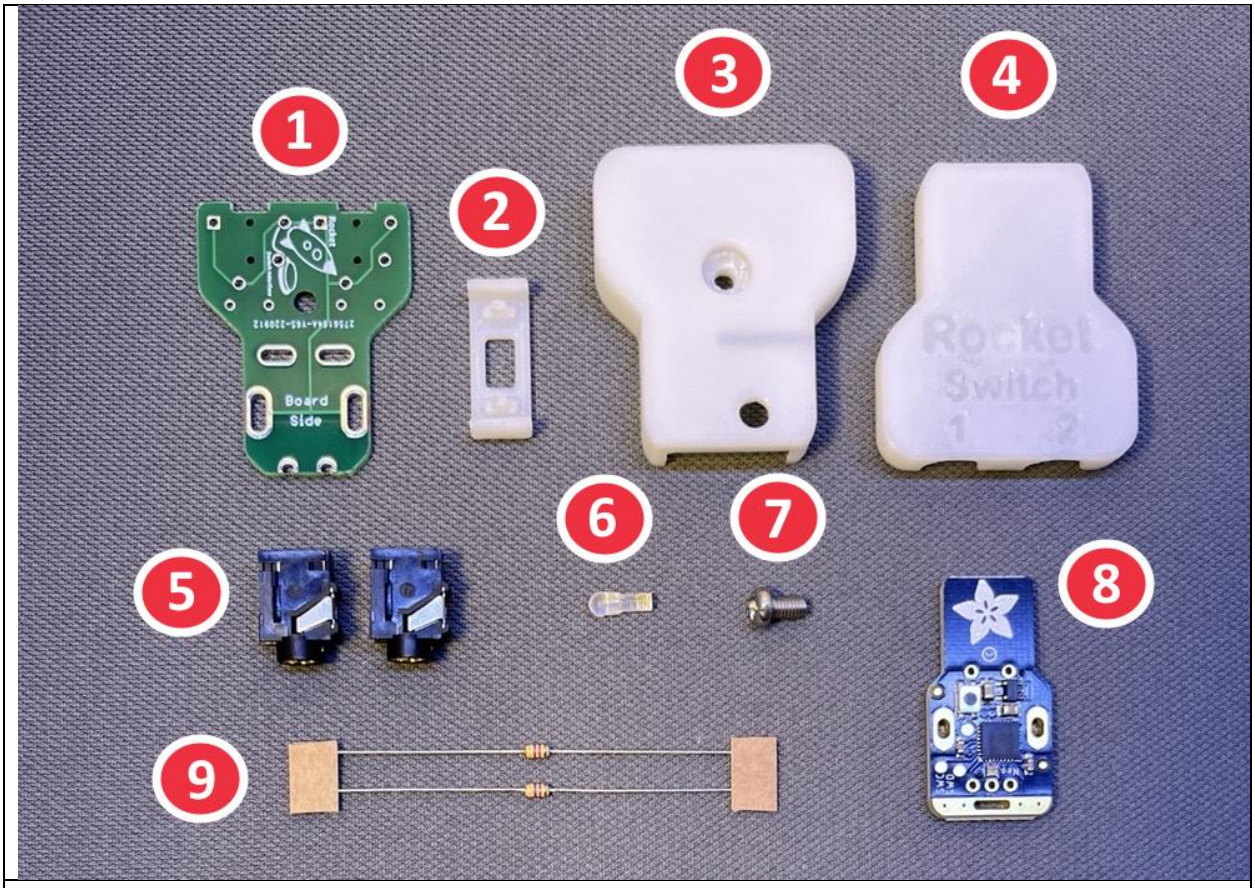
Rocket-Switch-Interface
ASSEMBLY GUIDE V1.1

Makers Making Change
A Neil Squire Program

Required Components



BOM

1. Rocket-Switch-Interface PCB (Printed Circuit Board)
2. 3D Printed Assembly Jig
3. Rocket-Switch-Interface Bottom Case
4. Rocket-Switch-Interface Top Case
5. SJ-43514 3.5mm Jack Stereo **x 2**
6. Light Pipe
7. M3 8MM Phillip Machine Screw
8. Adafruit Rotary Trinkey
9. 4.7K Through-Hole Resistor **x 2**

Required Tools

- Temperature regulated soldering Iron.

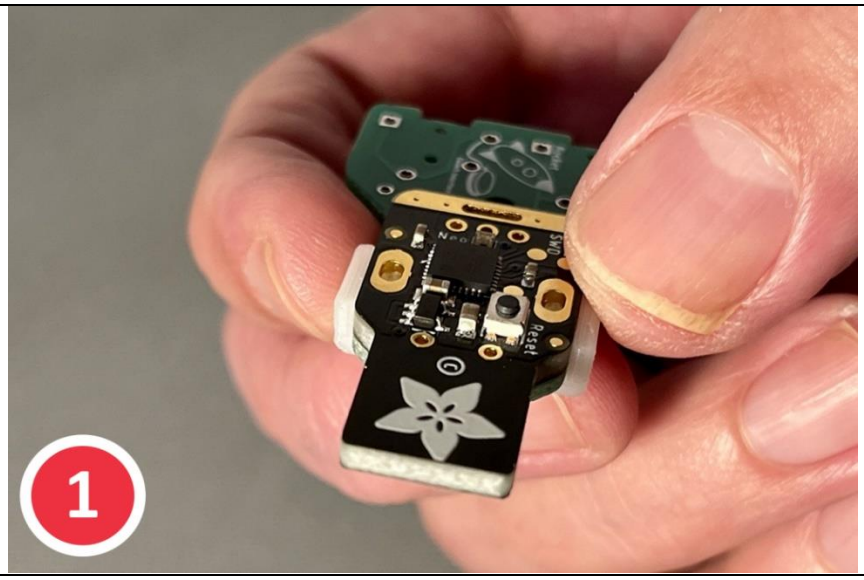
Required Personal Protective Equipment (PPE)

