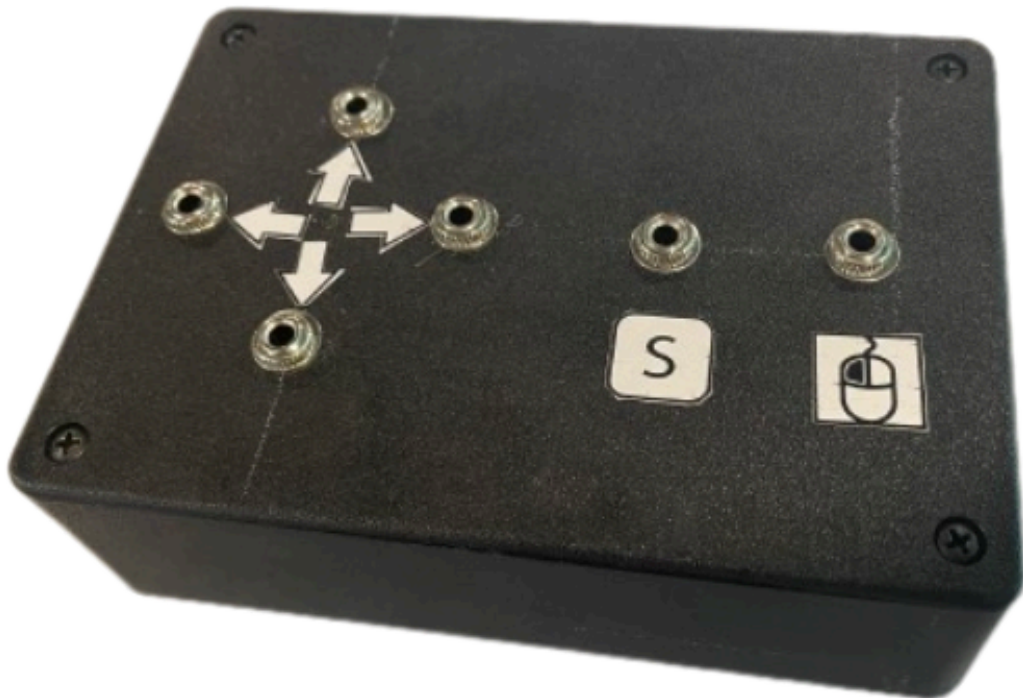


UPDATED 7/09

INPUT DEVICE MANUAL



Materials Needed

1

Audio Jacks (6)



Case (1)



Case Screws (4)



Nylon Female-Female 4-40
Threaded Standoffs (1/4" diameter
x 1/2" long) (12)



Hex-key button-head machine 4-40
machine screws (3/16" long) (3)



1/4-20 thread Nylon Spacer (0.5"
dia., 1" height) (1)



1/4-20 X 3/4 thread Nylon
Flathead (1/2" dia.) (1)



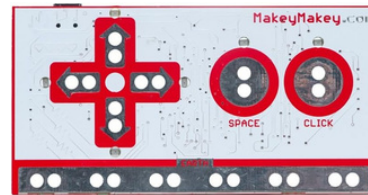
Mounting Tape (3 inches)



22 AWG Wires (2 diff. color rolls, 10
m each) (96 inches)



MakeyMakeyBoard (1)



#8 (M4) Ring Terminals (12)



1/8" dia. Felt Pads (4)



Electrical Tape (12 inches)



Tools Needed

Scissors



Wire Strippers



Filing Tool



Crimping Tool



Compact Drill



Drill Bit Set



Paint Pen or
Whiteout



Case Screws



1.5mm Allen
Wrench



X-Acto Knife



Wire Cutters



Scotch Tape



Soldering Pen



Soldering Wire



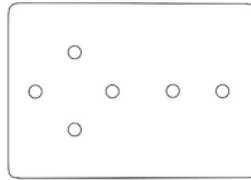
Ventilation Fan



Helping Hands



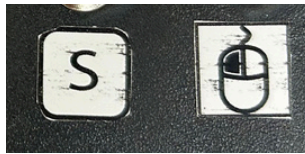
Templates
(Page 20)



3mm Screwdriver



Labels
(6 stickers)



Flathead
Screwdriver



Adaptable
Switch



USB Cable



Laptop



Safety Goggles



Instructions

1. **Solder Wires to Audio Jacks & Crimp Wires (45 minutes)**
2. **Drill Top Lid (15 minutes)**
3. **Drill USB Hole (15 minutes)**
4. **Connect Ring Terminals to MakeyMakey Board & Drill Mounts (30 minutes)**
5. **Apply Reinforcements (45 minutes)**
6. **Final Touches (5 minutes)**
7. **Test it Out! (5 minutes)**

How-To Videos



Solder



Wire Strip



Drill

Links to Buy Materials

TINYURL.COM/INPUTDEVICEMATS

Solder Wires to Audio Jacks & Crimp Wires

Tools: Audio Jacks, Wires, Ring Terminals, Solder Pen, Ventilation Fan, Wire Strippers, Electrical Tape, Scissors, Combination Square, Wire Cutters, Helping Hands, Ring Terminals, Solder Wire

Time: 45 minutes

1) Heat up the solder pen to the highest temperature (or at least 750 Fahrenheit) and turn on the ventilation fan.



Safety check!
Make sure you have safety goggles on and the fan is going.



