

MMC60 Assembly Guide

by Makers Making Change
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Required Parts and Tools

Parts

- 12 cm of 22 AWG wire
- 1 hex bolt
- 2 hex nut
- 1 limit switch
- 5 M4 screws
- 1 MMC60 Button Base Bottom
- 1 MMC60 Button Base Top
- 1 MMC60 Button Cap
- 1 MMC60 Button Flexure
- 1 MMC60 Button Pins
- 1 MMC60 Switch Mount
- 1 mono jack

Tools

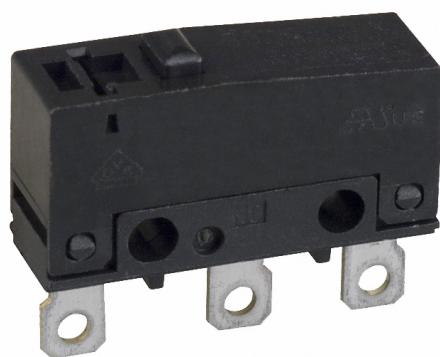
- 1 needle nose pliers
- 1 soldering iron
- 1 switch tester
- 1 wire strippers

You can access the full bill of materials [here](#).

Parts and Tools Images

All required parts and tools for this build are shown in the below image gallery.







Step Summary

- 3D Printing Parts (page 8)
- Remove sacrificial plastic (page 11)
- Insert Nuts (page 12)
- Assemble Electronics (page 14)
- Solder Electronics (page 18)
- Assemble Switch (page 20)

Bill of Materials

Parts

- 12 cm of 22 AWG wire
- 1 hex bolt
- 2 hex nut
- 1 limit switch
- 5 M4 screws
- 1 MMC60 Button Base Bottom
- 1 MMC60 Button Base Top
- 1 MMC60 Button Cap
- 1 MMC60 Button Flexure
- 1 MMC60 Button Pins
- 1 MMC60 Switch Mount
- 1 mono jack

Tools

- 1 needle nose pliers
- 1 soldering iron
- 1 switch tester
- 1 wire strippers

3D Printing Parts

Step 1: 3D print the following parts.

All .stl files for 3D printing this switch are available at the Printables MMC60 Switch device page.



All parts are designed to be printed with a 0.2 mm layer height, 20% infill, no supports, and a 0.4 mm nozzle diameter unless otherwise stated.

Part Picture	Part Name	Part Number
	MMC60 Base Bottom	1A
	MMC60 Button Base Top	1B
	MMC60 Button Flexure	1C

Part Picture	Part Name	Part Number
	MMC60 Button Pin	1D
	MMC60 Switch Mount	1E
	MMC60 Button Cap	1F

Part Picture	Part Name	Part Number
		

Remove sacrificial plastic

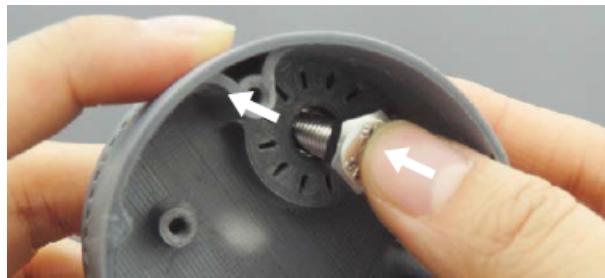
Step 1: Remove sacrificial plastic from button cap.

- Remove the sacrificial layer of plastic from the MMC60 Button Cap using a pair of needle nose pliers.



Step 2: Clear hole in base.

Push the hex bolt through the MMC60 Button Base Bottom, as shown in the first image. Make sure the layer of sacrificial plastic is fully removed and the hole is clear, as shown in the second image.



Insert Nuts

Step 1: Insert hex nut

Insert a hex nut into the space on the MMC60 Button Cap.