- Lexan (polycarbonate) safety glasses
- Disposable examination gloves (Optional- rosin residue may irritate sensitive skin)

Assembly Instructions

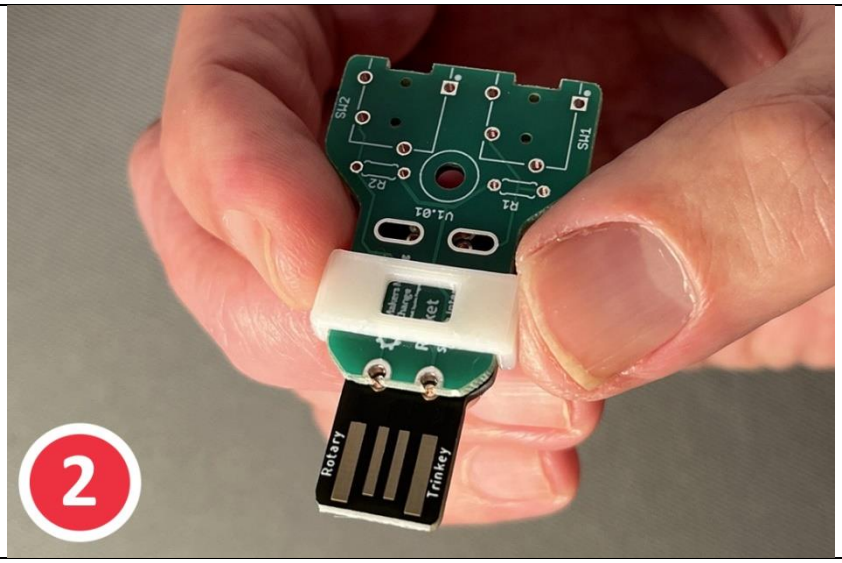
Step 1

Clip the Assembly Jig firmly onto the component side of the Rocket Switch PCB. Ensure the posts of the Jig go through the two oval holes.



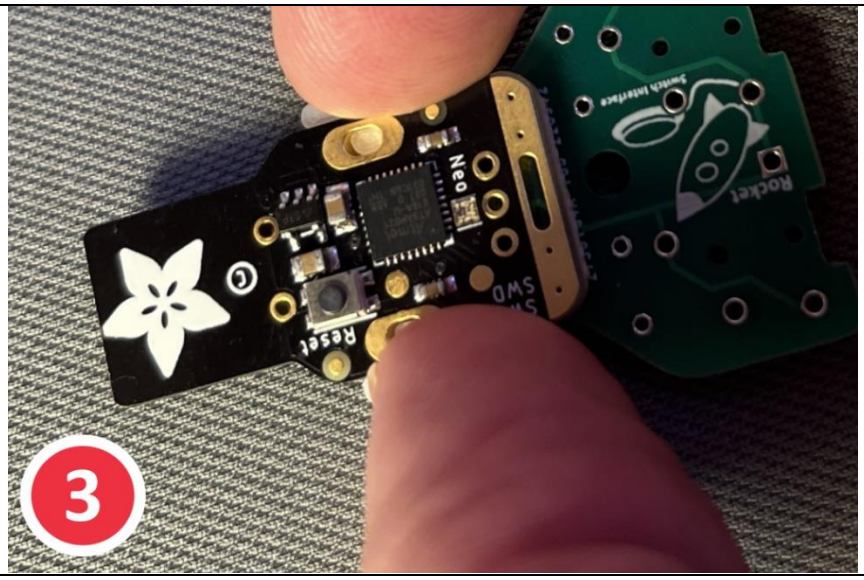
Step 2

While keeping the jig securely clipped in place, flip The PCB over to the solder side of the PCB. This is the side that has a small rocket ship logo, and text that says “Board side” to mark space reserved for the Rotary Trinkey board.