**Learn
how to
solder:**

2) Cut 6 pieces of white wire, 8 inches each. Then cut 6 pieces of red wire, 8 inches each.



3) Strip around 1/4" off of both sides of all 12 wires with the wire strippers.

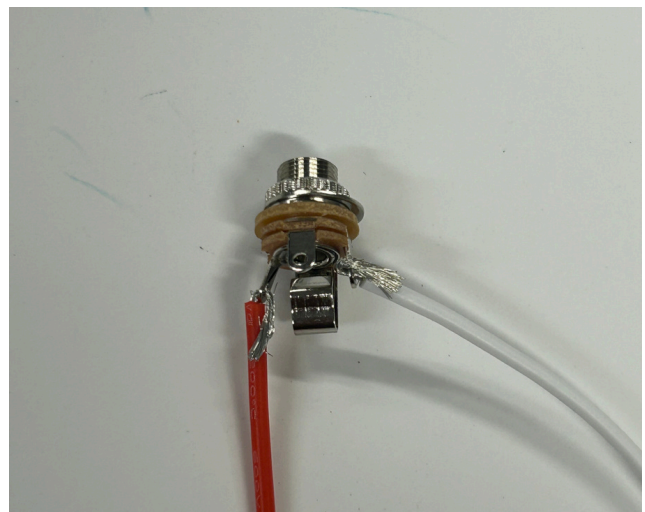


Learn
to wire
strip:



4) Take the white wire and twist together the exposed wire so that you can insert it through the right side of the ring terminal, then pinch it together with your fingers so it loosely stays on. Do this with all six ring terminals and six white wires on the right side.

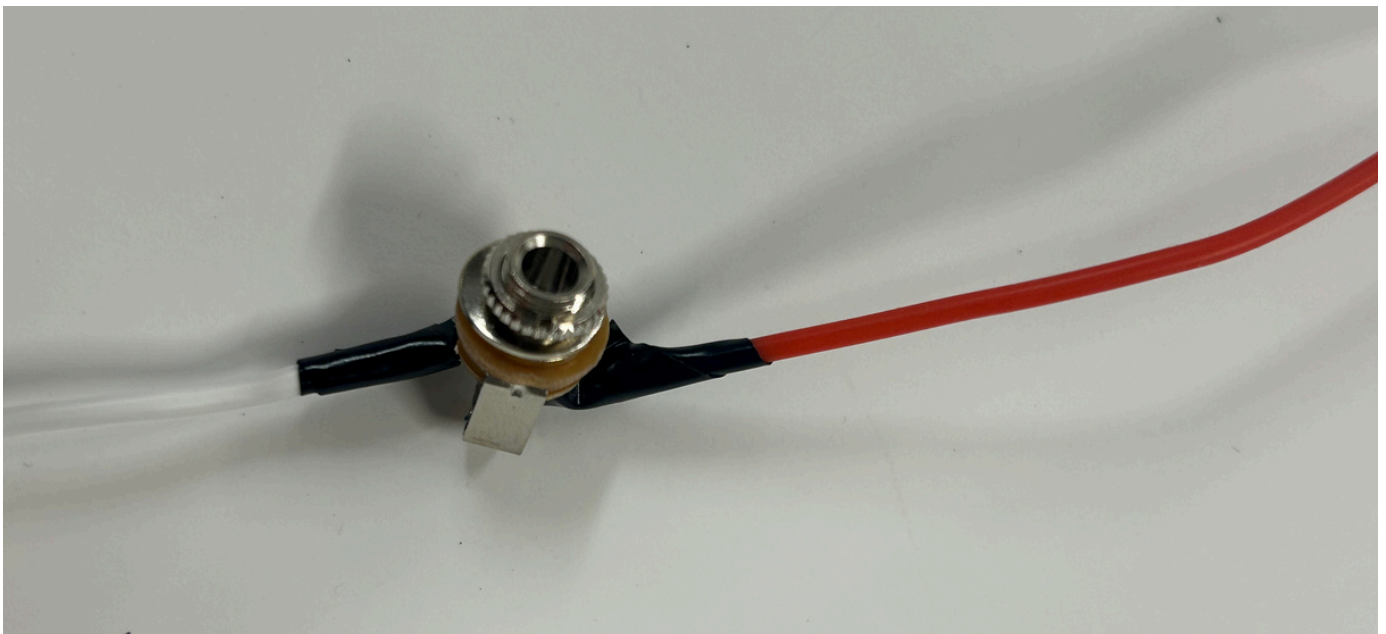
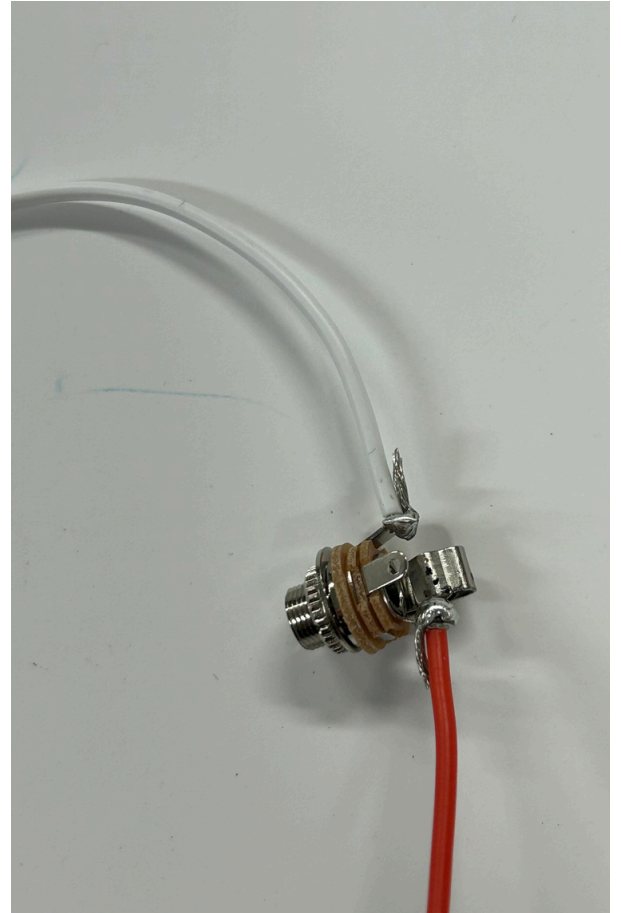
Then, do the same thing with all six red wires, this time on the left side of the ring terminals.



