

# LipSync (all versions)

## ASSEMBLY GUIDE

---

Version 1.6 | July 2021

# Contents

- 2 Part 0a - Obtaining Components and Files
- 3 Part 0b - Component Checklist
- 8 Part 0c - Equipment Checklist
- 9 Electrical Assembly
- 19 (Optional) Installing the *Bluetooth®* Component
- 33 Joystick Assembly
- 54 Setting Up the Device

VERSION	DESCRIPTION	CONNECTION TYPE
LipSync	Works like a mouse	USB
LipSync Wireless	Works like a mouse	Wireless
LipSync Gaming	Works like a joystick	USB
LipSync Macro	Works like a keyboard	USB & wireless



© 2021 by Neil Squire. "LipSync Assembly Guide" is licensed under the CC BY SA 4.0 License: <http://creativecommons.org/licenses/by-sa/4.0>

# Part 0a

## OBTAINING COMPONENTS AND FILES

**Components should be ordered at least 2 weeks in advance. See Part 0b for the full list of components and its purchase links.**

All components can be purchased through the links listed under each item.  
Required parts from Digikey can be purchased with these cart links

Canada: <http://www.digikey.ca/short/jb9vm5>

United States: <http://www.digikey.com/short/jb9vm5>

If you are building the **LipSync Wireless** or the **LipSync Macro**, order parts #44 (Bluetooth module) and #45 (1-position female header). These parts are not included in the Digikey carts above.

Download all the necessary files and directories to assemble a LipSync:

### LipSync:

<https://github.com/makersmakingchange/LipSync/blob/master/README.md>

### LipSync Wireless:

<https://github.com/makersmakingchange/LipSync-Wireless/blob/master/README.md>

### LipSync Macro:

<https://github.com/makersmakingchange/LipSync-Macro/blob/master/README.md>

### LipSync Gaming:

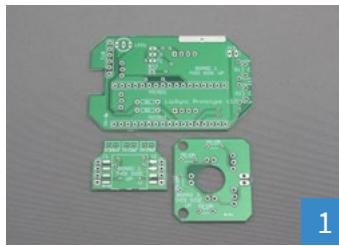
<https://github.com/makersmakingchange/LipSync-Gaming/blob/master/README.md>

# Part 0b

## COMPONENT CHECKLIST

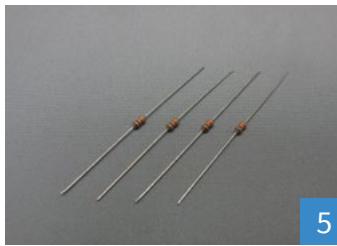
- 1 (1) LipSync Circuit Board Package (3 boards)
- 2 (1) Arduino Micro **OR**  
(1) Genuino Micro
- 3 (2) Right Angle Push Buttons
- 4 (2) 300 Ohm 1/4W T/H Resistors
- 5 (4) 10k Ohm Mini 1/4W T/H Resistors
- 6 (1) NXP Semiconductors Pressure Sensor
- 7 (1) 0.01uF Ceramic T/H Radial Capacitor
- 8 (1) 1.0uF Ceramic T/H Radial Capacitor
- 9 (1) 470pF Ceramic T/H Capacitor

<input type="checkbox"/> 10 (2) 17-Position Straight Female T/H Headers	<input type="checkbox"/> 22 (1) Joystick Baseplate	<input type="checkbox"/> 34 (4) Bumpers
<input type="checkbox"/> 11 (2) 3-Position Right Angle Male Headers	<input type="checkbox"/> 23 (1) Rear Housing	<input type="checkbox"/> 35 (4) Nuts M3
<input type="checkbox"/> 12 (2) 3-Position Straight Female Header	<input type="checkbox"/> 24 (2) Buttons	<input type="checkbox"/> 36 (1) Tubing 3/32" ID x 45mm
<input type="checkbox"/> 13 (2) 4-Position Straight Female T/H Headers	<input type="checkbox"/> 25 (1) Mouthpiece	<input type="checkbox"/> 37 (2) Light Pipe
<input type="checkbox"/> 14 (1) Break Away Male Headers	<input type="checkbox"/> 26 (1) Filter	<input type="checkbox"/> 38 (1) Threaded Insert 5/8"-27
<input type="checkbox"/> 15 (1) 5mm Bi-Color T/H LED	<input type="checkbox"/> 27 (1) Luer Lock Fitting	<input type="checkbox"/> 39 (1) Threaded Adapter 5/8"-27
<input type="checkbox"/> 16 (1) Shunt Connector	<input type="checkbox"/> 28 (4) Force Resistive Sensor	<input type="checkbox"/> 40 (1) USB Cable
<input type="checkbox"/> 17 (1) 2N3906 PNP-Type T/H Transistor	<input type="checkbox"/> 29 (4) Screws Phillips Head M3	<input type="checkbox"/> 41 (1) USB Adapter
<input type="checkbox"/> 18 (1) 6-Position Straight Female T/H Header	<input type="checkbox"/> 30 (6) Compression Springs	<input type="checkbox"/> 42 (1) Cable Tie
<input type="checkbox"/> 19 (1) Front Housing	<input type="checkbox"/> 31 (2) Standoffs M3 10mm	<input type="checkbox"/> 43 <b>OPTIONAL</b> (1) Magic Arm 11" and Clamp
<input type="checkbox"/> 20 (1) Joystick Front Plate	<input type="checkbox"/> 32 (2) Standoffs M3 15mm	<input type="checkbox"/> 44 <b>OPTIONAL</b> (1) SparkFun Bluetooth Module
<input type="checkbox"/> 21 (1) Joystick Rocker	<input type="checkbox"/> 33 (1) Luer Lock Nut	<input type="checkbox"/> 45 <b>OPTIONAL</b> (1) 1-Position Straight Female T/H Header



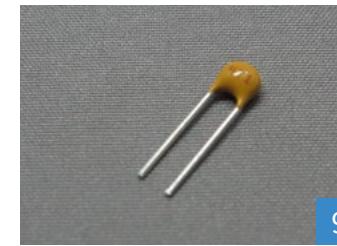
**LipSync Circuit Board Pack:**  
(1) Main Interface Board  
(1) Pressure Sensor Board  
(1) Joystick Board  
[Mouse ver.](#)   [Macro ver.](#)  
[Wireless ver.](#)   [Gaming ver.](#)  
NOTE: Same files for all versions.

1



(4) 10k Ohm Mini Axis Through Hole Resistors  
[Digikey.ca](#)  
[Digikey.com](#)  
\*or from any electronics shop

5



(1) 470pF Ceramic Through Hole Radial Capacitor [capacitor label: 471]  
[Digikey.ca](#)  
[Digikey.com](#)  
\*or from any electronics shop

9



(1) Arduino Micro/ Genuino Micro microcontroller  
[Arduino](#)   [Digikey](#)  
[Robotshop](#)   [Pololu](#)

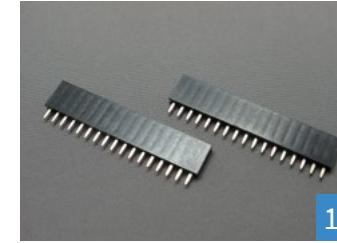
2

**COMPATIBILITY NOTE:** The "Arduino Micro" or "Genuino Micro" **MUST** be used.



(1) NXP Pressure Sensor [component label: MPXV7002DP]  
[Digikey.ca](#)  
[Digikey.com](#)

6



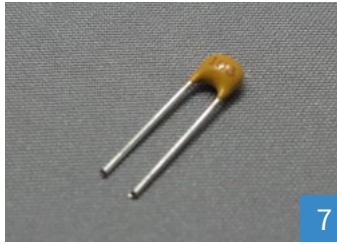
(2) 17-Position Straight Female Through Hole Headers  
[Digikey.ca](#)  
[Digikey.com](#)

10



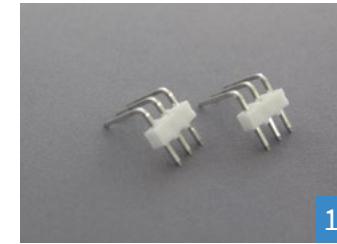
(2) Right Angle Push Buttons  
[Digikey.ca](#)  
[Digikey.com](#)

3



(1) 0.01uF Ceramic Capacitor [capacitor label: 103]  
[Digikey.ca](#)  
[Digikey.com](#)  
\*or from any electronics shop

7



(2) 3-Position Right Angle Male Header  
[Digikey.ca](#)  
[Digikey.com](#)  
\*or from any electronics shop

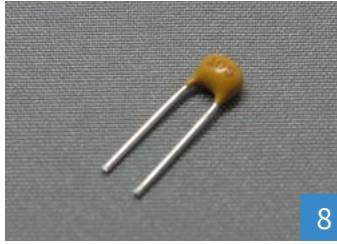
11



(2) 300 Ohm 1/4W Through Hole Resistors  
[Digikey.ca](#)  
[Digikey.com](#)

\*or from any electronics shop

4



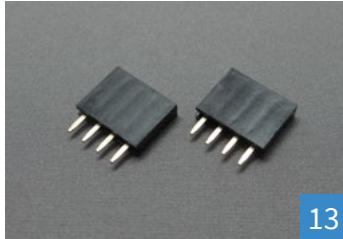
(1) 1.0uF Ceramic Capacitor [capacitor label: 105]  
[Digikey.ca](#)  
[Digikey.com](#)  
\*or from any electronics shop

8



(2) 3-Position Straight Female Header  
[Digikey.ca](#)  
[Digikey.com](#)  
**\*ONLY from the above source**

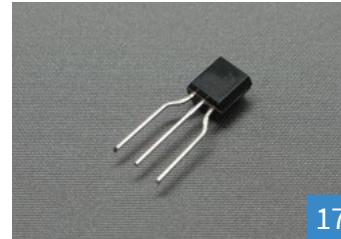
12



(2) 4-Position Straight Female Header  
[Digikey.ca](#)  
[Digikey.com](#)

\*or from any electronics shop

13



(1) 2N3906 PNP-Type T/H Transistor  
[Digikey.ca](#)  
[Digikey.com](#)

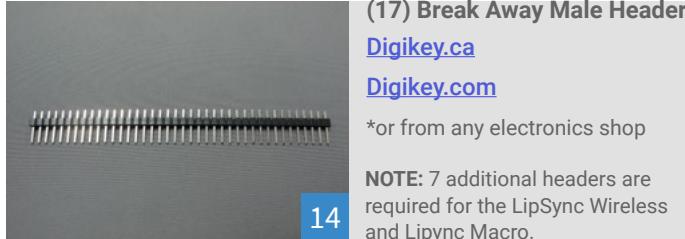
\*or from any electronics shop

17



(1) Joystick Rocker  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

21

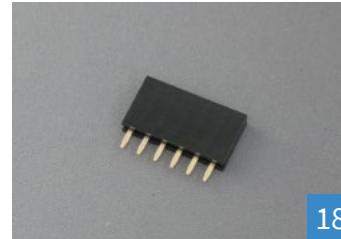


(17) Break Away Male Headers  
[Digikey.ca](#)  
[Digikey.com](#)

\*or from any electronics shop

NOTE: 7 additional headers are required for the LipSync Wireless and Lipync Macro.

14



(1) 6-Position Straight Female T/H Headers  
[Digikey.ca](#)  
[Digikey.com](#)

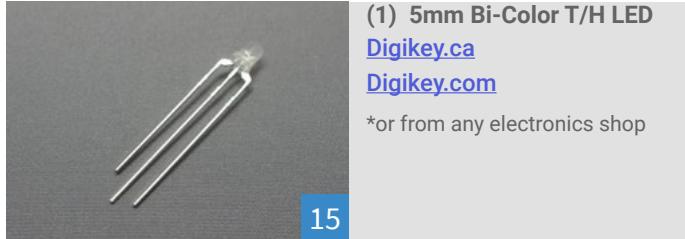
\*or from any electronics shop

18



(1) Joystick Top Plate  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

22



(1) 5mm Bi-Color T/H LED  
[Digikey.ca](#)  
[Digikey.com](#)

\*or from any electronics shop

15



(1) Front Housing  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

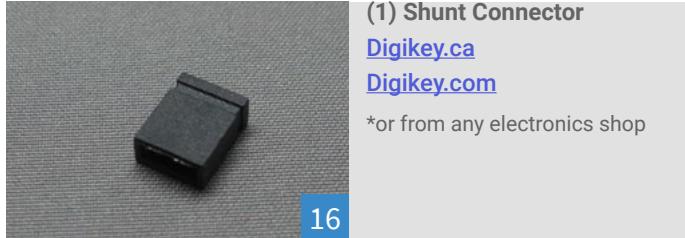
NOTE: Same file for all versions. 3D printed files and print settings can be found in "Housing\_design.zip"

19



(1) Rear Housing  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

23



(1) Shunt Connector  
[Digikey.ca](#)  
[Digikey.com](#)

\*or from any electronics shop

16



(1) Joystick Base Plate  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

NOTE: Same file for all versions. 3D printed files and print settings can be found in "Housing\_design.zip"

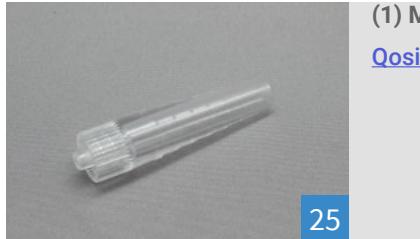
20



(2) Buttons  
[Mouse ver.](#) [Macro ver.](#)  
[Wireless ver.](#) [Gaming ver.](#)

24

NOTE: Same file for all versions. 3D printed files and print settings can be found in "Housing\_design.zip"



(1) Mouthpiece  
[Qosina](#)

25



(4) Screws Phillips Head M3  
[Digikey.ca](#)  
[Digikey.com](#)

29



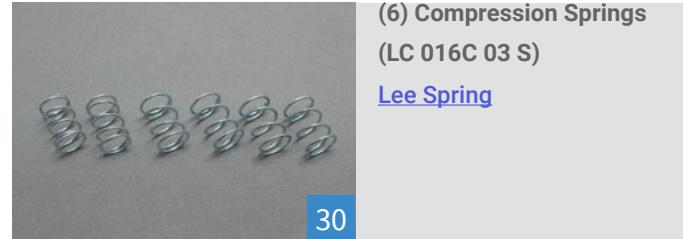
(1) Luer Lock Nut  
[Cole-Parmer](#)

33



(1) Filter  
[Qosina](#)

26



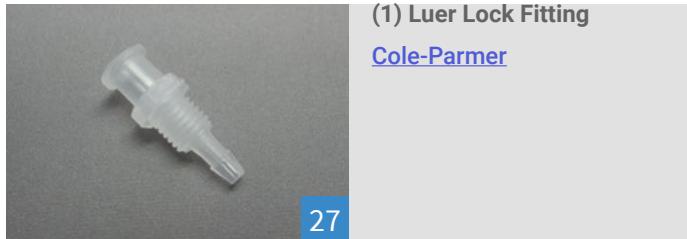
(6) Compression Springs  
(LC 016C 03 S)  
[Lee Spring](#)

30



(4) Bumpers  
[Mouser \(CA\)](#)  
[Mouser \(US\)](#)

34



(1) Luer Lock Fitting  
[Cole-Parmer](#)

27



(2) Standoffs M3 10mm  
[Digikey.ca](#)  
[Digikey.com](#)

31



(4) Nuts M3  
[Digikey.ca](#)  
[Digikey.com](#)

35



(4) Force Resistive Sensor  
[Digikey.ca](#)  
[Digikey.com](#)

28



32

(2) Standoffs M3 15mm  
[Digikey.ca](#)  
[Digikey.com](#)



(1) Tubing 3/32" ID x 45mm  
[US Plastic](#)

36



(2) Light pipe  
[Mouser](#)

37



(1) USB Adapter  
[Amazon.ca](#)  
[Amazon.com](#)

41



(OPTIONAL) (1) 1-Position  
Straight Female T/H Header  
[Digikey.ca](#)  
[Digikey.com](#)

45

\*REQUIRED for the LipSync Wireless and LipSync Macro.



(1) Threaded Insert 5/8"-27  
[Adorama](#)

38



(1) Cable Tie  
[Mouser \(CA\)](#)  
[Mouser \(US\)](#)

42

NOTE: Max cable width of 0.2mm  
is recommended.



(1) Threaded Adapter 5/8"-27  
[Amazon.com](#)  
[Camvate](#)

39



(OPTIONAL) (1) Magic Arm  
11" and Clamp  
[Amazon.com](#)

43



(1) USB Cable  
[Amazon.ca](#)  
[Amazon.com](#)

40



(OPTIONAL) (1) SparkFun  
Bluetooth Module  
[Digikey.ca](#)  
[Digikey.com](#)

44

\*REQUIRED for the LipSync Wireless and LipSync Macro.

# Part 0c

## EQUIPMENT CHECKLIST

- Small spool of 60Pb/40Tn solder wire
- Temperature adjustable soldering iron set at 350°C
- Needle nose pliers
- Fine file or sandpaper (150-220 grit)
- Baby powder
- Super glue
- Desolder pump
- Adjustable tabletop vise
- Safety glasses
- Small fan or fume extractor
- Hobby knife
- Flush cutters
- Tweezers
- ABS, high strength PLA, or PETG filament 100g



= Solder the part outlined in the white outline



= Component number



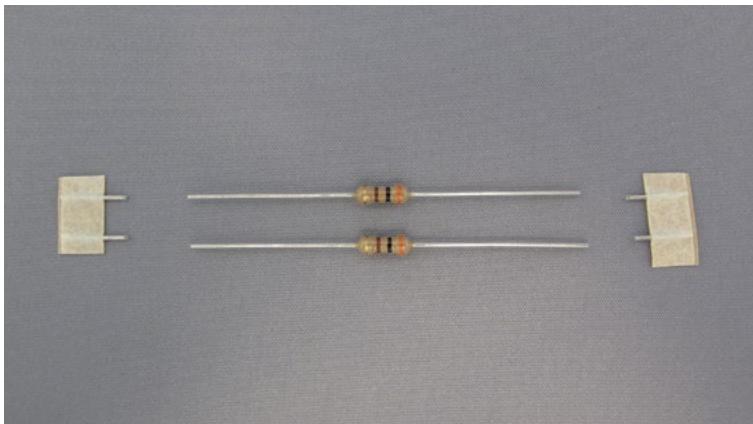
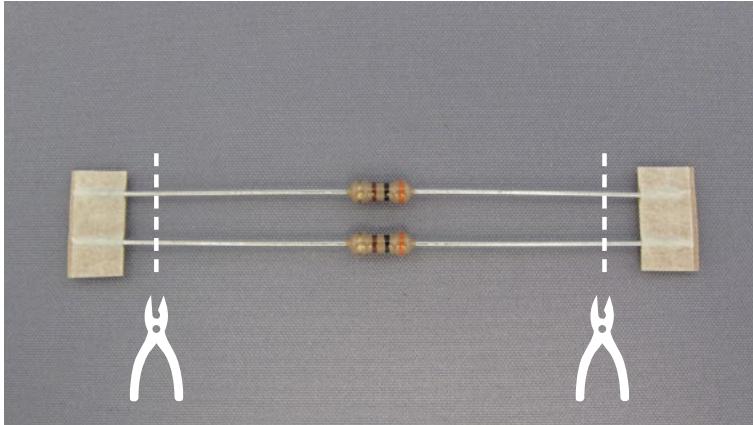
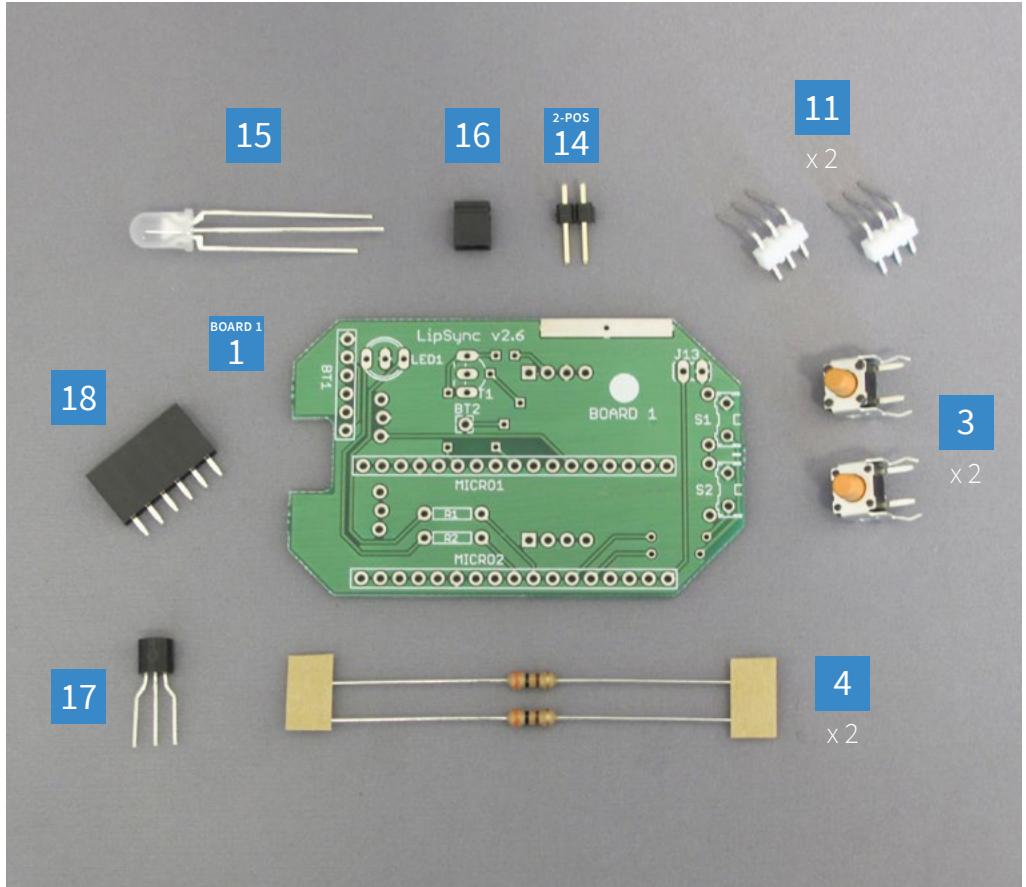
= Name of plated through-hole



### CAUTION

- Safety glasses should be worn at all times during the assembly.
- Be aware of electrostatic discharge when soldering
- Be aware that too much heat can damage component

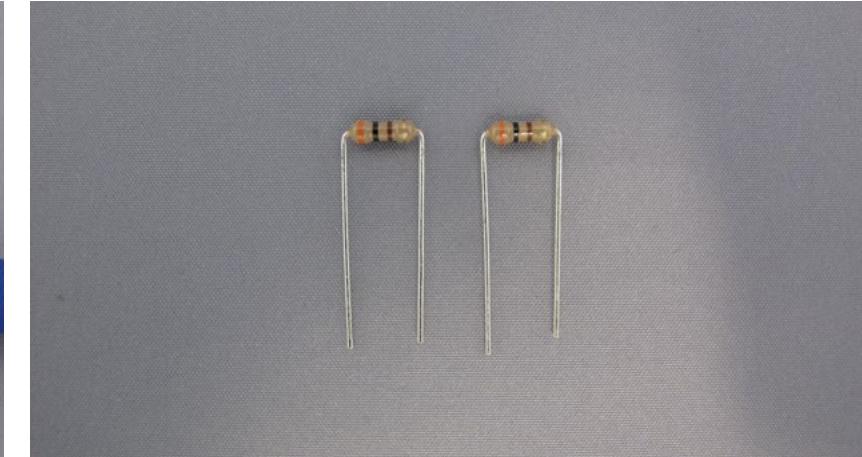
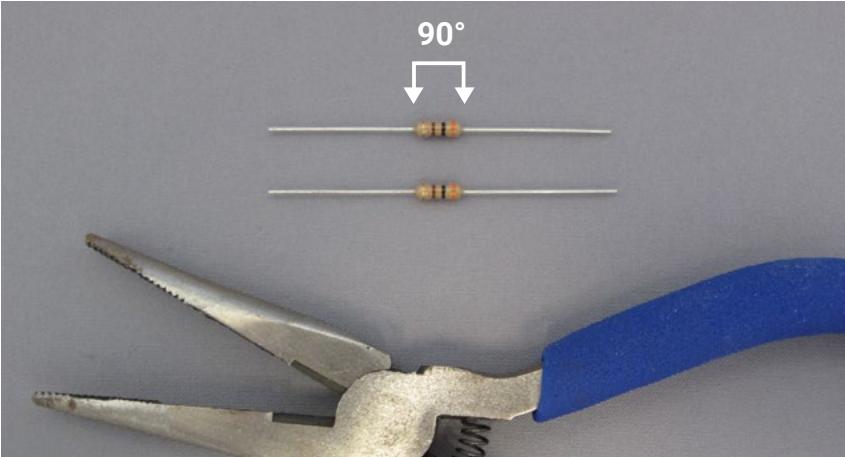
# Part 1



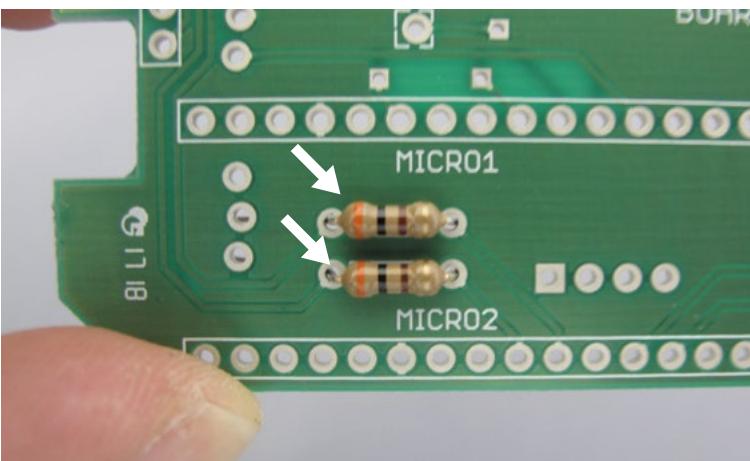
01.