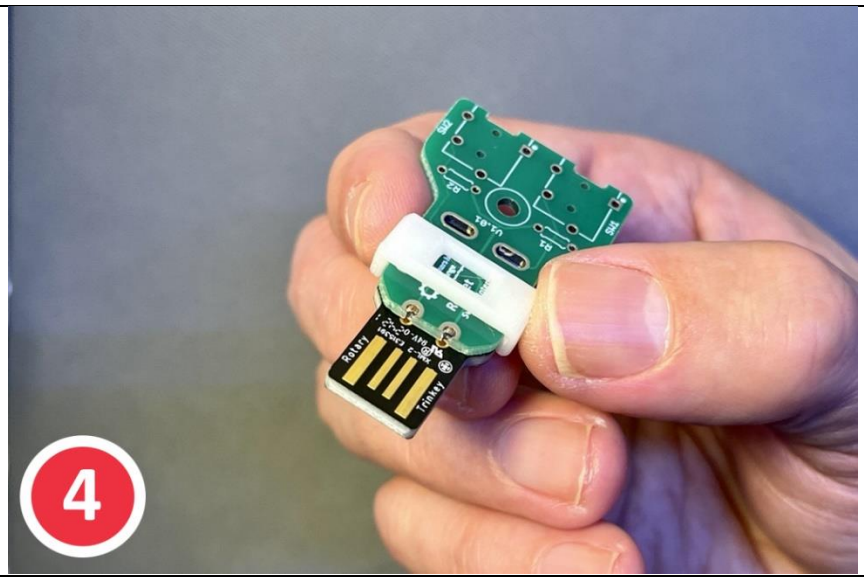
Step 3

Place the flat side of the Trinkey board onto the protruding clip posts, as shown in the image below. The Trinkey board should kept flat against the Rocket switch board.



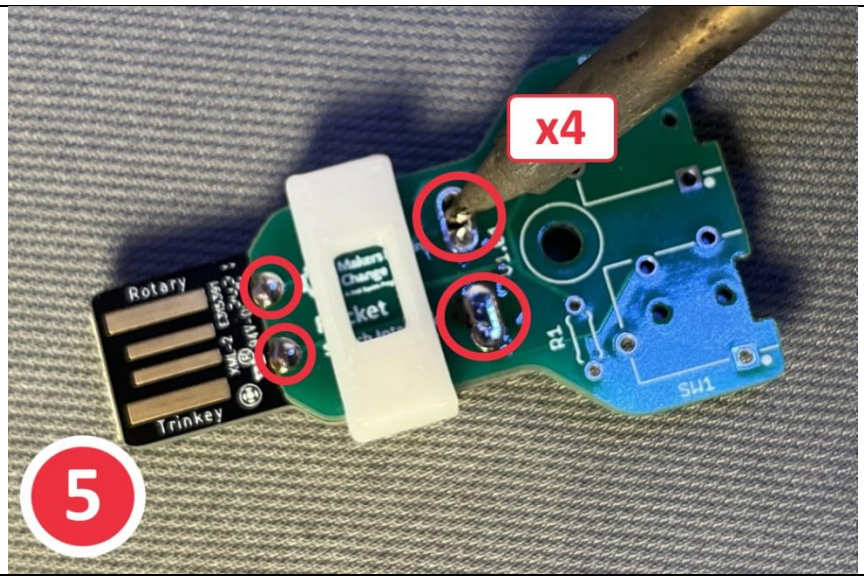
Step 4

Flip the board back to the component side, while again keeping the boards clipped flat together.



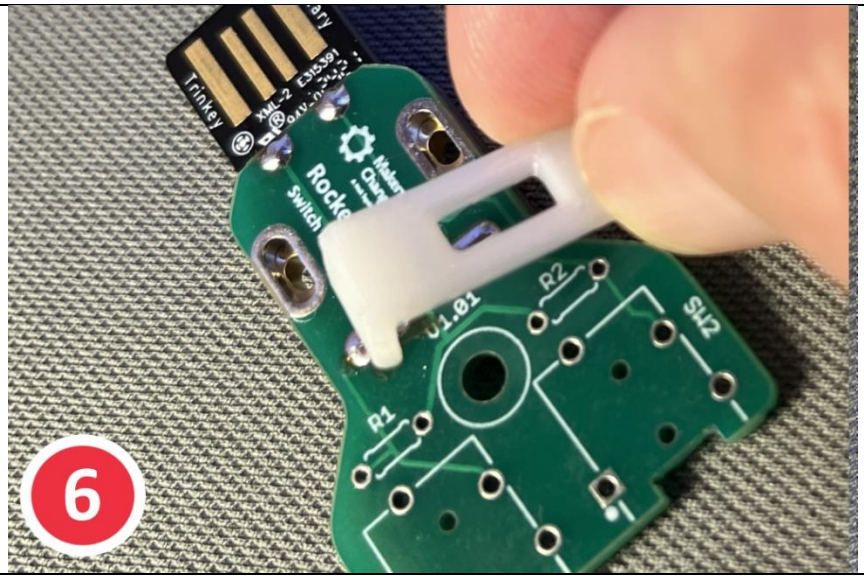
Step 5

Using a soldering iron and rosin core solder, fill one of the large oval holes with solder while maintaining the boards positioned together flat (no gap). Inspect the boards to confirm the boards are flush and straight. If so, solder fill the two round holes adjacent to the USB connector, and the remaining large oval hole.