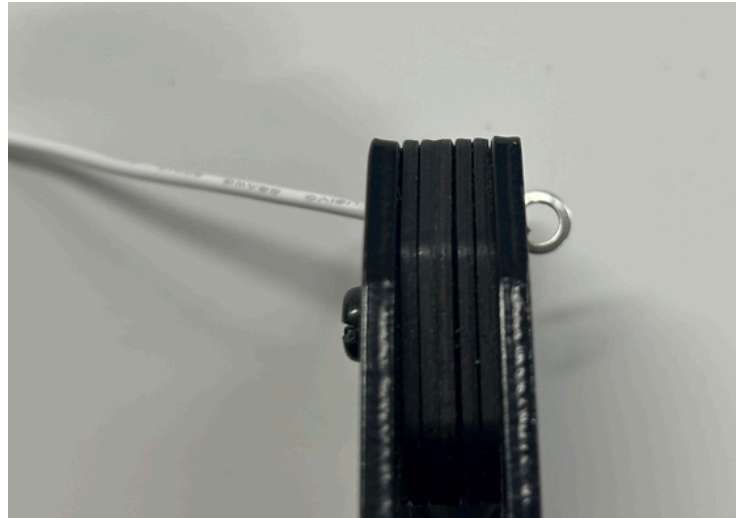
5) Place the ring terminal in the helper hands. Now use the soldering iron to solder each of the wires in place. Make sure your soldering is strong enough that you are not able to pull the wire out of the ring terminal. Make sure to wait 15 seconds before touching, and to use safety goggles.

Repeat this with all 12 wires and their respective holes.

6) Now cut around 0.5 inches of electrical tape to cover the wire terminal on the audio jack. Repeat for all 12 wires.

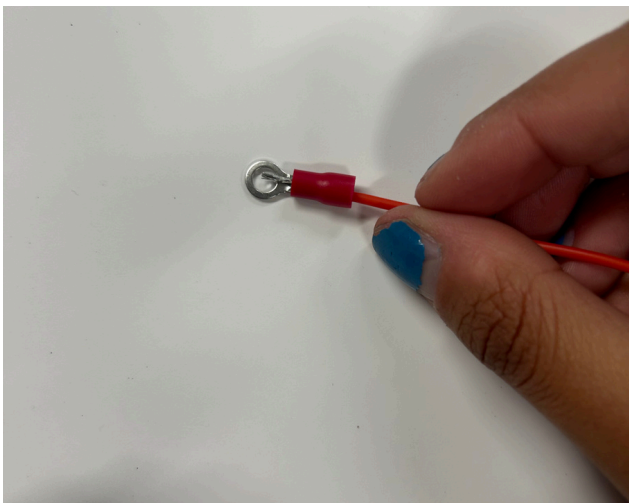


7) Now take the other end of the wire that is not soldered to the ring terminal. Insert it into an M4 red ring terminal so that the wire is barely showing on the ring side.



8) Carefully crimp the wire (using the red or 22-16 slot on the wire crimper). It is recommended that you insert the insulated part of the terminal just enough for the terminal to be snugly inserted then crimp the tool using both hands. Then crimp the terminal until the tool unlocks again.

To check if you crimped the wire correctly, lightly pull at the wire. If it does not come out from the ring, you've succeeded! Repeat this step for all 12 wires.



**Check in
before
moving
onto the
next step!**

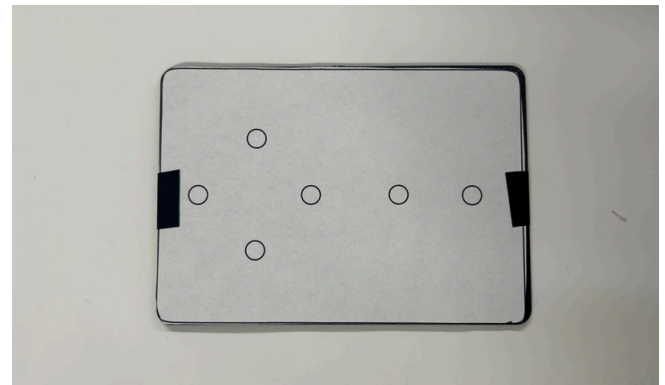
Drill The Lid

Tools: Case Lid, Audio Jacks, Safety Glasses, Compact drill, 1/4" drill bit, Lid Template, Small Filing Tool, Round Filing Tool, Scotch Tape

Time: 15 minutes

Alternatively: Laser cut: go to Page 20 for the files!