4  
x 2

**02.**

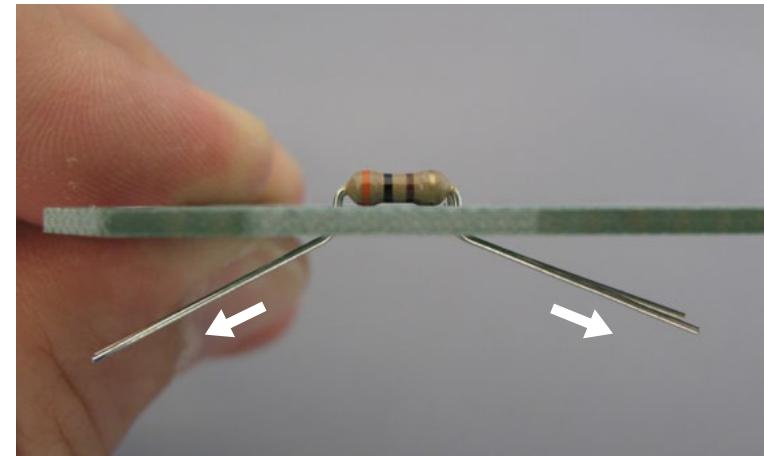


**03.**

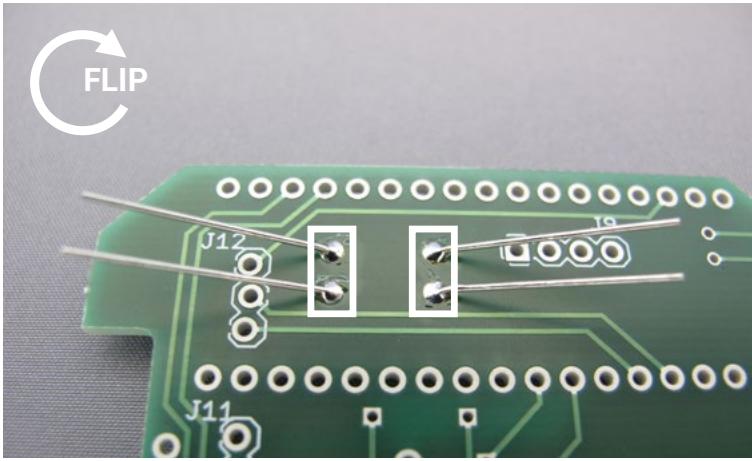


BOARD 1	1
HOLE	R1
HOLE	R2

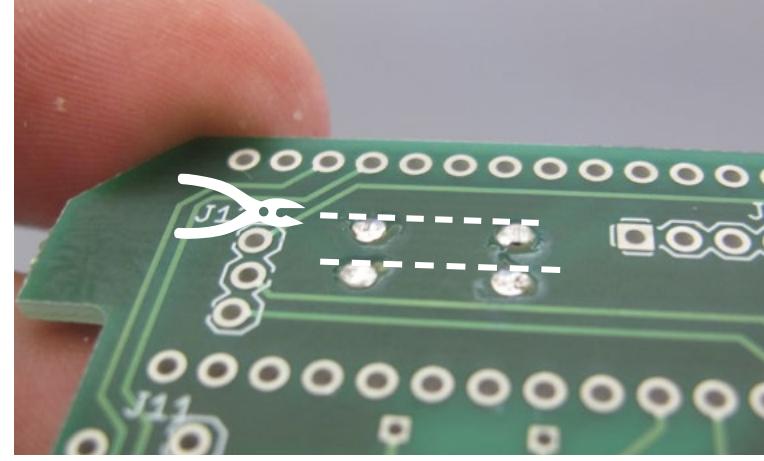
**04.**



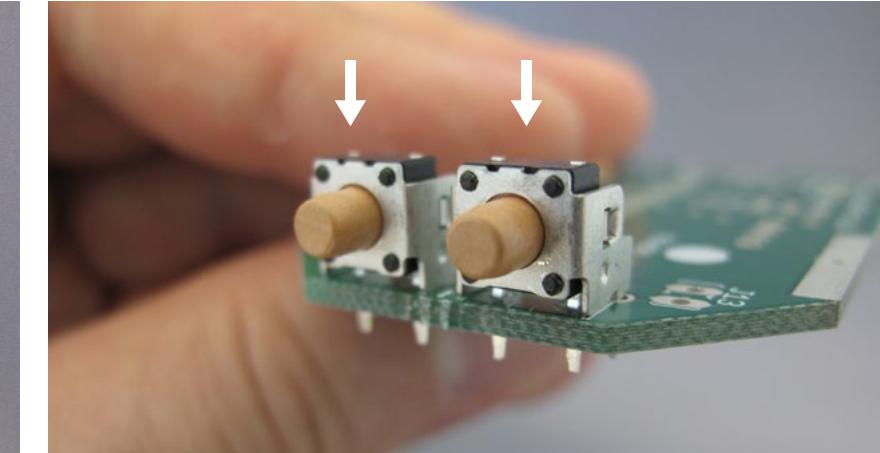
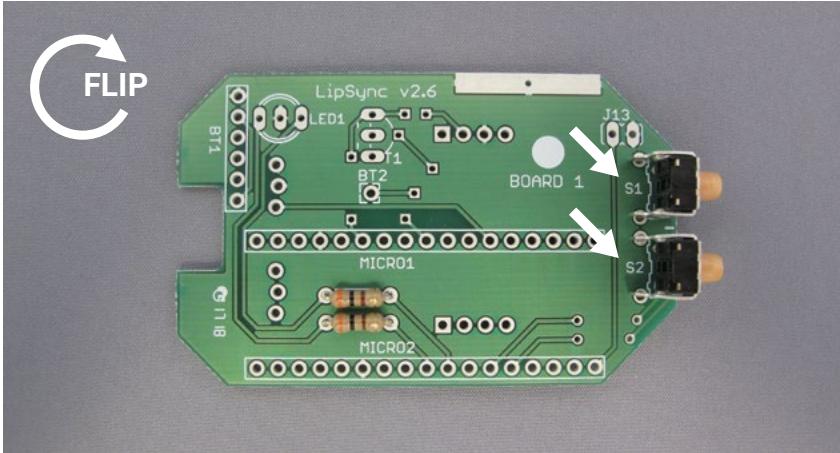
05.



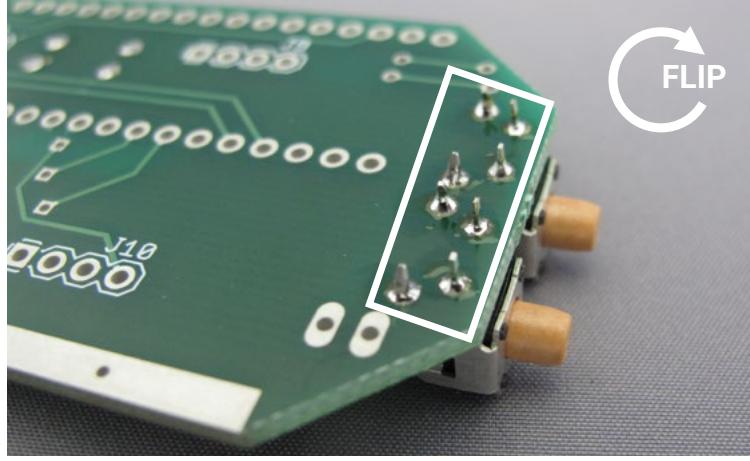
06.



07.

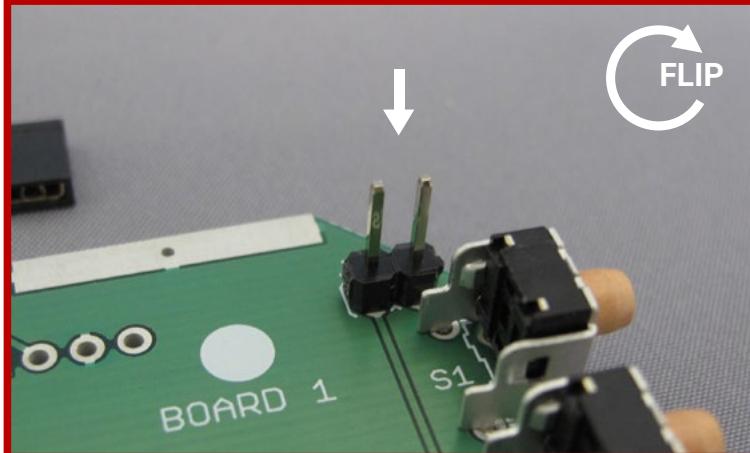


# 08.



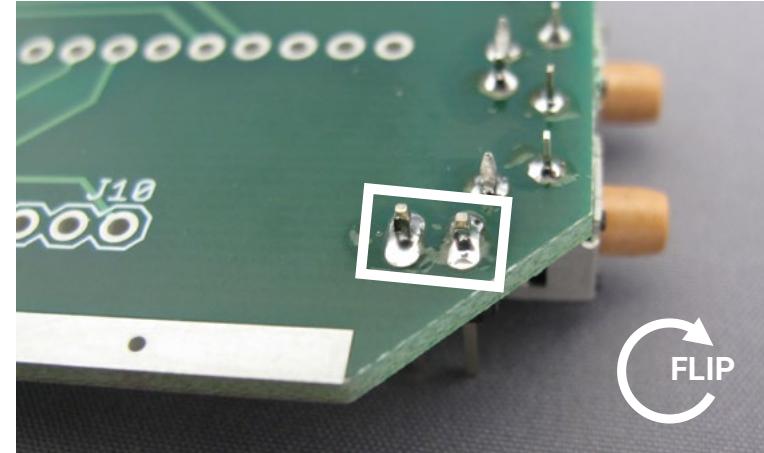
14

# 10.

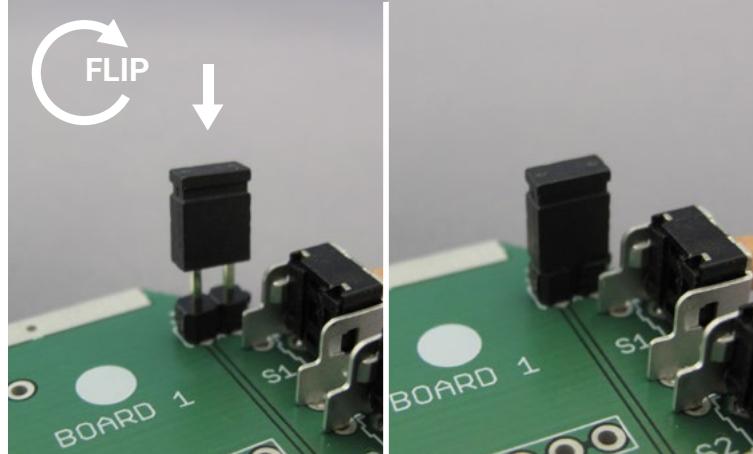


x 2

# 11.

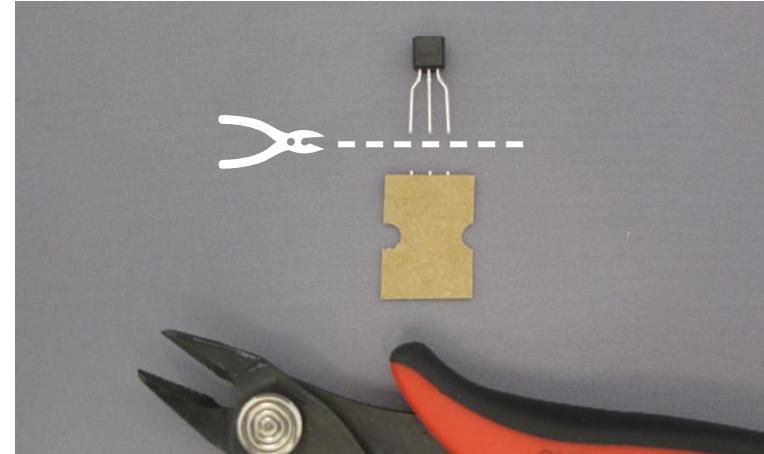


12.



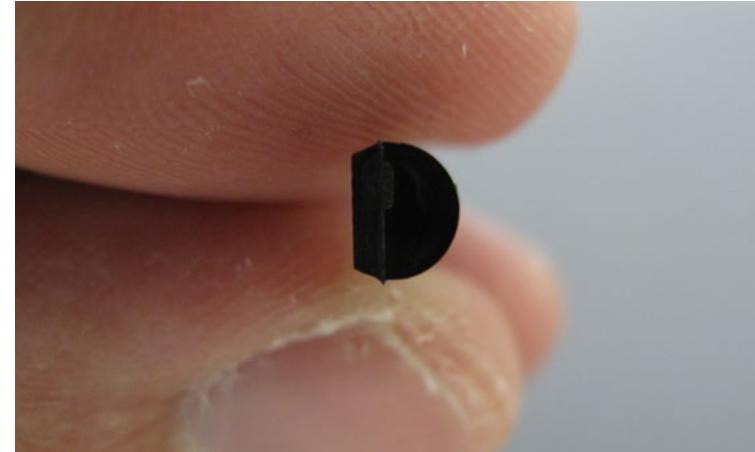
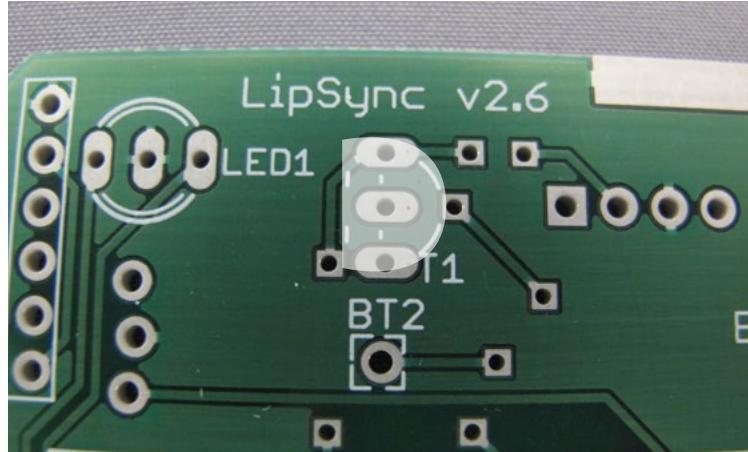
16

13.



17

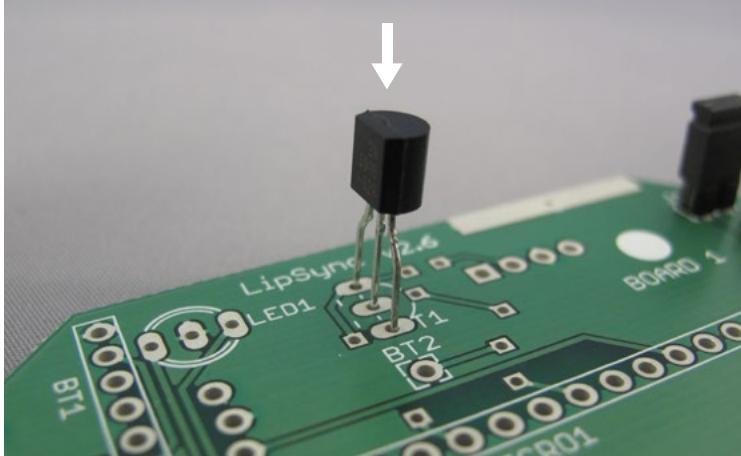
14.



HOLE  
T1

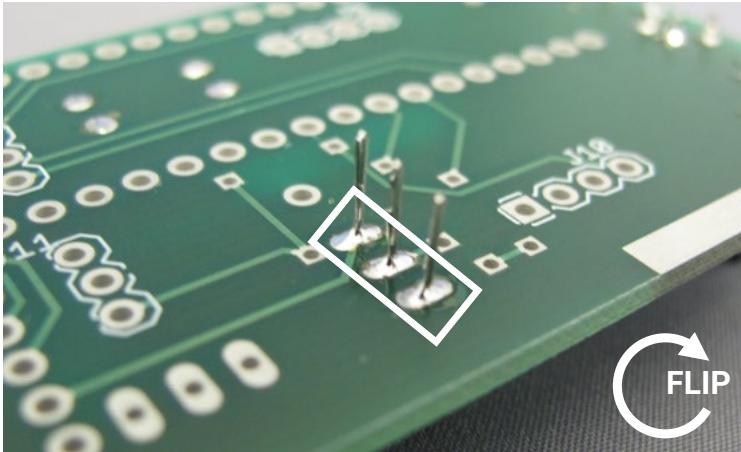
**NOTE:** The silkscreen outline for hole T1 on Board 1 matches the orientation of which the transistor is inserted.

**15.**



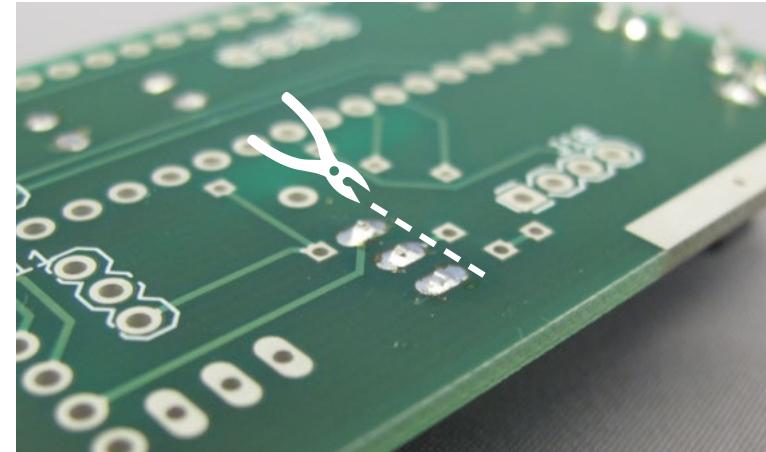
**NOTE:** After inserting the transistor, there will be a gap between the transistor and Board 1

**16.**

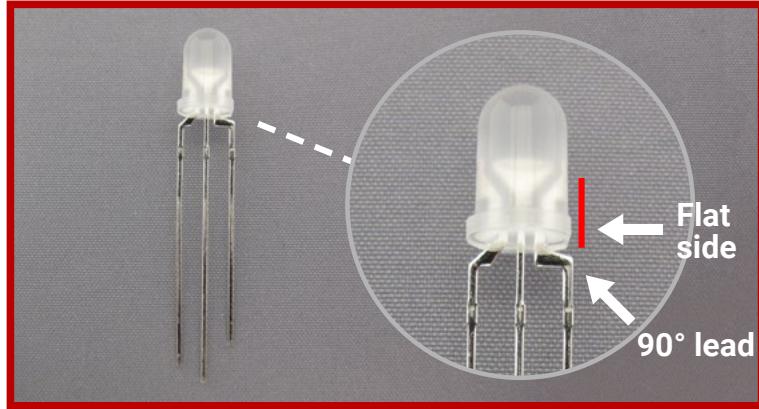


x 3

**17.**



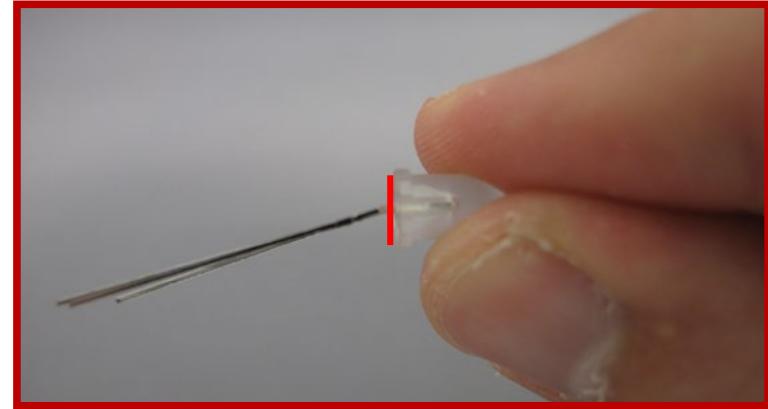
# 18.



**IMPORTANT:** The flat side of the LED head and the 90° lead should be on the **RIGHT** when installed.

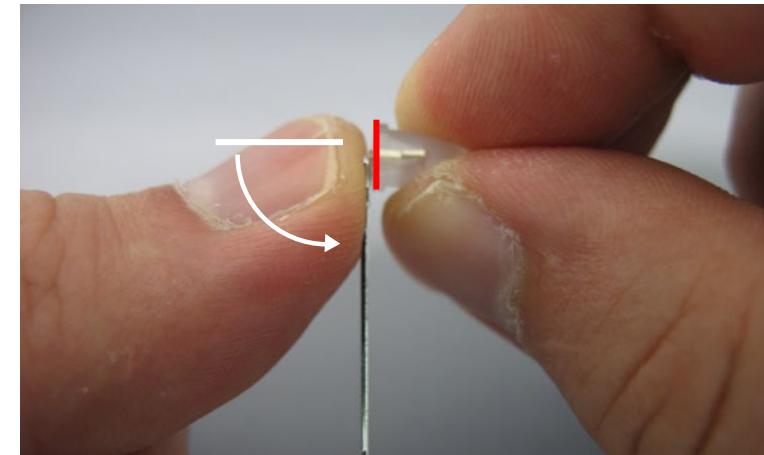
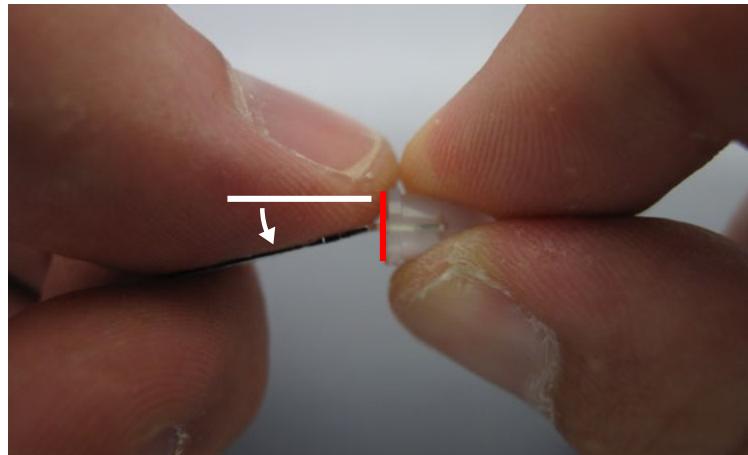
15

# 19.



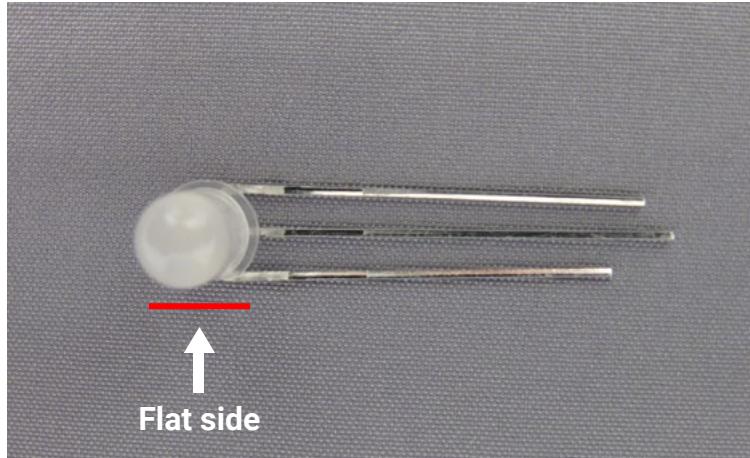
**IMPORTANT:** Hold the LED so that the flat side and the 90° lead is facing **TOWARDS** you.

# 20.



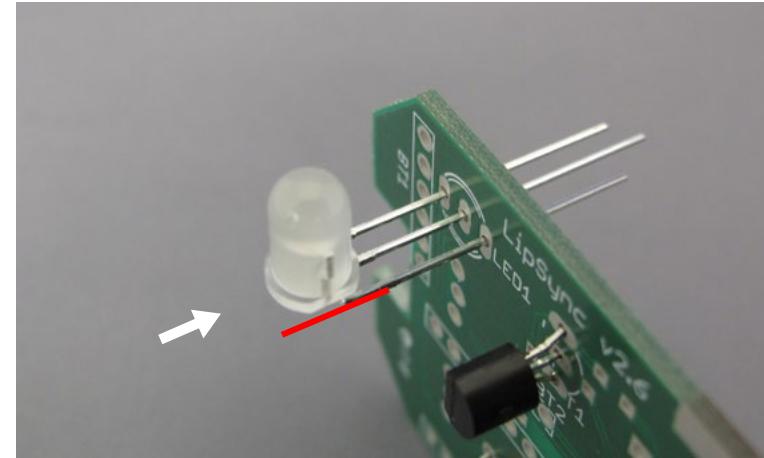
**NOTE:** Using a finger, bend the leads by 90° right at the base.