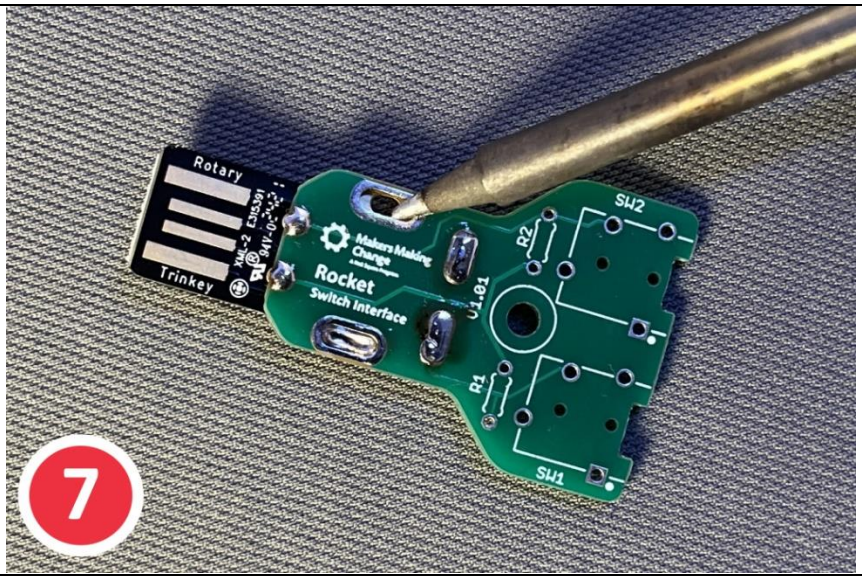
Step 6

Remove the jig clip from the two joined PCBs, as its task is complete. If you have access to a PLA plastic recycling bin, please place it there.



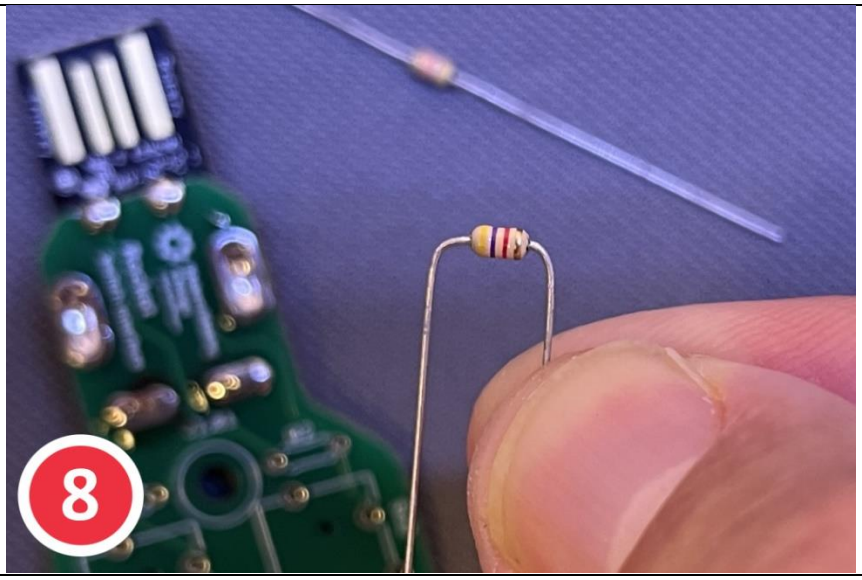
Step 7

Solder fill the two oval holes that were occupied by the posts on the jig.



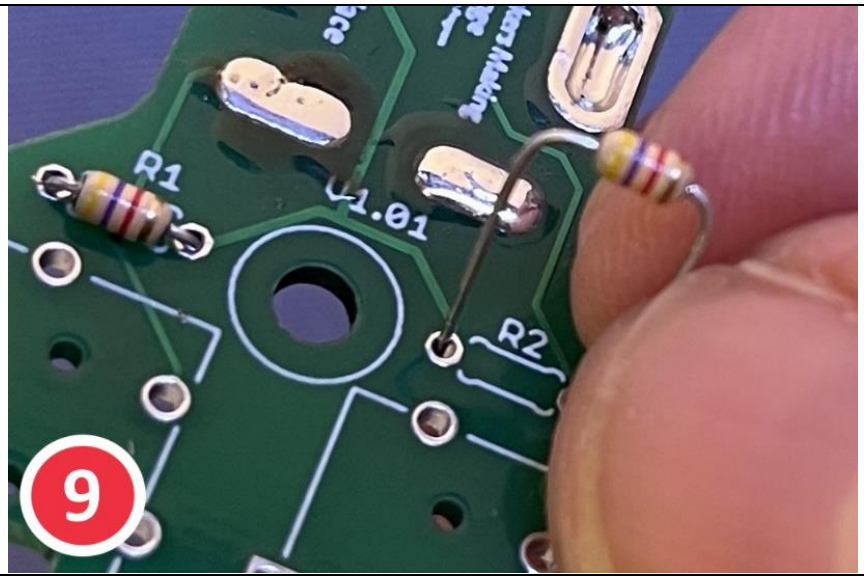
Step 8

Bend the leads of both 4.7K resistors (90 degrees), so that they appear as shown in the image below.