1) Remove the lid from your case and set it facing down. Take a lid template and tape it to the lid so it does not move.

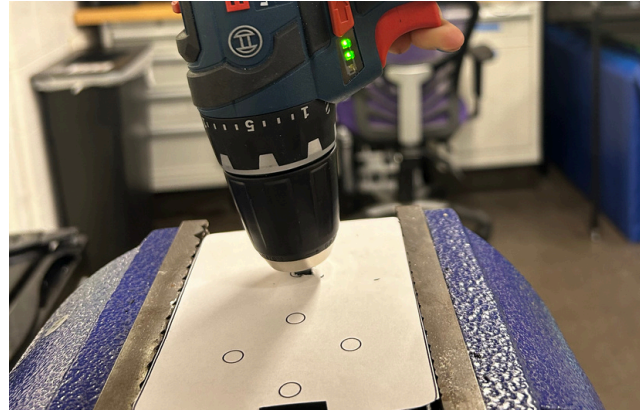
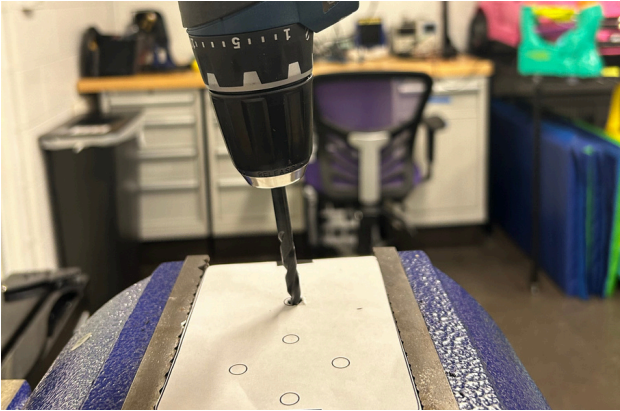


2) Use the 1/4" drill bit. Insert it into the drill and turn the chuck clockwise to close so the drill bit is secured. Ensure it holds by pressing the drill button. If it falls out or is wobbly, insert the drill bit again and tighten it more.



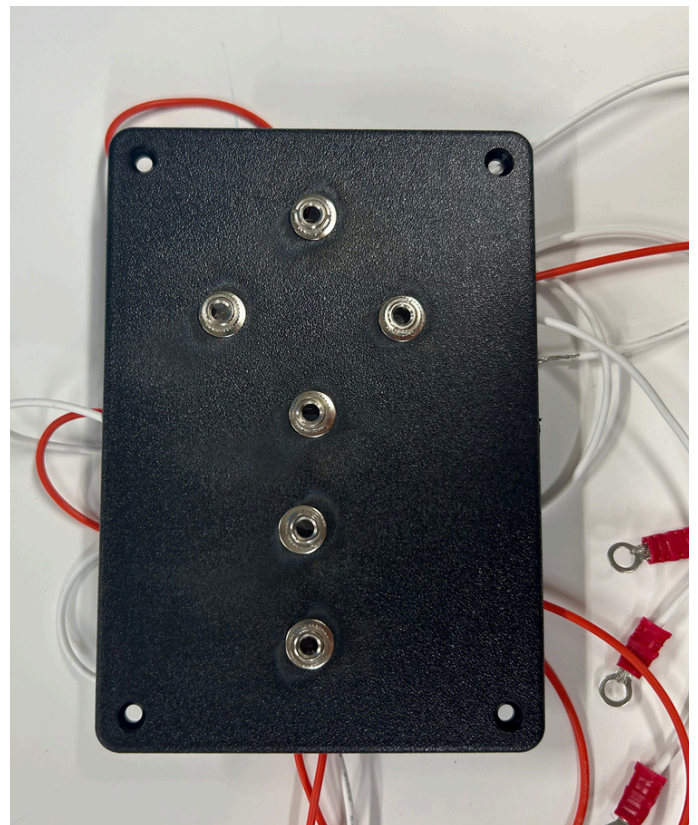
Learn
how to
drill:

3) Use your drill to drill through each hole in the template. To drill forward, press the button on the right side of the drill and push down. Keep drilling as you go down and then bring it back up.



4) Use an Exacto knife to carefully file away any plastic shavings covering the hole.

5) Finally, remove the bearings and washers from the screws. Screw in each audio jack into the lid from the underside, and screw back on the washer and the bearing from the top.