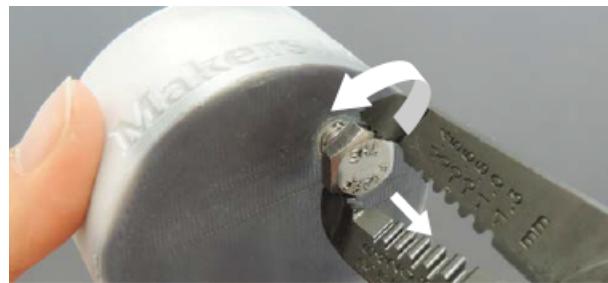
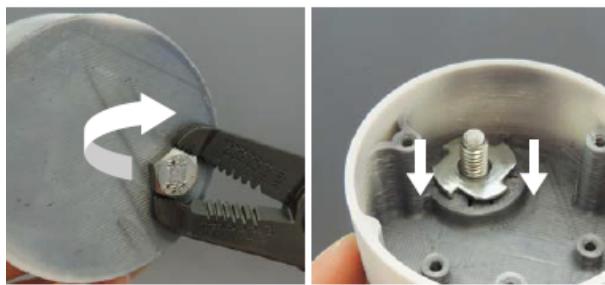
Step 2: Position the Tee-Nut

Place the tee-nut teeth onto the slits in the base bottom, as shown.



Step 3: Seat the Tee-Nut

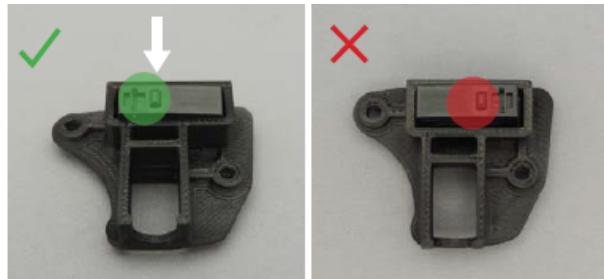
- Screw the hex bolt from the bottom of the base through the tee-nut.
- Use the pliers to tighten the hex bolt until the tee-nut sits flush with the 3D printed part.
- Remove the hex bolt.



Assemble Electronics

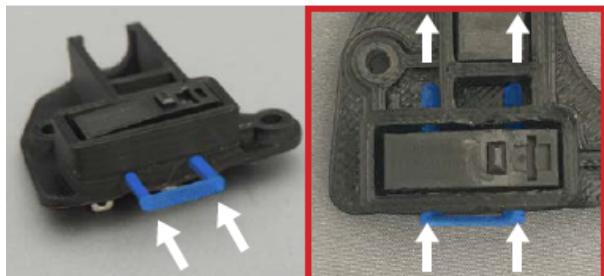
Step 1: Position limit switch

Insert the limit switch into the MMC60 Switch Mount as shown.



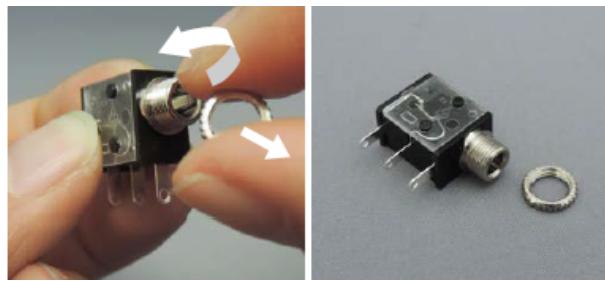
Step 2: Insert pins

Insert the MMC60 Button Pins through the switch mount and limit switch, as shown.



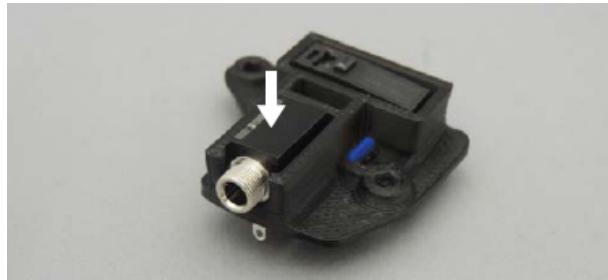
Step 3: Remove nut from jack

If the nut is attached to the mono jack, remove it. Place the nut somewhere you will not lose track of it or where it cannot roll away.



Step 4: Position jack

Place the mono jack in the switch mount, as shown.



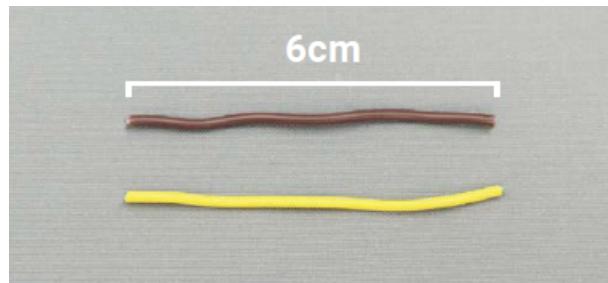
Step 5: Secure jack

Tighten the nut onto the mono jack to secure it to the switch mount. You may need to use pliers to tighten it sufficiently.

