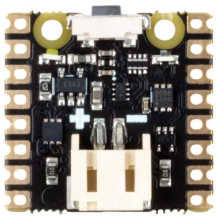
Required parts page 1

1 X Pimironi Tiny 2040 8MB WITHOUT HEADER PINS
https://shop.pimoroni.com/products/tiny-2040?variant=39560012234835



1 X Pimironi LiPo SHIM for Pico
https://shop.pimoroni.com/products/pico-lipo-shim?variant=32369543086163

2 X Waveshare RGB Full-color LED Matrix Panel for Raspberry Pi Pico, 16×10 Grid
https://www.waveshare.com/pico-rgb-led.htm
https://www.amazon.com/dp/B09CHFXLHV

2 X LiPo battery 552535
https://www.adafruit.com/product/4236

(this was the best way I found to fit as much battery as possible into the space available. A single battery that fits the space would have been ideal to increase the mAh capacity but oh well.)

2 X 3x6x5H tactile switch
https://www.amazon.com/dp/B07GNZM4YJ

Pin backs, at least a 2 pack. Metal backings recommended, as the plastic ones can sometimes fall off.
https://www.amazon.com/dp/B09WQHPBZW/

Required parts page 2

26 AWG enameled copper wire to carry up to 1A which can happen with two Waveshare 16x10 arrays displaying all white.

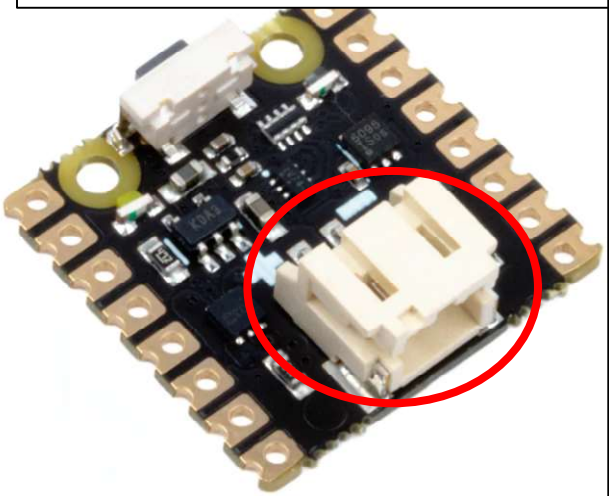
30 AWG enameled copper wire (optional)
To save space by using thinner wire on any wires that don't need to carry current to and from the 16x10 LED arrays.

Polyimide Film with Silicone Adhesive. Also known as the name brand Kapton tape. This is needed to insulate stuff because there isn't space for the thickness of normal electrical tape.
I used 0.5" wide, but any width will work.

Other tools you will need:
Soldering iron
Hot glue gun
Craft "xacto" knife.
3D printer

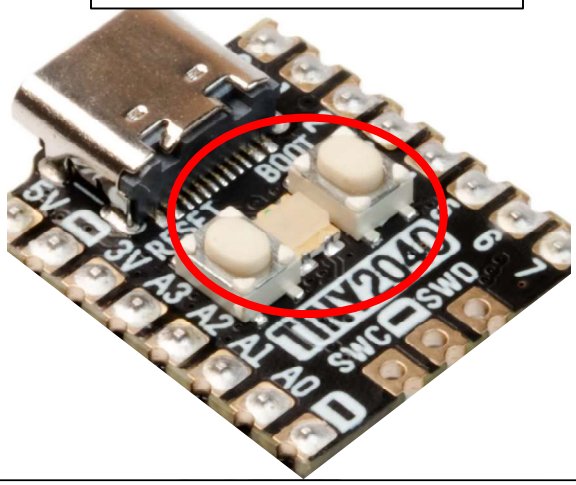
Required steps before assembly (but **after** testing on a breadboard)

PicoShim: Remove the battery header. Desolder all remaining metal bits.