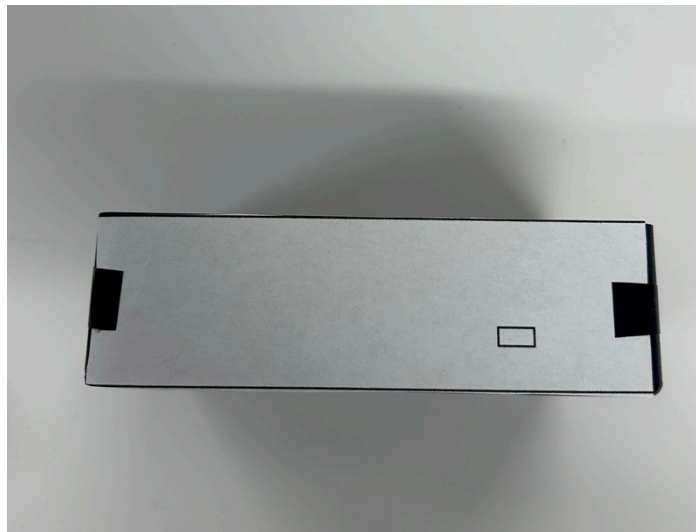


Drill The USB Hole

Tools: Safety Glasses, Compact drill, 1/8" Drill Bit, Side Template, Small Filing Tool, Scotch Tape

Time: 15 minutes

1) Take your side template and tape it to the long side of the case, then tape it on so it does not move.



2) Use a 1/4" drill bit to drill two holes on opposite sides of the open slot, then use an Exacto knife or a filing tool to file away all plastic until the hole is clear.



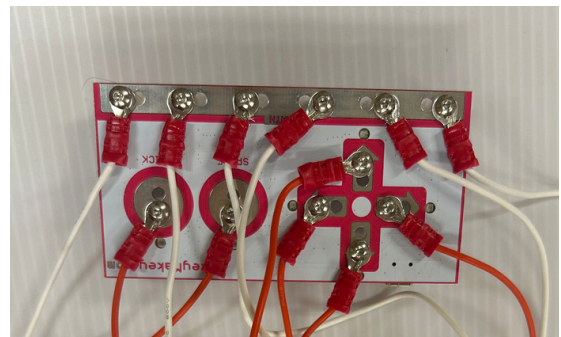
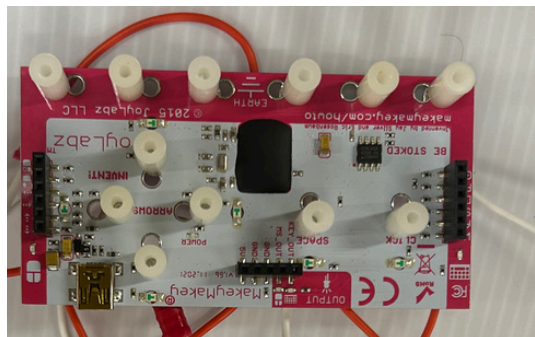
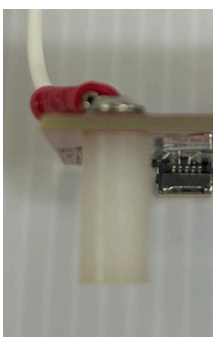
Safety check! Make sure you're cutting away from yourself when using a blade!

Connect Ring Terminals to Board and Drill Mounts

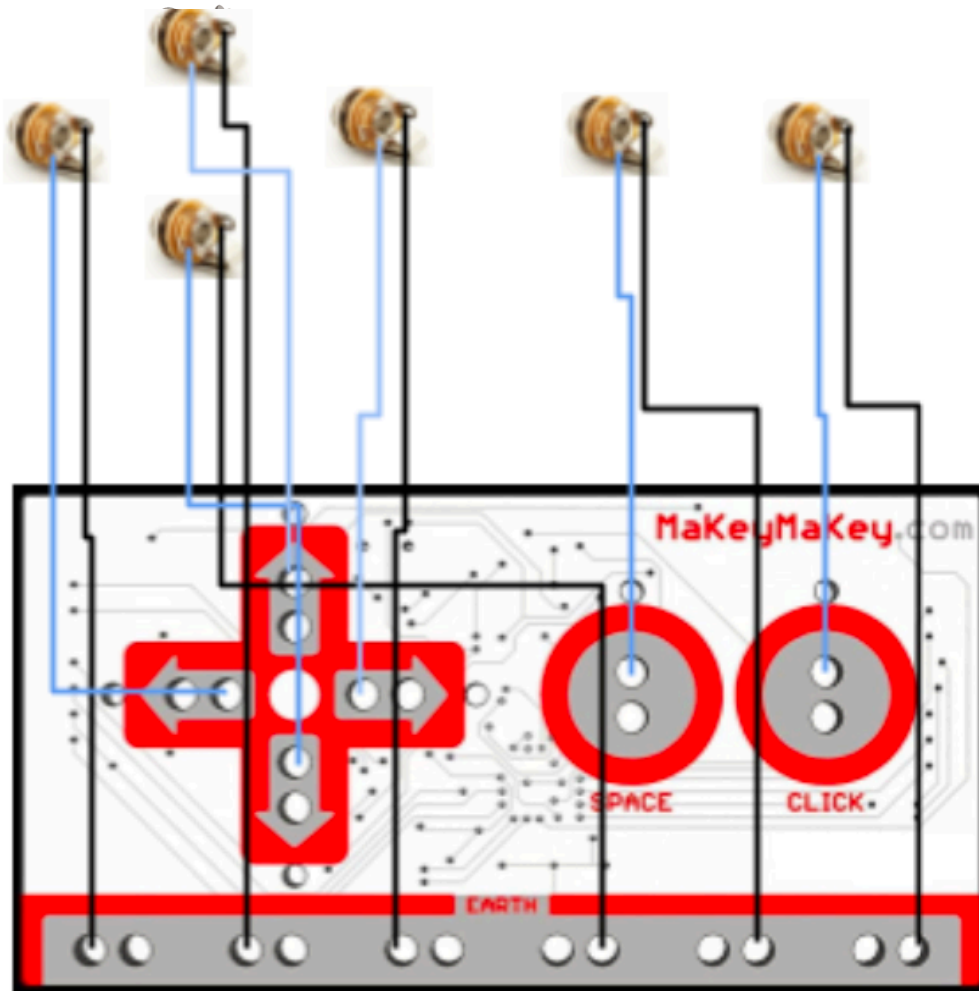
Tools: MakeyMakey Board, Audio Jacks, Mounting Kit, Allen Wrench, Case Lid, Safety Glasses, Compact Drill, 7/64" Drill Bit, Paint Pen, Small Filing Tool, Nylon Spacer, Nylon Flathead Screw, Flathead Screwdriver