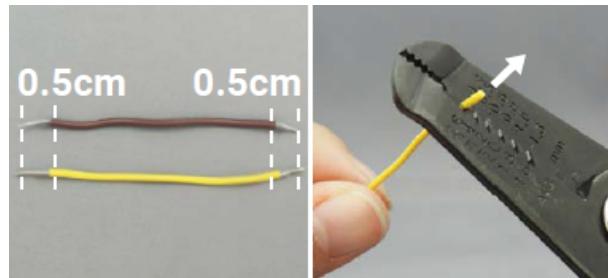


Step 6: Cut and strip wires

- Use the wire strippers to cut two, 6 cm lengths of 22 AWG wire.

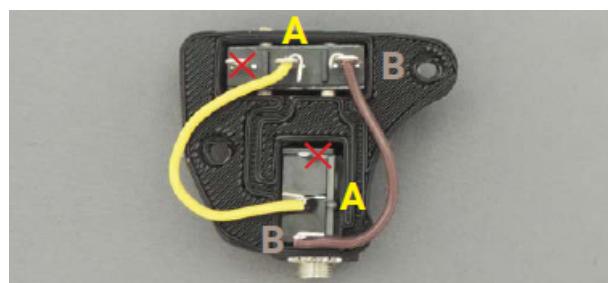


- Use the wire strippers to strip 0.5 cm off both ends of each wire.

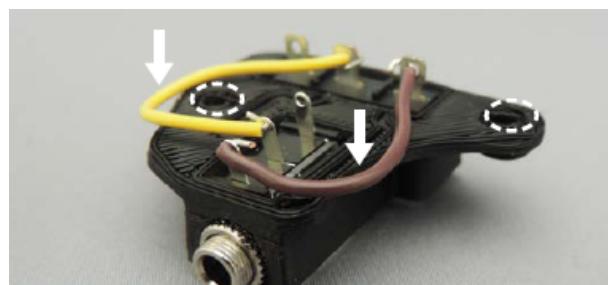


Step 7: Connect wires

- Connect the **A terminals** together with one wire and bend in place. Connect the **B terminals** with the second wire and bend in place.



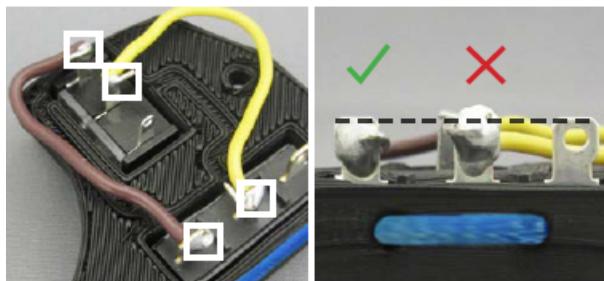
- Flatten the wires so they're flush against the switch mount. Do not obstruct the two holes.



Solder Electronics

Step 1: Solder the wired connections

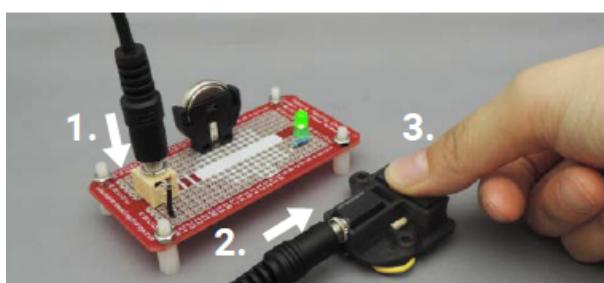
Using a soldering iron, solder the wired connections at the four indicated squares. Keep the tips of the terminals free of solder, as shown.



Step 2: Test the switch

Using a switch tester, test that the newly soldered switch works. Use the 3.5 mm mono cable to connect the mono jack to the switch tester, and press the small bump on the top of the limit switch. The LED on the switch tester should light up when you press the switch.

If the switch works as expected, skip the Troubleshooting section below.