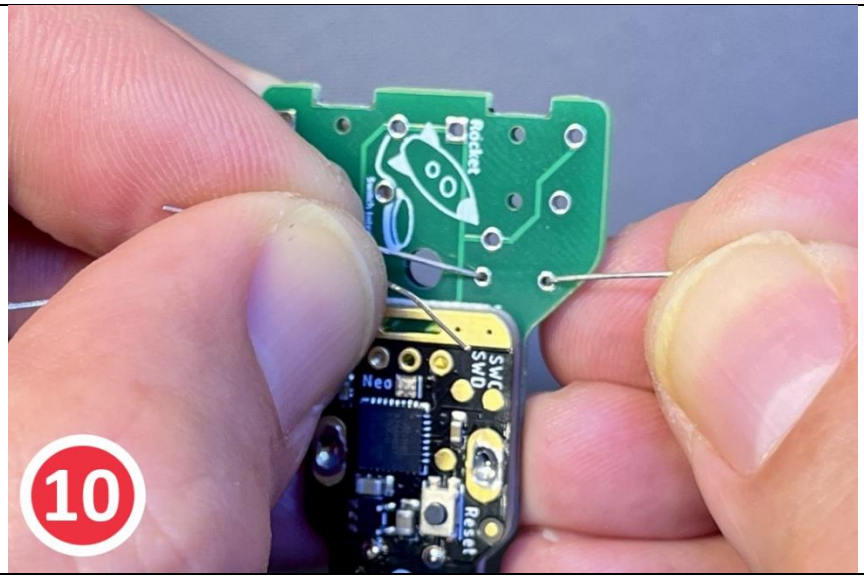
Step 9

Install both resistors into their respective locations marked “R1” and “R2” on the component side of the PCB (shown below), keeping each resistor against the PCB.



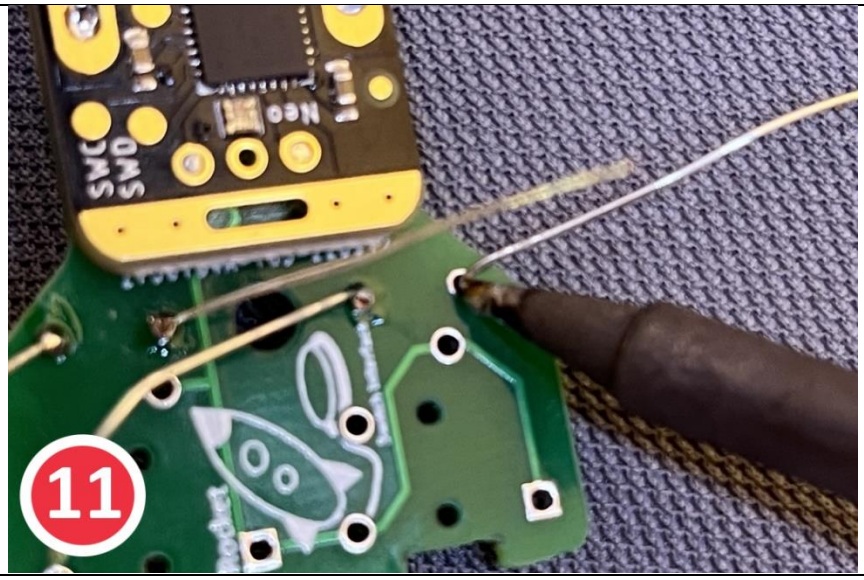
Step 10

Bend the inserted wires apart (45 degrees) on the solder side of the PCB. This will help keep the resistors in place for soldering (next step).



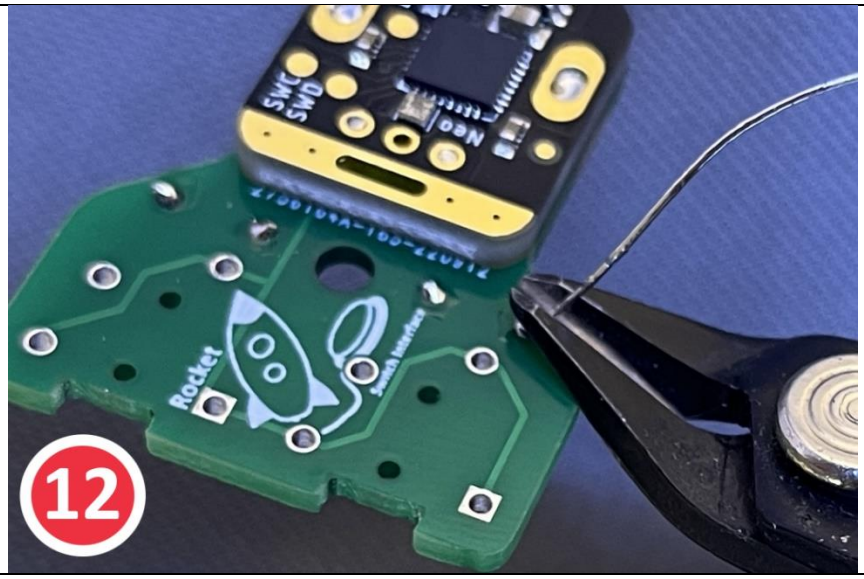
Step 11

Using the soldering iron, apply solder to all resistor wire holes.



