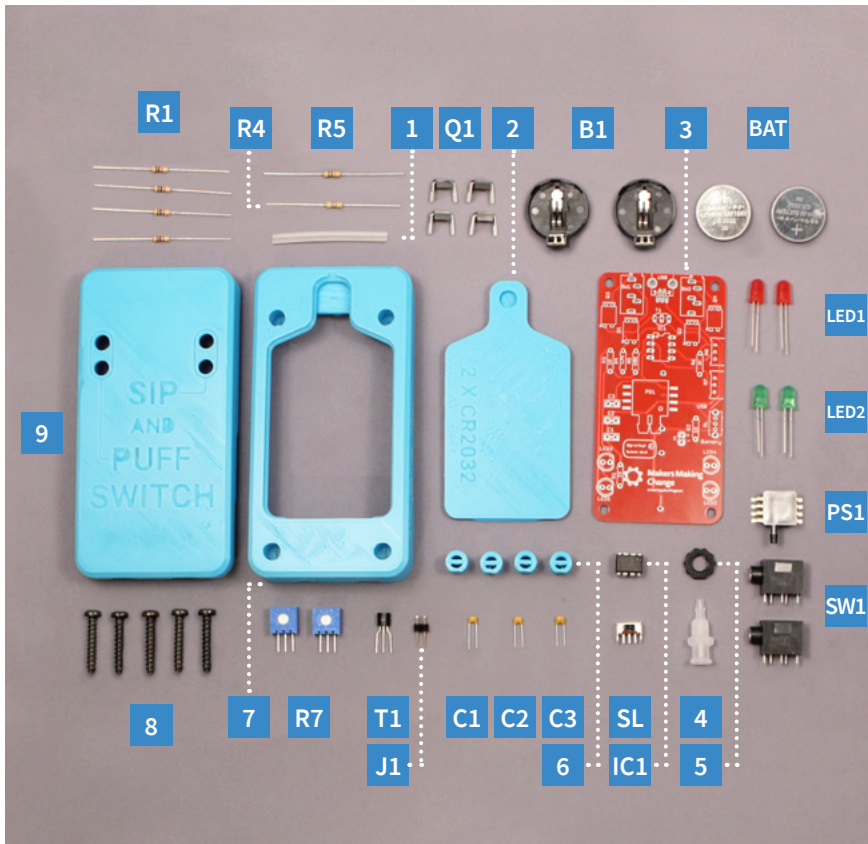


# Sip & Puff Analog Switch

## ASSEMBLY MANUAL



**Makers Making Change**  
A Neil Squire Program



### BILL OF MATERIALS

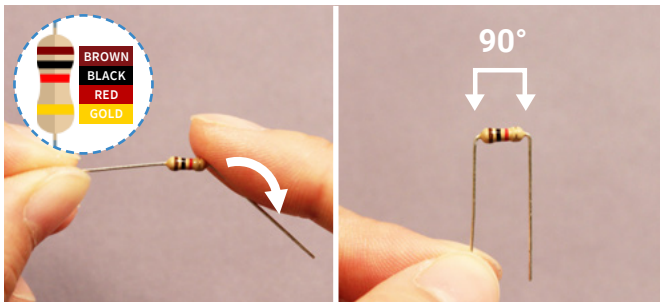
<b>R1</b>	1k Ohm Resistor (4)	<b>5</b>	Luer Lock Nut
<b>R4</b>	4.7M Ohm Resistor	<b>SL</b>	Slide Switch
<b>R5</b>	10k Ohm Resistor	<b>IC1</b>	OP Amp
<b>1</b>	Tubing	<b>C1</b>	1uF Capacitor (label: 105)
<b>Q1</b>	MOSFET (4)	<b>C2</b>	10nF Capacitor (label: 103)
<b>2</b>	Battery Case Cover	<b>C3</b>	47pF Capacitor (label: 471)
<b>B1</b>	Battery Holder (2)	<b>6</b>	LED Spacer (4)
<b>3</b>	PCB	<b>T1</b>	Transistor
<b>BAT</b>	Battery (2)	<b>J1</b>	2-position Male Header
<b>LED1</b>	Red LED (2)	<b>R7</b>	Potentiometer (2)
<b>LED2</b>	Green LED (2)	<b>7</b>	Case Bottom
<b>PS1</b>	Pressure Sensor	<b>8</b>	#4 3/8" Screws (5)
<b>SW1</b>	Mono Jack (2)	<b>9</b>	Case Top
<b>4</b>	Luer Lock Fitting		

### BEFORE STARTING:

- All components are inserted into the PCB from the side with the MMC logo except the battery holders.
- Insert components flush to the PCB except Q1, IC1, and T1.
- Some components need to be inserted in a specific orientation.
- = Hole to put component through
- = Solder the area in the white square.

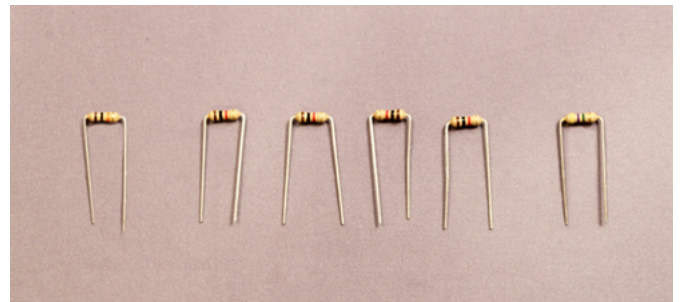
### TOOLS

- Soldering iron
- Solder
- Flush cutters
- Wire stripper
- Needle nose pliers
- Phillips screwdriver
- Clamp
- Magnifier
- Desoldering pump
- Plate
- Tape



