

Teams Button Instructions

I spend a lot of my work day in Teams meetings and frequently need to mute / unmute my microphone, turn my camera on and off, or raise or lower my hand. If using my mouse I invariably can't find the right icon to click fast enough and I never remember the right keyboard shortcuts. So I built this simple device so that I can press one big fat arcade button for each of those actions.

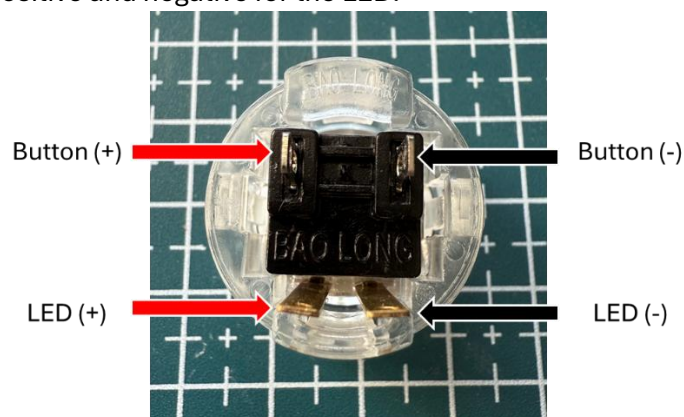


The device is simple – three arcade buttons which are connected to an RP2040 Zero microcontroller. I chose the RP2040 because it is cheap, very small and I am already used to using Raspberry Pi Picos (which would also work well); other microcontrollers may also be suitable but I am not experienced in using them.

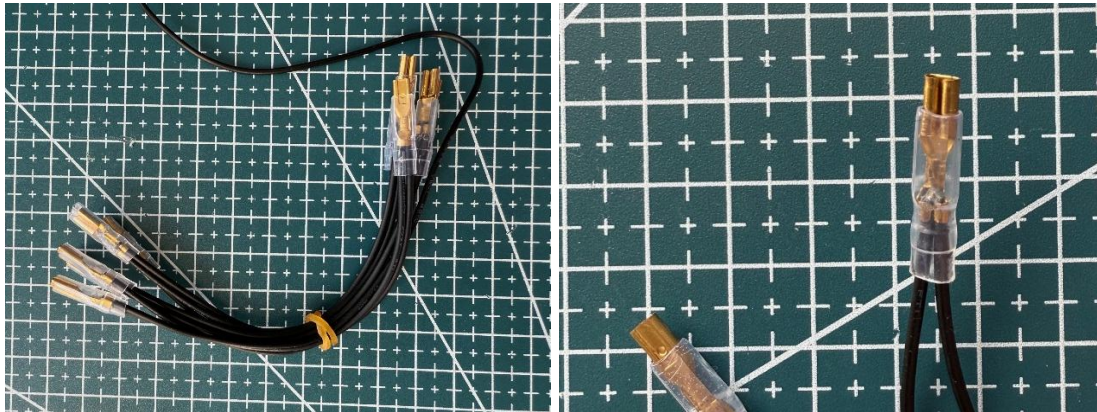
The microcontroller runs a simple programme (written in Circuit Python) that sends the keyboard shortcuts to your computer when a button is pressed, as if it were a keyboard. For example, if you press the microphone mute / unmute button then “CTRL+SHIFT+M” is sent to your computer which is the mute / unmute shortcut. Each button press toggles the LED built into the arcade button between on and off.

Equipment needed:

- 3 x 24mm 5V LED arcade buttons – I got mine from AliExpress. Each arcade button has four connectors on its base – a positive and negative for the button mechanism and a positive and negative for the LED.



- Daisy chained spade connector wire which are sold alongside the arcade buttons. The picture shows just the black wire side – there is also a red wire side.



- A RP2040 Zero microcontroller board (or a Raspberry Pi Pico). The pinout of the RP2040 Zero can be found here <https://www.waveshare.com/wiki/RP2040-Zero>
- Male USB C to Male USB A cable (or USB A to Micro USB if using an Raspberry Pi Pico)
- Small piece of stripboard or protoboard.
- Equipment to solder everything together.
- Access to a 3D printer and two different coloured filaments.

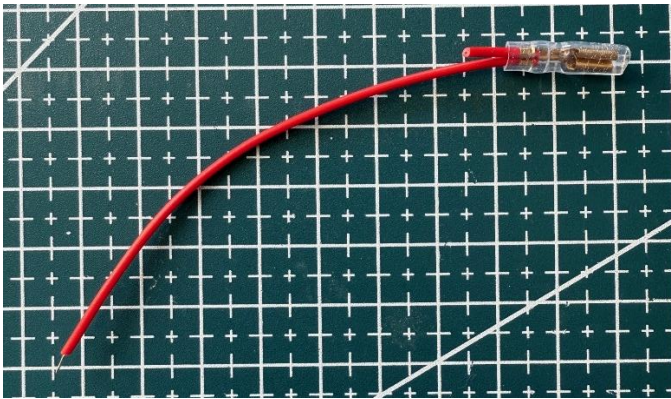
Software:

