

Interact Switch

MAKER GUIDE



Overview

This document contains the necessary information to build the Interact Switch, a large customizable switch with a low activation force.



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Files available at <https://github.com/makersmakingchange/Interact-Switch>

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MAKER GUIDE



Contents

Overview	1
Maker Checklist.....	3
Maker To Do List	3
Items to Give to User	3
Attribution.....	3
Tool List	4
Tools / Equipment.....	4
Supplies.....	4
Personal Protective Equipment (PPE).....	4
Customization Guide.....	5
3D Printing Guide	7
3D Printing Summary	7
3D Printing Settings.....	7
Post-Processing.....	8
Examples of Quality Prints	8
Building the Interact Switch.....	9
Required Components	9
Required Tools and Supplies.....	9
Required Personal Protective Equipment (PPE)	9
Assembly Steps	10
Testing.....	14
Troubleshooting.....	14

Interact Switch

MAKER GUIDE

Maker Checklist

This list provides an overview of the steps required to build and deliver the Interact Switch.

Maker To Do List

- Read through the Maker Guide to become familiar with required components, tools, supplies, safety gear, and overall assembly steps.
- Talk to the User about customization options
 - What colour(s) would they like the topper and/or topper pattern to be printed in?
 - Which topper would they like to have? There are a variety of toppers available with different patterns and textures.
 - How would they like to receive the “User Guide”? (PDF or physical copy)
- Order hardware components
- Gather tools, supplies, and safety equipment.
- Assemble the device
- Test the Interact Switch

Items to Give to User

- Interact Switch
- User Guide

Attribution

The [Interact Switch](#) design by [Mike Turvey](#) is used under [CC-BY 4.0](#). Instructions adapted from [Original Interact Switch Assembly Instructions](#) by [Mike Turvey](#), used under [CC-BY 4.0](#).

Due to changes made to make the switch compatible with the #4 sheet metal screws, the Base and Switch holder are no longer compatible with the original parts.



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Tool List

Tools / Equipment

Tool ID	Description	Required / Recommended	Notes
T01	Wire Strippers	Required	Stripping insulation from the cable
T02	Soldering Iron	Required	Soldering the Cable to the switch
T03	Phillips Screwdriver	Required	Attaching the base to the top

Supplies

Supplies ID	Description	Quantity	Notes
S01	Solder	Roughly 1 inch	To attach the mono cable to the button

Personal Protective Equipment (PPE)

PPE ID	Description	Notes
P01	Safety Glasses	To keep flying debris out of your eyes

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Interact Switch

MAKER GUIDE

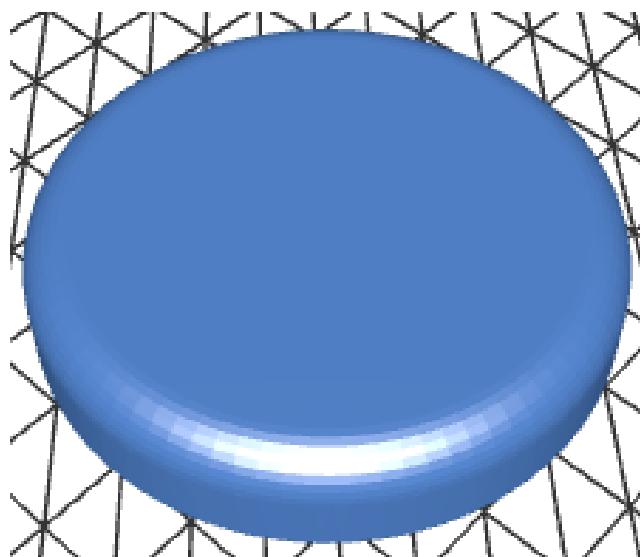
Customization Guide

The device can be printed in the user's desired colour.

There are over 12 different button caps available in the GitHub repository, and some projects such as the Open Playback Recorder have custom Interact Switch caps that match buttons on the device.