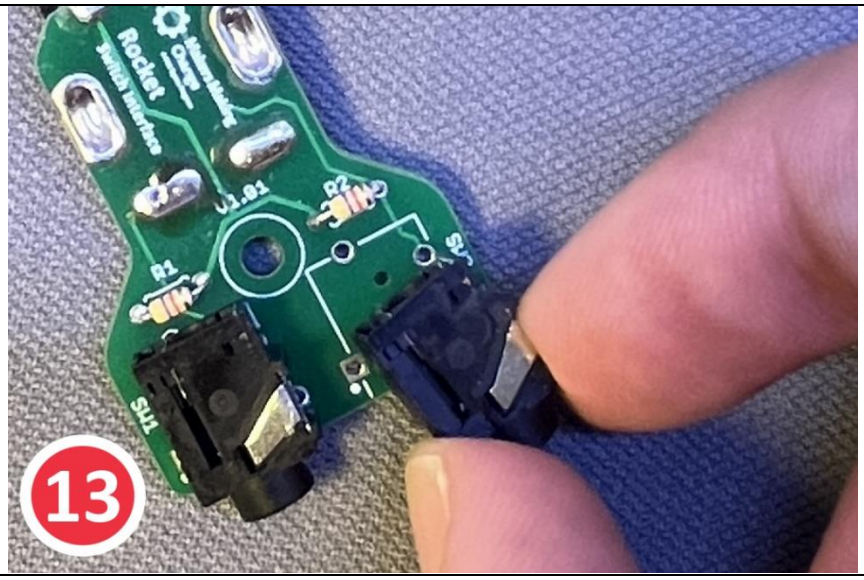
Step 12

Using side cutters, trim all the resistor wire leads flush with the top of each solder joint.



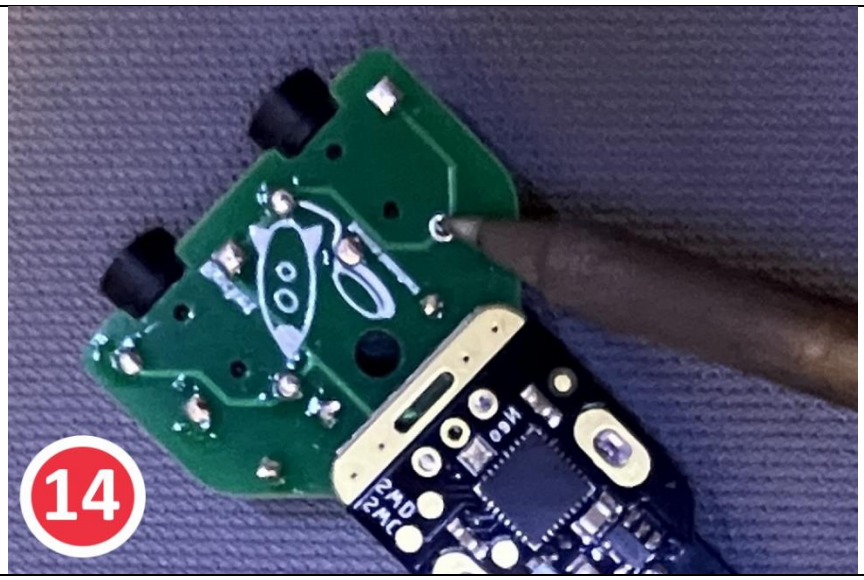
Step 13

Insert the two jacks into locations SW1 and SW2 on the component side of the PCB. Keep the jacks held in place with your fingers and flip the PCB in preparation for soldering.



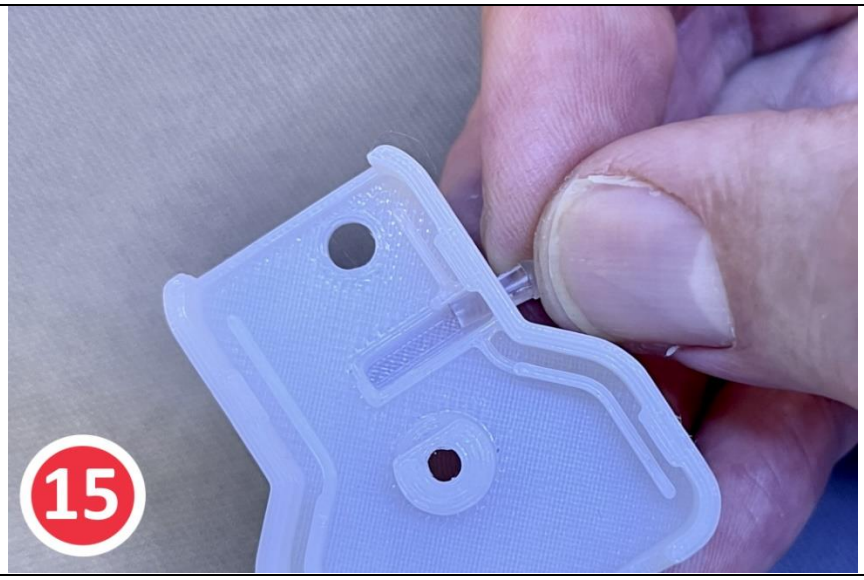
Step 14

Confirm the jacks remain firmly against the Rocket Switch PCB, as you solder the four jack pins on each jack to the PCB. This completes all the soldering steps for this project.