Time: 30 minutes

- 1) Use the mounting kit to screw each ring terminal into their respective holes through the board to the plastic mount using your allen wrench (be careful not to mix up and down if you have the underside of the lid facing towards you).
- 2) First place the screw in the ring terminal and hole (the ring should be in between the nail head and the board). Then screw the plastic mount onto the nail while holding the nail and ring terminal down.

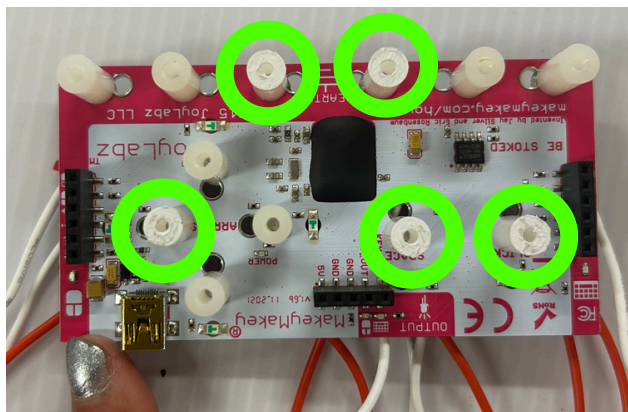
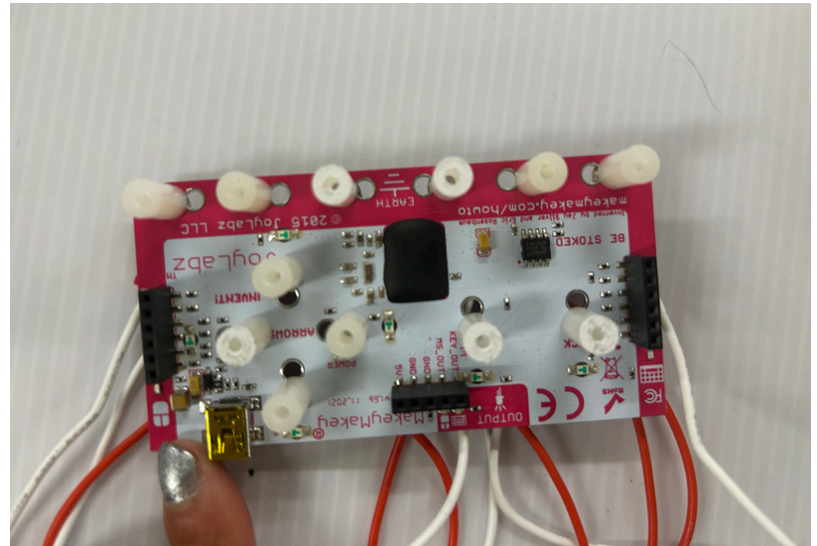


3) Follow the schematic below to place your ring terminals. Ensure you are following this exactly so that the board works properly and for mounting purposes later.



At this point, the wiring should be working! You can conduct a test by plugging in your switches and ensuring the device works. Check in with your leader.