**01.**

**R1**

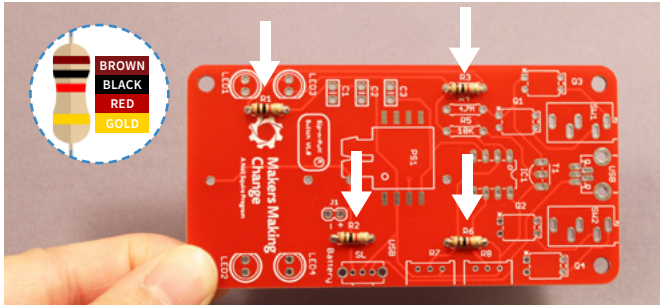


**02.** Bend all 6 resistors.

**R4 R5**

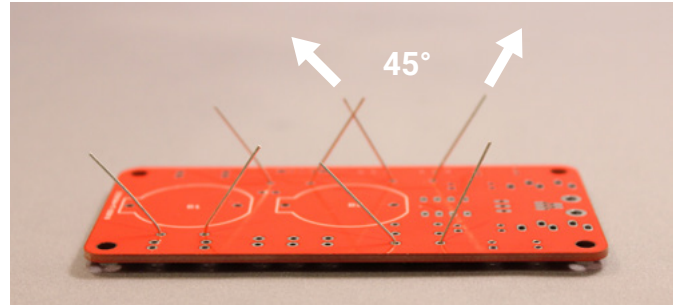
# Sip & Puff Analog Switch

## ASSEMBLY MANUAL



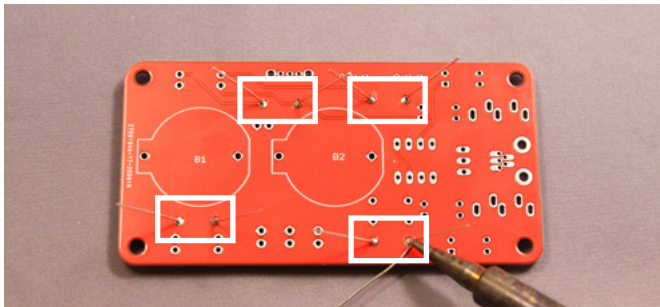
**03.**

3 R1 HOLE R1 HOLE R2 HOLE R3 HOLE R6



**04.**

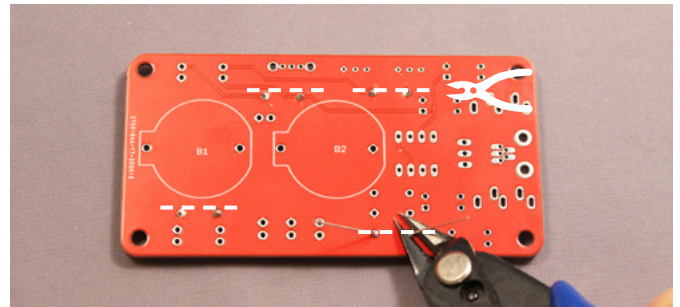
Bend all leads so components stay in place.



**05.**

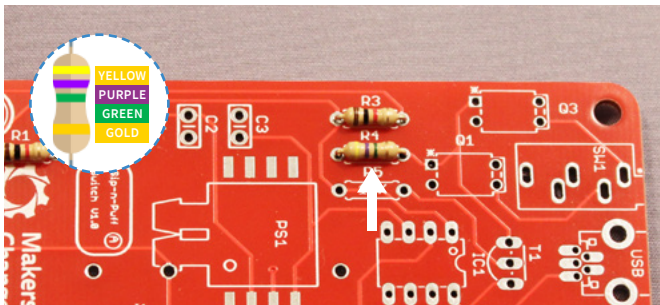


x 2



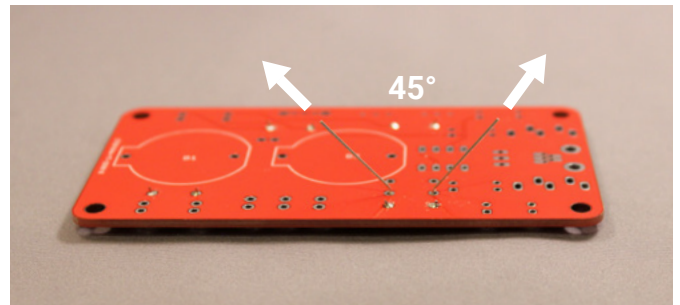
**06.**

Snip off all excess leads flush to the PCB.