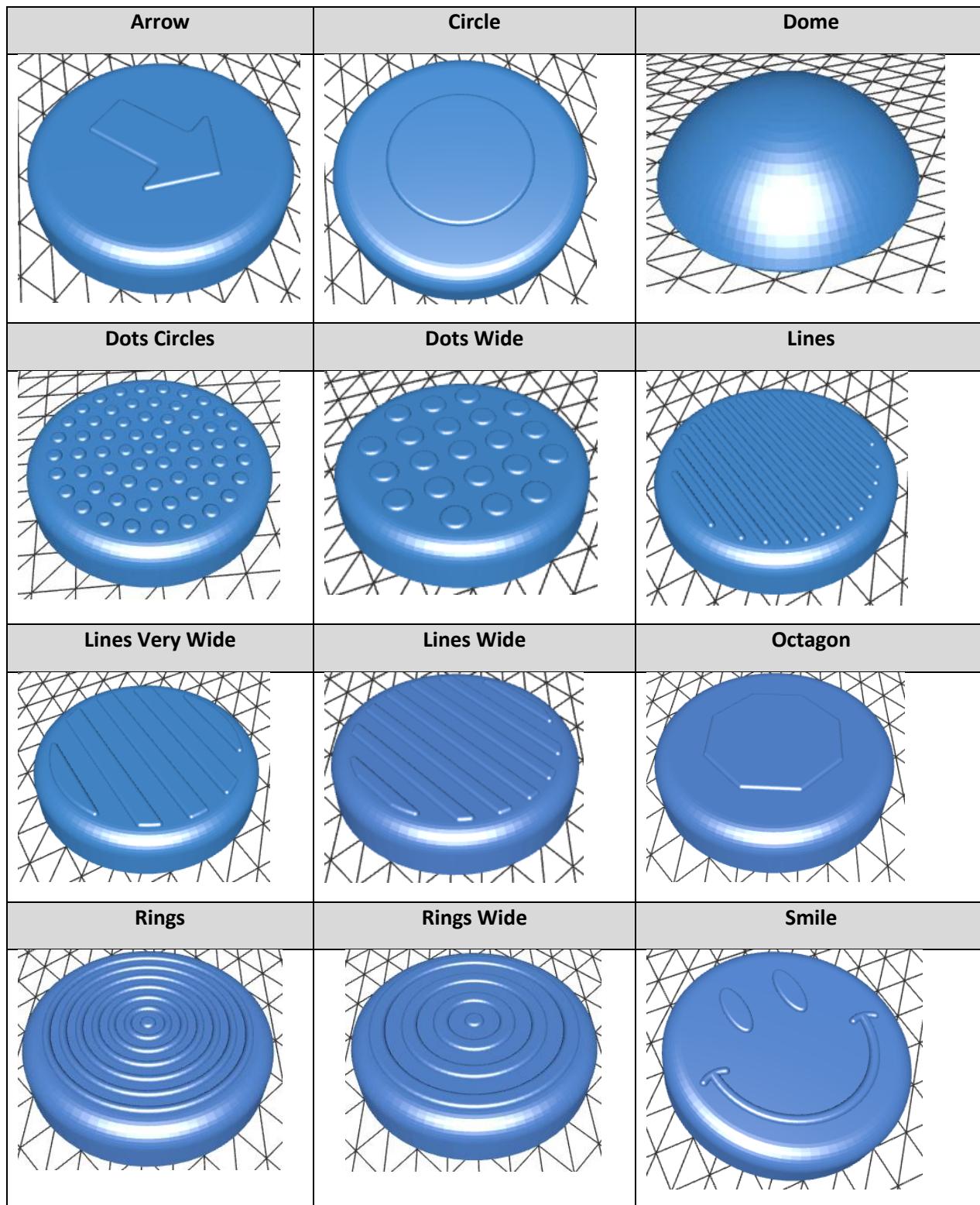
When printing the textured button caps, a filament change can be done to print the textured part of the cap in a different colour from the main body, increasing contrast. This can also be done automatically on printers that support multi-material printing.

The plain, 'default' button topper can be seen below, and the other options included in the Interact Switch Repository are listed in the table below.



Interact Switch

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Interact Switch

MAKER GUIDE

3D Printing Guide

The device was originally printed on a Bambu P1S using Bambu Studio using the default profile.