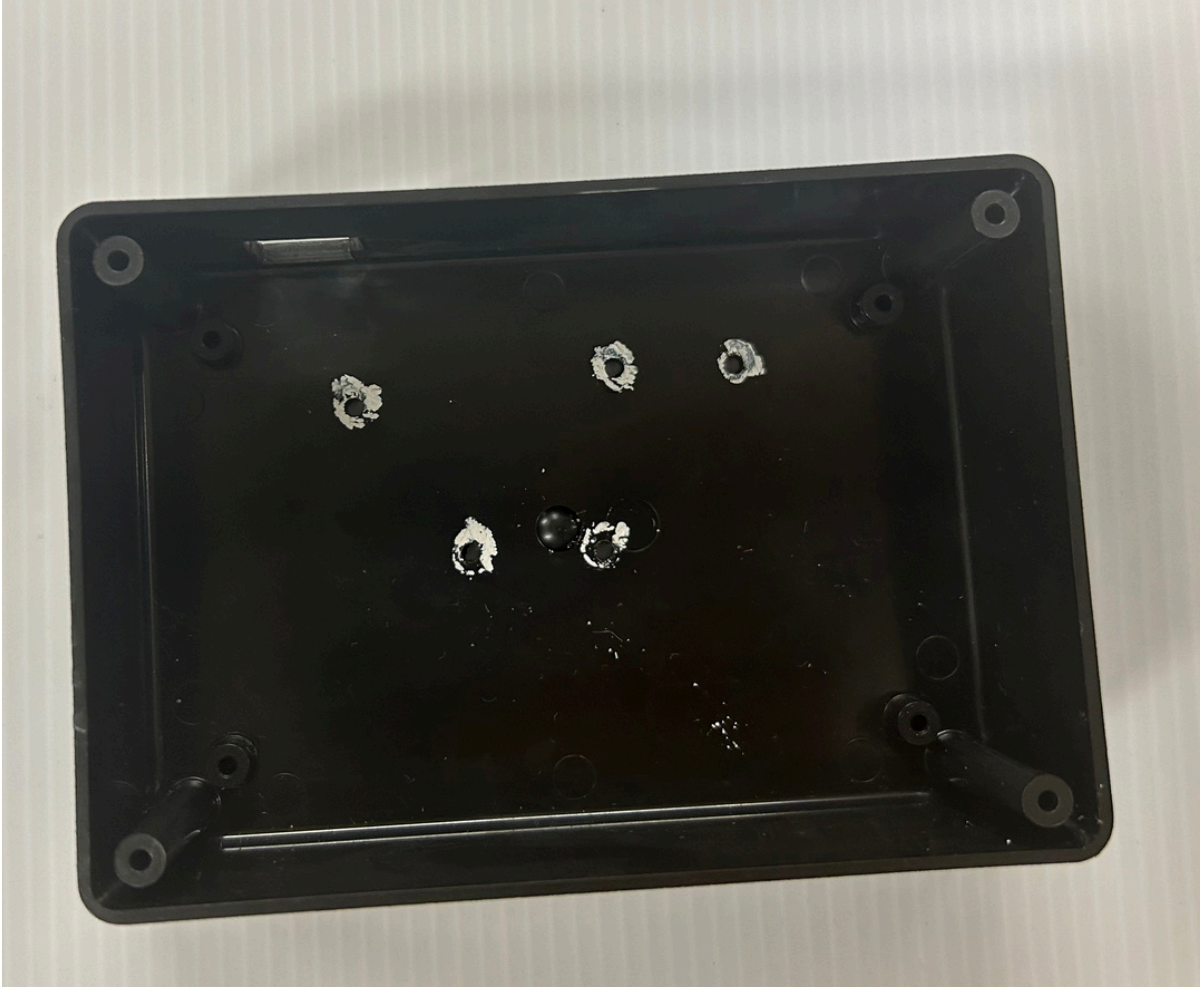
4) Flip the MakeyMakey board so that the underside of the standoffs are showing.



5) Using your paint pen or whiteout, paint the underside of each selected standoff (green circles). We will use this as a stamp to know where to drill.

7) Press down on the MakeyMakey board, while keeping the board flush to the edge and lined up to the USB hole, to mark the spots where you need to drill (The circles surrounded by white ink). If the circular protrusion in the middle of the board is blocking your board from fitting, file it down.

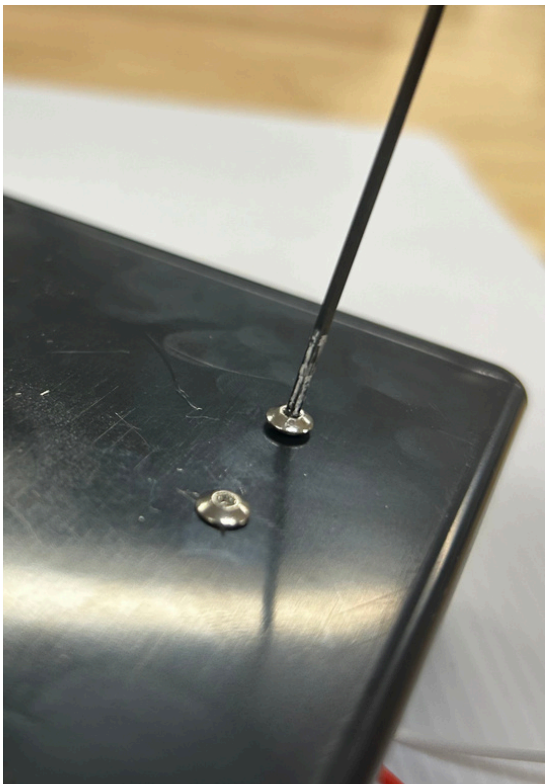
8) This is what the inside of the case should look like. If the circles didn't transfer properly, no worries! This part can be tricky to get right. Simply wipe away the paint/whiteout and try Steps 5 and 6 again.



Safety check! We're using a drill again. If you need a refresher, check Page 8.

9) Put on your safety goggles and insert a 7/64" drill bit to the compact drill. Then drill through the marked circles on the bottom lid.

Afterwards you might need to use the Exacto knife and/or the small filing tool to scrape away any plastic shavings.



10) Place the MakeyMakey board to where you had it when you pressed down the paint. Then screw each mounting kit screw into the 5 holes from the underside of the lid. Use your allen wrench to tighten the screws as much as you can. Tip: angle your screw while screwing if you're having difficulty getting it in!



Check in before moving onto the next step!

