



Mini Raspberry Pi Handheld Notebook

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Overview



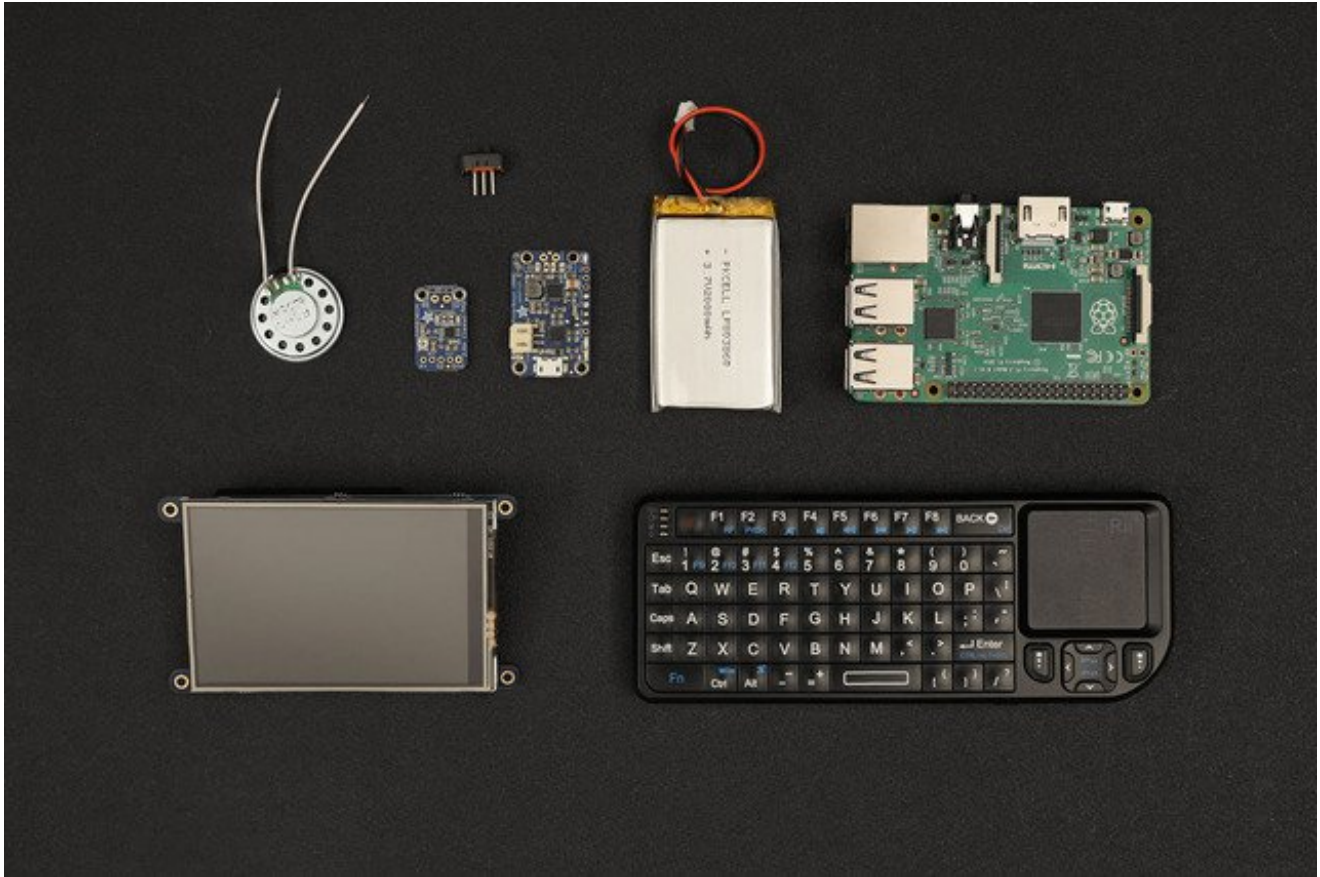
This is a Raspberry Pi notebook. Our 3D Printed enclosure turns the Pi 2 and a 3.5" PiTFT into a sweet retro mini laptop. The mini chiclet keyboard is both adorable and wireless. It features a trackpad, but you can also use the Touch screen on the PiTFT.

Rechargeable through the PowerBoost 1000C, the 2000mAh battery fits between the screen and the Raspberry Pi. 3D Printed hinges attach to the enclosure, making this a tiny portable computer!

The 3.5" PiTFT is much bigger and slower than the 2.8" PiTFT and is not good to use with fbcp and certainly wont be able to run emulationstation or the like at any reasonable quality

Usage

The best use case for this project is for monitoring and controlling prints, checking up on webcams or even streaming music. You can even play text adventures games like Zork!