3D Printing Summary

Metrics	Single Unit
Total Print Time (hour min)	1h8min
Total Number of Components	4
Typical Total Mass (g)	35
Typical Number of Print Setups	3

3D Printing Settings

Note that the 3D printing material should be assumed to be PLA unless otherwise noted in the table below.

Print File Name	Qty	Total Print Time (hr:min)	Mass (g)	Infill (%)	Support (Y/N)	Layer Height/ Nozzle Diameter(mm)	Notes
Interact_Switch_Base.stl	1	0:32	17	20	N	0.2/0.4	
Interact_Switch_Cap_Plain.stl	1	0:25	14	20	N	0.2/0.4	Default cap; others are available
Interact_Switch_Holder.stl	1	0:09	3	20	N	0.2/0.4	
Interact_Switch_Insert_0.6mm.stl	1	0:02	1	20	N	0.1/0.4	Print with 0.1 mm layer height if printing an odd numbered insert (i.e. a 0.5 mm or 0.9 mm)
Interact_Switch_Solder_Jig.stl	1	0:25	12	20	N	0.2/0.4	Optional

Depending on the tolerances of your printer, you may have to print a different switch insert than the 0.6mm insert. The insert is the part that makes the cap press the switch in the base, and depending on the tolerances of your printer, this distance might be too close or too far for the 0.6mm insert. The repository includes inserts from 0.2 to 1.5mm and it may take a few tries to find the right one that works for your printer.



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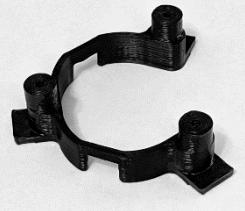
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Post-Processing

Inspect the 3D printed parts for any printing defects, sharp edges, or burrs. Sharp edges and burrs can be removed with sanding or deburring tools.

Examples of Quality Prints

Compare your 3D prints to the images here. If there are significant differences, you may need to reprint the part.

Interact Switch		
Interact_Switch_Base.stl	Interact_Switch_Cap_Plain.stl	Interact_Switch_Holder.stl
		
Interact_Switch_Insert_0.6mm.stl	Interact_Switch_Solder_Jig.stl	
		



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Building the Interact Switch



Required Components

Interact Switch								
A01	Switch Base	QTY: 1	A02	Button Cap Holder	QTY: 1	A03	Button Cap Insert	QTY: 1
A04	Button Cap	QTY: 1	A05	Limit Switch	QTY: 1	A06	Mono Cable	QTY: 1
A07	#4 Sheet Metal Screw	QTY: 3						

Required Tools and Supplies

- Wire Strippers
- Soldering Iron
- Screwdriver

Required Personal Protective Equipment (PPE)

- Safety Glasses

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Assembly Steps



Step 1: Prep Cable

Cut off and discard one of the plugs from the mono audio cable.

Use the wire strippers to carefully remove about 15 mm of the outer insulation from the end.



Step 2: Prep Cable Wires

Twist the copper strands together into a single wire.

Use the wire strippers to remove roughly 5 mm of insulation from the other wire.

(Note: Your cable may differ. If there are two wires with insulation, strip 5 mm from the end of each wire.)



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Step 3: Thread Cable into Switch Base

Thread the cable through the hole in the Switch Base. You will not be able to do this after you solder the limit switch onto the wire.