Reinforcements

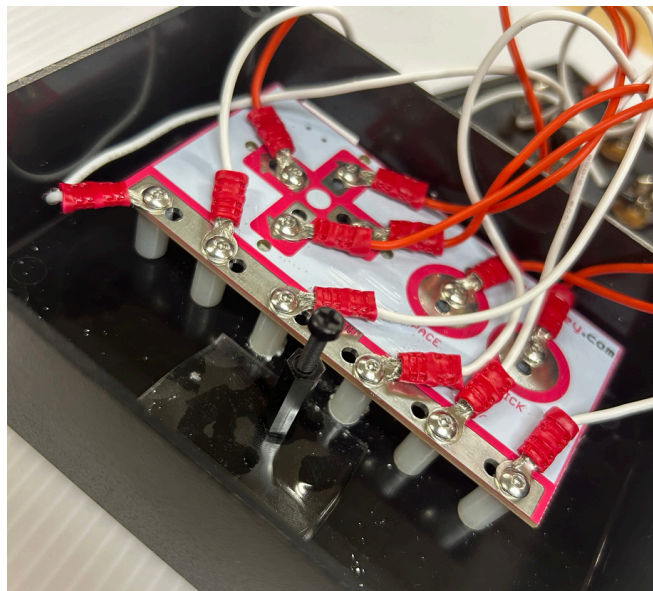
Tools: Flathead screwdriver, Nylon flathead screw, Nylon spacer, Permanent foam mounting tape

Time: 5 minutes



1) With your flathead screwdriver, screw a nylon flathead screw to a nylon spacer until the flathead/spacer pillar is a height of 1.335 inches.

2) Use the permanent foam mounting tape to mount the nylon pillars right next to the MakeyMakey board on the lower side of the board. Then push the nylon pillar into the specified spot.

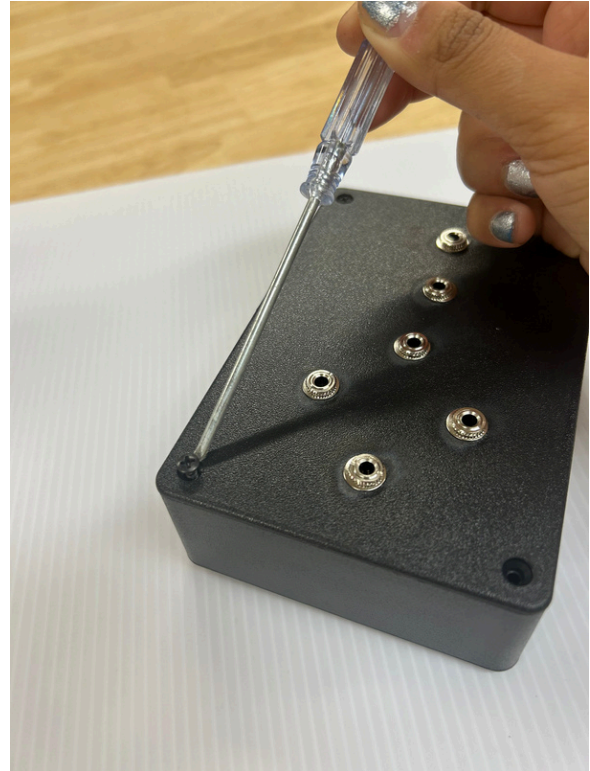


Finishing Touches

Tools: 3mm Screwdriver, Case Lid, Felt Pads, Stickers

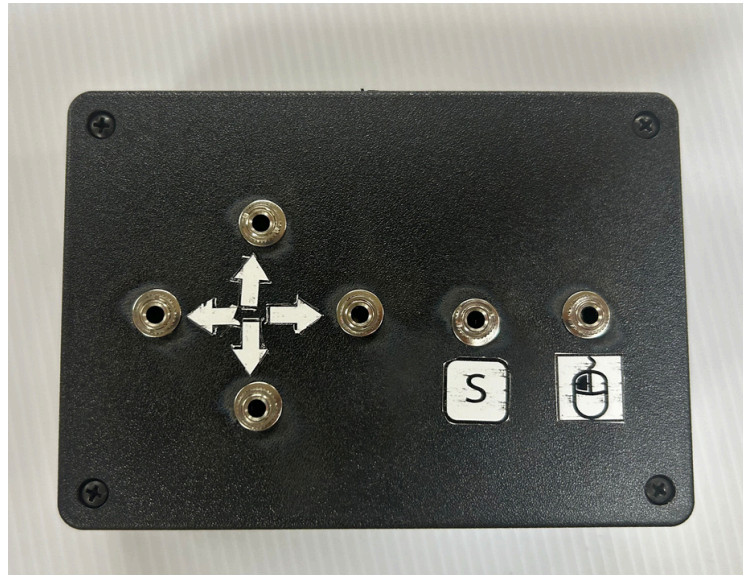
Time: 5 minutes

1) Close the lid and screw the case lid on using the case screws (on the 4 corners). You might need to move some of the wires out of the way from the pillar as you are closing (you shouldn't have to force it in.)



2) Flip over the Case and put a felt pad on each corner on the underside of the case.

3) Use your label stickers to put the stickers in their respective places (for all directions, space, clicker and USB hole).



4) Test it out: plug in the red cord to your input device and a laptop, then plug in a switch (or multiple!), and try out a game. Not sure what game to play? Try one from our ever-growing spreadsheet: tinyurl.com/switchkitgames



The End!

Templates

The following links and pages are intended to assist you through the build. This is a template for the lid and USB hole on the side of the device if you intend to drill.

If you want to use a laser cutter instead, we've attached the Adobe file with the correct dimensions.

tinyurl.com/inputdeviceadobefile