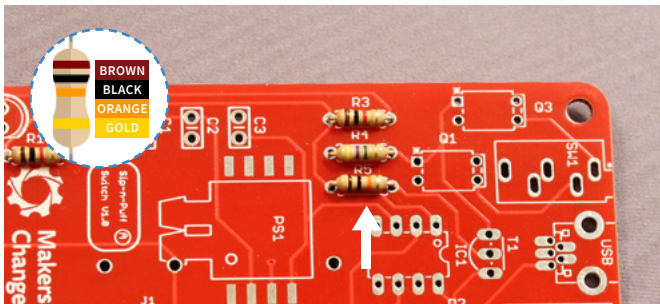


**07.**

R4 HOLE R4

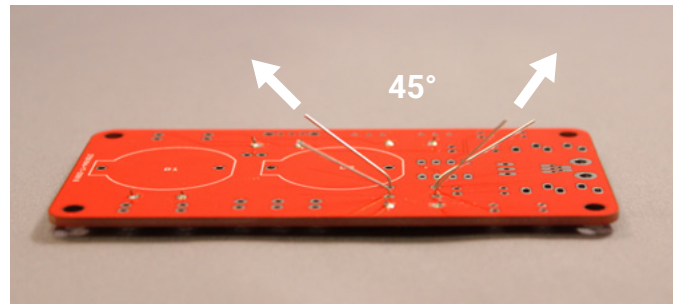


**08.**



**09.**

R5 HOLE R5

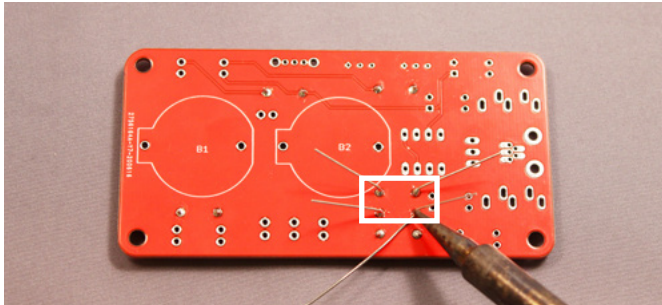


**10.**



# Sip & Puff Analog Switch

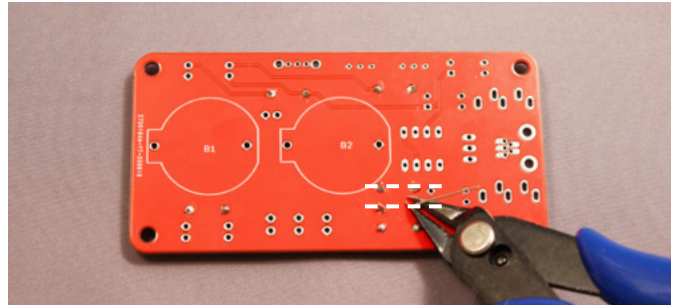
## ASSEMBLY MANUAL



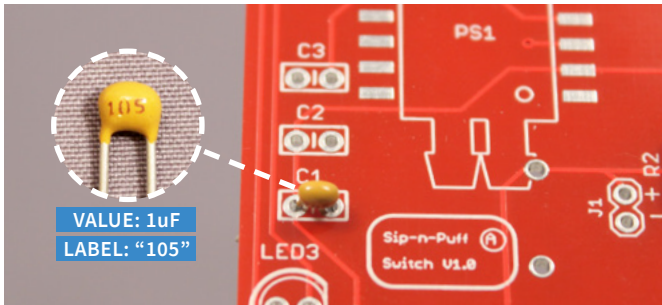
11.



x 4

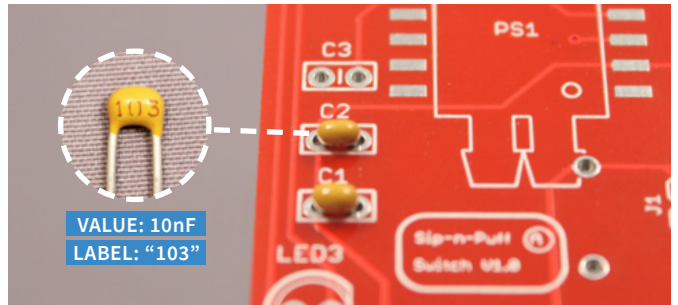


12.



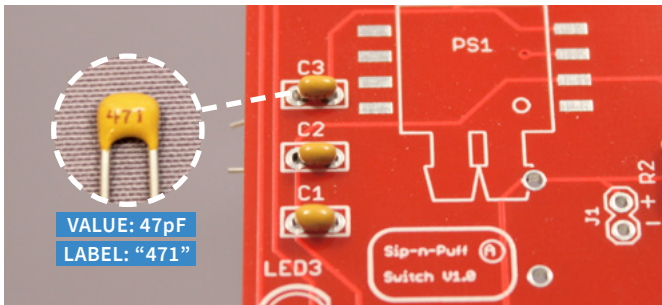
13.

C1 HOLE C1



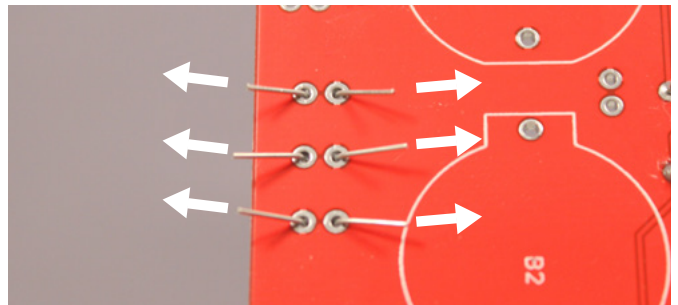
14.

C2 HOLE C2

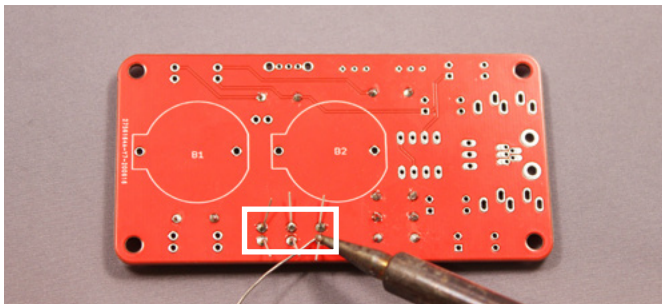


15.