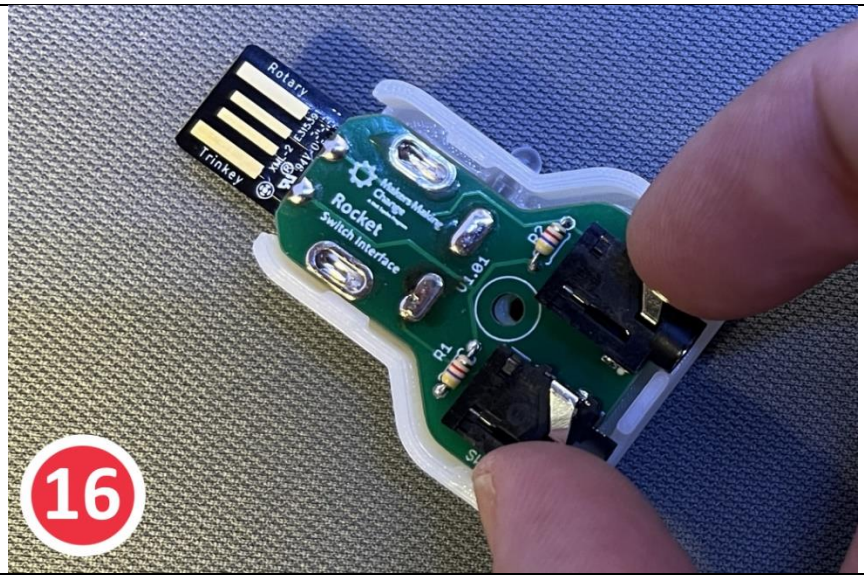
Step 15

Prepare the lower shell of the Rocket Switch case by inserting the light pipe into the side hole. The light pipe should be inserted until only the half sphere tip protrudes from the case.



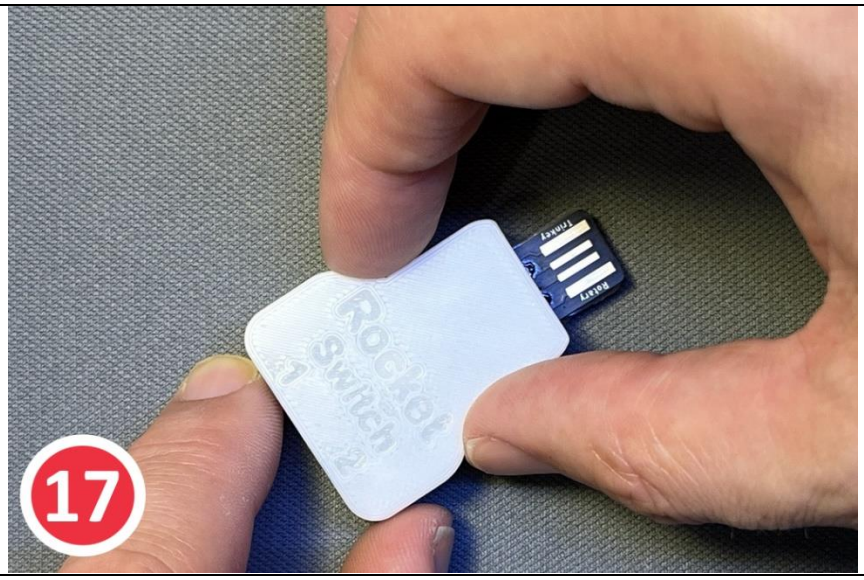
Step 16

Insert the Rocket Switch assembly into the bottom case. Ensure the jack ends are resting in the U-shaped half holes of the case, as shown.



Step 17

Align the top case with the lower case edge, then push down until it snaps together with the lower one.

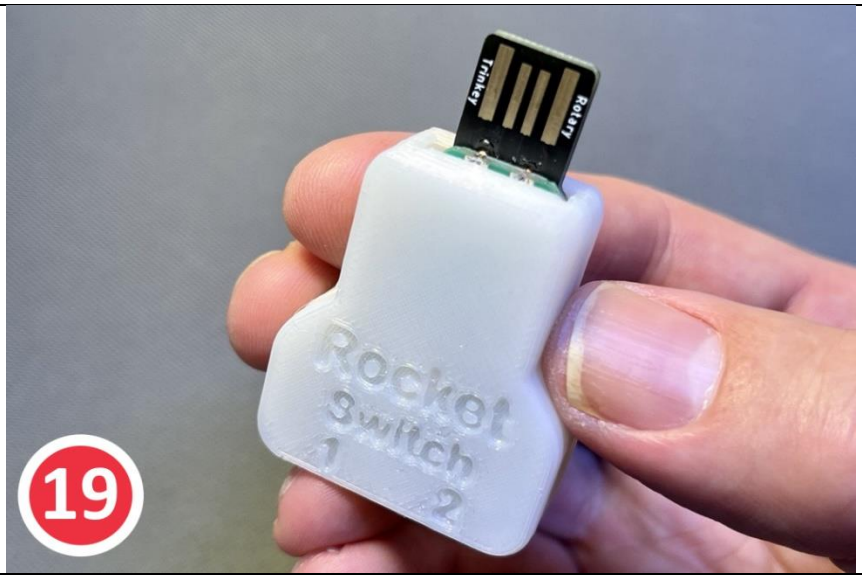


Step 18

Flip the encased Rocket Switch unit to gain access to the screw hole. Install the M3 X 8 mm screw into the hole with a Phillips screwdriver until it is snug. Do not overtighten.