- The programme is written in Circuit Python and also requires the Adafruit HID Library
- Go to my Github <https://github.com/TellinStories/Teams-Shortcut-Buttons> to download the code.py file onto the RP2040 Zero
- You also need to copy the Adafruit HID libraries to the RP2040 Zero to allow the device to communicate with your computer as if it is a “human input device” (HID) such as a keyboard. Simply copy the Adafruit HID Library to your RP2040 / Raspberry Pi Pico library folder.
- Adafruit HID libraries: <https://docs.circuitpython.org/projects/hid/en/latest/index.html> and https://github.com/adafruit/Adafruit_CircuitPython_Bundle

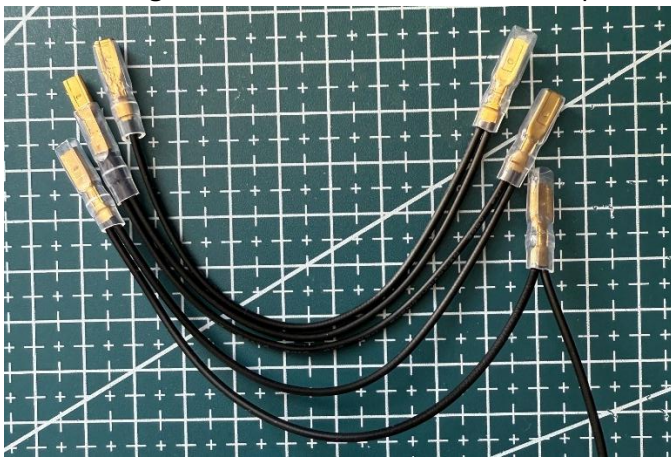
To Build:

- Download and 3D print the case and base
<https://makerworld.com/en/models/1436571-teams-shortcut-buttons#profileId-1494585>

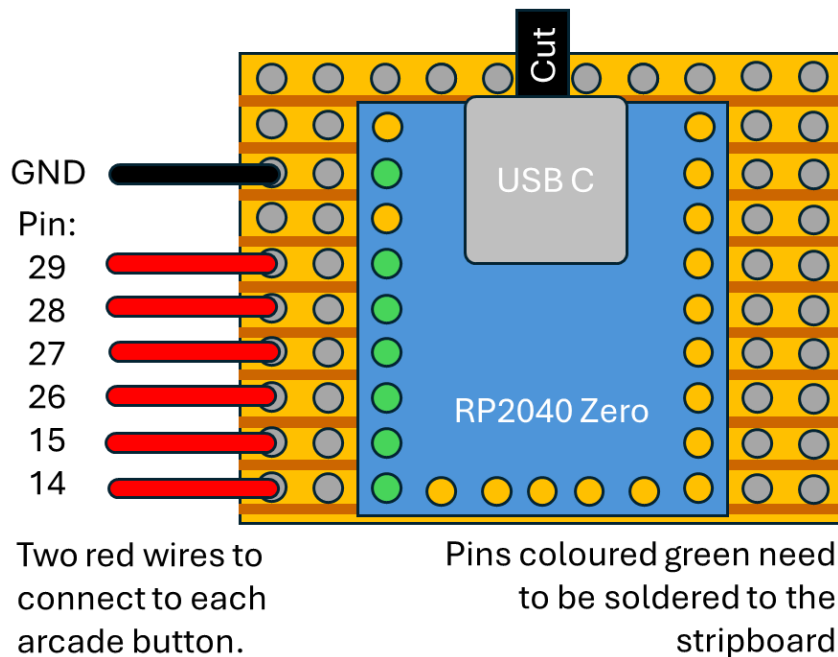
- Cut 6 red spade connectors with approx. 10 cm of wire off each long wire. You should end up with 6 individual lengths of wire each with a spade connector on the end.



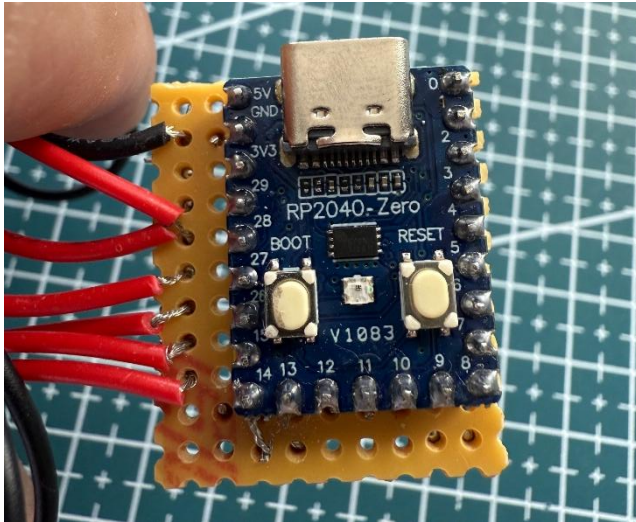
- Cut one length of black wire so that it has six spade connectors daisy chained together.