Prerequisite Guides

Check out the following guides below to get a better understanding of the pin outs for the PiTFT and Powerboost 1000C.

- [PiTFT 3.5" \(http://adafru.it/eno\)](http://adafru.it/eno)
- [PowerBoost 1000C \(http://adafru.it/jbk\)](http://adafru.it/jbk)

Please note this project was specifically designed for the PiTFT Plus 3.5" display, PID 2441. This will NOT work with PID 2097.

Parts, Tool & Supplies

If you don't have access to a 3D printer, you can send the files to a service or check with your local hackerspace/library.

- [Powerboost 1000C \(http://adafru.it/f9N\)](http://adafru.it/f9N)
- [Mini Metal Speaker \(http://adafru.it/1890\)](http://adafru.it/1890)
- [Raspberry Pi 2 \(http://adafru.it/eCB\)](http://adafru.it/eCB)
- [3.5" PiTFT \(http://adafru.it/jbl\)](http://adafru.it/jbl)
- [Miniature Keyboard \(http://adafru.it/fmq\)](http://adafru.it/fmq)

- 3D Printer (<http://adafru.it/doT>)
- Filament (<http://adafru.it/2080>)
- #2-56 machine screws (<http://adafru.it/f9O>)
- #4-40 machine screws (<http://adafru.it/fkj>)

Software

The PiTFT requires kernel support and a couple other things to make it a nice stand-alone display. We have a detailed step-by-step setup for hackers who want to tweak, customize or understand the PiTFT setup. If you just want to get going, check out the following for easy-install instructions!

Ready to go image

If you want to start with a fresh image, we have one for Raspbian - click here to download it and install into a new SD card. [Unzip and follow the classic SD card burning tutorials \(http://adafru.it/aMW\)](http://adafru.it/aMW)

Download PiTFT 3.5" Resistive Image for Pi 1 and Pi 2 (March 12, 2015)

<http://adafru.it/eUE>

This image is customized for the RESISTIVE touch 3.5" TFT, also known as PID #2097! Not for PID #1601 or #1983

3D Printing

Download STLs

<http://adafru.it/fmr>

3D Printed Parts

All you need are these seven parts to get started:

- Case
- 4 hinges
- Keyboard case
- Back cover



Slicer Settings

You can use the settings below as a reference. The parts are oriented in the center of the bed and ready to print "as is". They do not require any support material.

lib-case.stl 230c

lib-keybaord.stl 3 shells

lib-hinge-top.stl 3 top/bottom shells

total time for all parts should be about 6 hours.