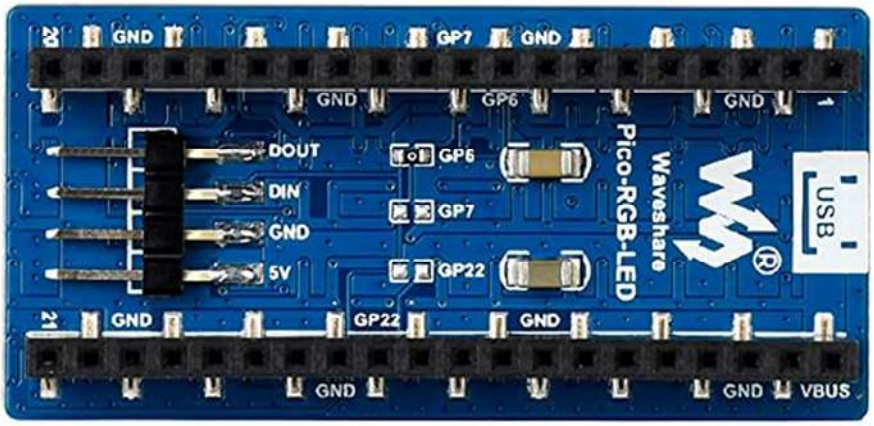
Tip: use side cutters or another small cutting tool to break away the plastic. Once all the plastic is removed, it will be easier to desolder the remaining bits of metal.

Tiny 2040: Remove the buttons (The LED can stay)



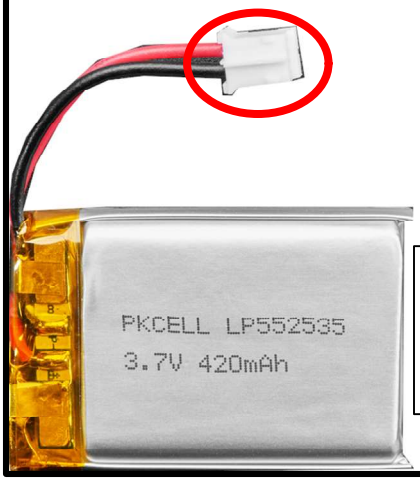
Tip: use side cutters or another small cutting tool to break away the plastic. Once you get the switches to be as thin as the LED, you do not need to continue any further but if you do, be very careful when desoldering the buttons as it is very easy to rip off solder pads.

Waveshare 16x10 LED array: Remove all three headers from the LED arrays.



Tips:
Large headers: Wiggle back and forth gently a lot of times. They will eventually break off from metal fatigue. Desolder the individual pins now that they aren't held together with a piece of plastic.

Small header: heat up the 5V pin solder first. Once it is melted, use side cutters to cut the plastic to remove the 5V pin. Do the same for the rest of the pins.