C3 HOLE C3



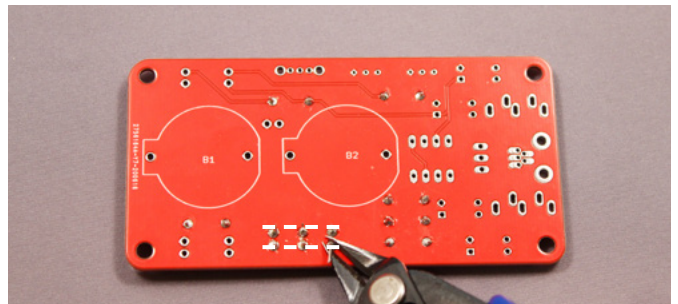
16.



17.



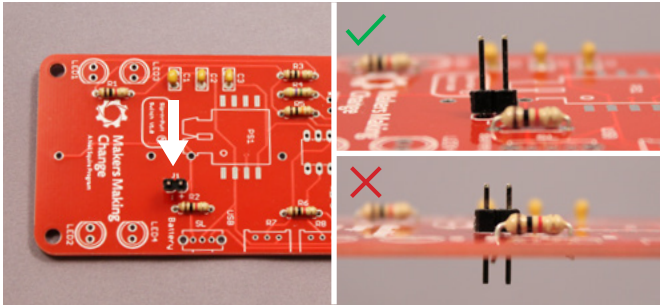
x 6



18.

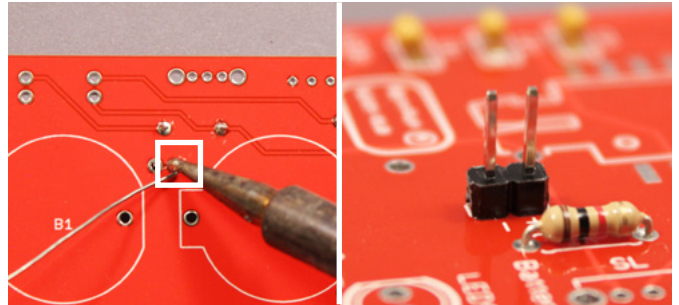
# Sip & Puff Analog Switch

## ASSEMBLY MANUAL

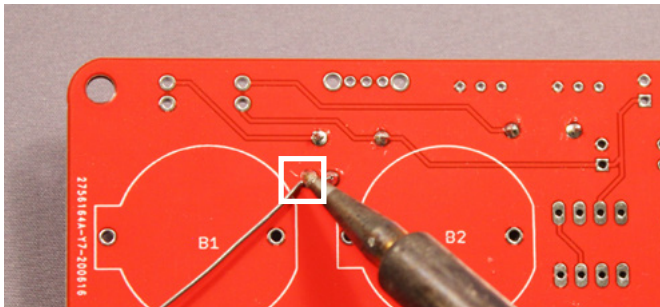


**19.** The **short** leads are inserted.

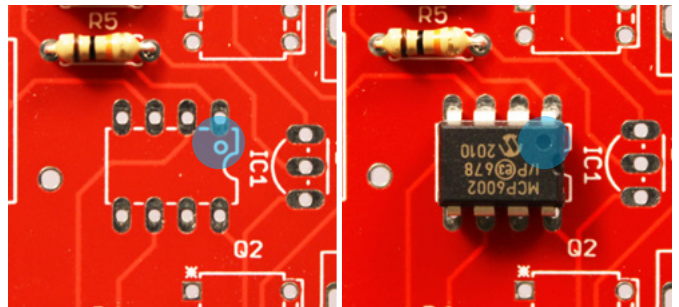
J1 HOLE J1



**20.** Solder **only 1 lead** and check if the component is flush to board. Adjust as necessary.

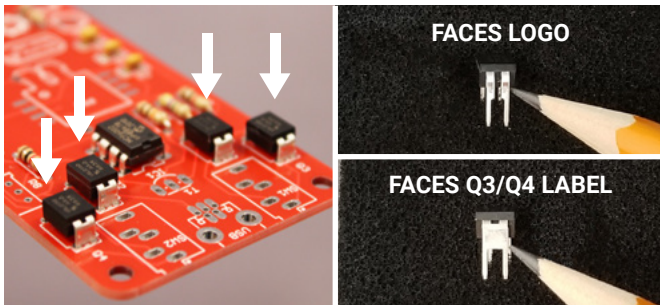


**21.**



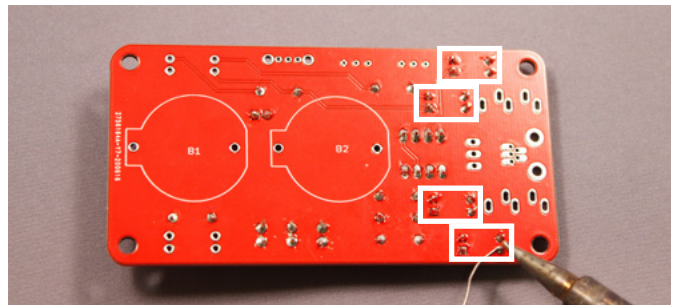
**22.** **IMPORTANT:** Insert and orient the OP Amp with dot towards the PCB dot.