Step 19

The physical construction of the Rocket switch is now complete. If the firmware's been pre-installed, then there's nothing more to do. Otherwise, flash the current firmware onto the Rocket switch prior to being used. See the Software Setup section (below) for instruction on this.



Software Setup

The Rocket-Switch-Interface software can be downloaded from the Rocket-Switch-Interface GitHub repository under ***Build_Files > Software_Files*** directory.

Installing Arduino IDE

The Arduino IDE is required to compile and upload the source code to the Adafruit Rotary Trinkey board. You can download and install the Arduino from official Arduino website that you can find using following link:

https://www.arduino.cc/en/software

Installing Arduino Libraries

The following instructions on how to install additional Arduino libraries helps you to get started with setting up Arduino IDE with required libraries and dependencies.

https://www.arduino.cc/en/guide/libraries

Board Support Packages

You can find the official instructions to install Board Support Packages on Adafruit website using following link:

https://learn.adafruit.com/adafruit-qt-py/arduino-ide-setup

Alternatively, you can perform following instructions to install Board Support Packages:

1. Open and start the Arduino IDE.
2. Go to ***File > Preferences***.
3. Add following link as a new line under ***Additional Board Manager URLs***
    - ***https://adafruit.github.io/arduino-board-index/package_adafruit_index.json***
4. Restart the Arduino IDE
5. Open the ***Boards Manager*** option from the ***Tools > Board*** menu and install ***Adafruit SAMD Boards by Adafruit***
6. Wait until the IDE finishes installing the cross-compiling toolchain and tools associated with Board Support Package. This may take few minutes.
7. That's it! The installation of Board Support Packages is finished.

Required Software and libraries

- StopWatch library
- Adafruit_NeoPixel library
- FlashStorage library
- Rocket_Switch_Interface.ino

You can use the following instructions to download and install the required libraries:

1) Visit the StopWatch library github repository page.
2) Click on ***Code > Download Zip*** to download ***StopWatch*** library.
3) Extract ***Stopwatch_RT-master.zip*** file
4) Rename ***Stopwatch_RT-master*** folder to ***Stopwatch*** folder under ***Stopwatch_RT-master*** subdirectory.
5) Copy or move ***Stopwatch*** folder to Arduino installation library subdirectory. As an example: This is found under ***C:\Program Files (x86)\Arduino\libraries*** in windows 10.
6) Visit the FlashStorage library github repository page.
7) Click on ***Code > Download Zip*** to download ***FlashStorage*** library.
8) Extract ***FlashStorage-master.zip*** file
9) Rename ***FlashStorage-master*** folder to ***FlashStorage*** folder under ***FlashStorage-master*** subdirectory.
10) Copy or move ***FlashStorage*** folder to Arduino installation library subdirectory. As an example: This is found under ***C:\Program Files (x86)\Arduino\libraries*** in windows 10.
11) Visit the Rocket_Switch_Interface.ino raw source code file under ***Rocket-Switch-Interface*** github repository page.
12) Right click on the source code or any place on this page and select ***Save Page As…***
13) Select the directory you would like to save the software in your computer.
14) Change ***File name*** from ***Rocket_Switch_Interface*** to ***Rocket_Switch_Interface.ino***
15) Change ***Save as type*** to ***All Files***.
16) Click on ***Save*** button.
17) Open the directory you selected in ***step 13***.
18) Double left click or open ***Rocket_Switch_Interface*** file
19) Arduino IDE will ask your permission to create a new sketch folder named ***Rocket_Switch_Interface*** and move ***Rocket_Switch_Interface.ino*** under this folder.
20) Click on the ***Ok*** button.
21) Arduino IDE should now open the ***Rocket_Switch_Interface.ino*** file automatically.

Uploading Software

Note: Make sure all files are included in your local copy of Software directory before uploading it to the Adafruit Rotary Trinkey board. The libraries can be installed in Arduino libraries..

1. Start the Arduino IDE
2. Open ***Rocket_Switch_Interface.ino***
3. Select the Board under ***Tools > Board > Adafruit SAMD Boards*** as ***Adafruit Rotary Trinkey (SAMD21)***
4. Select ***Arduino*** as ***USB Stack*** under ***Tools > USB Stack***
5. Select the correct port number under ***Tools > Port*** which should show ***COM XX (Adafruit Rotary Trinkey)***

Note: It's very important to make sure the correct Board and port number are selected as selecting the wrong board may result problems with bootloader of Adafruit Rotary Trinkey board.

6. Press the ***Verify*** button to make sure there is no problem with the software and libraries.
7. Press ***Upload*** button

You can now upload the software, Arduino IDE will show you a ***Done Uploading*** message indicating the software is uploaded to your Rocket-Switch-Interface.

The LED on the **Adafruit Rotary Trinkey** board blinks two times in ***teal*** to indicate the start of initialization process has been started and it will blink again two times in green to indicate end of the initialization process.