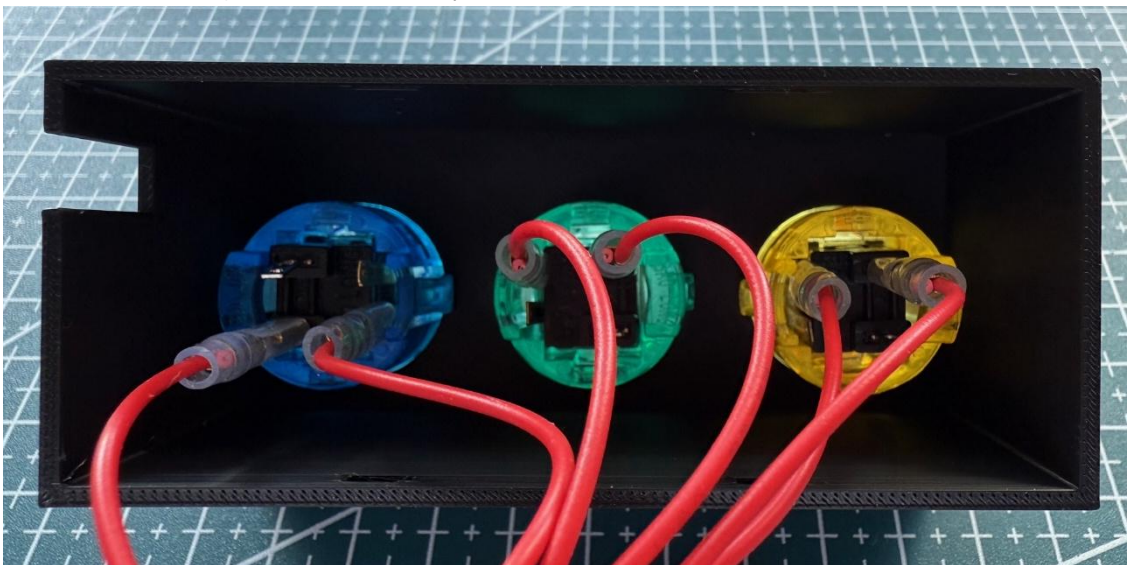
- Attach the RP2040 Zero board to the stripboard and solder the GND pin and pins 14, 15, 26, 27, 28 and 29 to it.



- Solder the black wire to the stripboard next to the GND and a red wire to the stripboard next to pins 14-29 as shown. Note that in my photograph you can see that I've got a bit too much bare wire showing – that's not ideal so try and do better than I did!



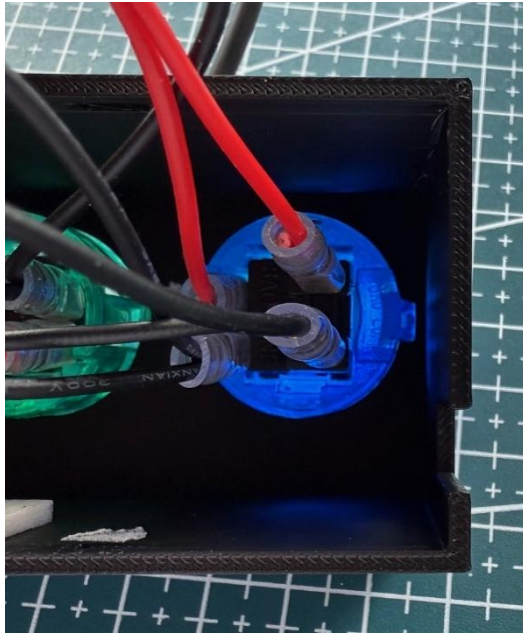
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- Push the arcade buttons into the holes in the 3D printed case. The base of each arcade button shows a positive and negative symbol. Attach one red wire spade connector to each positive pin – again there are two on each arcade button. You need to attach the positive wires to each button as shown in the table below (or you can attach them in any order and then adjust the code later).



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Button	Button Pin	LED Pin
Hand	14	15
Camera	26	27
Microphone	28	29

- Attach a spade connector from the black wire to each negative pin – there are two on each arcade button.



- Connect the USB cable to the RP2040 Zero and to your computer. There is a gap in the case for the USB cable.
- Use a keyboard tester website such as <https://keyboard-test.space/> to test it all works!
- Use a couple of sticky pads to attach the RP2040 Zero to the inside of the case. and then attach the base to the case – it will clip into place.

Operation Notes:

- The LEDs simply toggle between on and off each time you press their button. They are set to off when you plug the device into your computer, so if your camera and microphone are off and your hand is not raised when you plug it in then they will be in sync – i.e. the LEDs will light up when you unmute / turn the camera on / raise your hand. Otherwise simply use your mouse to toggle the hand / microphone / camera on the screen so that the LEDs are in sync with your Teams.
- The USB cable should be permanently attached to the RP2040 Zero – the case doesn't allow it to be removed easily. You should attach and unattach the device to your computer by plugging the other end into your computer.
- The LEDs are designed for 5V but our output pins only supply 3.3V – hence the LEDs are a little dimmer.