IC1 HOLE IC1



**23.** MOSFETs will slightly above the PCB.

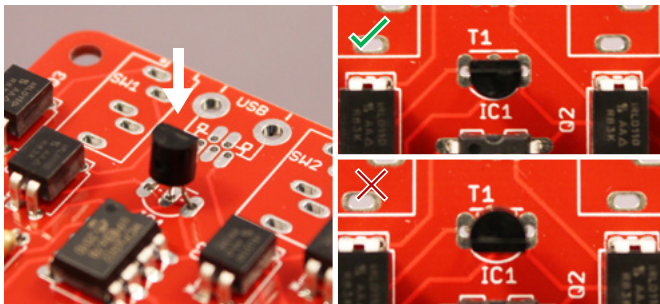
Q1 HOLE Q1 HOLE Q2 HOLE Q3 HOLE Q4



**24.**

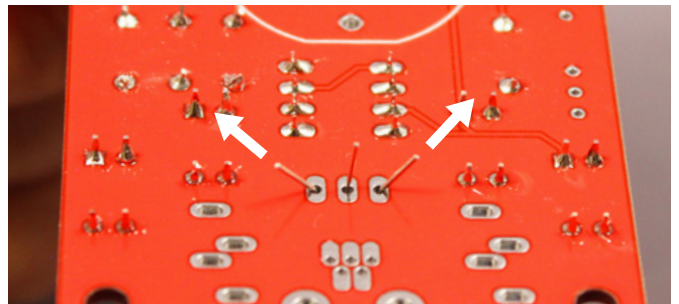


x 16



**25.**

T1 HOLE T1

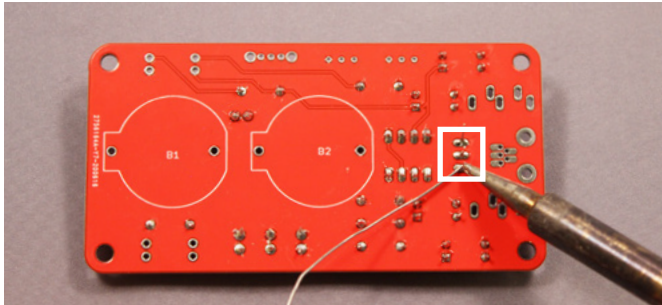


**26.**



# Sip & Puff Analog Switch

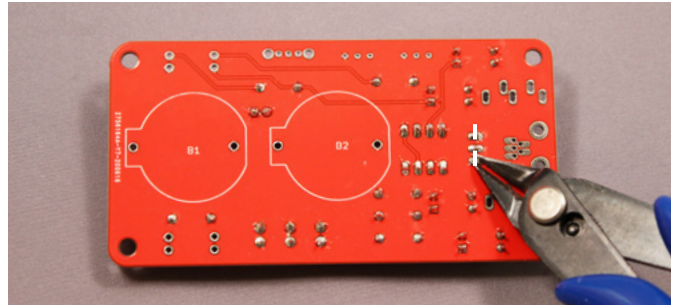
## ASSEMBLY MANUAL



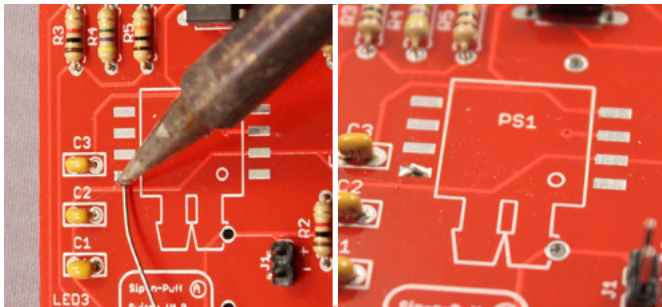
**27.**



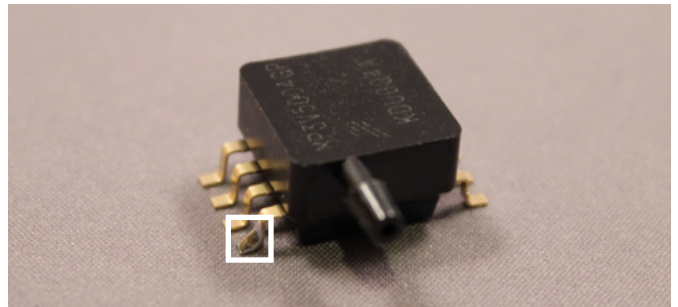
x 3



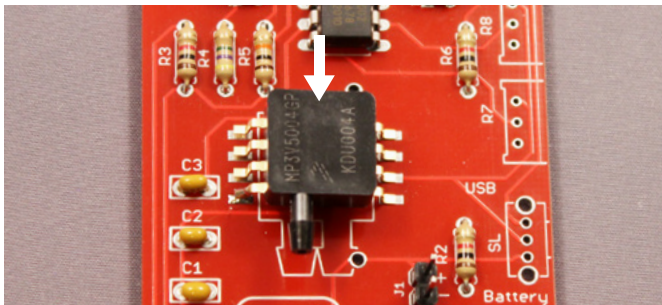
**28.**



**29.** Add solder to the bottom left pad.



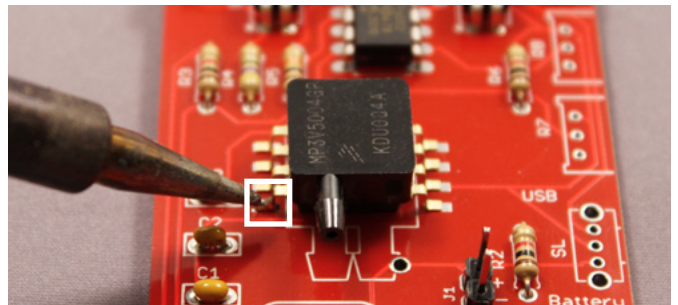
**30.** Add solder to the bottom left lead.