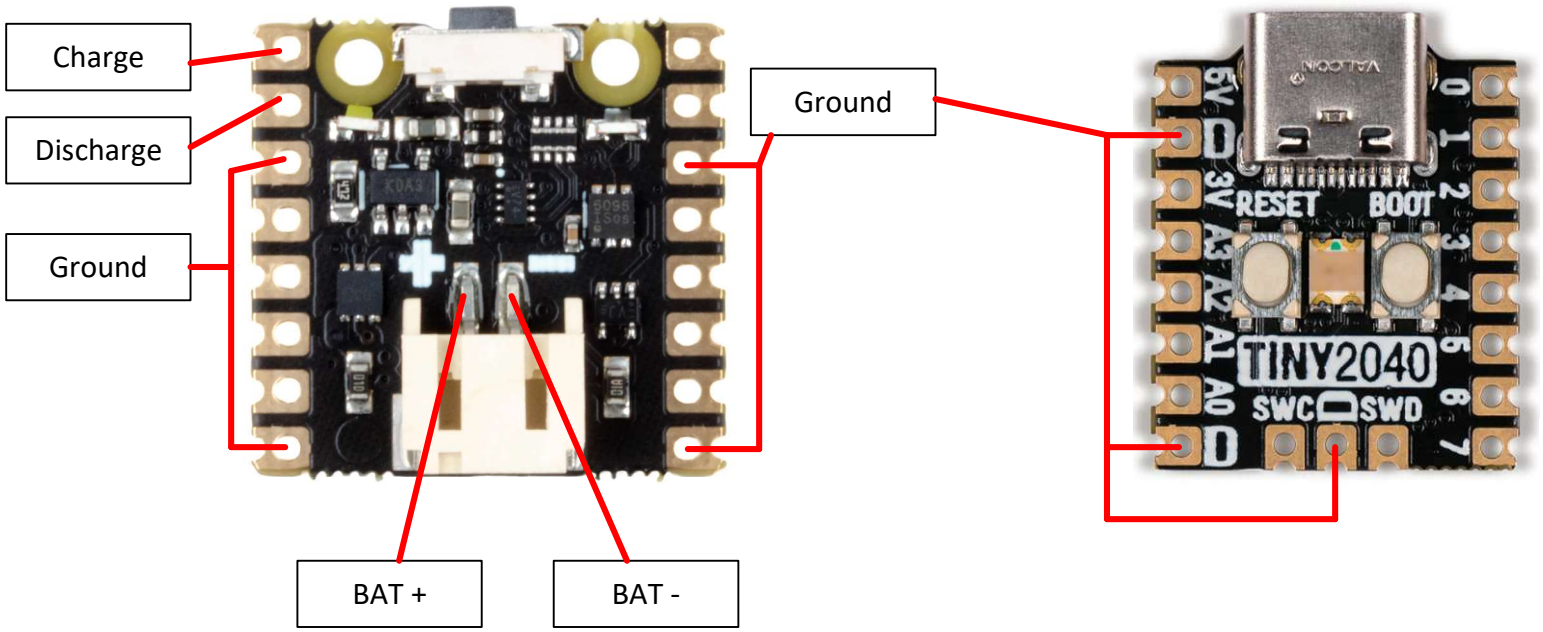


Batteries: Remove the plug (but not the wires) from both batteries. Strip the ends of the wires, leaving about 1/8th of an inch of exposed wire. Put tape over the positive or negative so you don't accidentally short something.

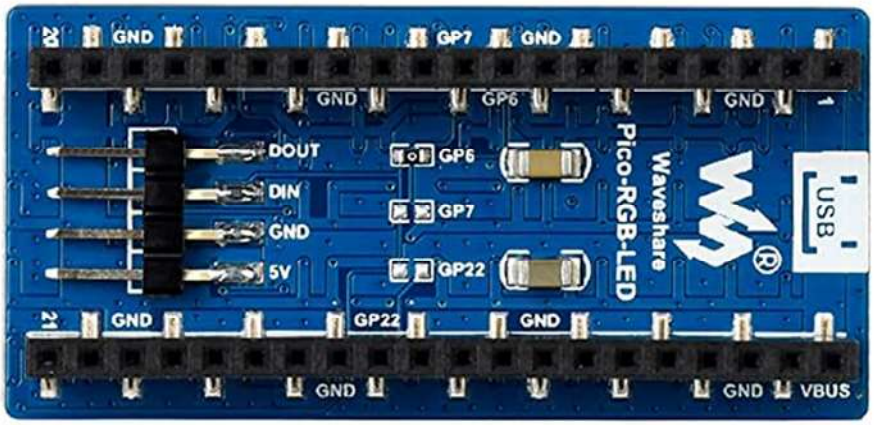
Explanation of solder points

PicoShim: Charge and Discharge should be bridged together.

Tiny 2040: No special notes.