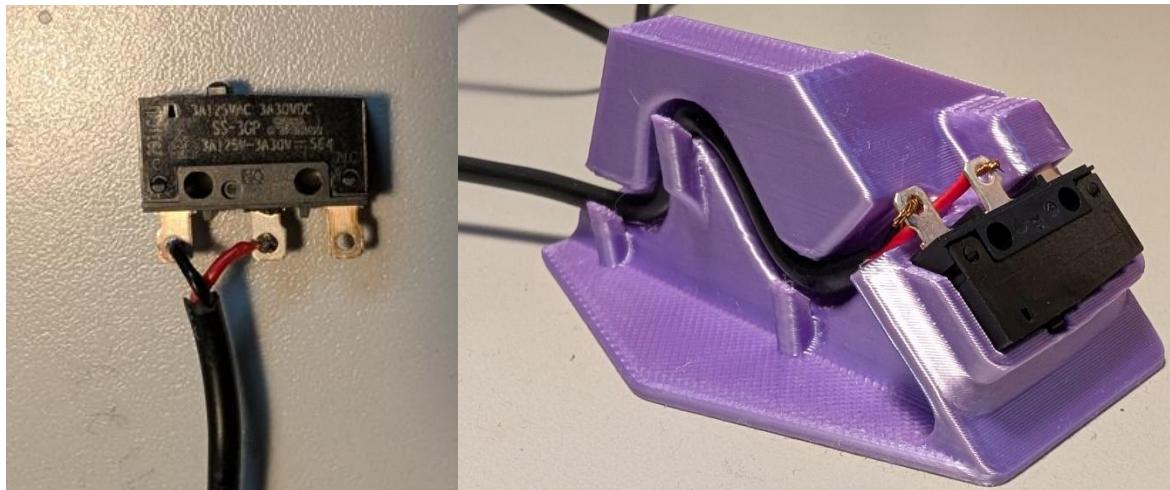


Step 4: Solder Wires to Switch

Solder the wires into the switch in the position shown below. The optional soldering jig can be used to hold the cable and switch in place, and to isolate the correct terminals to solder to.

Note: Solder the two leads closest to the button on the switch.

Test: plug your switch into a switch activated device and push the button on the limit switch



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Step 5: Position Switch in Base

Place the limit switch into the Switch Base as shown.

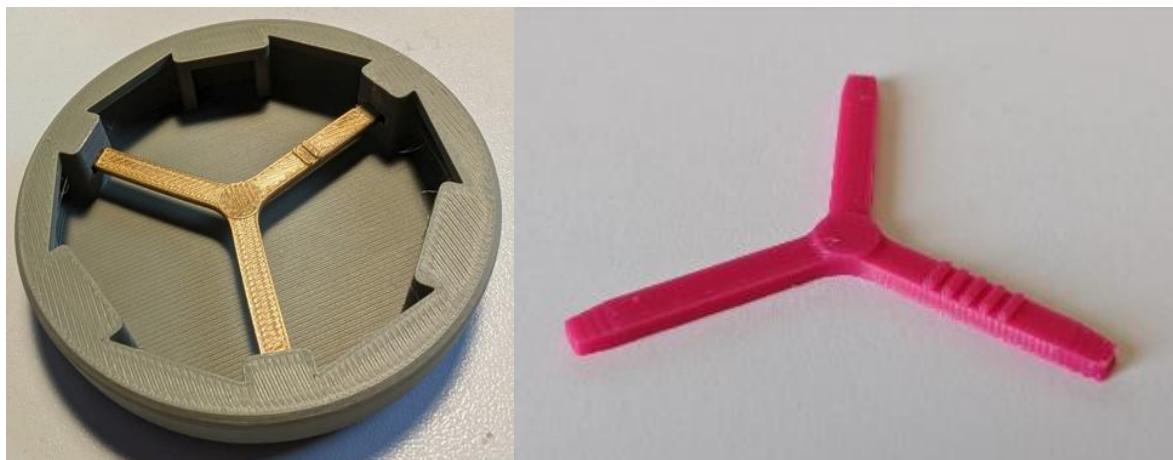
For the orientation of the switch, when the cable is coming towards you, the button on the limit switch should be offset to the left. Make sure that no wires are stuck underneath, preventing the limit switch from going all the way down.

Push the cable in the slot as shown in the picture.



Step 6: Assemble Button Cap

Turn the Button Cap over and insert the Button Cap Insert. If you're unsure which size to use, try starting with 0.6 mm. The lines on the button insert should be facing up, with the print surface facing down towards the cap. The raised section where all three legs on the insert join should be visible.



