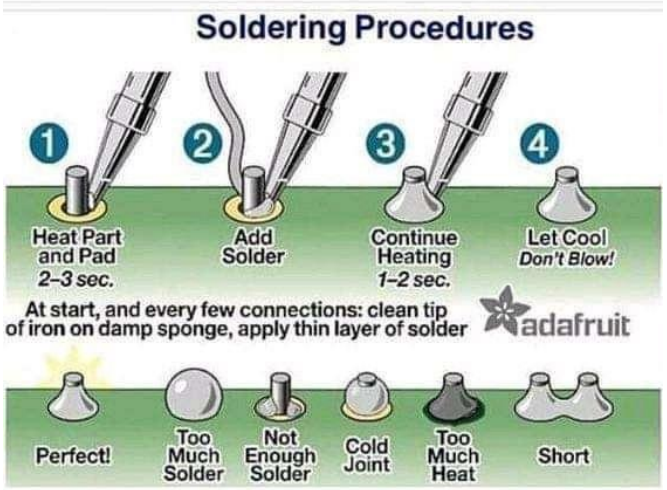
Steps

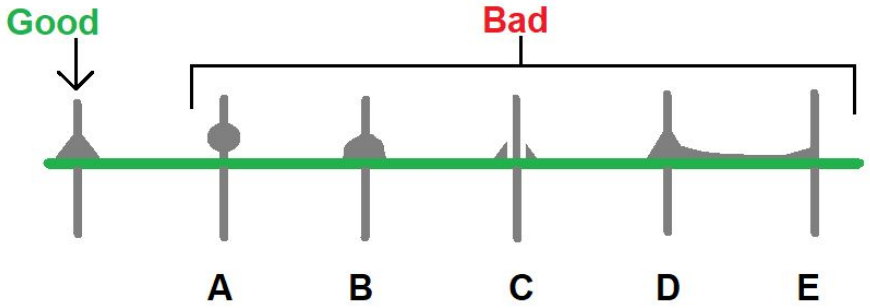
1. Prepare Board & Components
2. Assemble Components on Board
3. Confirm Circuit (Check with OPS Lab Instructor!)
4. Solder Components
5. Test Joints (with multimeter)
6. Cut Leads (extra wire)
7. Clean Up Area
   - What’s wrong with this image?

Video

Basics of Soldering - Solder Joints

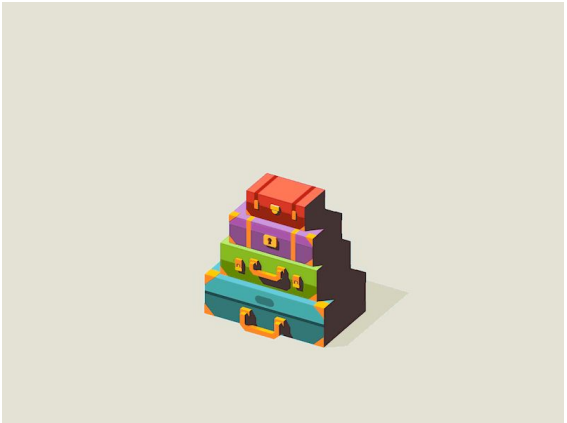
- We want OK solder joints
- Cold Joints = not enough heat to melt solder (increases resistance, could affect current)
- Insufficient Wetting, not enough rosin or too much grime
  - PCB/Components not clean
- Pro tip: When dealing with resistors and components, feel free to bend the wires





Clean up:

1. Turn off, tin the tip and leave in stand to cool
2. Close brass wool tin
3. Collect trimmed leads, cooled solder and any other trash to be thrown away
4. Pack up your things
5. WASH YOUR HANDS!!!!



Our Setup - The Soldering Iron

- The soldering iron comes in two parts, iron tip and iron body
- To assemble it, put the white end of the iron tip into the iron body
- To turn the iron on, toggle the switch on the back of the box the iron body is connected to
- The reading on the box's screen should be 325° C, if not, adjust with the knob on the front
- Before and after soldering, you should tin the iron
  - Tin the iron by melting a small amount of solder on the tip
  - Wipe on brass wool (inside silver cylinder) to get rid of excess tin on iron

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