lib-hinge-btm.stl 50mms print speed

lib-cover.stl 10% infill

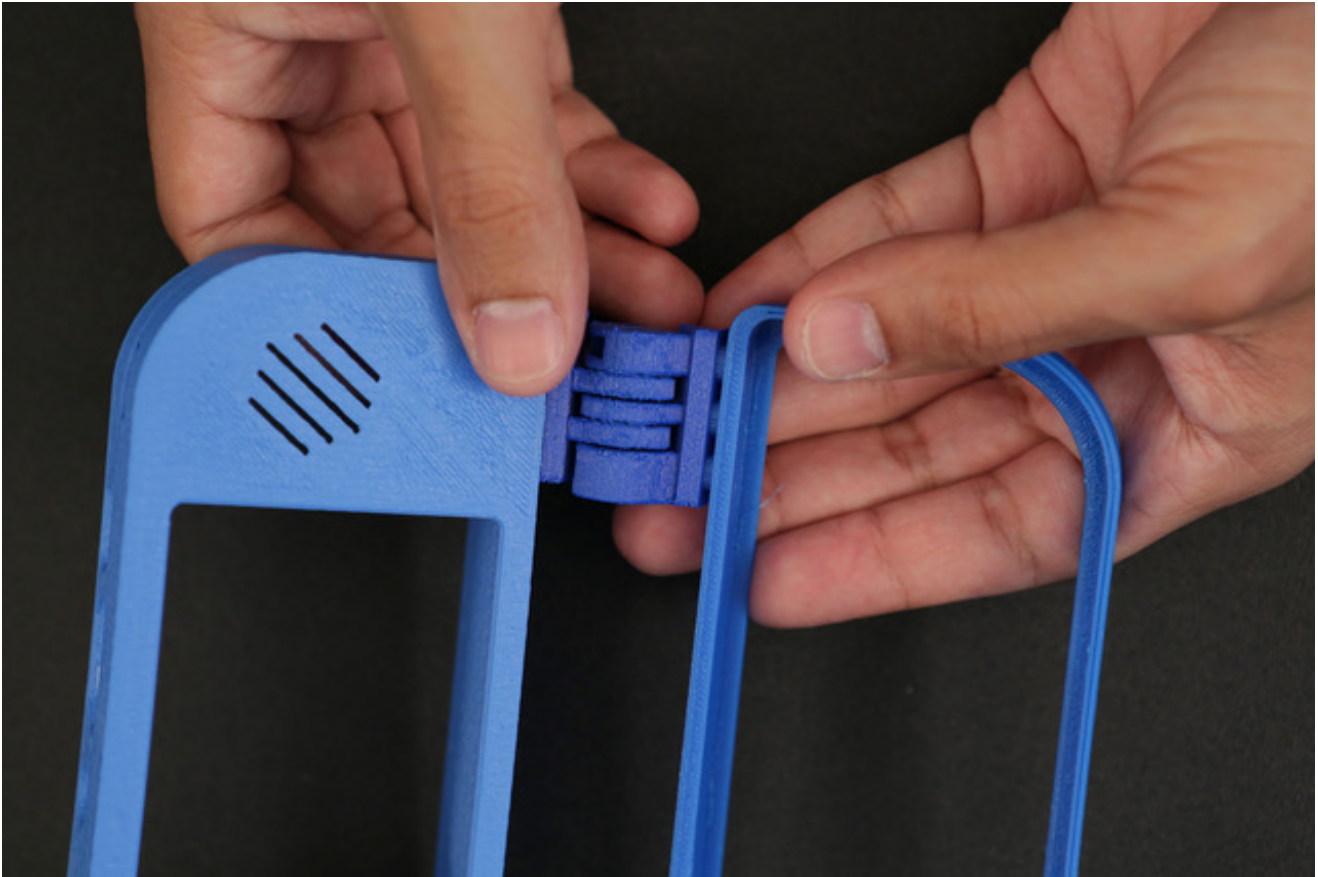
Materials

These parts have been printed in PLA but should print without any problems in ABS or other materials like bamboo and metal filaments.



Hinge Assembly

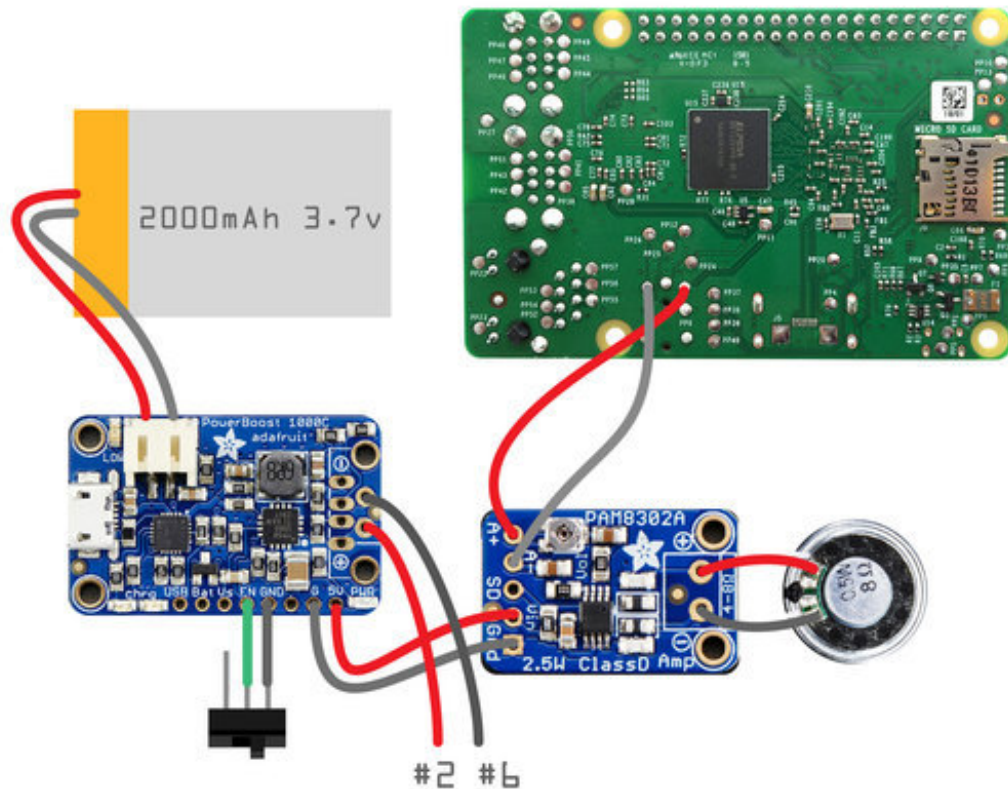
The hinges print with no support material and are held together with a machine screw, nut and friction. You can adjust the tolerance by fastening the machine screw.