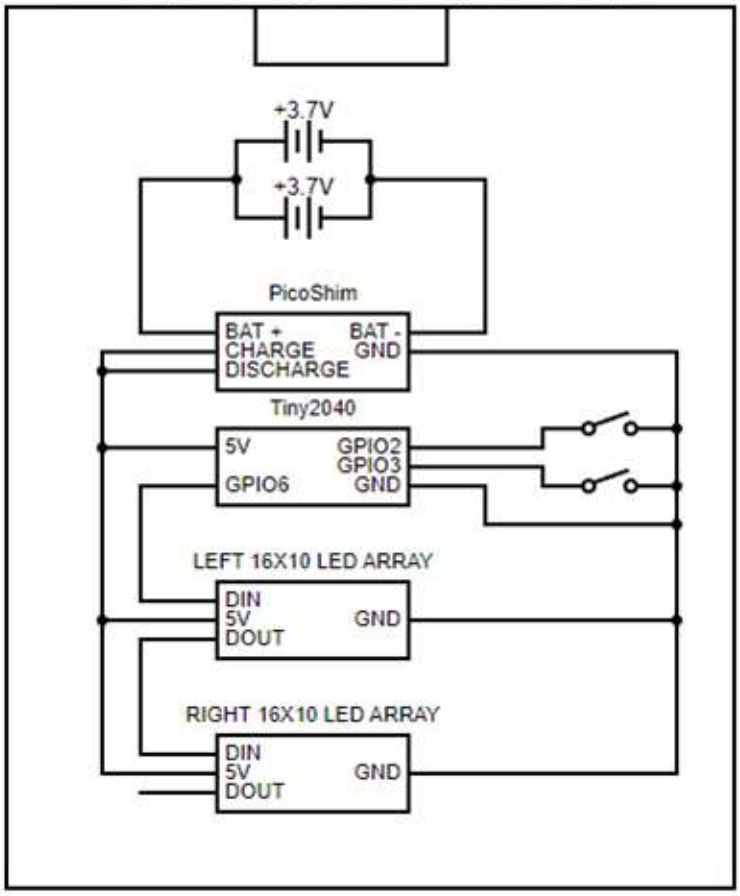
Waveshare 16x10 LED array: VBUS and 5V are the same. GP6 can be used as an alternative to DIN.



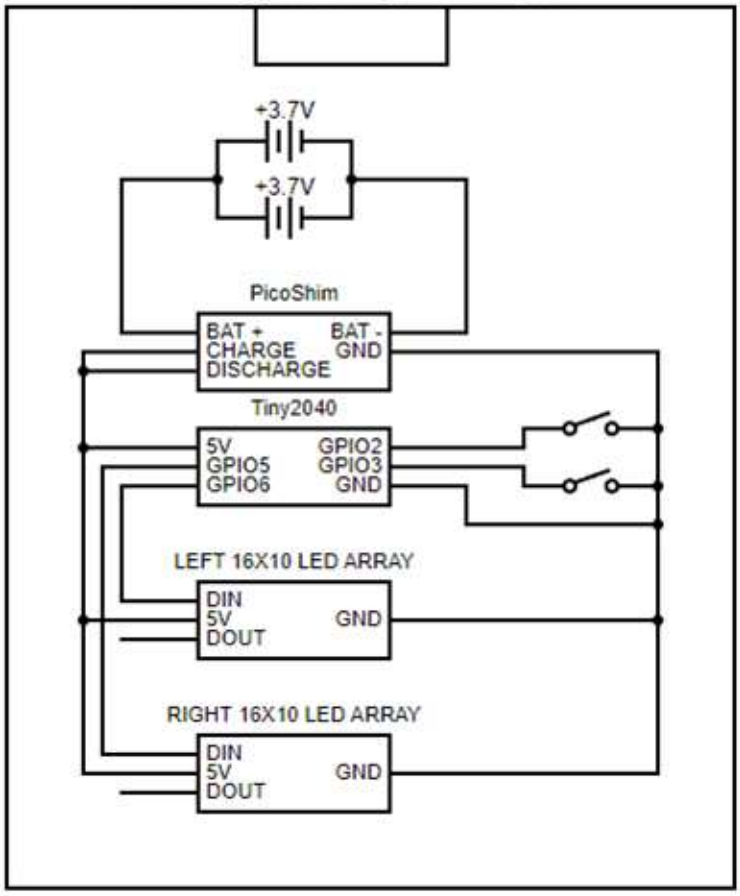
Schematic

Set the variable ImUsingPins6and5 = False Allows using any number of LED arrays	Set the variable ImUsingPins6and5 = True Only works with two LED arrays

Normal setup when driving both 16x10 arrays off one GPIO pin



When driving two LED arrays off different pins



https://crcit.net/c/523c296d15b04a64b24df0ce39a208a0

3D printed parts page 1

Optimal 3D printer settings:
Perimeter type: Arachne
Layer height: 0.2mm
Nozzle diameter: 0.4mm
Supports: Disabled
Infill: 100%
Print orientation: All files come in the correct print orientation.

Parts you will need to print:
1X of any “main body”.
1X back
1X battery tray
1X button brace

Instructions still in progress

3D printed parts page 2