**21.**

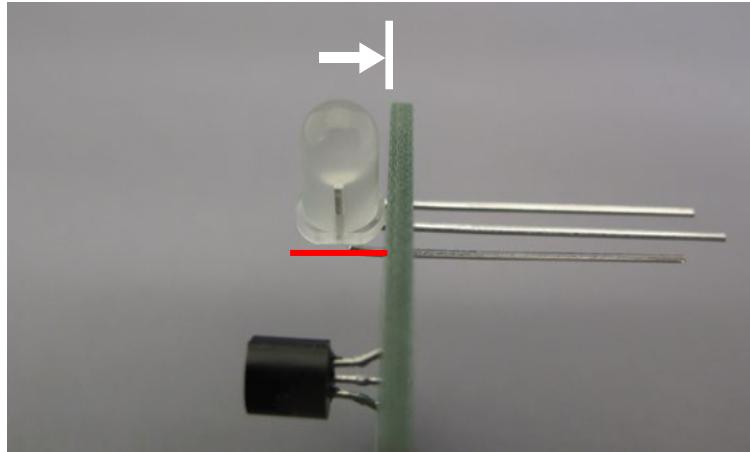


HOLE  
LED1

**22.**

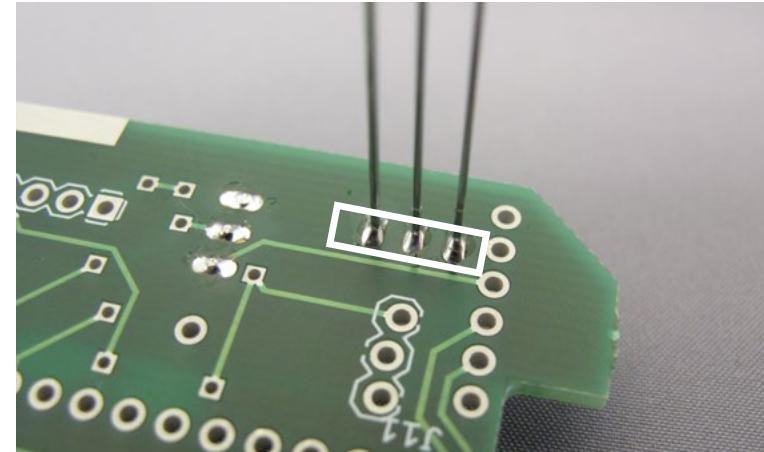


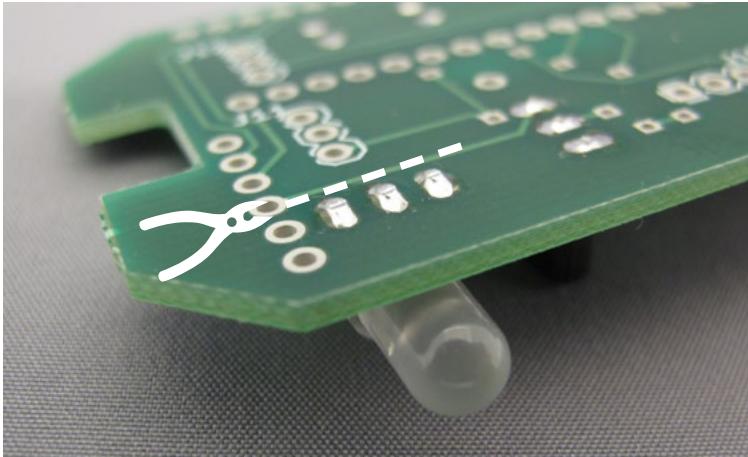
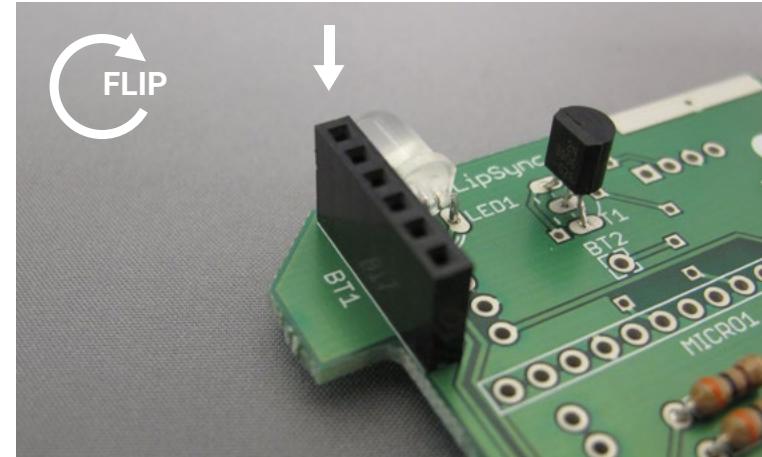
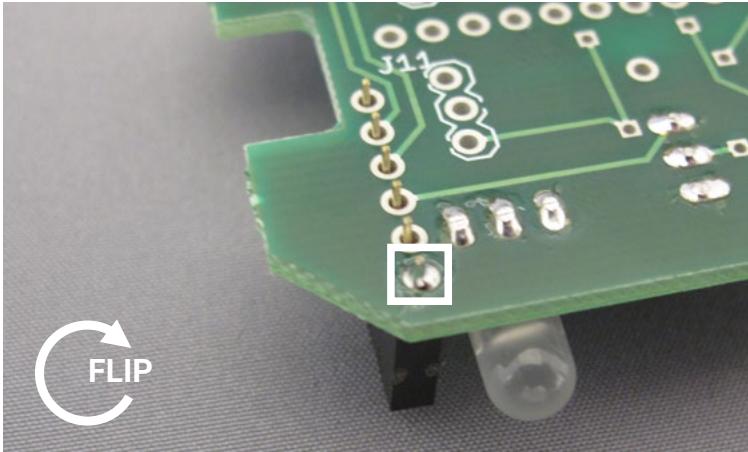
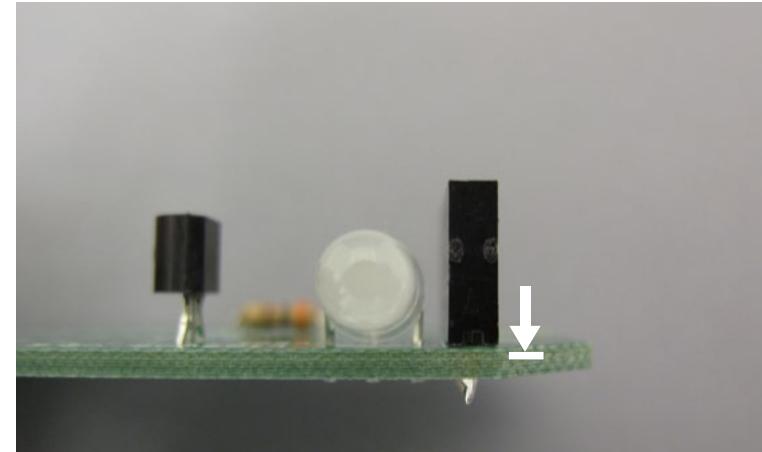
**23.**



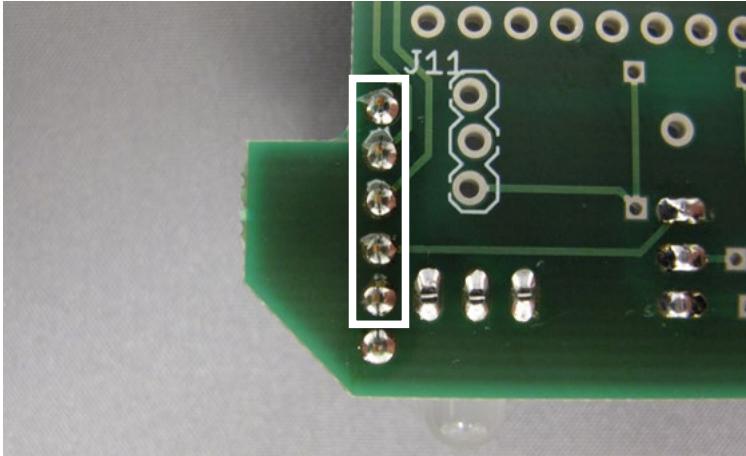
x 3

**24.**



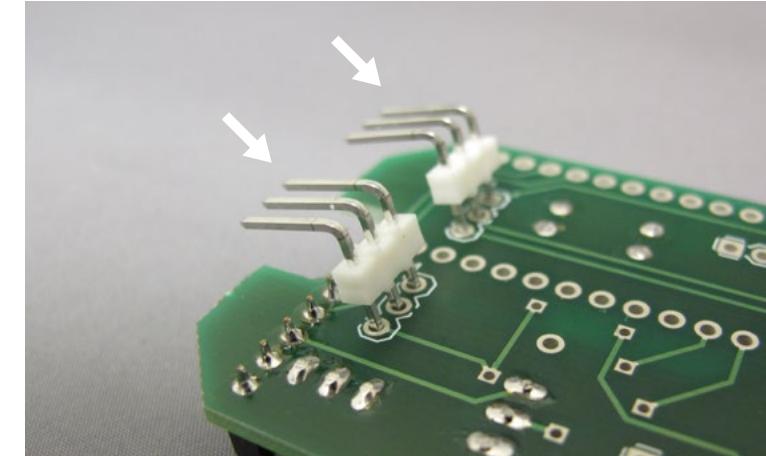
**25.****26.****27.****28.**

**29.**



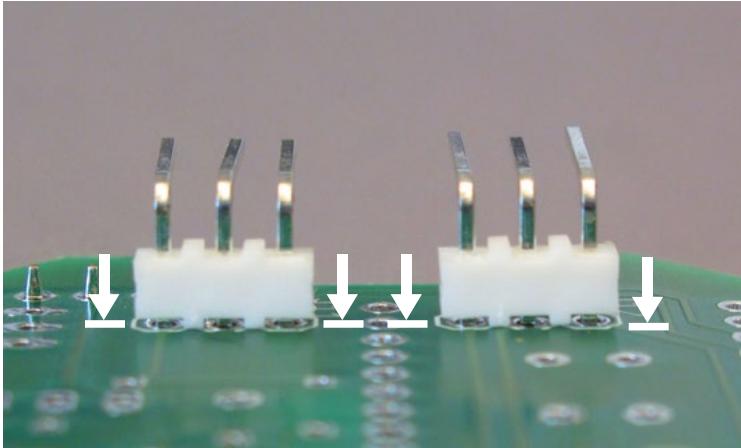
PAGE 18 OF 55

**30.**

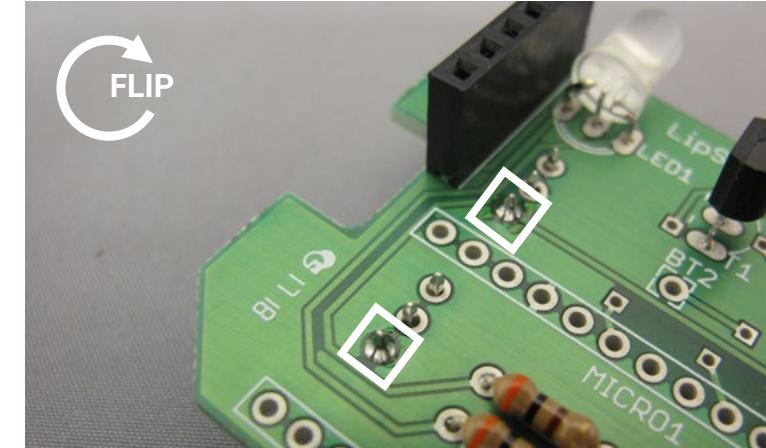


**11**  
x 2  
SECTION  
J11  
SECTION  
J12

**31.**

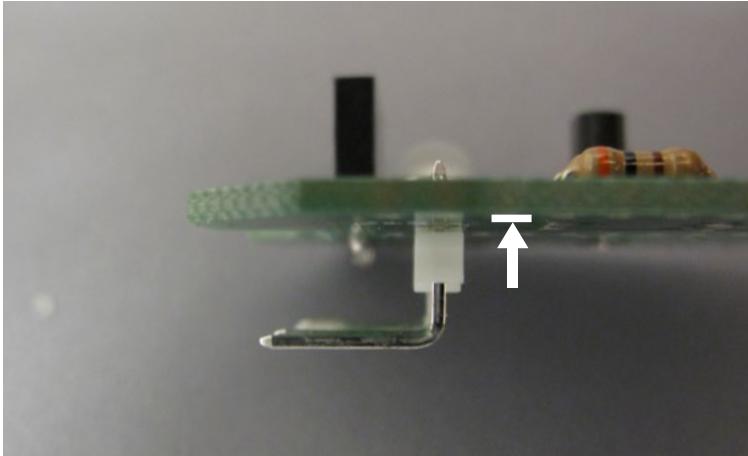


**32.**

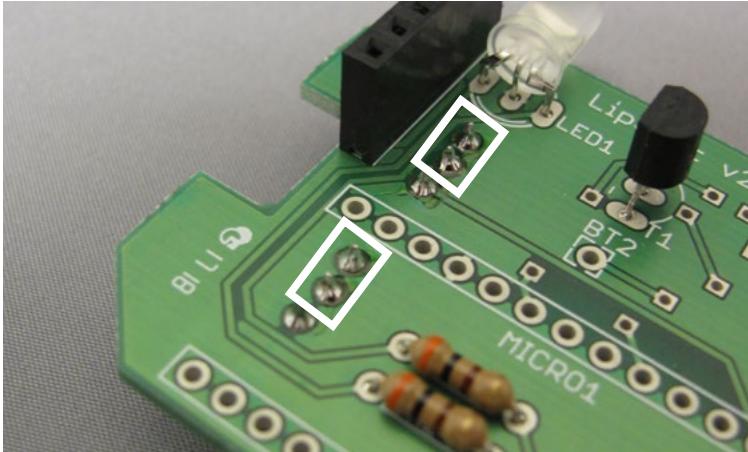


**12**  
x 1  
FLIP

**33.**



**i** NOTE: Check that component is flush to the board

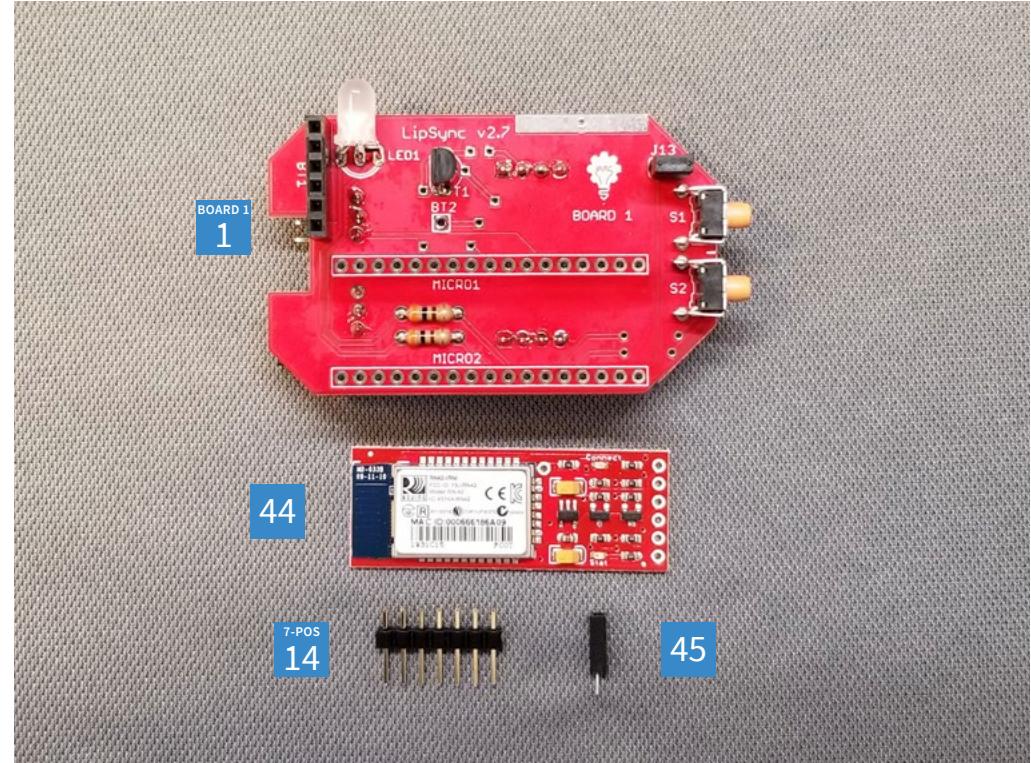


**34.**

# Part 2

## (OPTIONAL) INSTALLING THE BLUETOOTH® COMPONENT

If you are building the LipSync Wireless or the LipSync Macro, complete Part 2.  
If not, skip to Part 3.

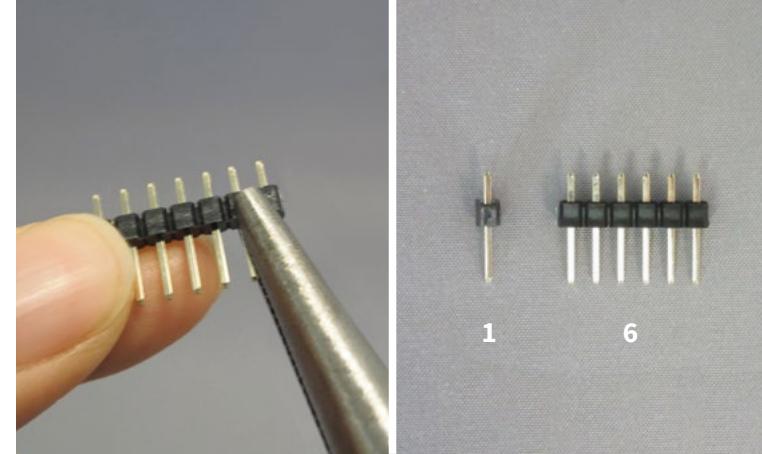


# 01.



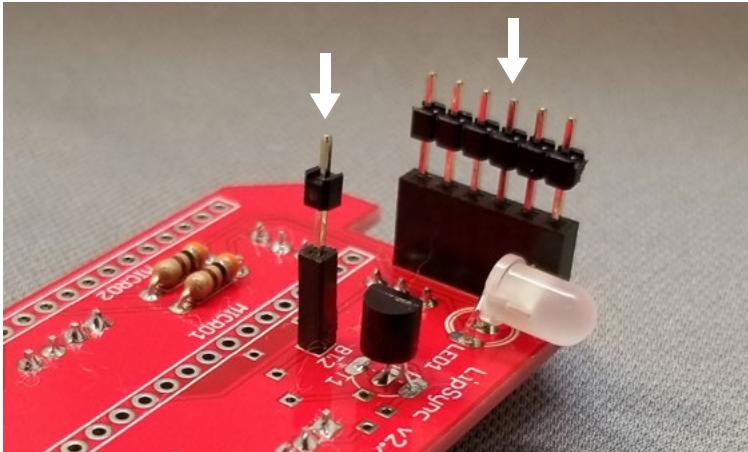
BOARD 1  
1  
45  
HOLE  
BT2

# 02.



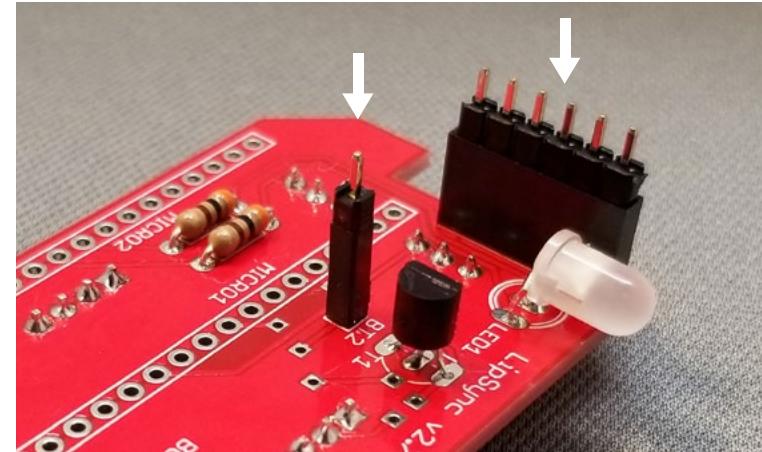
1-POS  
14  
6-POS  
14

# 03.

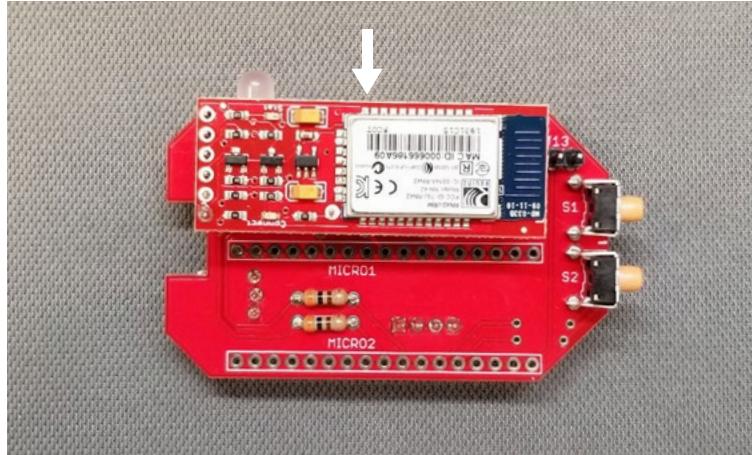


**IMPORTANT:** The LONG leads are inserted.

# 04



# 05.



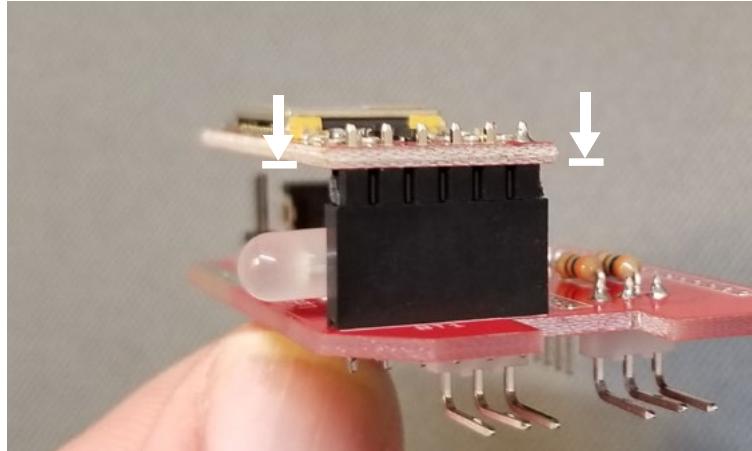
44

x 2

# 06.



# 07.



**NOTE:** Check that the Bluetooth module is flush.

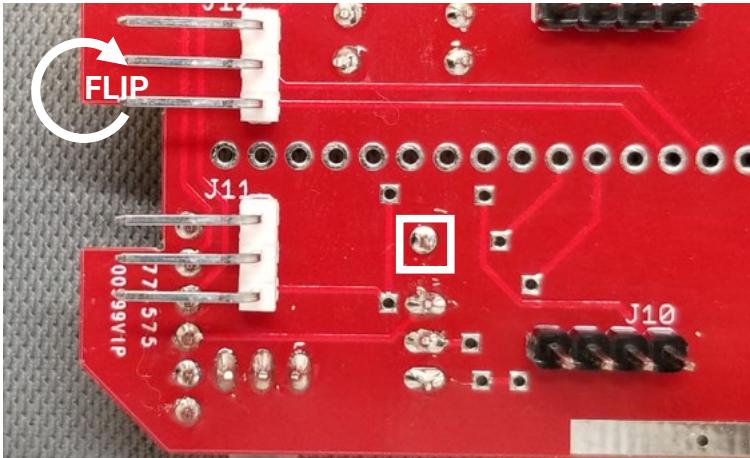
PAGE 21 OF 55

# 08.



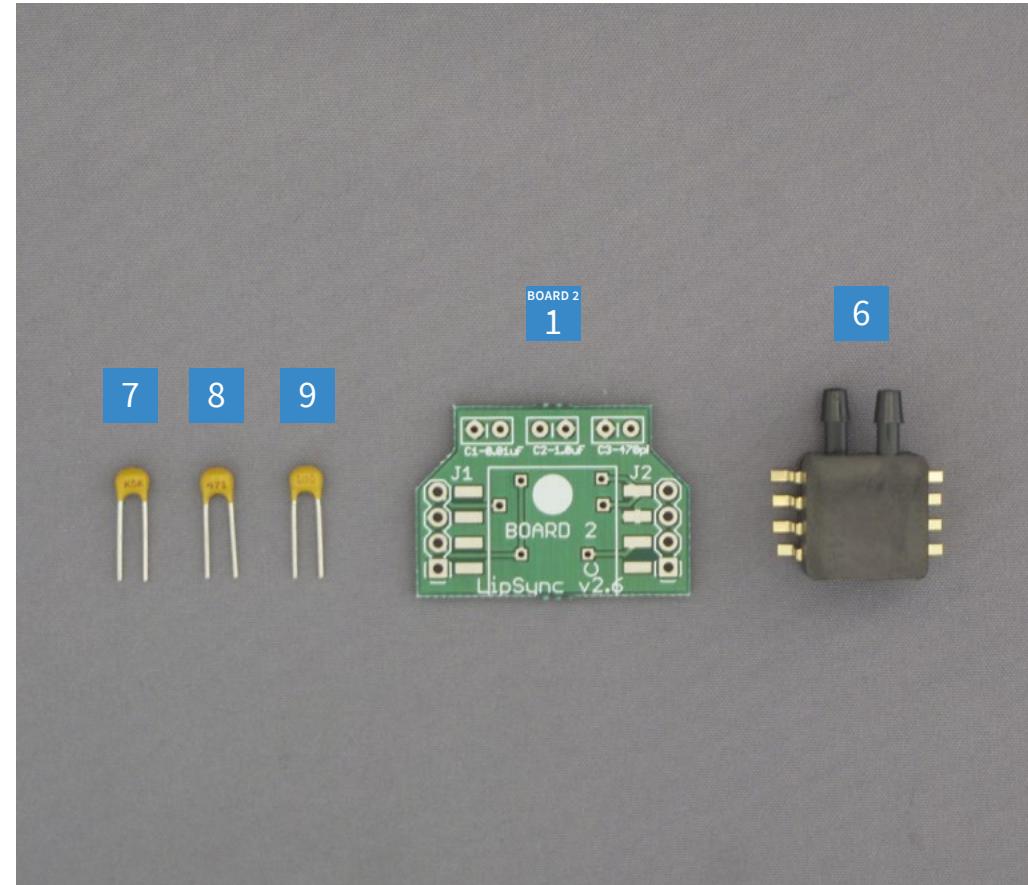
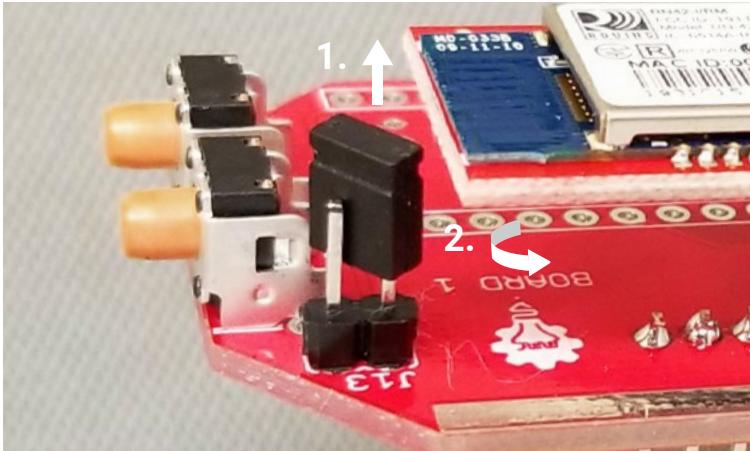
x 5

09.