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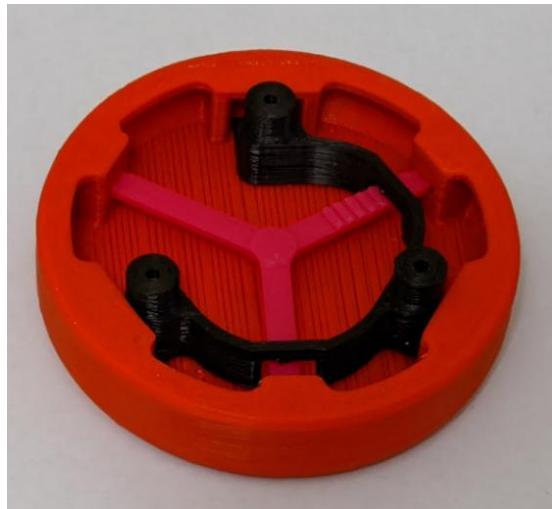
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Step 7: Finalize Button Cap Assembly

Insert the Button Cap Holder into the Button Cap Assembly. The orientation of the “open” side doesn’t matter.

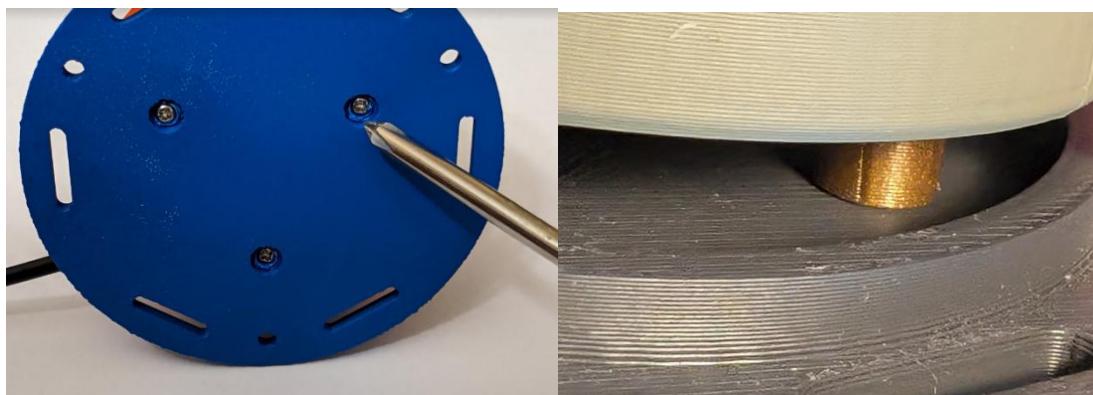
Note: for smoother switch action, sand the edges of the Button Cap Holder where it rubs on the switch.



Step 8: Assemble Switch

Align the three posts of the Switch Cap Holder to the three holes in the Switch Base. Secure the Switch Cap Holder to the Switch Base using three screws. Tighten them until the Switch Cap holder is firmly against the base.

Note: Be careful not to over tighten the screws. Tighten them until you notice the resistance increases and the Switch Cap Holder is firmly against the Switch Base.



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Interact Switch

MAKER GUIDE

Testing

The last thing to do is test your switch. If this is your first switch, you'll likely need to test it out and figure out the best size of Switch Cap Insert to use.

The first thing to do to test a switch is to push it a lot. Tap it everywhere, repeatedly. Every time you push it, you should hear it click down and click as it goes back up. It should never stick. If you wiggle the top, it should move some, but it shouldn't feel like it's rattling around. Next, plug the switch into a switch activated device and make sure that it works.

Troubleshooting

Problem	Solution
The switch cap is too loose and rattles around easily.	Use a larger/ thicker Switch Cap Insert.
Switch doesn't make any noise when pushed.	Use a smaller/ thinner Switch Cap Insert. An insert that is too big can cause the limit switch to be always depressed. When this is the case, you'll often hear the limit switch "click" closed when you're screwing everything together, but it won't ever click open.
Switch sticks/ doesn't always go back up.	Use a smaller/ thinner Switch Cap Insert. You may likely need just one size thinner.
Switch makes clicking noise, but the switch activated device isn't activating	<ul style="list-style-type: none"> Test the switch activated device with a switch known to work, just to make sure it's working fine. Check that the plug is firmly plugged into the device The solder connection may be bad and need to be re-soldered. There may be an internal break in the wire, and you will need to replace it. This is a particularly common failure point for an older switch.



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