Balloon Payload Workshop

Soldering 101
Soldering:

What am I about to do?

Advice for success

✓ Follow steps
✓ Be patient with yourself
✓ Safety!
Soldering:

Supplies:
- ✓ Soldering 101 Kit
- ✓ Soldering Iron
- ✓ Solder
- ✓ Wire “Sponge”
- ✓ Safety Glasses
- ✓ Wire Snippers
- ✓ Solder Sucker
- ✓ 9V Battery
- ✓ Helping Hands
- ✓ Secure Power Source
Soldering:
Soldering:

- How much solder?

- Cold Solder Joints
Soldering

- Use caution when clipping leads to avoid flinging metal across the room
- Please put clipped leads in the trash not the floor
Soldering

Top View

Side View

Circuit Board

Solder Pads

Resistor
Soldering iron is to heat the pad on the board.

Tip ~450 - 600 F
Bring tip to the solder pad
Soldering

Move solder to touch edge of tip

Solder will flow toward heat
Soldering

Hold until solder melts on tip by resistor lead

Iron is still on the board/pad
Continue until a small blob of solder forms

Maintain contact with pad the whole time
**Soldering**

Remove solder and then iron leaving nice shiny fillets *(Hershey kisses)*
Soldered

Top View

Solder bridge shorting two traces or pads

But, can be fixed by reheating or using solder sucker
Soldering:

- Easy to add solder or re-melt vs. remove it
Soldering Test:

Little Quiz!!
Soldering Test:
Safety

- Soldering is dangerous so follow my instructions
- Be mindful of where you are and where the soldering iron is
- Eyes and liquid solder – everyone shall wear safety glasses
- Hair (get it out of the way)
- If you get burned...
- LEAD – Wash Hands
Hand-on Soldering:

- I will guide you and the rest of the video through the **20 steps**

- Turn your soldering irons on now!

YOU GOT THIS
Step 1: Retrieve Kit
Step 2: Layout Kit
**Step 3:** Orient board, find reference point

Install Side
Step 3: Orient board, find reference point

Solder Side
Step 4: Install 8 pin socket
Step 4: Install 8 pin socket

Make sure the notch on the socket matches the notch on the board
Step 5: Socket Lead Bending

DO NOT SOLDER AT THIS TIME
Soldering:

- Tin the tip of the soldering iron by melting an inch or so of solder on the tip
- The iron will now look shiny on the tip
- Then wipe any excess solder on the golden “sponge”.
Soldering
**Step 6: Install 33 resistor (Orange, Orange, Orange)**

**DO NOT SOLDER THE LEADS AT THIS TIME**
**Step 7:** Install 120 kΩ resistor 
(Brown, Red, Yellow)

**DO NOT SOLDER THE LEADS AT THIS TIME**
Step 8: Verify Resistors

120 kΩ
Brown, Red, Yellow

33 kΩ
Orange, Orange, Orange
Step 9: Solder Resistors

- **33 kΩ**: Orange, Orange, Orange
- **120 kΩ**: Brown, Red, Yellow
Step 10: Inspect solder joints and trim leads

Ok to NOT clip leads, if you want to wait until the end to ease troubleshooting.
Step 11: Install Capacitor

Gray strip indicates “negative” lead

“-” Lead
Shorter Lead
Step 12: Verify capacitor install and solder

“-” Lead
**Step 12:** Verify capacitor install and solder

Also trim leads when finished

“-” Lead
Step 13: Install GREEN LED

DO NOT SOLDER THE LEADS AT THIS TIME

“-” Lead
**Step 14: Install RED LED**

DO NOT SOLDER THE LEADS AT THIS TIME
**Step 15:** Verify and solder LED leads

Also trim leads when finished
Step 16: Solder socket to board. Go Slow

Verify solder joints and check for solder bridges
Step 17: Install the chip

Small circle on chip placed over pin hole “1” on socket
**Step 18: Install 9V battery clip to board**

Install 9V battery clip to board

9V = Red
GND = Black
Step 19: Solder battery leads
Step 20: Attach test battery

If LEDs don’t blink, detach battery immediately.
• Go through steps and see if you find any mistakes.
• Do any component need to be desoldered/resoldered?
• Check polarity!
• Use the multimeter to make sure all connections have been made.
Step 21:
Install the chip

Hands-on: Soldering

Small circle placed over pin hole "1"