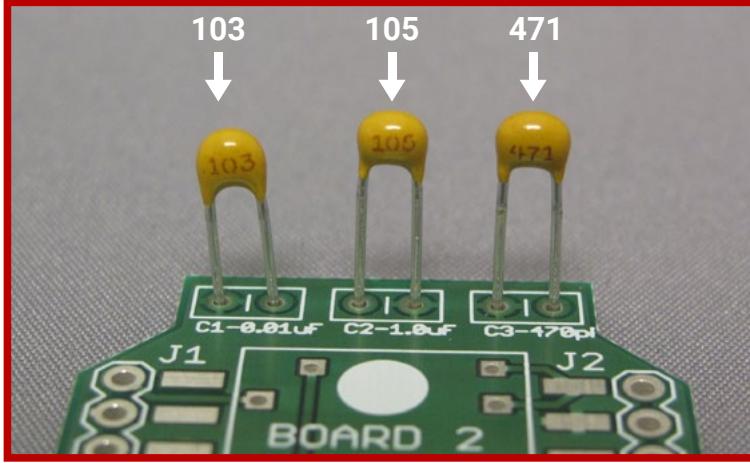
# PART 3

10.



**NOTE:** The shunt connector is taken off when using Bluetooth. PAGE 22 OF 55

# 01.

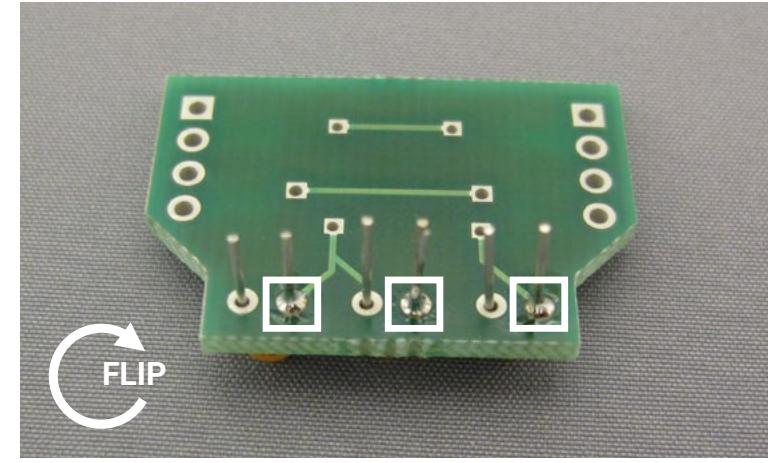


BOARD 2
1
7
8
9

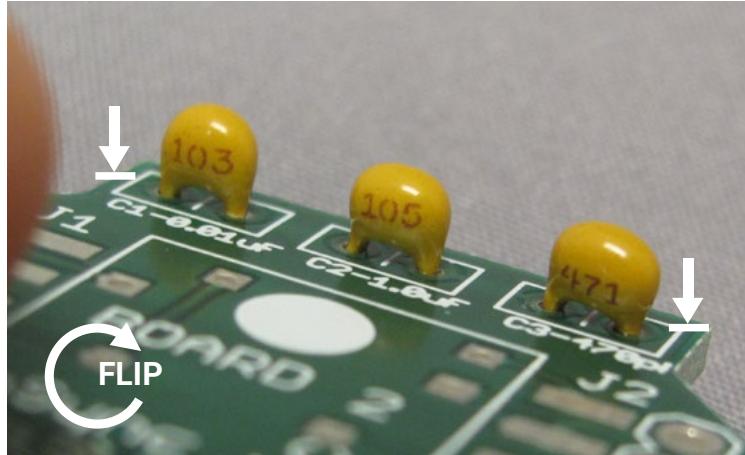
**⚠ NOTE:** The capacitors **MUST** be inserted in the order shown.



# 02.



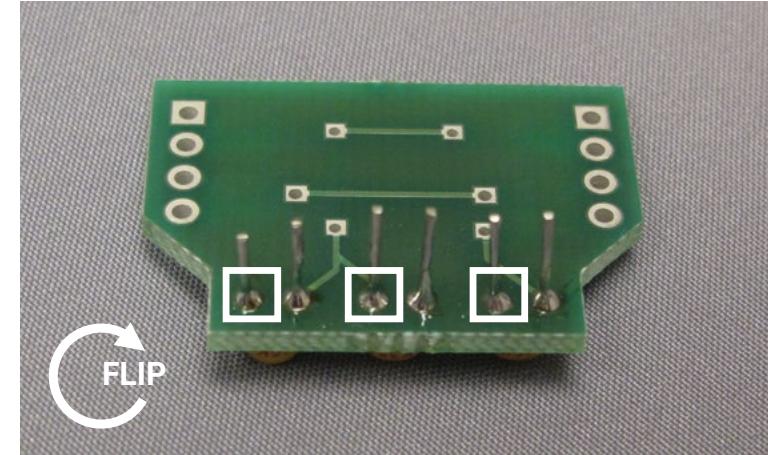
# 03.



**ℹ NOTE:** Check that component is flush to the board



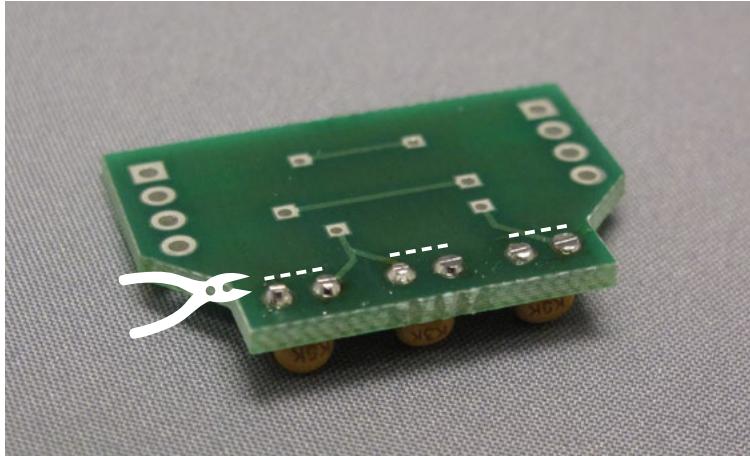
# 04.



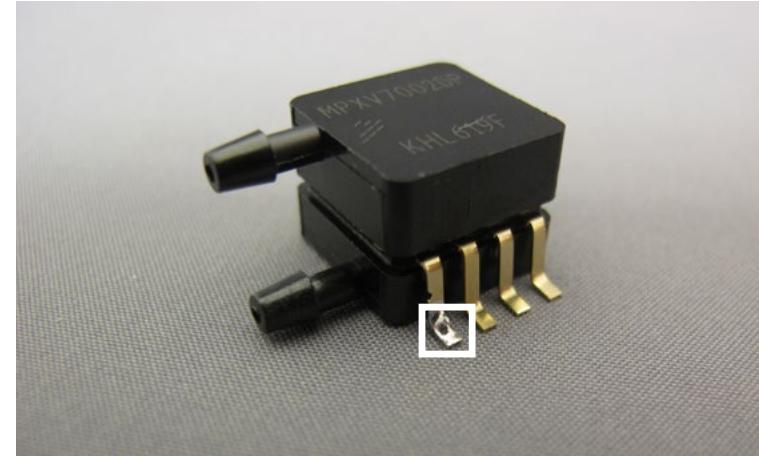


x 1

05.

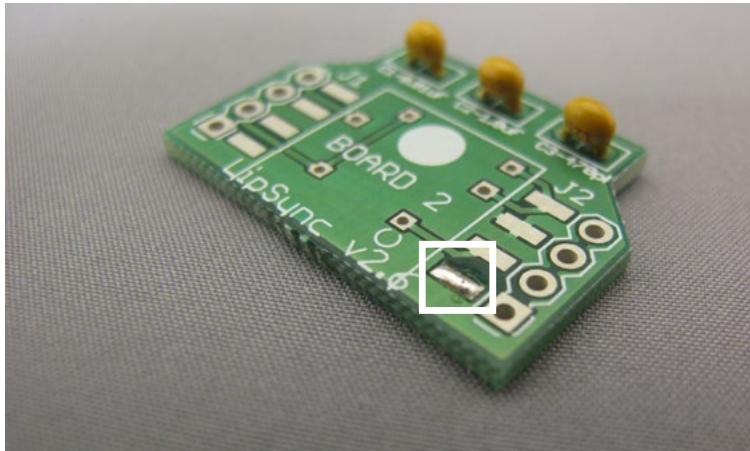


06.

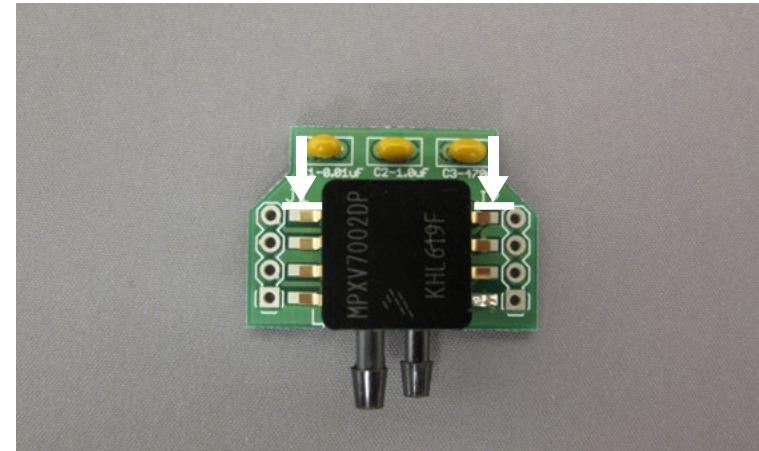


x 1

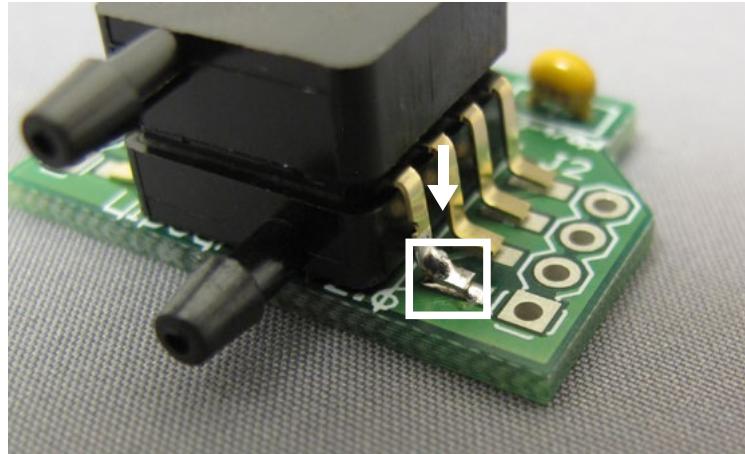
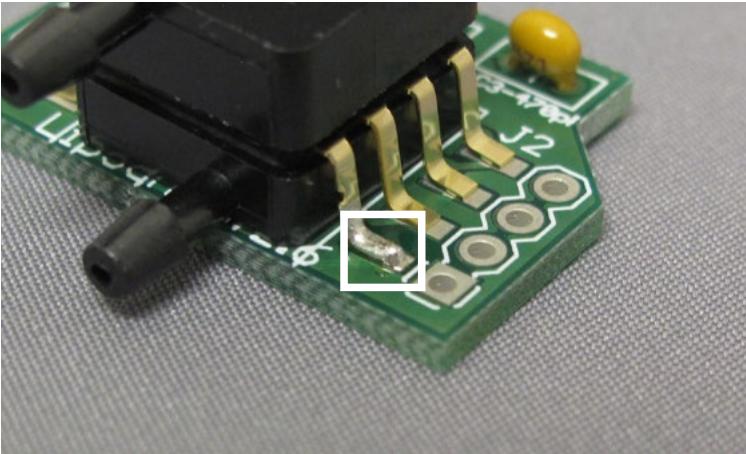
07.



08.



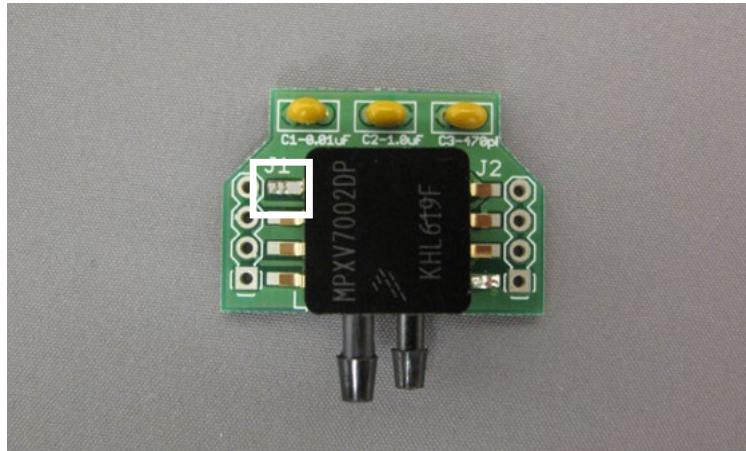
09.



**NOTE:** Place the solder tip on the lead to reflow the solder on the two components. The pressure sensor should "drop" onto Board 2.

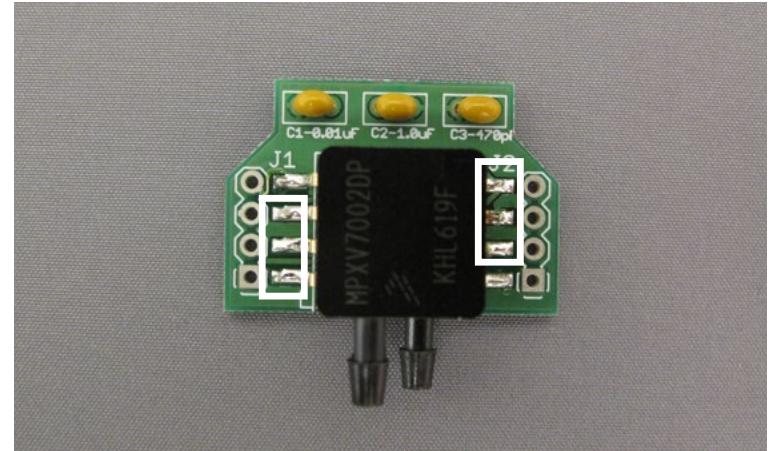
x 1

10.

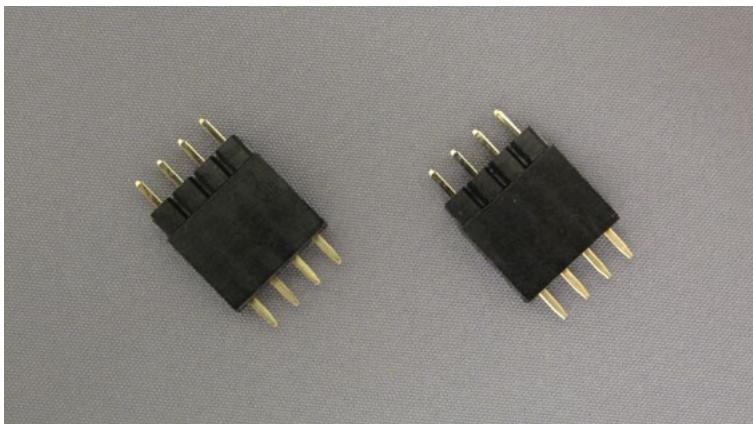
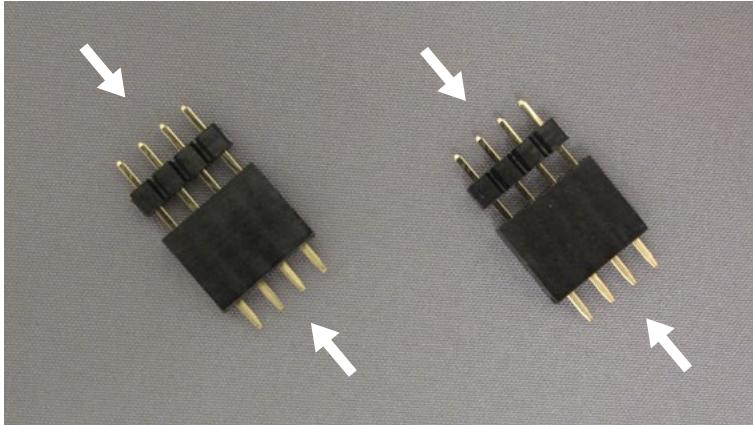
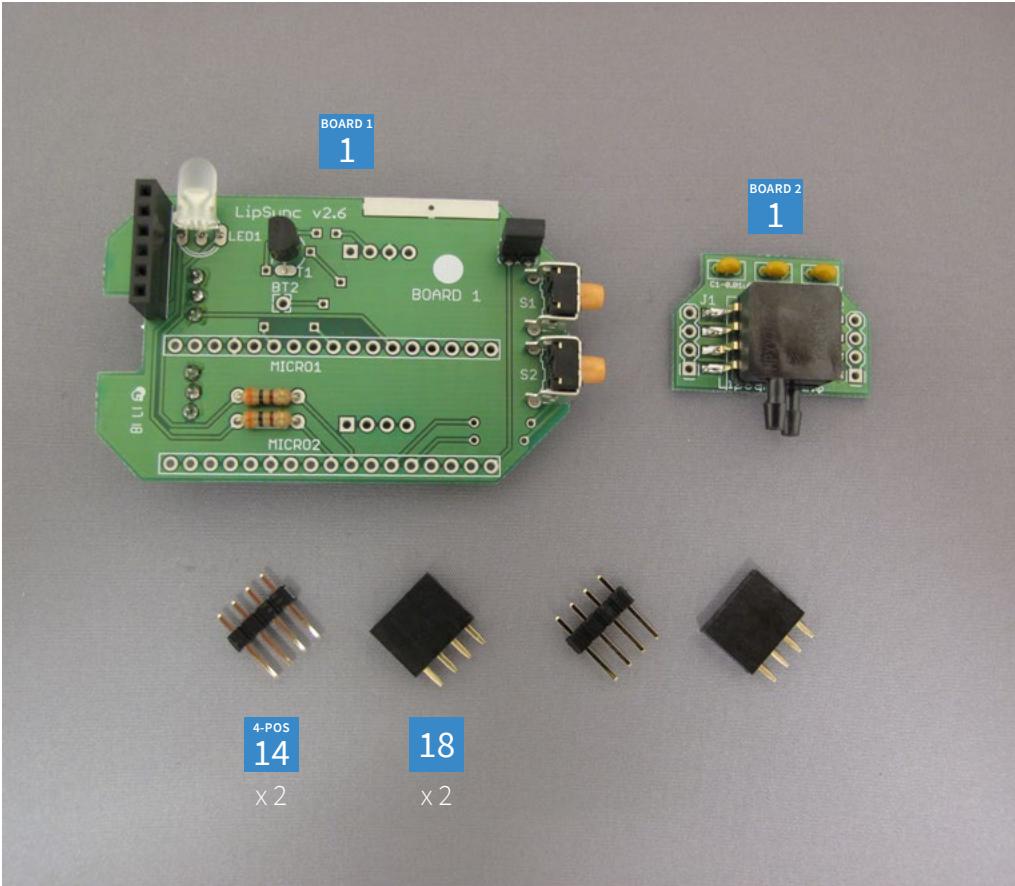


x 7

11.

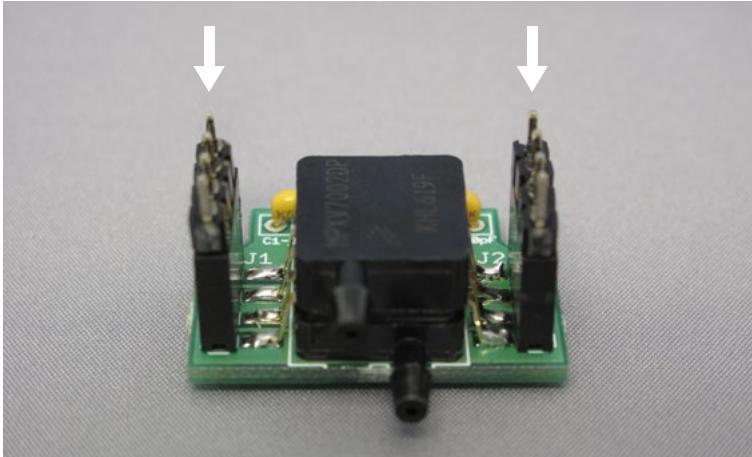


# Part 4



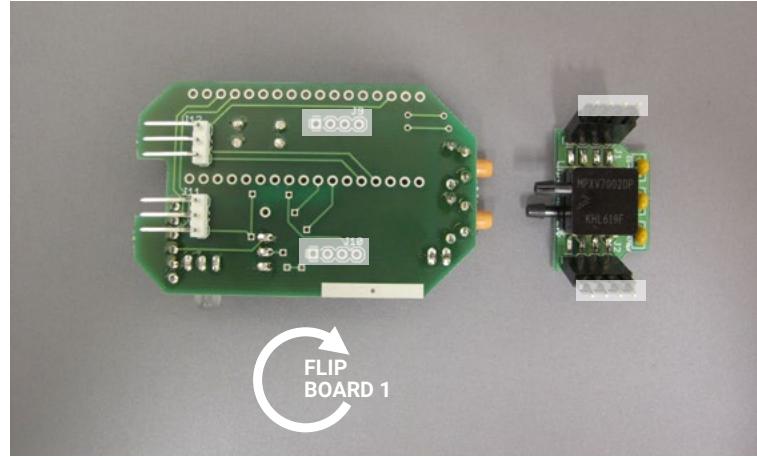
01.

# 02.



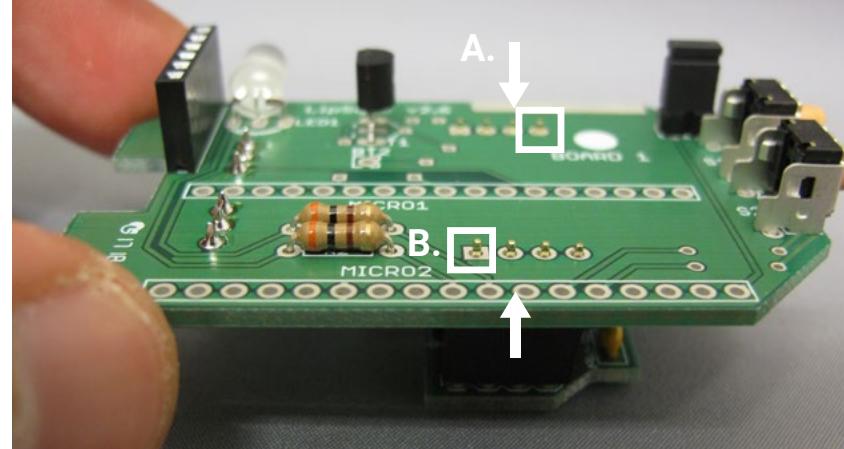
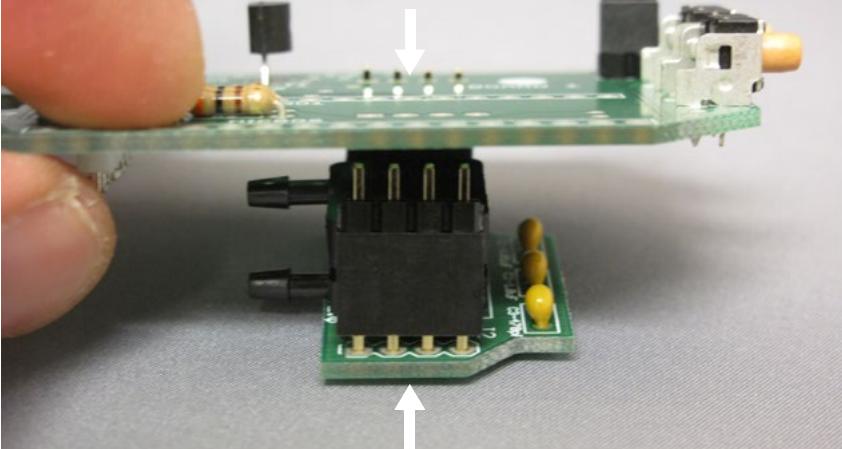
BOARD 2  
1  
HOLE  
J1  
HOLE  
J2

# 03.



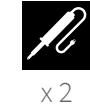
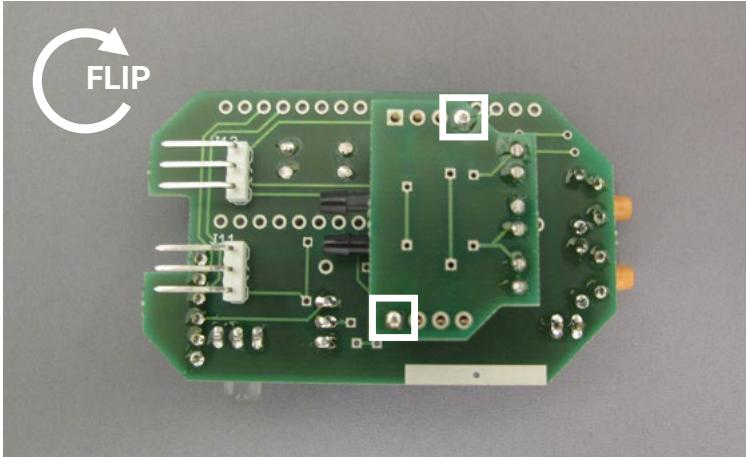
BOARD 1  
1