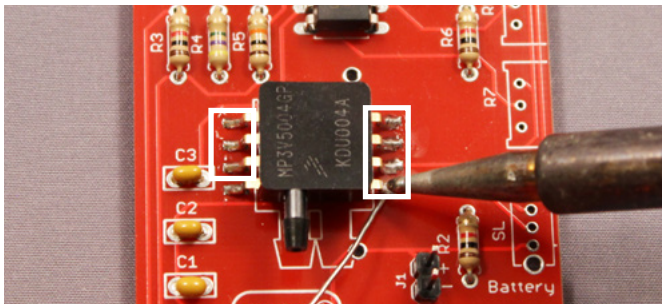
**31.**



HOLE PS1



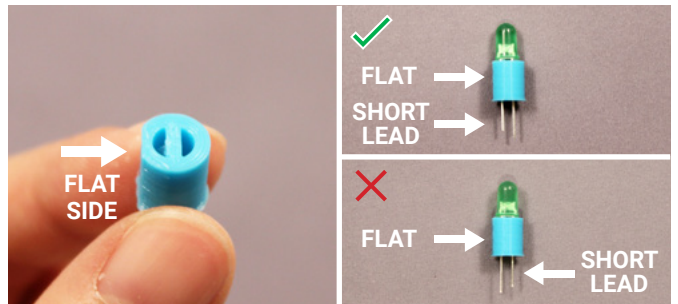
**32.** Put the iron tip on the lead and the sensor should "drop." Adjust as necessary.



**33.**



x 7



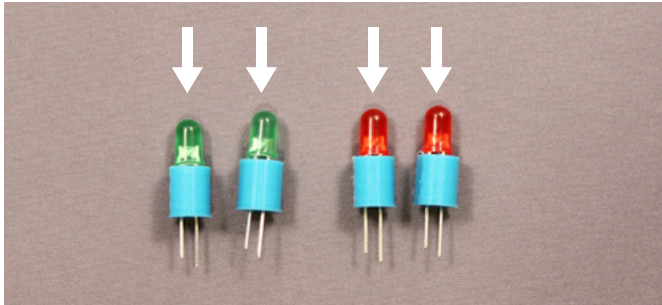
**34.** Insert the LED into the spacer with the shorter lead towards the flat side.



LED1 6

# Sip & Puff Analog Switch

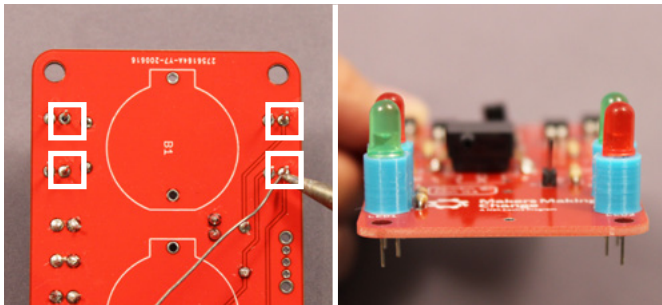
## ASSEMBLY MANUAL



**35.**



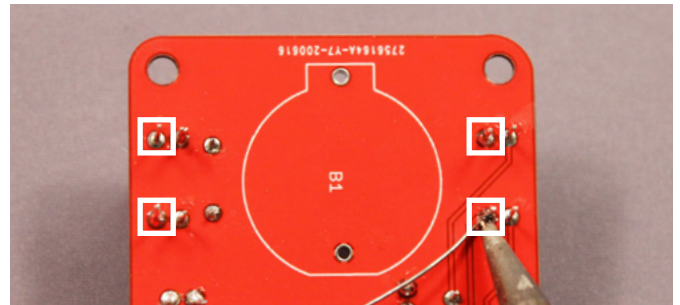
**36.** Insert the red LED in **LED2** & **LED3**. Insert the green LED in **LED1** & **LED4**.