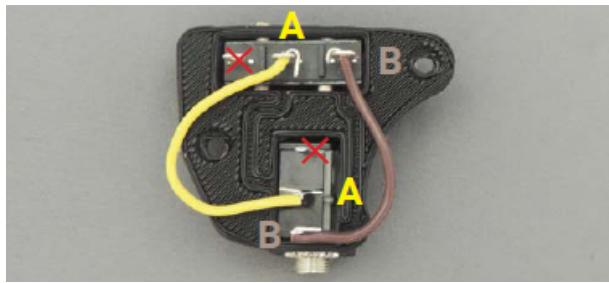


Troubleshooting

If the switch does not work as expected, try these troubleshooting steps.

Issue: The LED does not turn on or is inconsistent (blinks or only sometimes turns on) when the limit switch is pressed.

- Check that the wires are connected to the correct terminals.



If the wires were connected incorrectly, remove the wires and connect them correctly, then solder them in place.

- Check that the soldered connections are secure. Gently pull on/twist the wires. They should not move at the solder joints.

If the wires move at the solder joints, use the soldering iron to reheat the joint. Make sure the wires and terminals (metal legs on the mono jack and limit switch) are both heated so solder connects them together.

Issue: The LED is always on when the switch is plugged in.

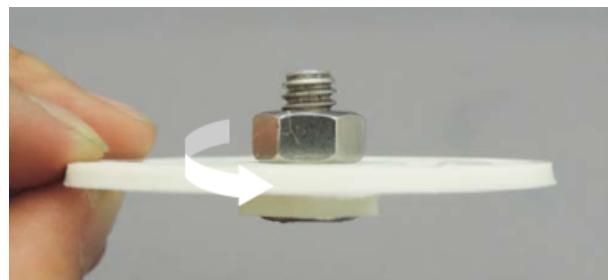
- Check if wires or solder are touching across the terminals of the mono jack and/or limit switch.

If wires are touching across terminals, you may trim excess wire. If solder is connecting two terminals together, remove the excess solder using a solder sucker or other tool.

Assemble Switch

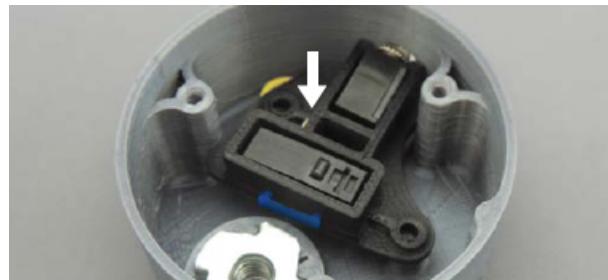
Step 1: Assemble flexure

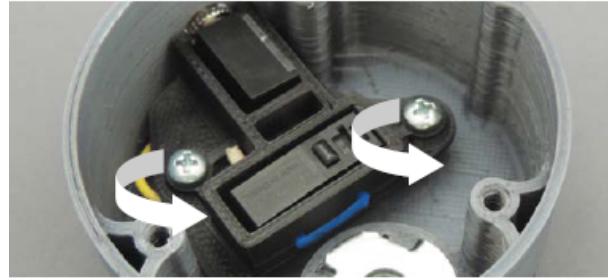
Place the hex bolt through the bottom of the MMC60 Button Flexure. Tighten a hex nut onto the bolt to secure it in place.



Step 2: Mount the switch and jack

Place the switch mount with the mono jack and limit switch in the MMC60 Button Base Bottom. Use two M4 screws to secure them in place.





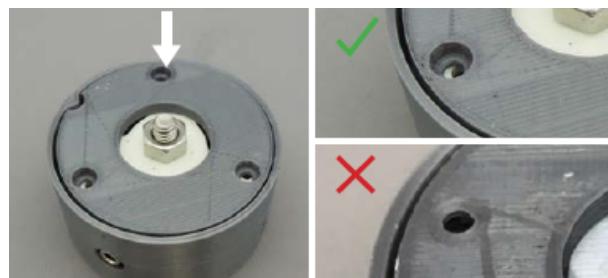
Step 3: Insert flexure

Insert the flexure into the base. Use the keyed notch to guide insertion.



Step 4: Connect the base top

Insert the MMC60 Button Base Top into the base bottom with the screw hole divots up. Use three M4 screws to secure it in place.



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Step 5: Add button cap

Screw the MMC60 Button Cap onto the exposed threads of the hex bolt.



Congratulations, your switch is now complete!



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