# 04.

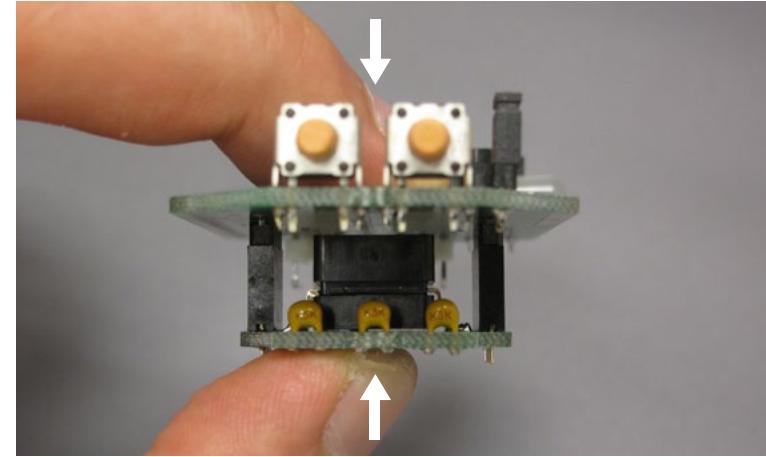


HOLE  
J9  
HOLE  
J10  
x2

**05.**

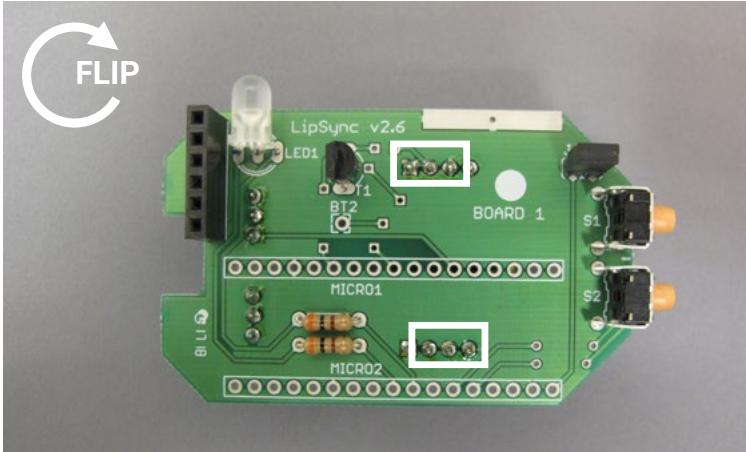


**06.**

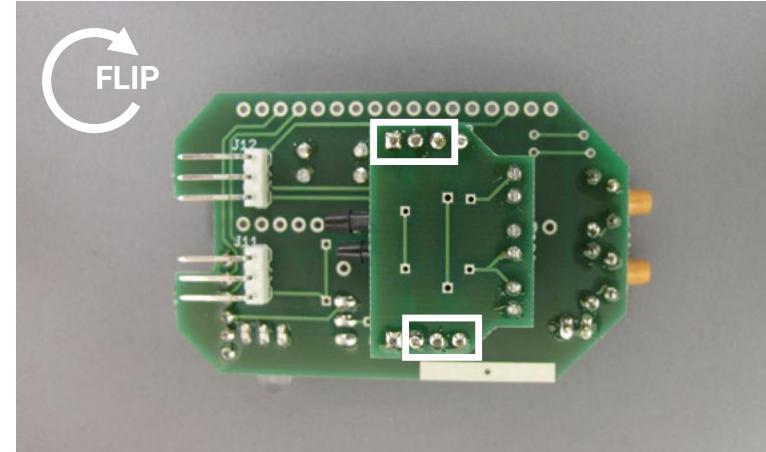


**NOTE:** Check that component is flush to the board

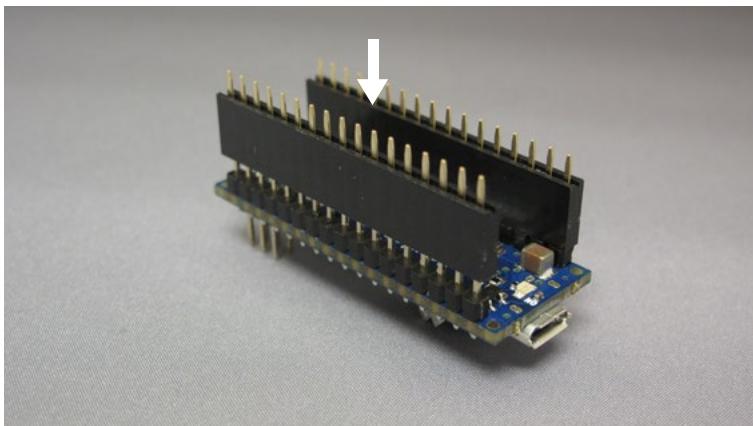
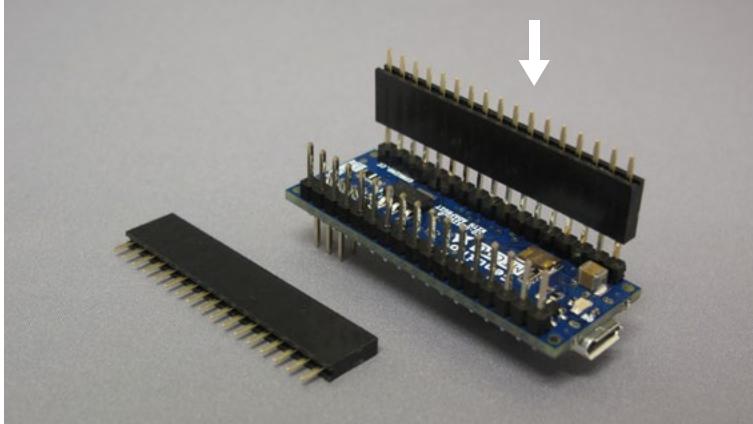
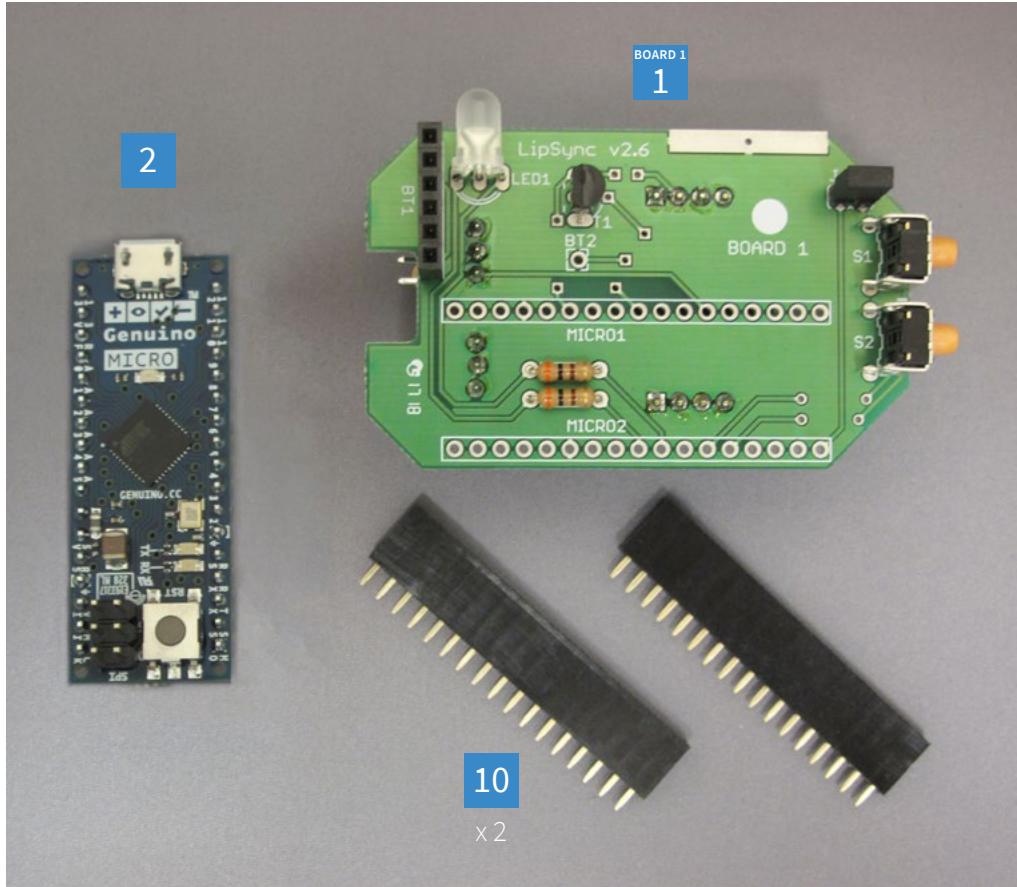
**07.**



**08.**



# Part 5



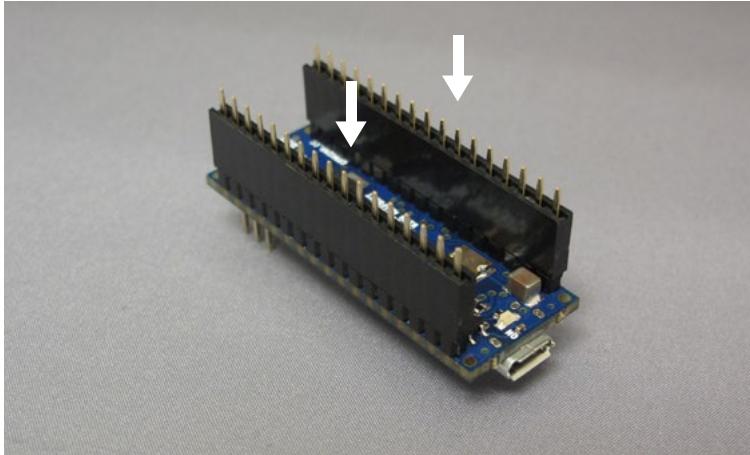
01.

2

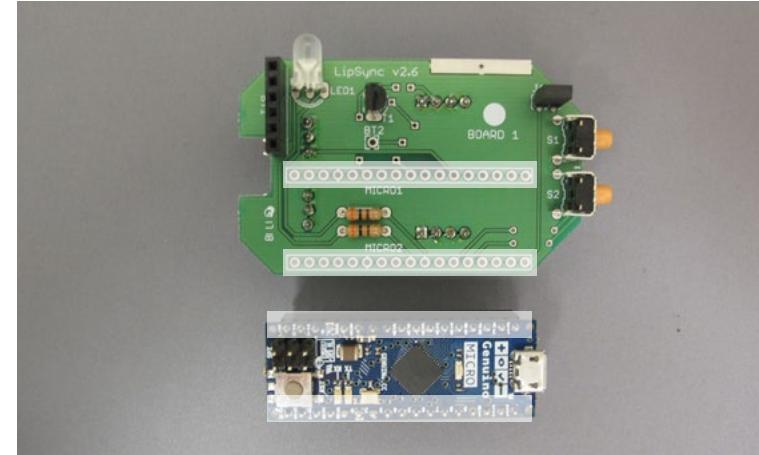
10

x 2

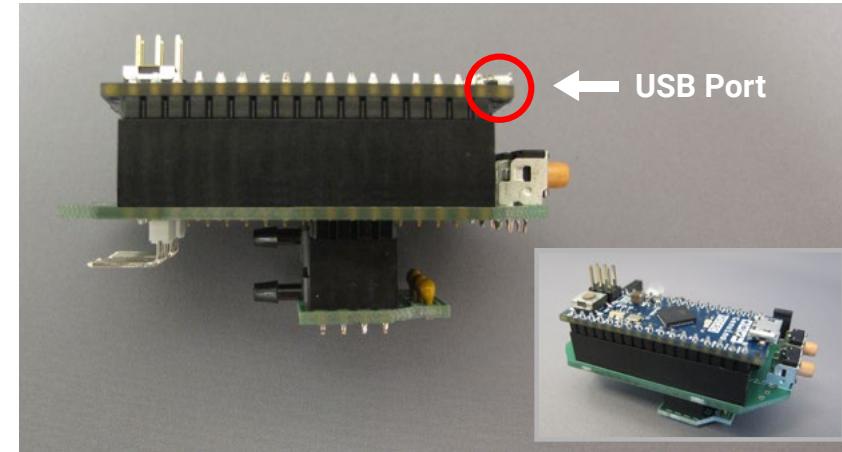
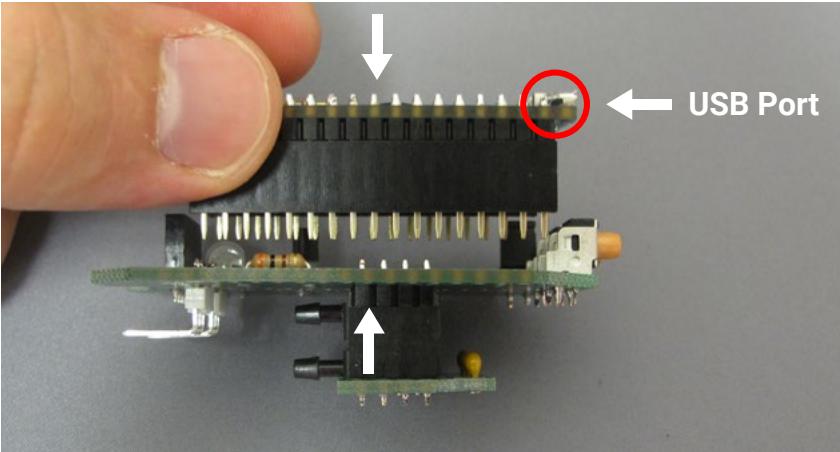
02.



03.

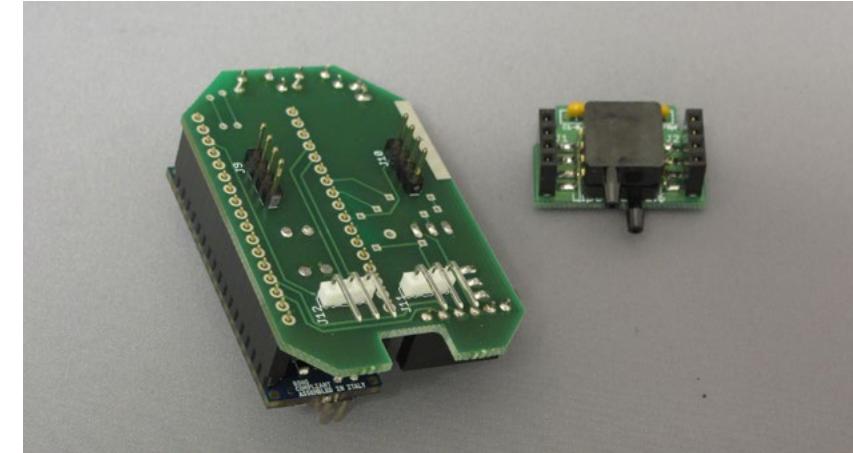
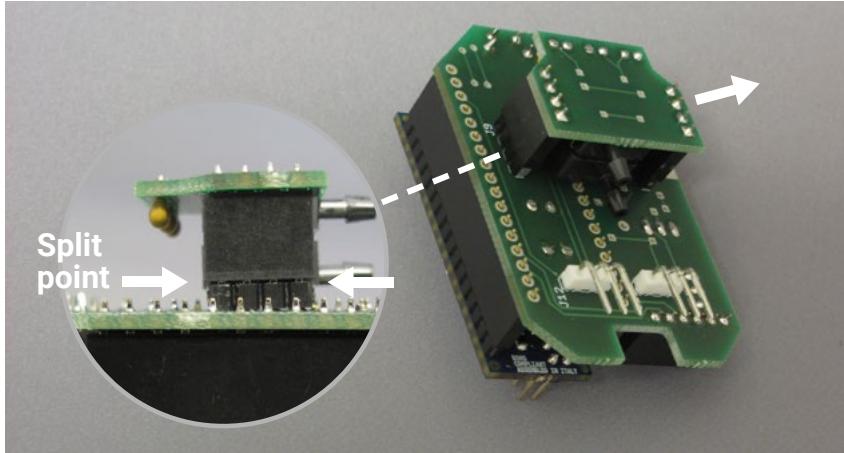


04.

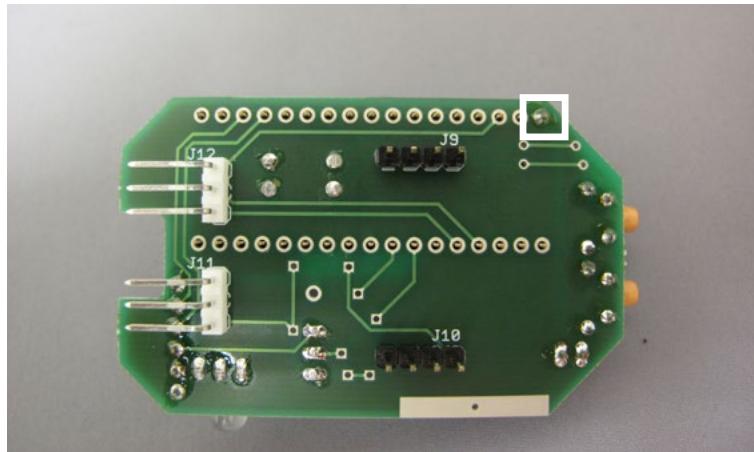


**i** NOTE: USB Port should be on the right side during installation

**05.**

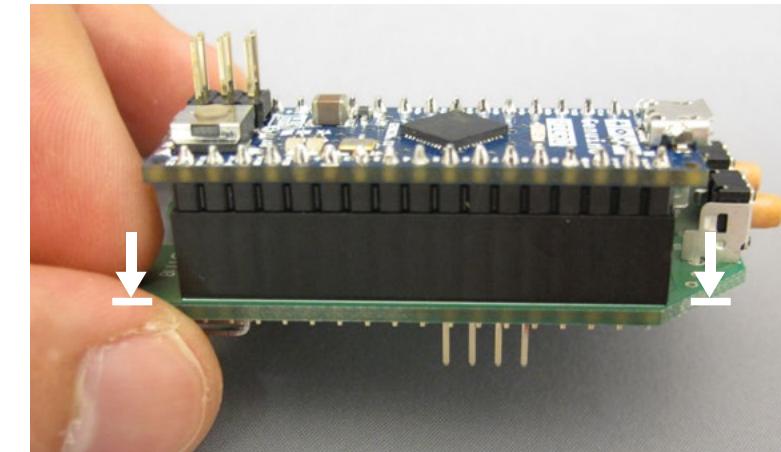


**06.**

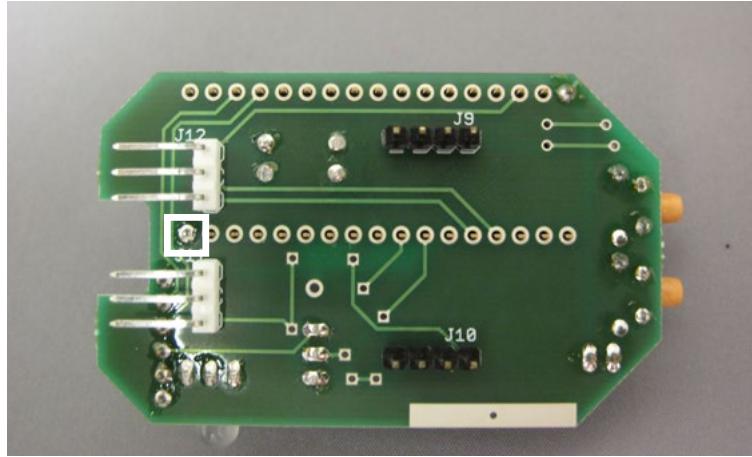


x 1

**07.**

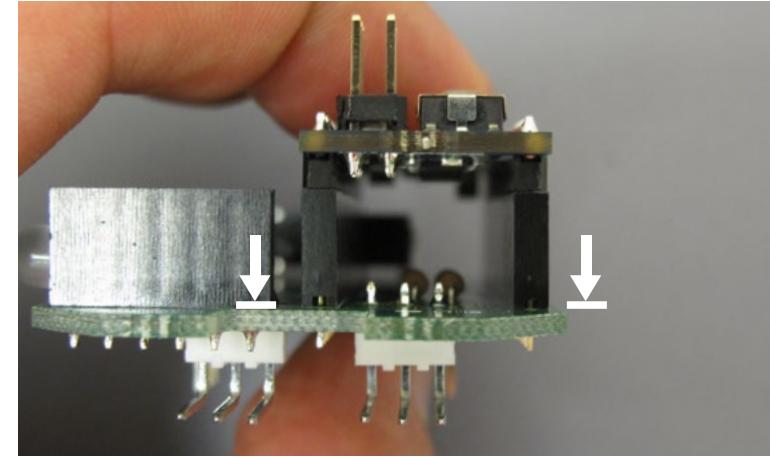


**08.**



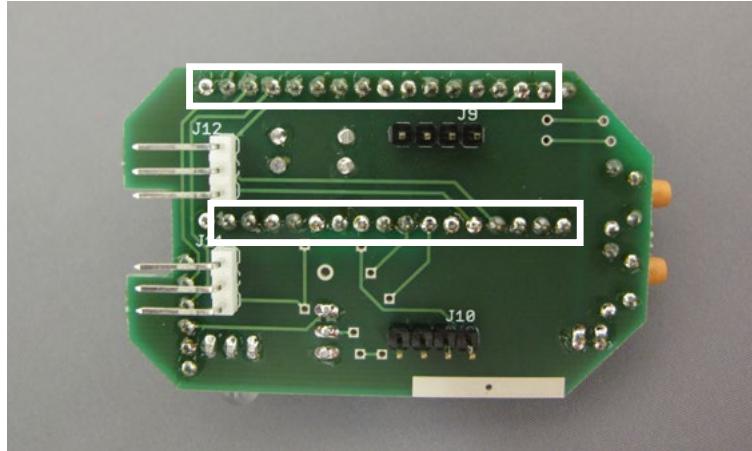
x 1

**09.**



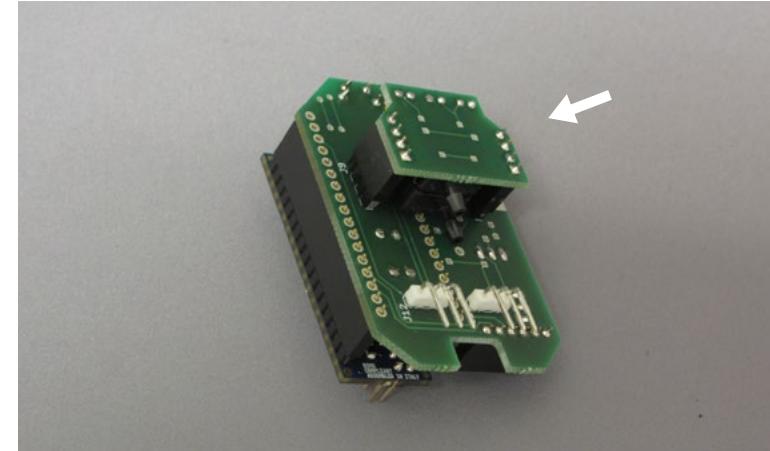
**i** NOTE: Check that component is flush to the board

**10.**

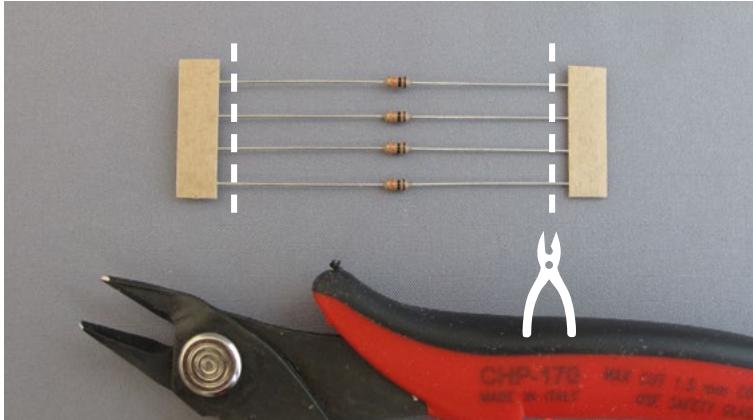
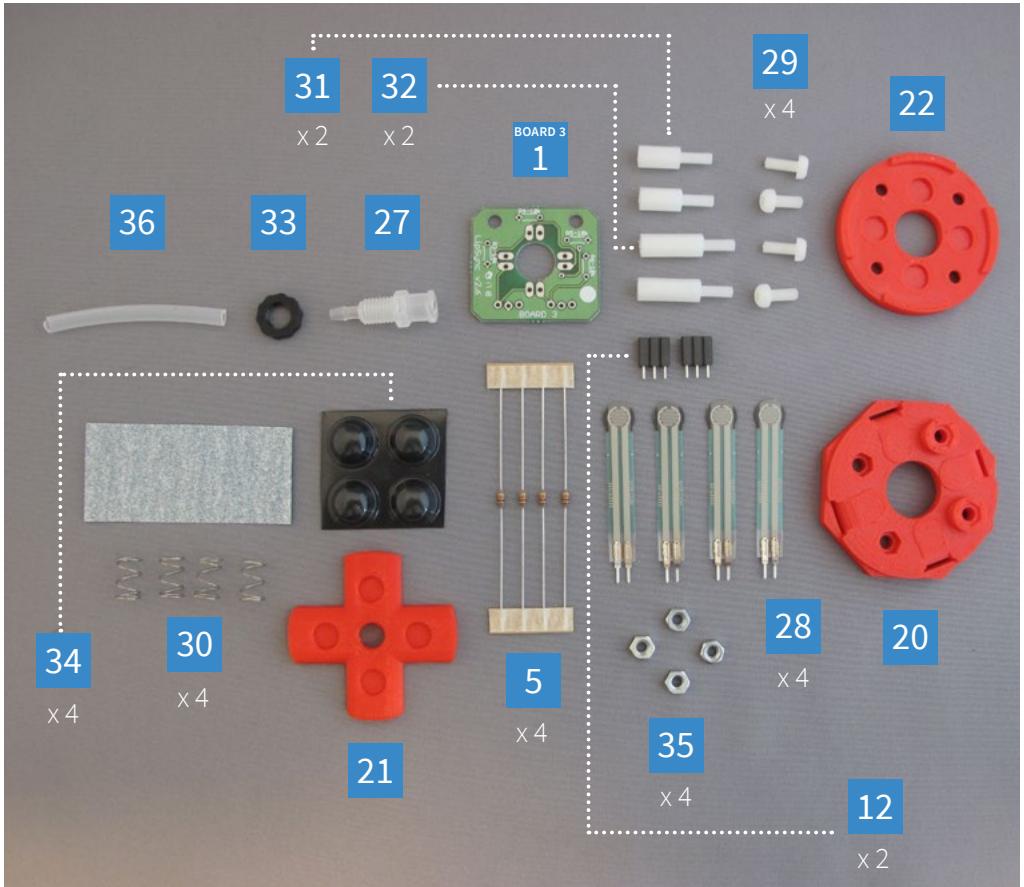


x 32

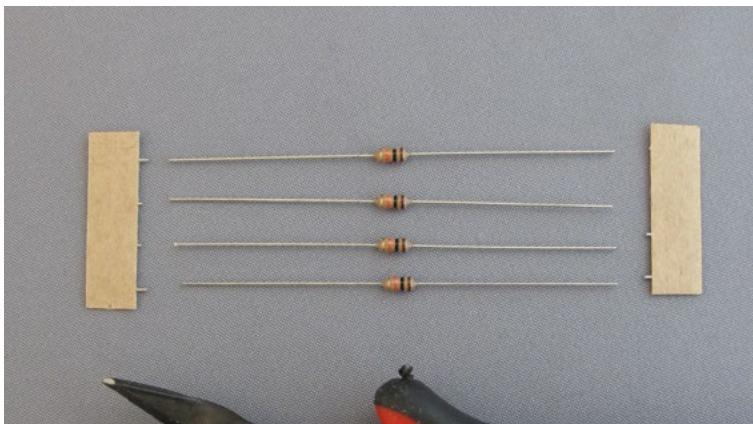
**11.**



# Part 6

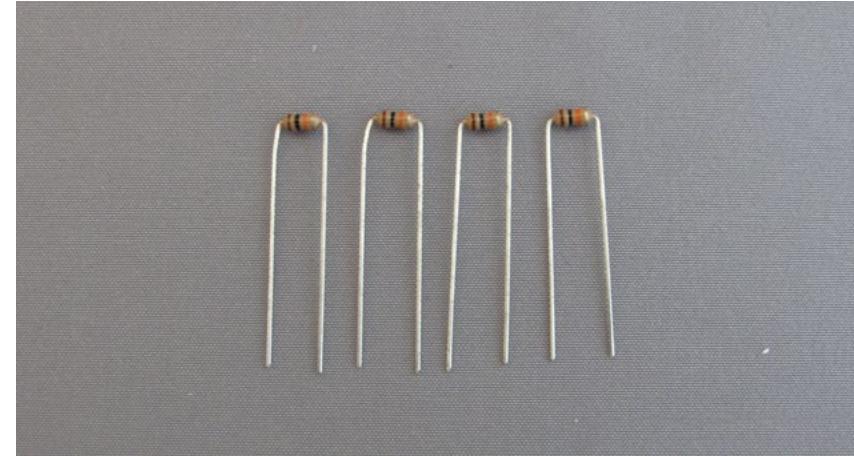
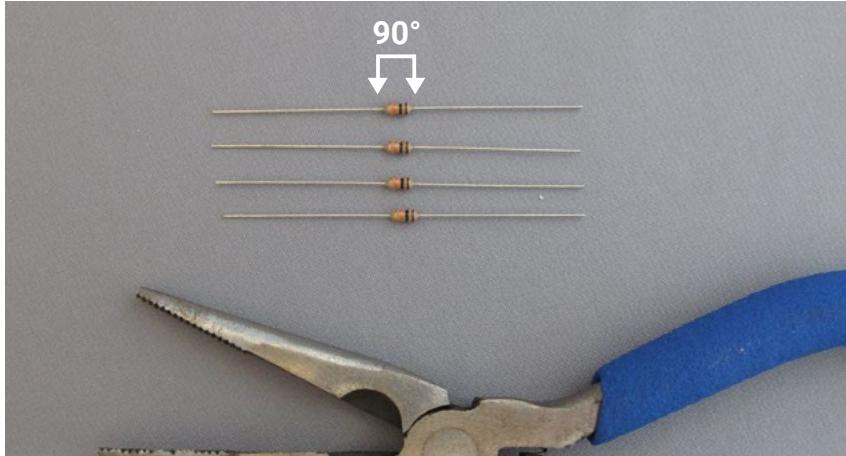


5  
x 4

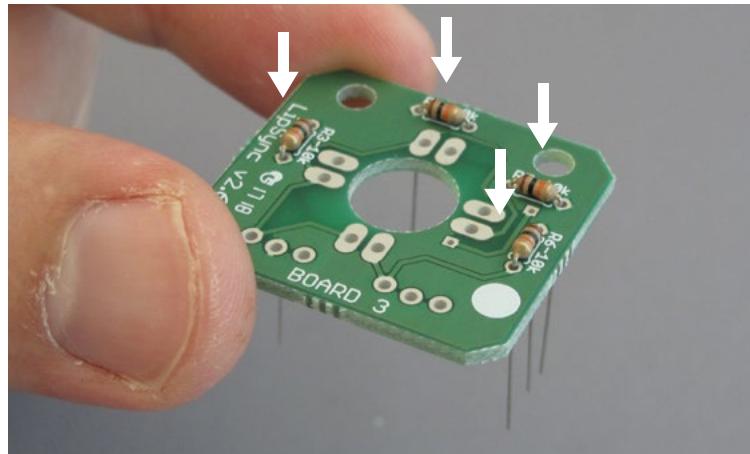


01.