**37.** Solder **only 1 lead on each LED** and check if it's flush to the board. Adjust as necessary.



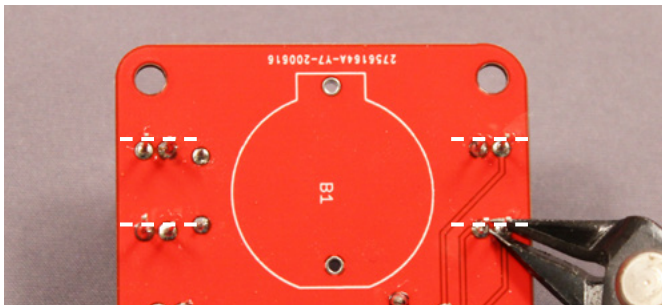
x 4



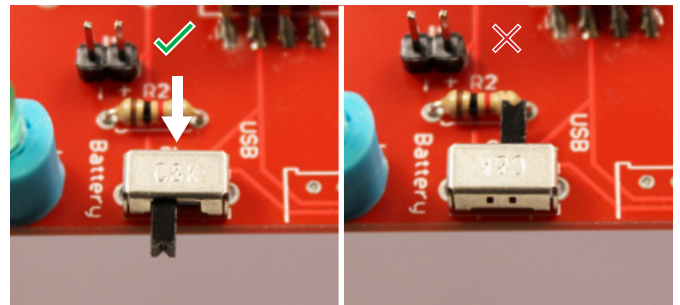
**38.**



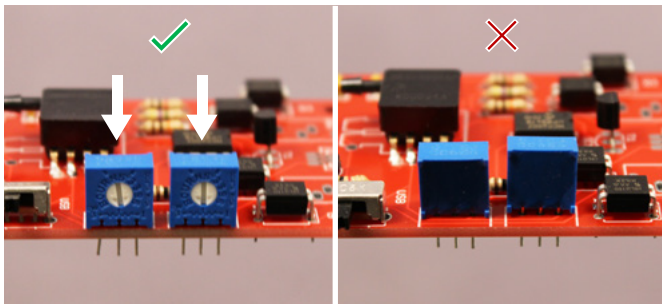
x 4



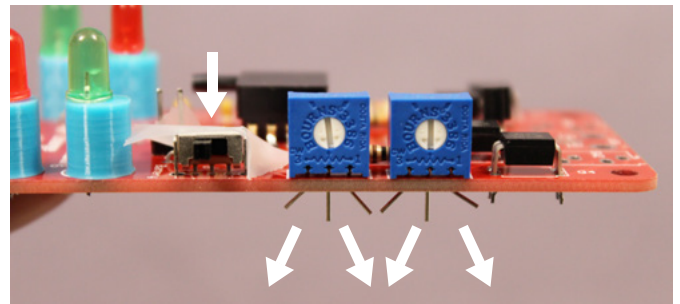
**39.**



**40.**



**41.**

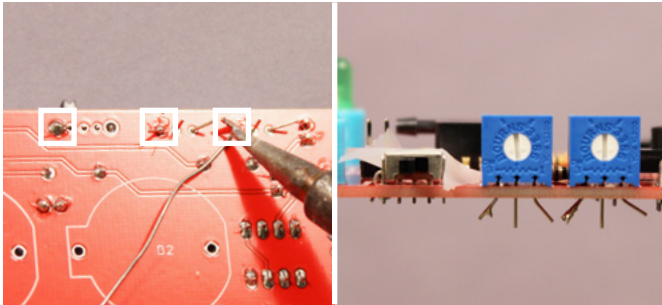


**42.** Optional: use tape to keep the slide switch in place.

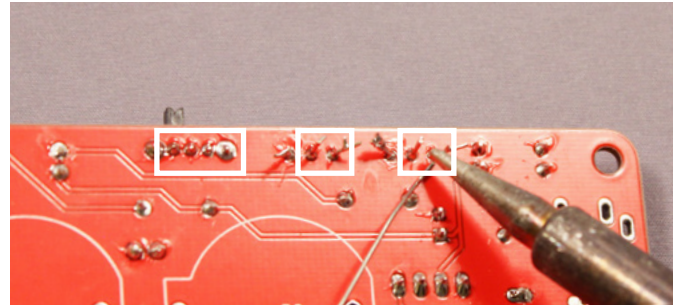


# Sip & Puff Analog Switch

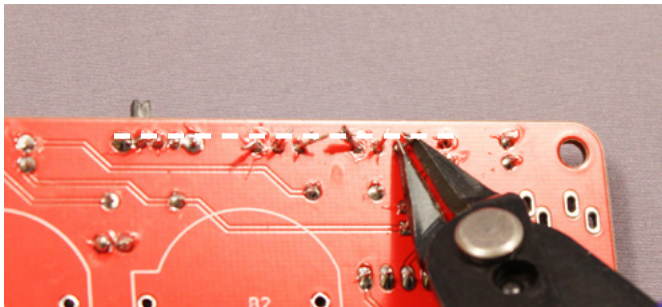
## ASSEMBLY MANUAL



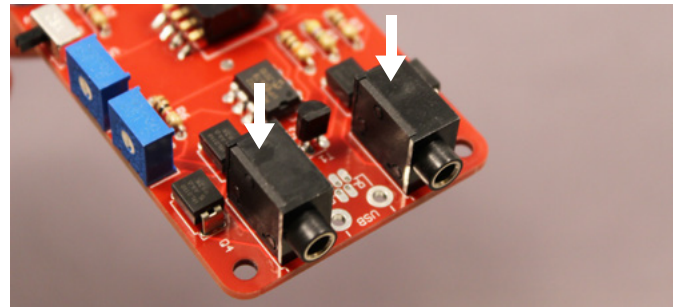
**43.** Solder **only 1 lead on each component** and check if they're flush to the board. Adjust as necessary.