**02.**



**03.**



BOARD 3

1  
x 4

HOLE

R3

HOLE

R4

HOLE

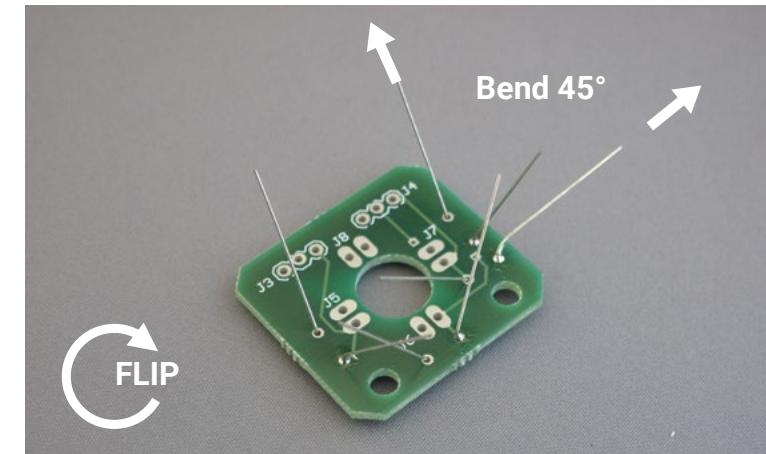
R5

HOLE

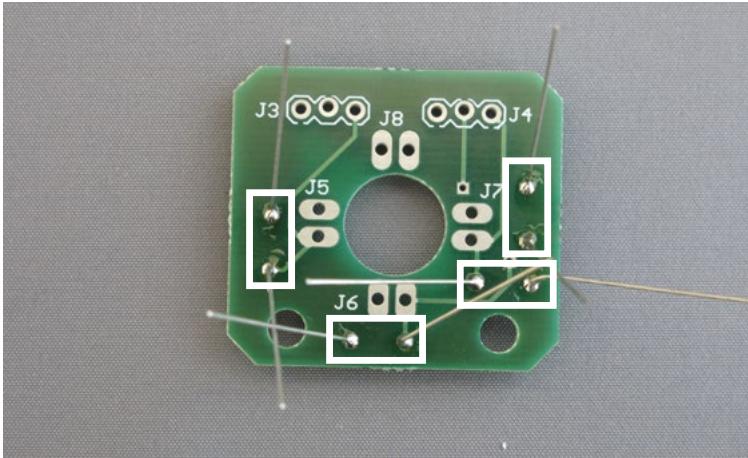
R6

PAGE 34 OF 55

**04.**

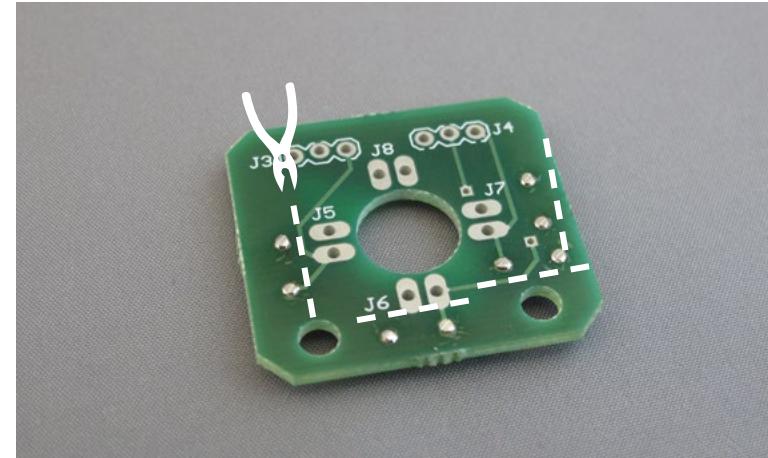


05.

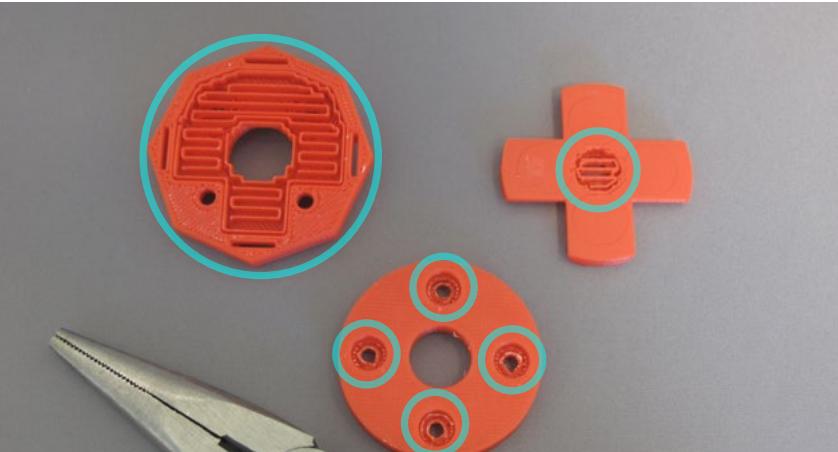


x 8

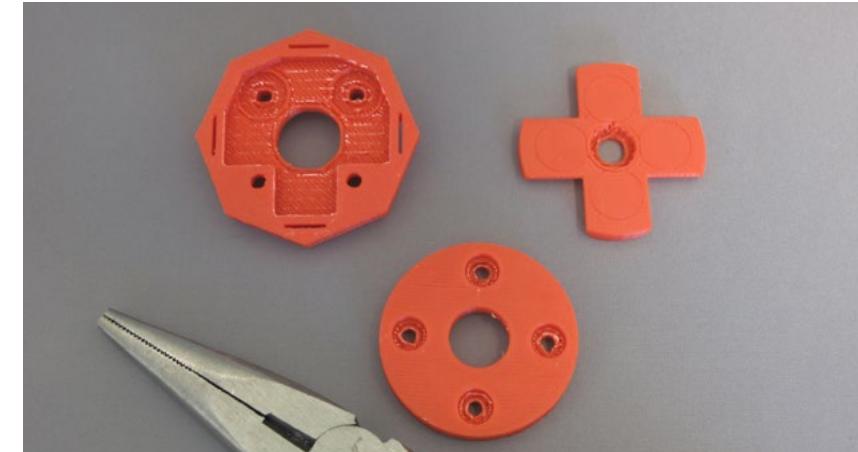
06.



07.



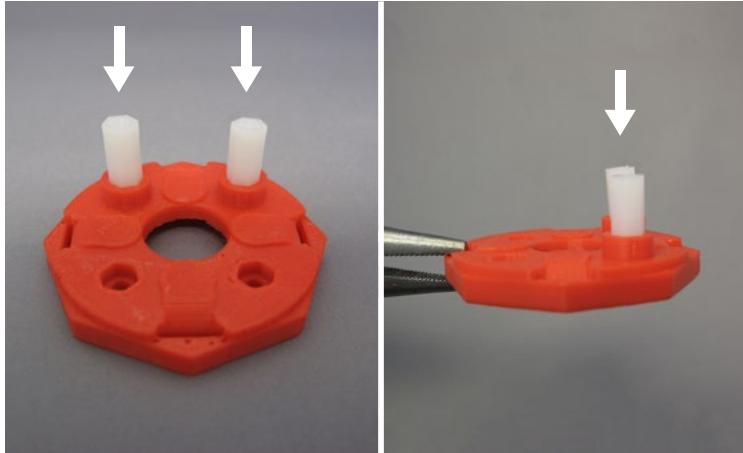
PAGE 35 OF 55



20 | 21 | 22

Remove all 3D  
printed support  
materials.

# 08.



**i** **NOTE:** Insert the 10mm standoffs

31

x 2

# 09.



35

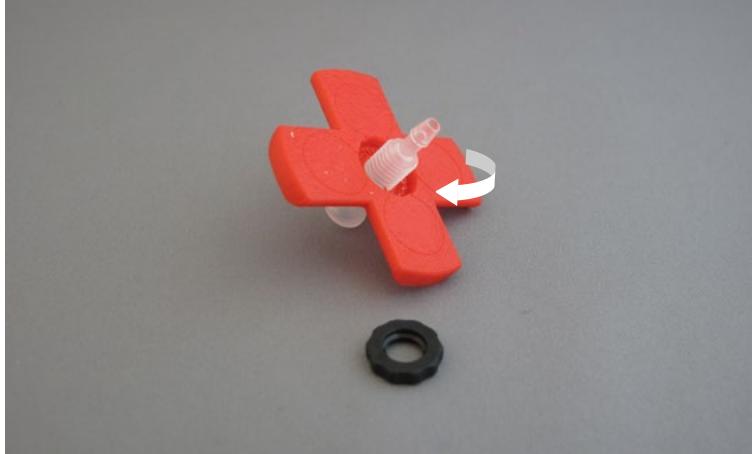
x 2

# 10.



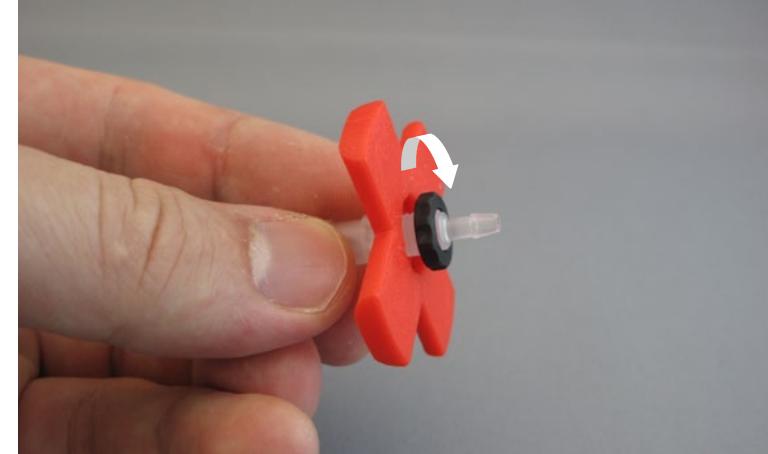
**⚠️ IMPORTANT:**  
Only add a small  
**DROP** of superglue

**11.**

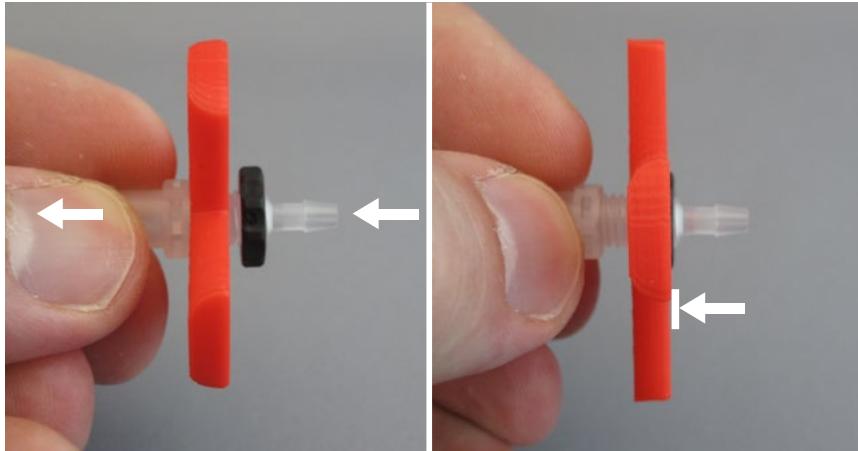


21  
27  
33

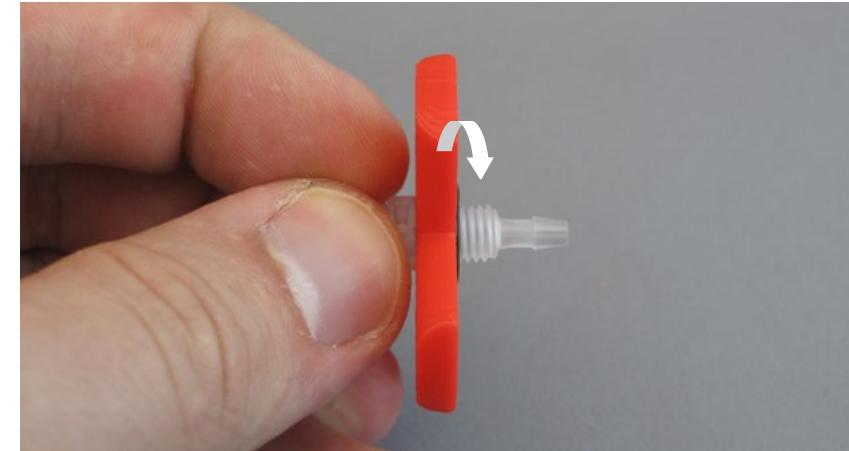
**12.**



**13.**

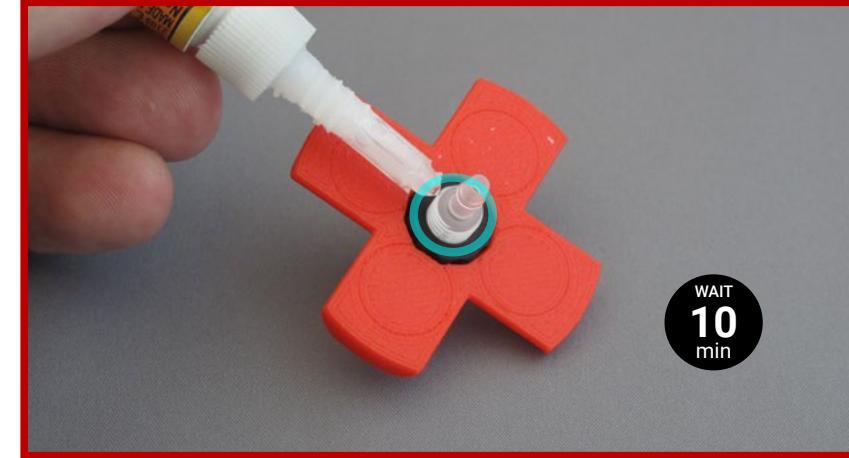


PAGE 37 OF 55



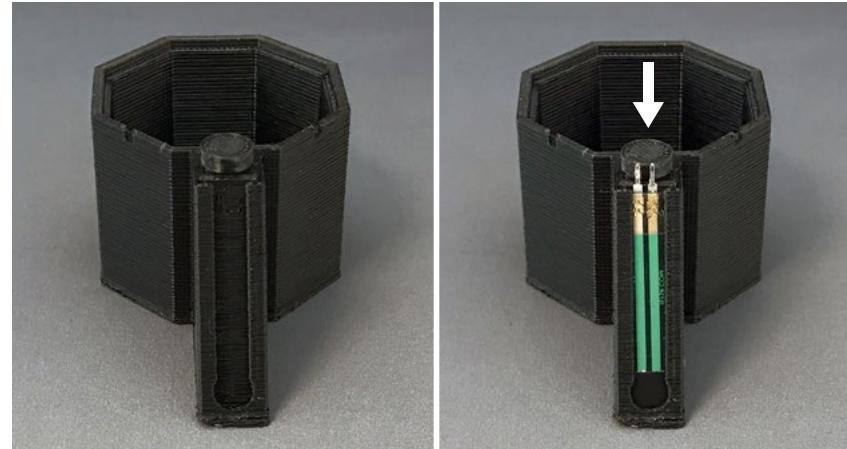
**NOTE:** The luer lock nut should sit flush to the rocker. Once flushed, twist the luer lock fitting the rest of the way.

**14.**



**⚠️ IMPORTANT:**  
Apply enough  
superglue  
between where  
the transparent  
luer lock filter and  
black luer lock nut  
meet.

**15.**

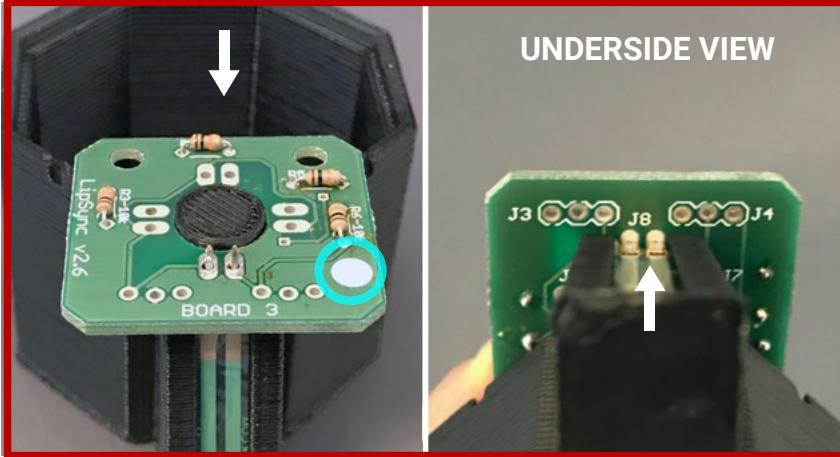


Use the joystick  
stand holder  
to assist with  
Steps 15-19

**28**

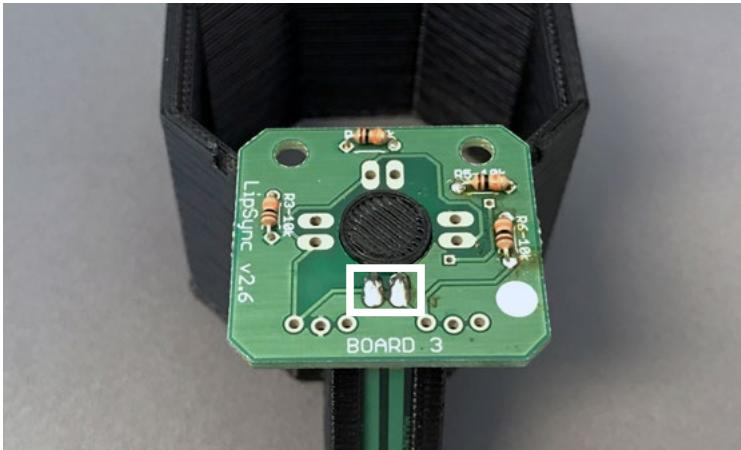
**⚠️ IMPORTANT:**  
Orient the FSR with  
the metallic side  
facing down

**16.**

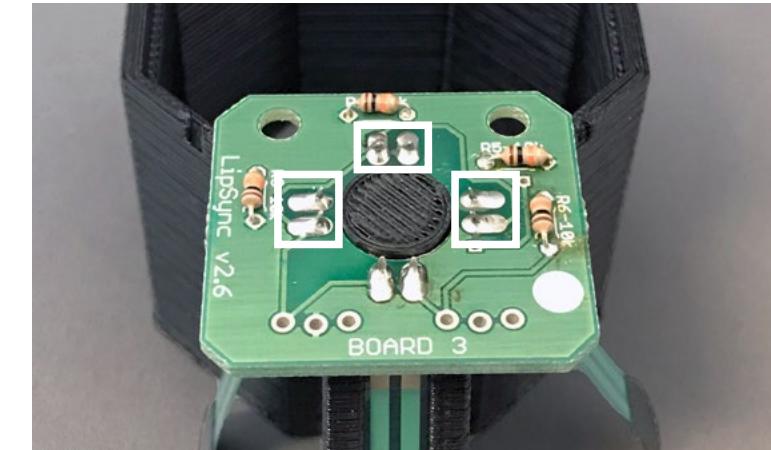


**⚠️ IMPORTANT:**  
Place Board 3 onto the holder with the FSR leads inserted into Hole J8 with the **white circle** facing up.

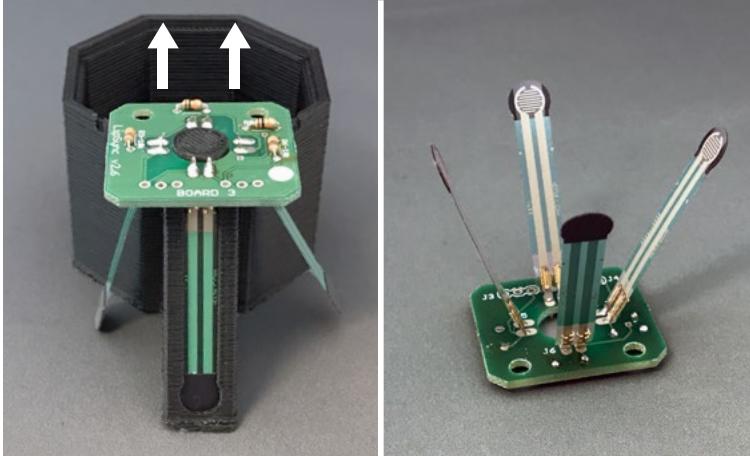
**17.**



**18.**



**19.**



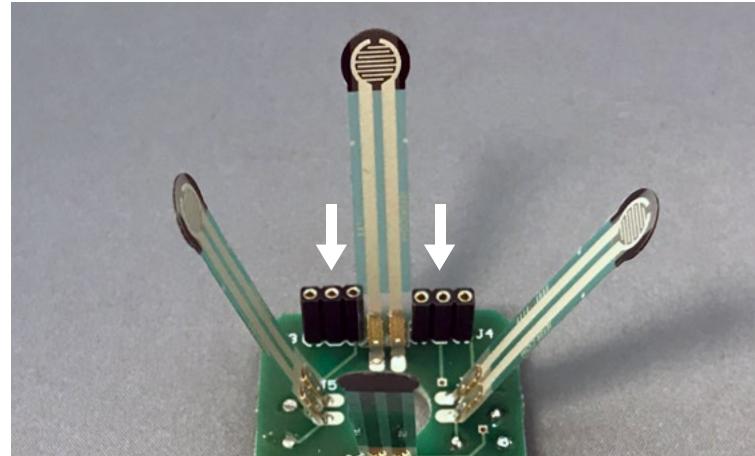
12

x 2

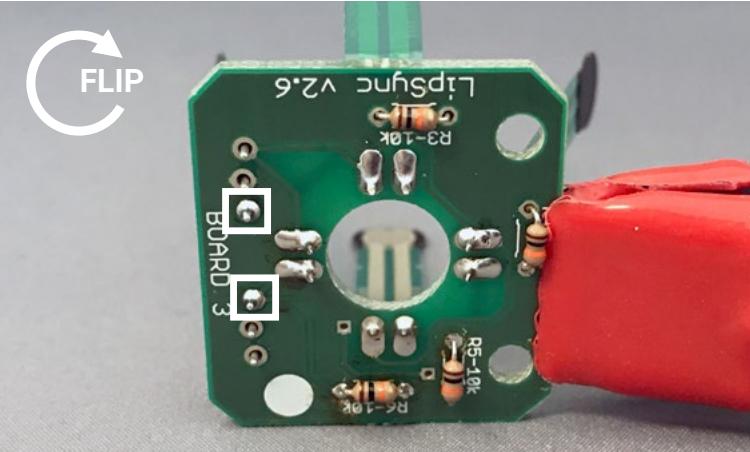
HOLE  
J3

HOLE  
J4

**20.**

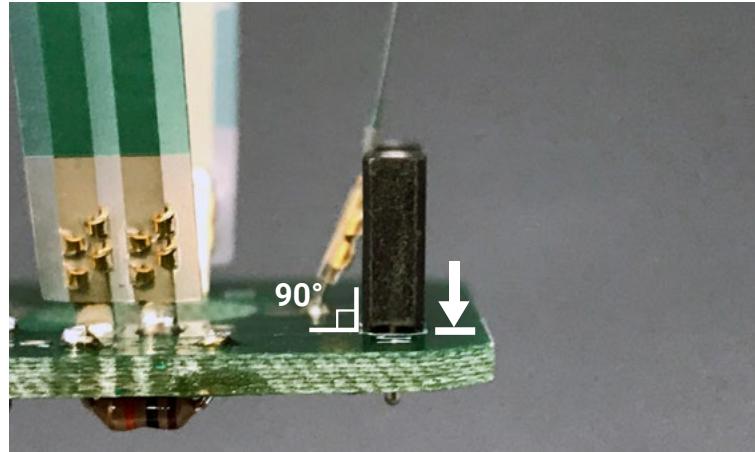


**21.**

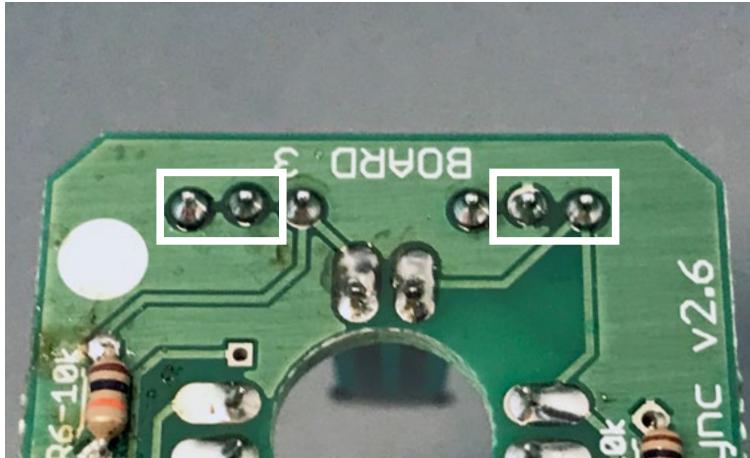


x 2

**22.**



23.

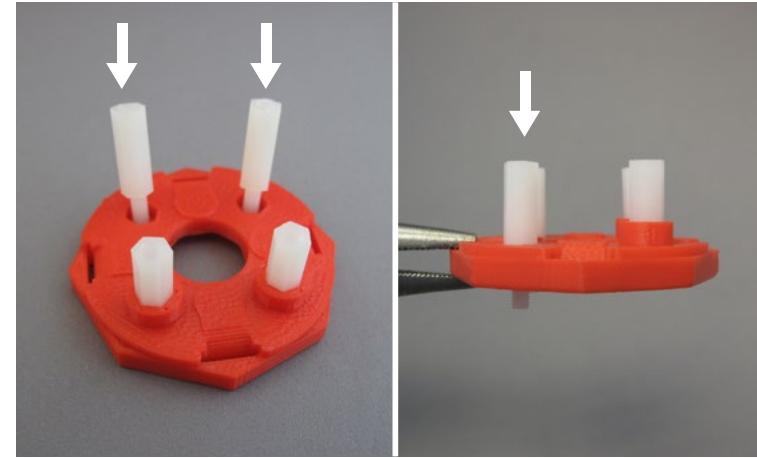


x 4

32

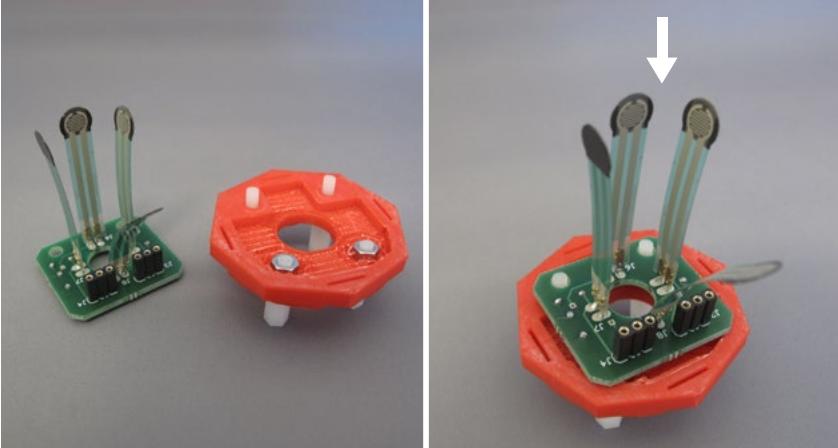
x 2

24.

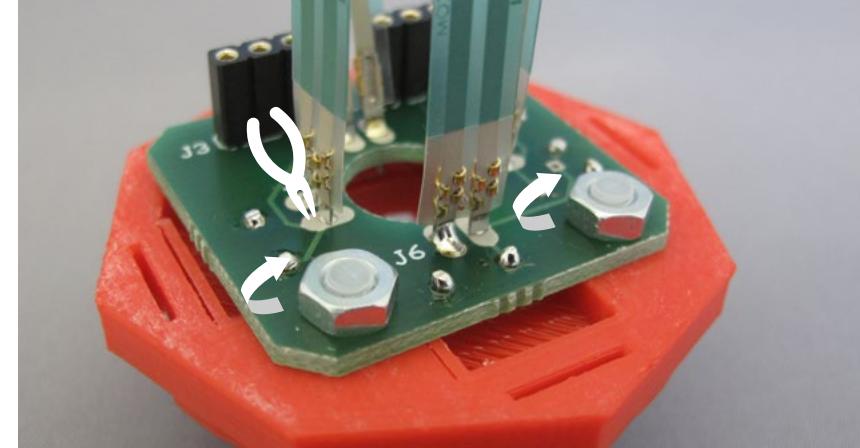


**NOTE:** Insert the 15mm standoffs

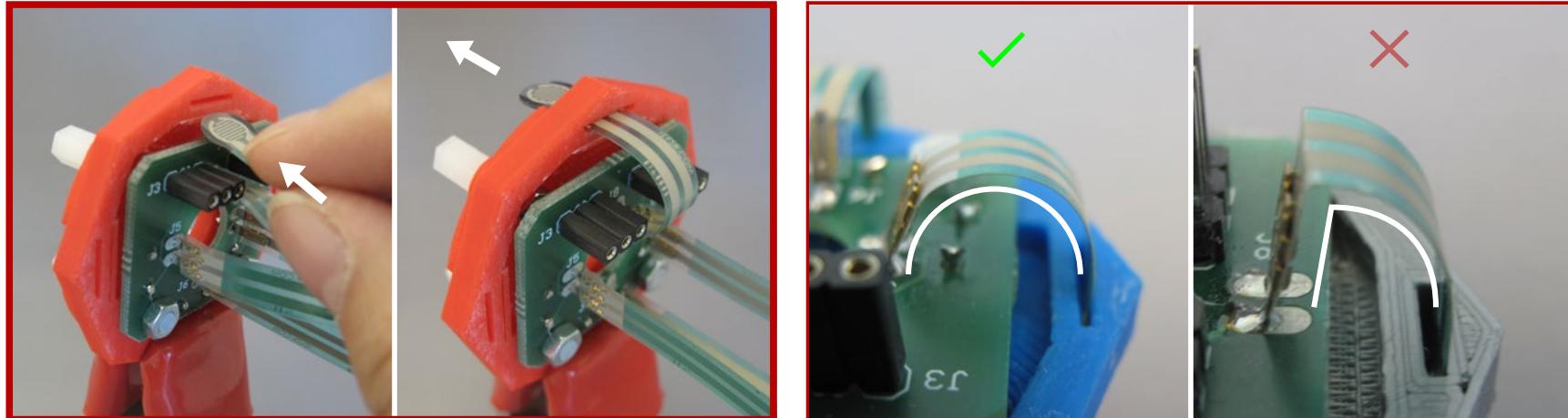
25.



26.

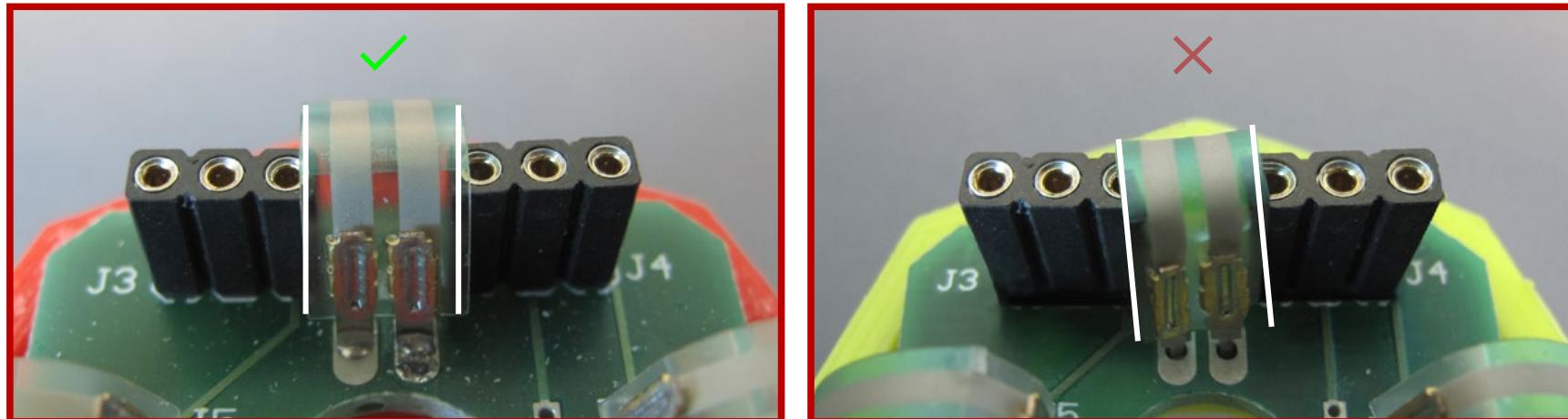


**27.**



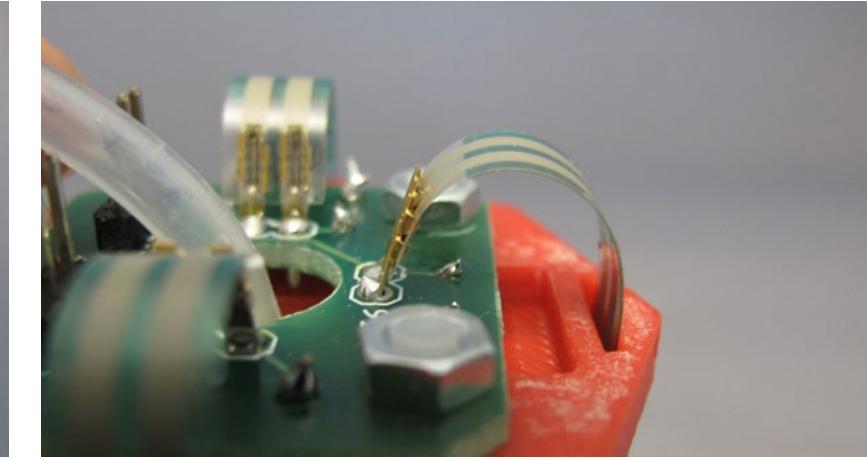
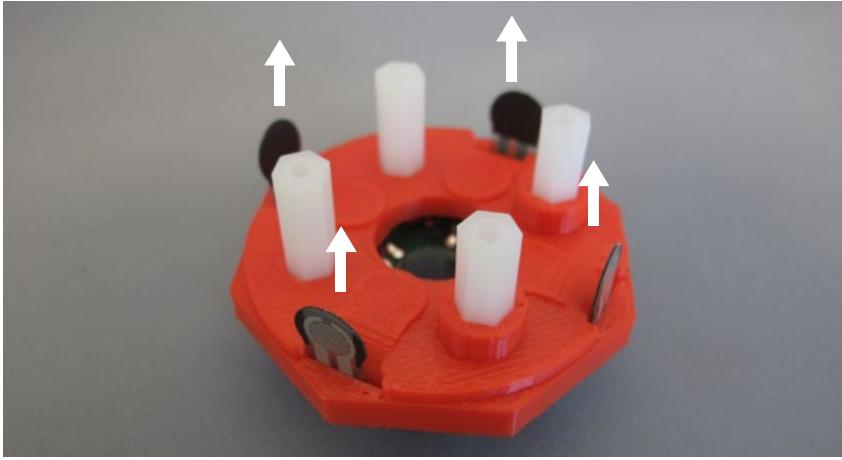
**CAUTION:**  
Bend the FSR  
so it arcs  
**GRADUALLY**. Do  
not fold or bend  
it abruptly as the  
ribbon breaks  
easily.

**28.**

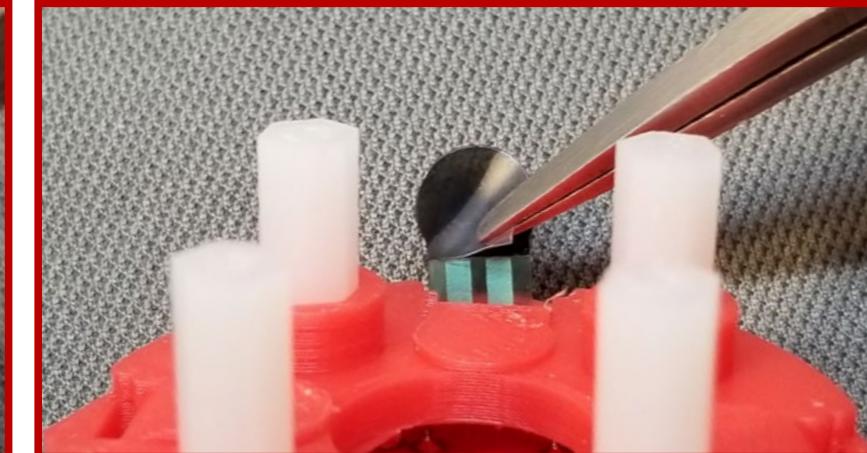


**CAUTION:**  
One FSR ribbon  
will slightly  
overlap the  
3-position  
female headers.  
The ribbon  
should not cover  
the through  
hole if soldered  
straight.

**29.**



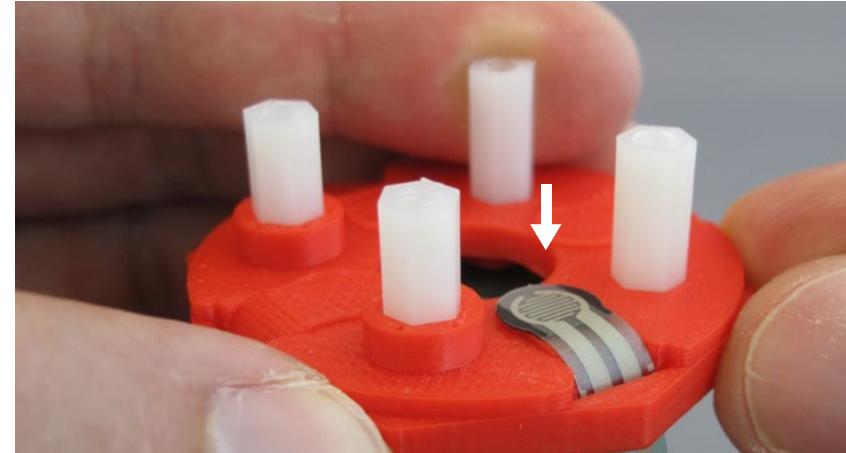
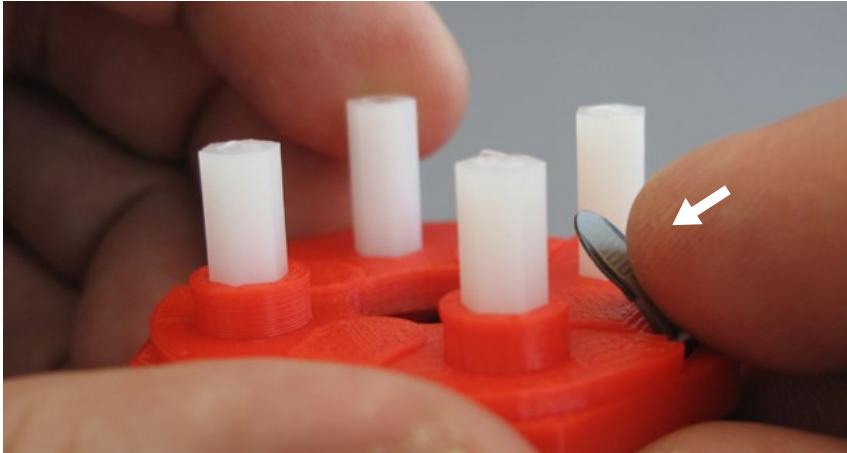
**30.**



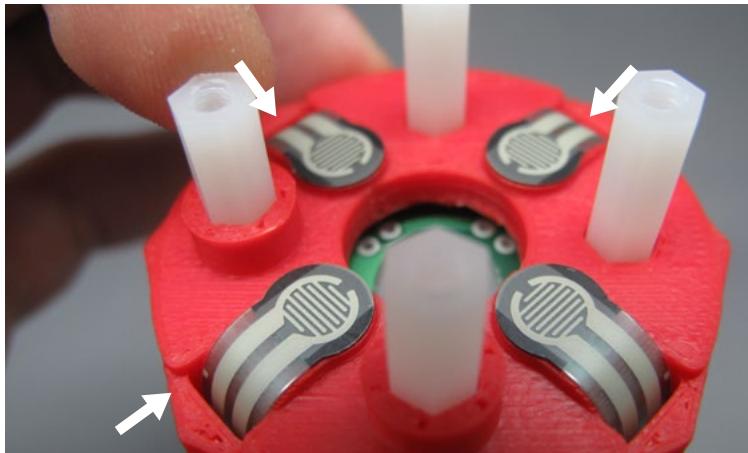
**⚠ CAUTION:**

On the back of each FSR is a clear adhesive lining on the black pad. **CAREFULLY** remove the lining with tweezers or needle nose pliers from the bottom corner. **Do not** remove the black pad.

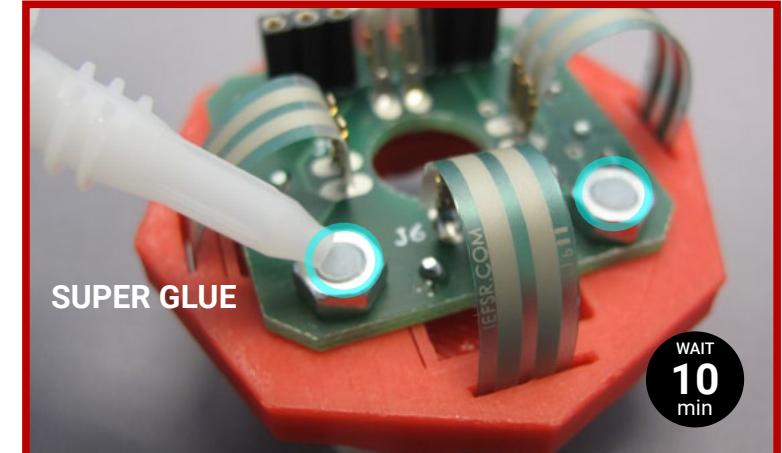
31.



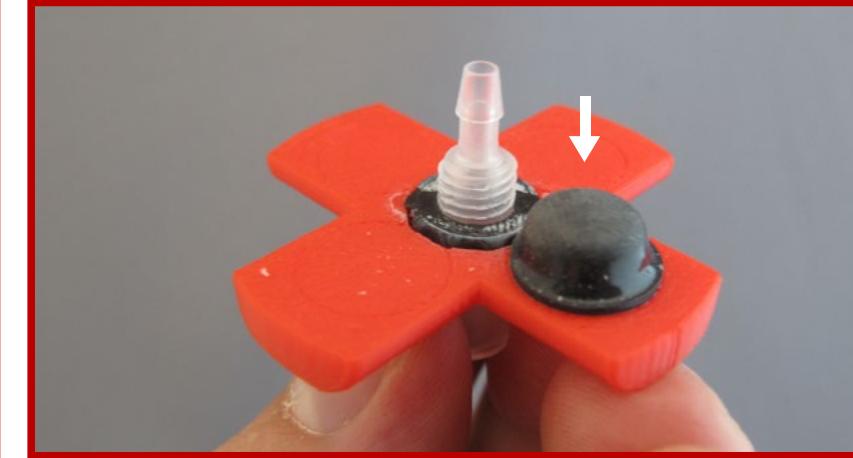
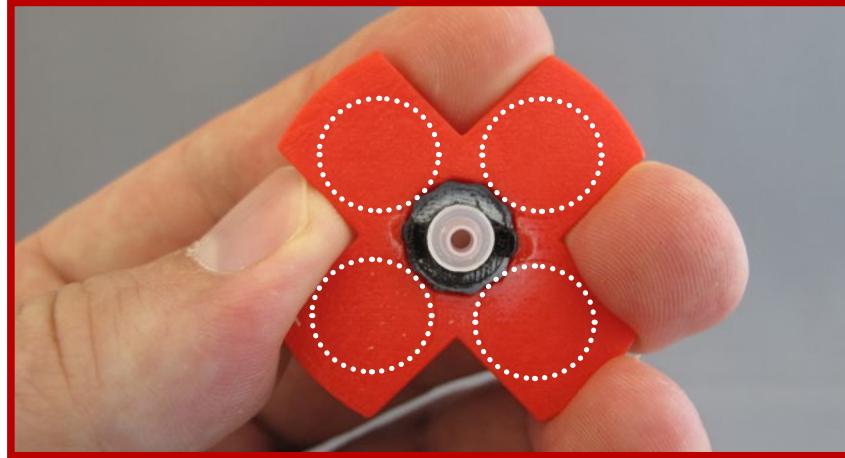
32.



33.



**34.**

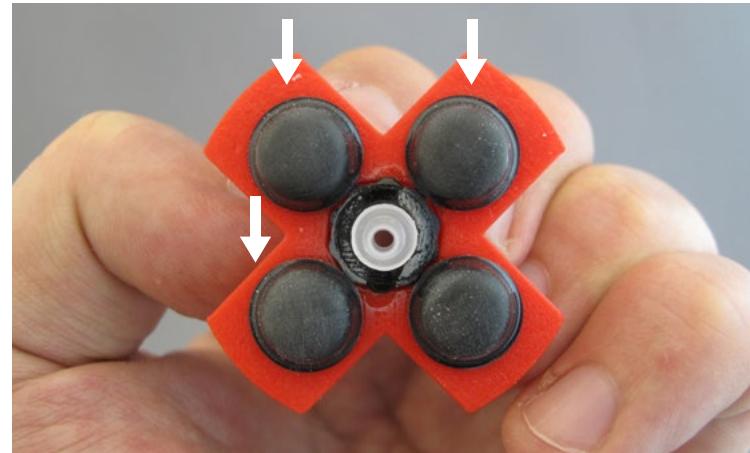


**34**

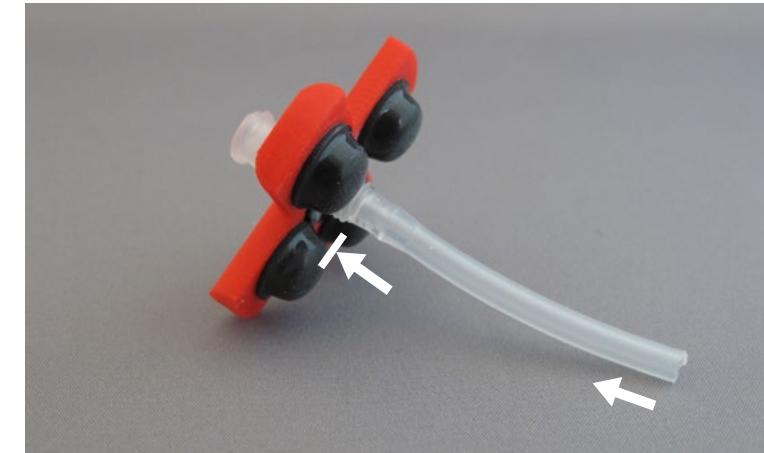
x 4

**IMPORTANT:**  
On the flat side  
of the rocker  
are 4 circular  
outlines. Place a  
bumper directly  
on each outline.

**35.**

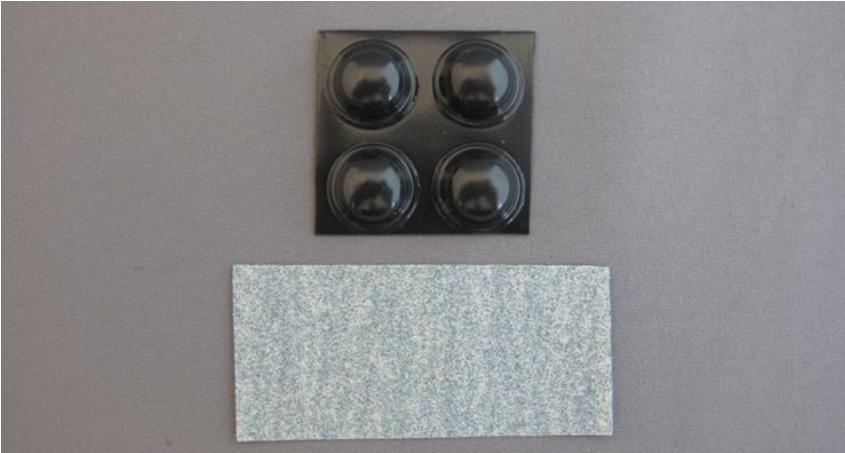


**36.**



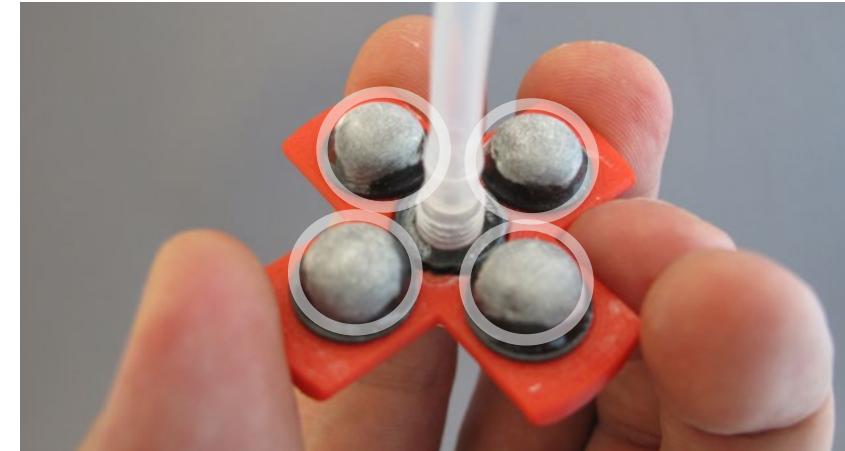
**36**

37.