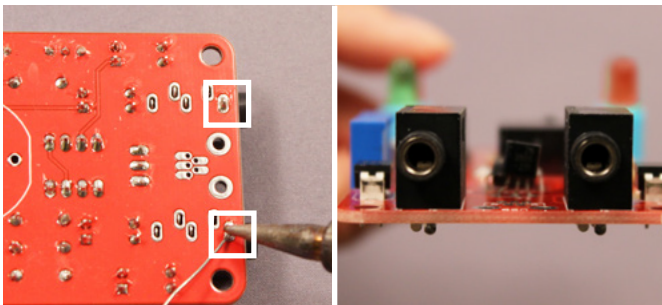
**44.**



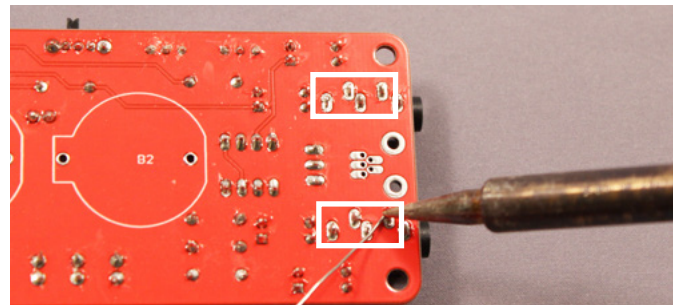
**45.**



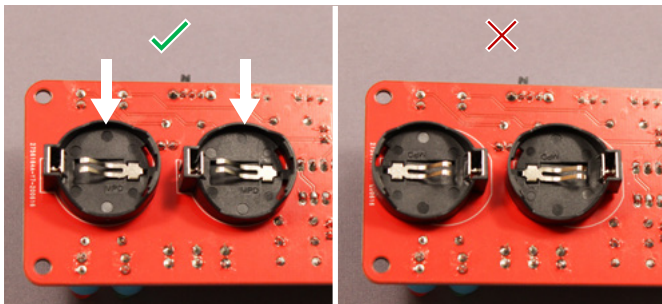
**46.**



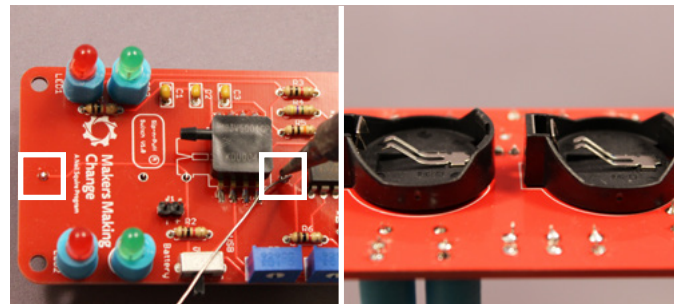
**47.** Solder **only 1 lead on each component** and check if they're flush to the board. Adjust as necessary.



**48.**



**49.**

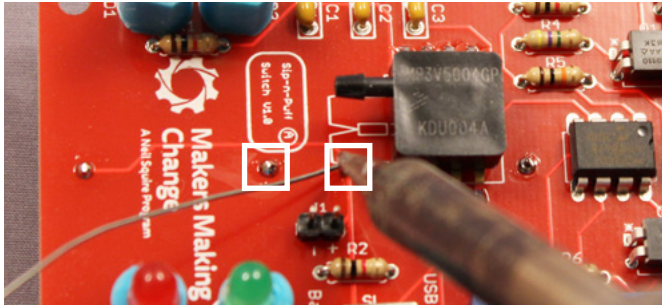


**50.** Solder **only 1 lead on each part** and check if they're flush to the board. Adjust as necessary.



# Sip & Puff Analog Switch

## ASSEMBLY MANUAL



51.



52.

4 9

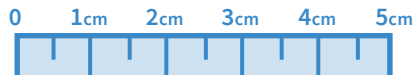


53.

5



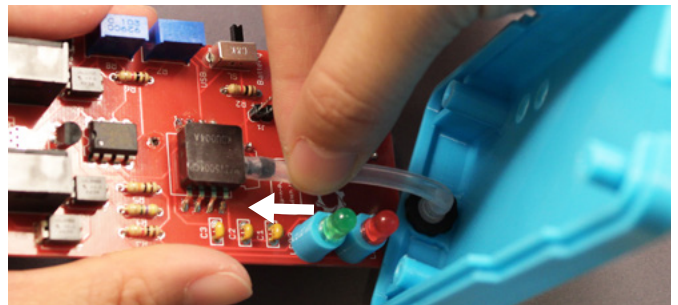
54.



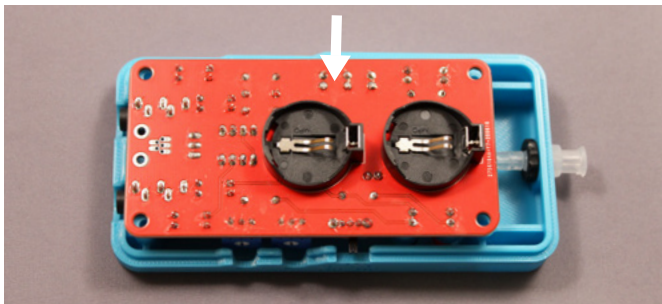
1



55.



56.



57.



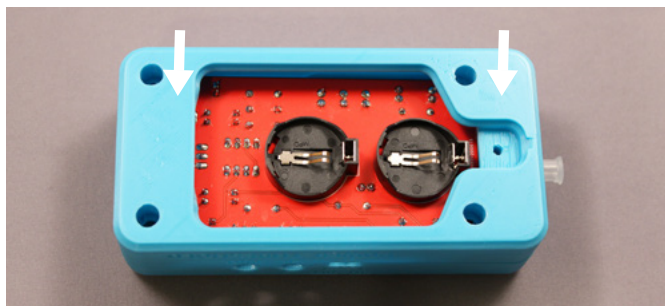
58. Clear any 3D printed material from the screw holes.

7



# Sip & Puff Analog Switch

## ASSEMBLY MANUAL

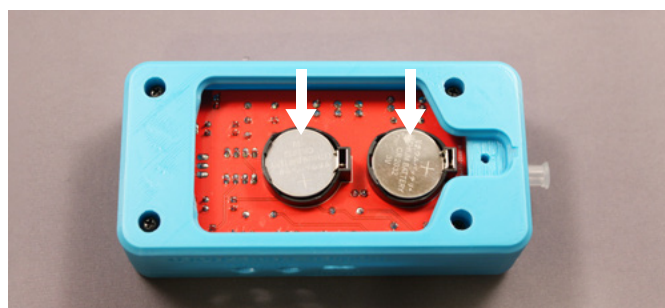


59.



60.

8



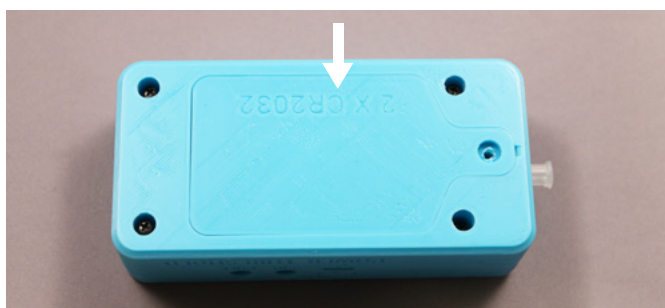
61.

BAT



62. Clear any 3D printed material from the screw hole.

2



63.



64.

8