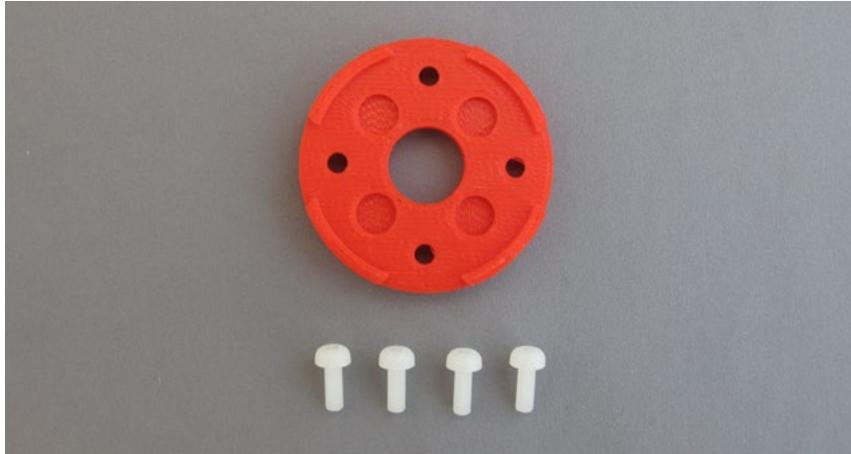
**i** NOTE: Sand the top surface and around the bumpers

38.



**i** NOTE: Apply baby powder with your finger

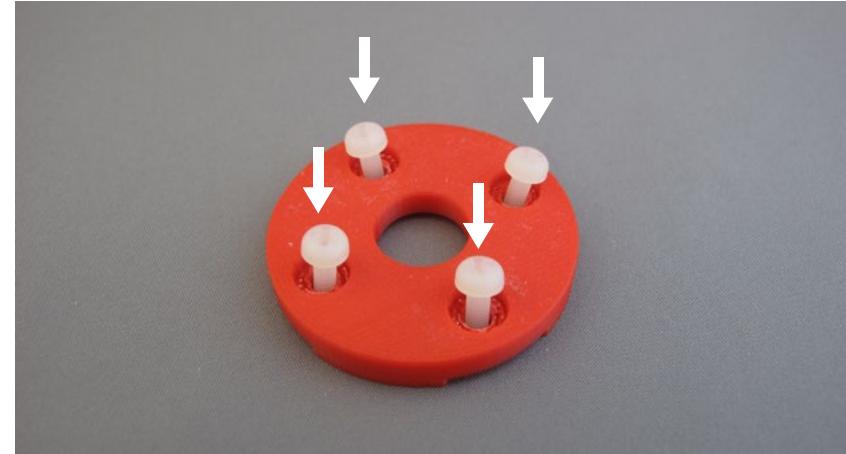
**39.**



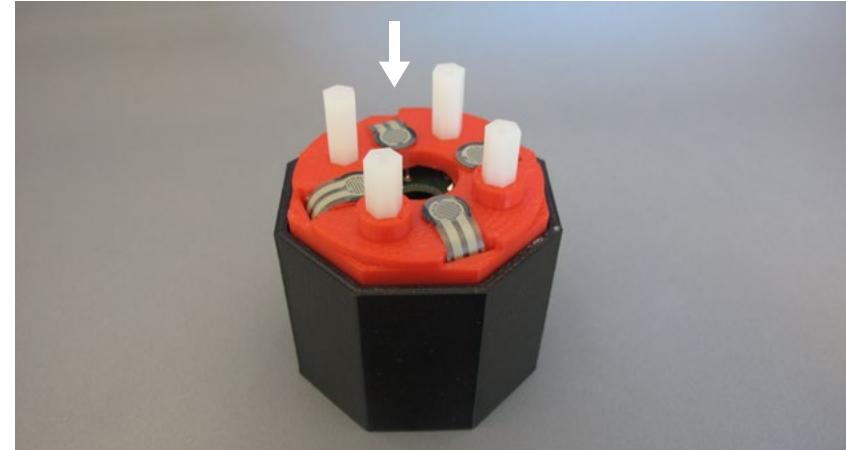
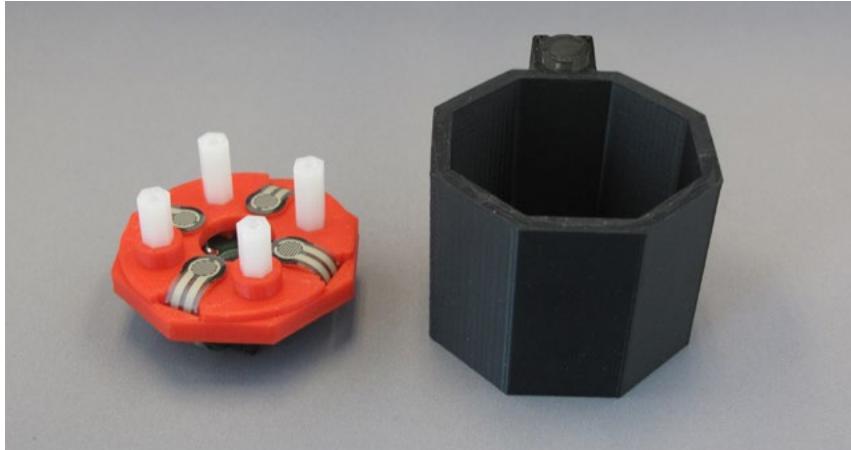
22

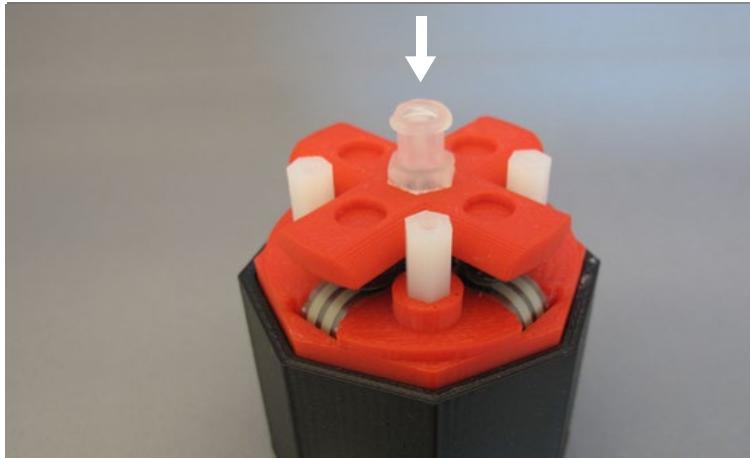
29

x 4

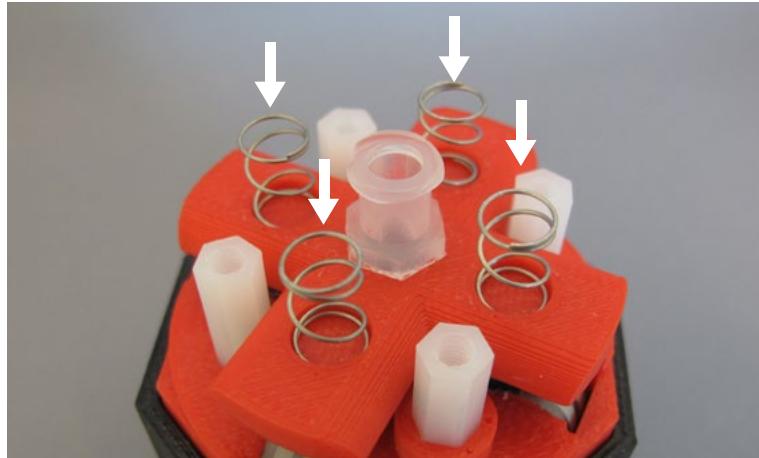
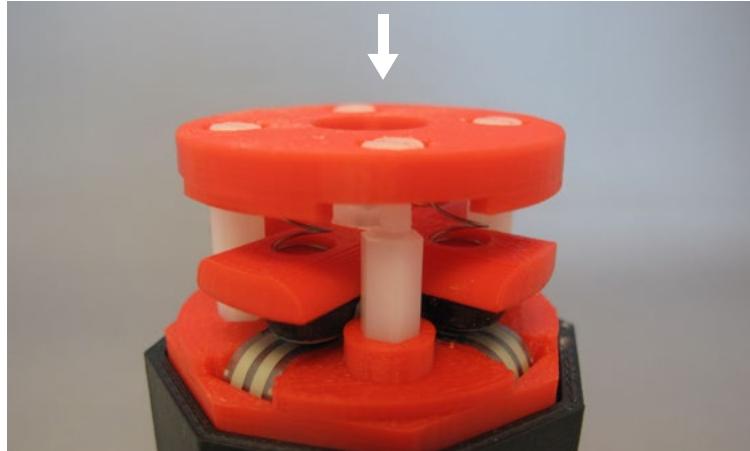
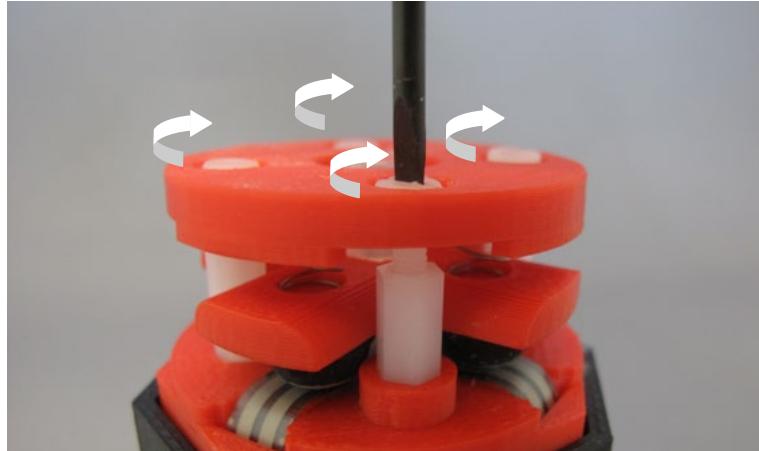


**40.**

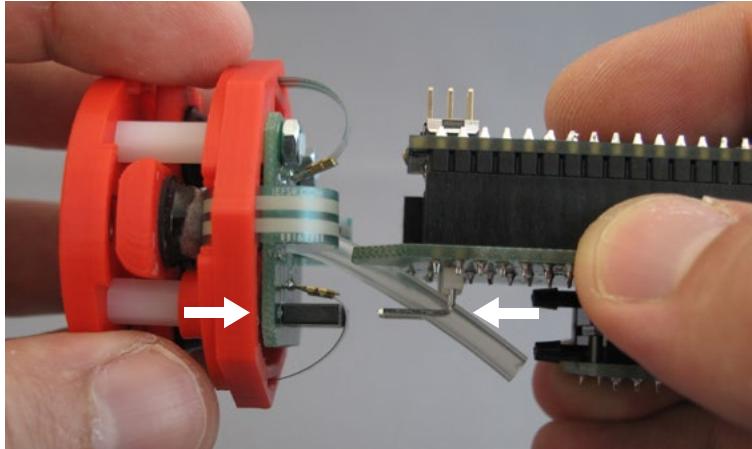
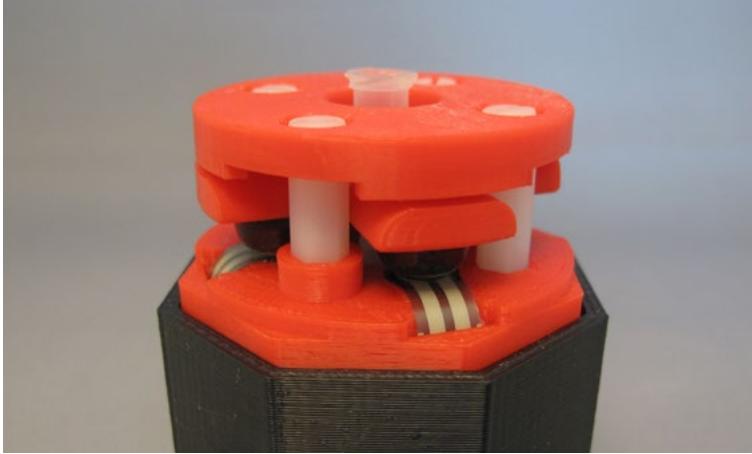


**41.**

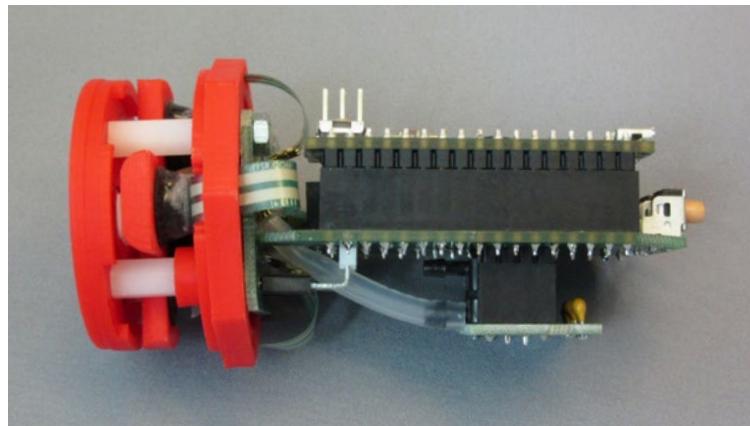
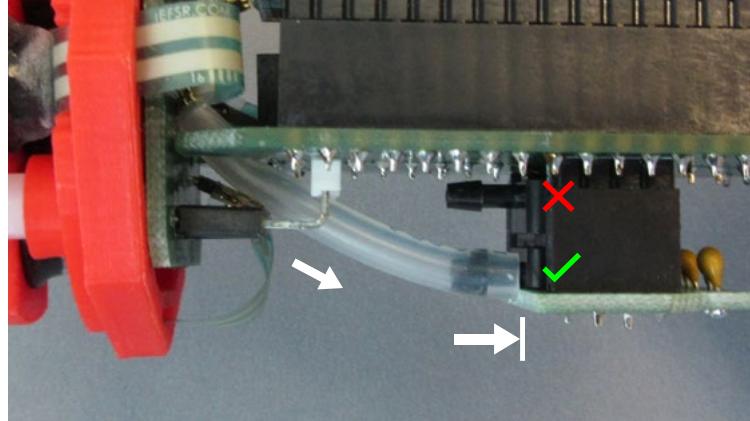
Place joystick rocker assembly from sztep 38.

**42.****43.****44.**

**45.**



**46.**

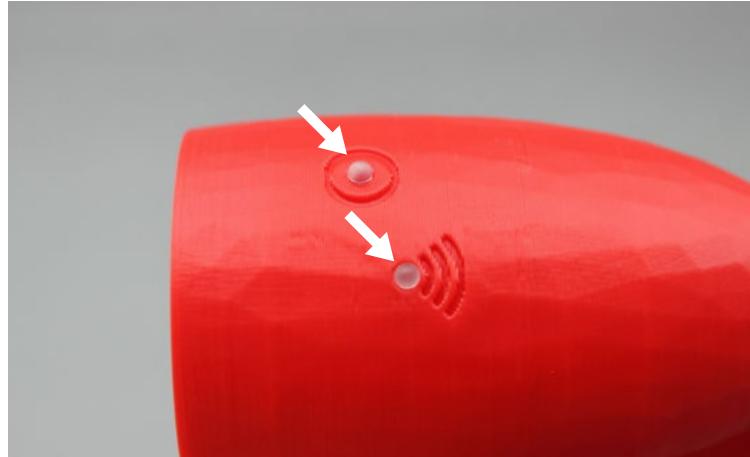


**47.**

# Part 7



01.



23  
37  
x 2

02.



40  
42

**03.**



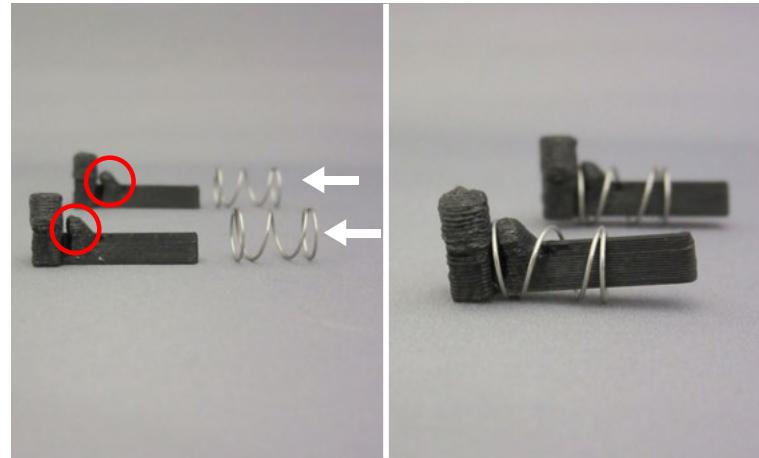
30

x 2

24

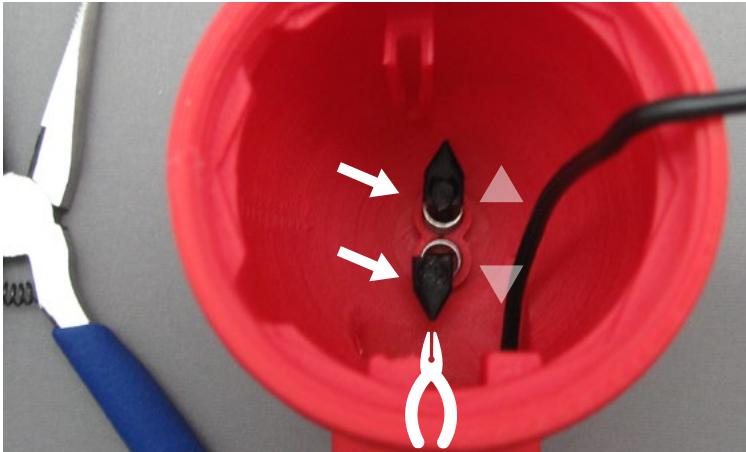
x 2

**04.**



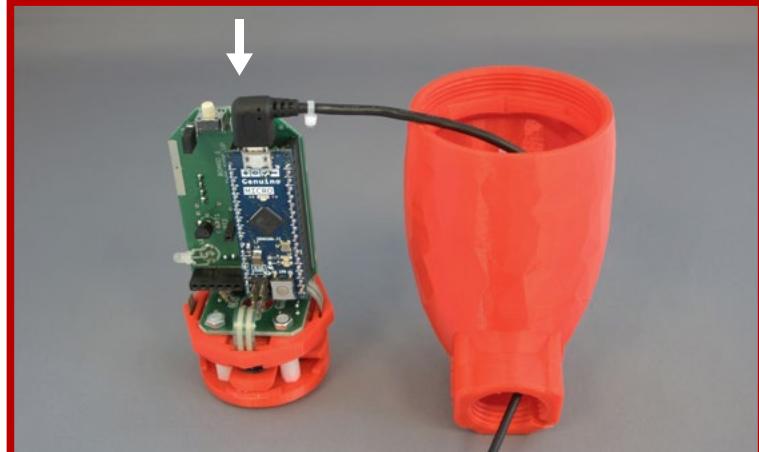
**i NOTE:** Push springs onto the spring catch highlighted in red.

**05.**



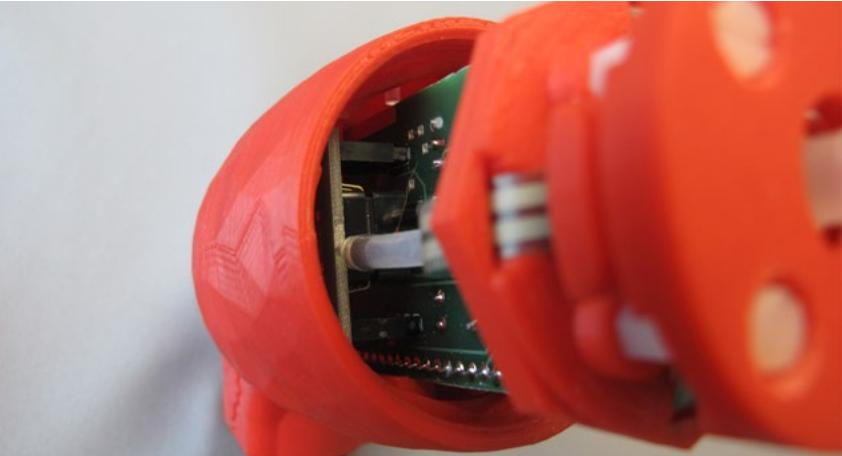
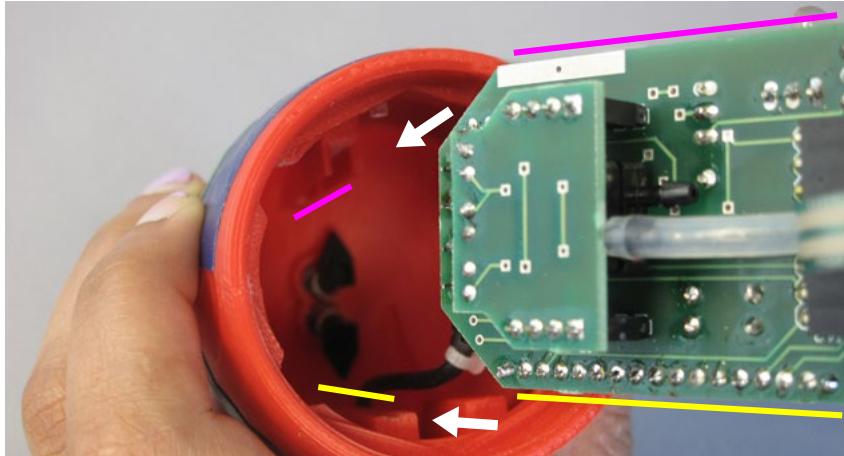
**IMPORTANT:** Push both buttons until they click into place.

**06.**



**CAUTION:** If need be, unplug cable gently while holding onto the port.

**07.**



**NOTE:** Slide the assembly along the internal tracks in the rear chamber housing.

**08.**



**09.**



**CAUTION:** Twist on hand tight

**10.**



26



**12.**



38

Slot the USB cable in the hole highlighted in yellow.

**11.**



25

PAGE 53 OF 55

**13.**



39

# Part 8

## SETTING UP THE DEVICE

For **LipSync**, **LipSync Wireless**, and **LipSync Macro** follow steps A-C:

- A. Upload the microcontroller code.
- B. Calibrate the joystick.
- C. Read through the Startup Guide for complete information on using the LipSync.

OR

For **LipSync Gaming**, don't follow Steps A-C.

Instead, follow the instructions in the LipSync Gaming Setup Guide: [https://github.com/makersmakingchange/LipSync-Gaming/blob/master/LipSync\\_Gaming\\_Startup\\_Guide.pdf](https://github.com/makersmakingchange/LipSync-Gaming/blob/master/LipSync_Gaming_Startup_Guide.pdf)

### A - UPLOADING THE MICROCONTROLLER CODE

1. Download and install the latest version of Arduino IDE:  
<https://www.arduino.cc/en/main/software>
2. Select from the following 3 LipSync versions to download the microcontroller code:  
[LipSync code](#) | [LipSync Wireless code](#) | [LipSync Macro code](#)

3. Right click on the webpage and select "Save Page As." Add an ".ino" extension to the end of the file name. Click "Save"
4. Open Arduino IDE → Click on **Tools** → **Board** → **Arduino/Genuino Micro**
5. Connect the LipSync to the PC using the USB cable and allow the LipSync a few seconds to initialize.
6. Open the microcontroller code. Click "OK" to create sketch folder if prompted.
7. Click on **Tools** → **Port** → **COM##** (number may be different for each user).

*-- Complete only for **LipSync Wireless** or **LipSync Macro**. For **LipSync**, skip to 11. --*

8. Ctrl + F to find "#define BT\_CONFIG\_FLAG false" and change to "#define BT\_CONFIG\_FLAG true". Save file.
9. Click the right arrow at the top left of the Arduino IDE to upload the code. After a few seconds, the blue LED on the Bluetooth module will start to blink quickly.
10. Modify the code to read "#define BT\_CONFIG\_FLAG false" again. Save file.

11. Click the right arrow at the top left of the Arduino IDE to upload the code.
12. Once upload is complete, a message saying "Upload Successful" will show at the bottom left of the Arduino IDE.

## B - JOYSTICK CALIBRATION

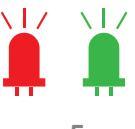
Calibrate your LipSync joystick before first using your device.

**⚠️ IMPORTANT:** Allow the LipSync to initialize for 3 seconds before moving the mouthpiece each time after it's connected to a device.



1

Press both speed adjustment buttons on the back of the LipSync for a few seconds until LED comes on



x 5

2

LED slowly blinks red & green 5 times



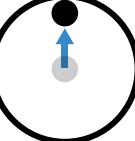
3 sec.  
pause



x 6

3

While LED blinks green 6 times, move the mouthpiece to the 12 o'clock position (up direction)



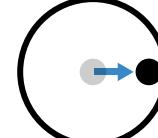
x 1

4

LED blinks red 1 time when position is measured



x 6

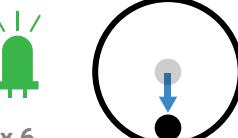


5

While LED blinks green 6 times, move the mouthpiece to the 3 o'clock position (right direction) time when position is measured



x 1



6

While LED blinks green 6 times, move the mouthpiece to the 6 o'clock position (down direction) time when position is measured



x 1



7



x 6

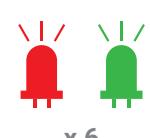


8

While LED blinks green 6 times, move the mouthpiece to the 9 o'clock position (left direction) time when position is measured



x 1



10

LED rapidly blinks red and green 6 times when calibration is complete