Hinge Connections

The hinges connect like legos. Snap fit each to the screen and keyboard case. The hinge is modular, so you can use these on other projects.

Circuit Diagram



Take a moment to review the components in the circuit diagram. This illustration is meant for referencing wired connections - The length of wire, position and size of components are not exact.

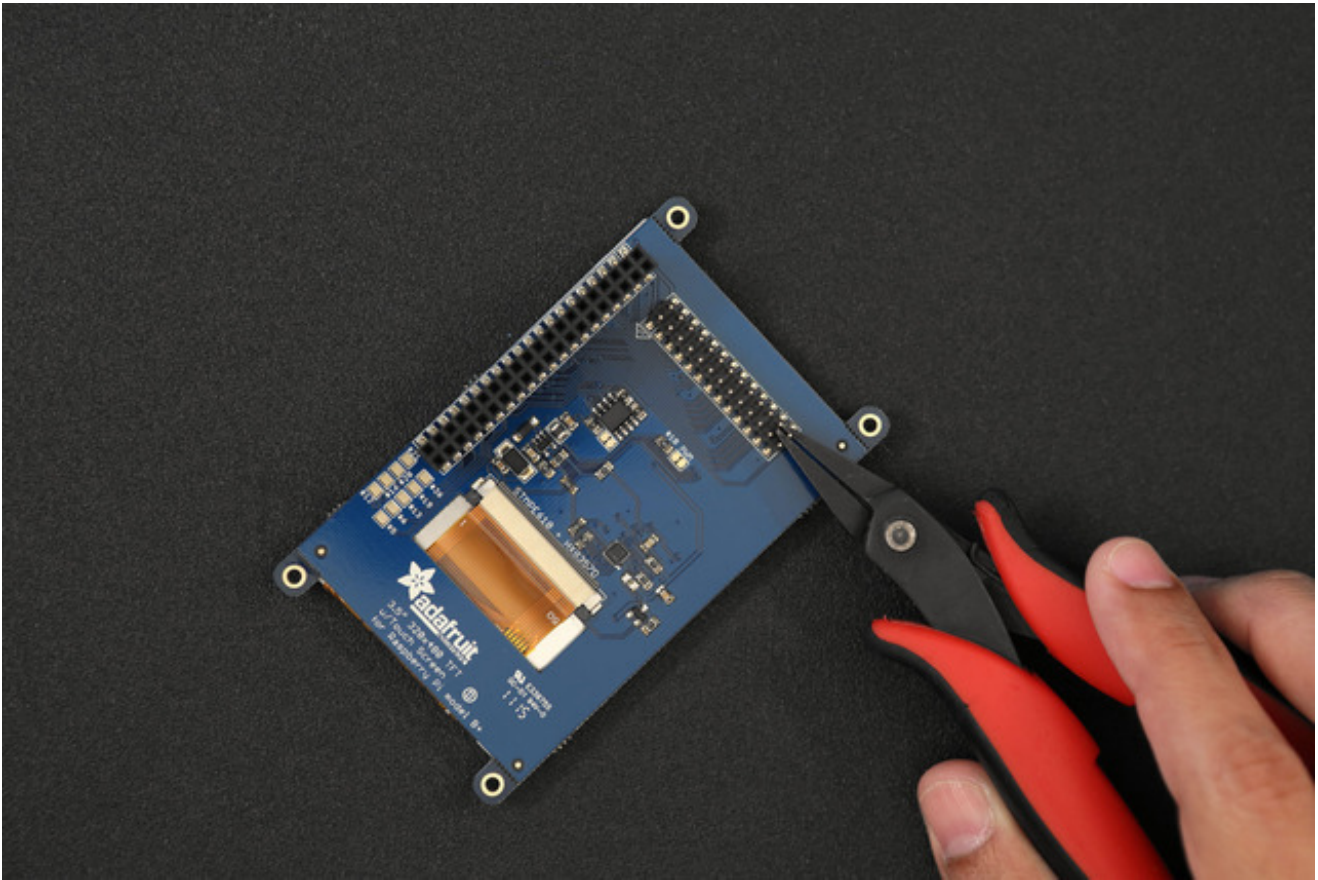
The PAM8302 amplifier connects to the + and - sides of the mini speaker. Route power by connecting **VIN** to **5V** on the PowerBoost 1000C and then **Gnd** to **G**.

PowerBoost 1000C hooks up to pins **#2(5V)** and **#6(ground)** on the Pi.

The slide switch will need to connect to **Ground** and **Enable**.

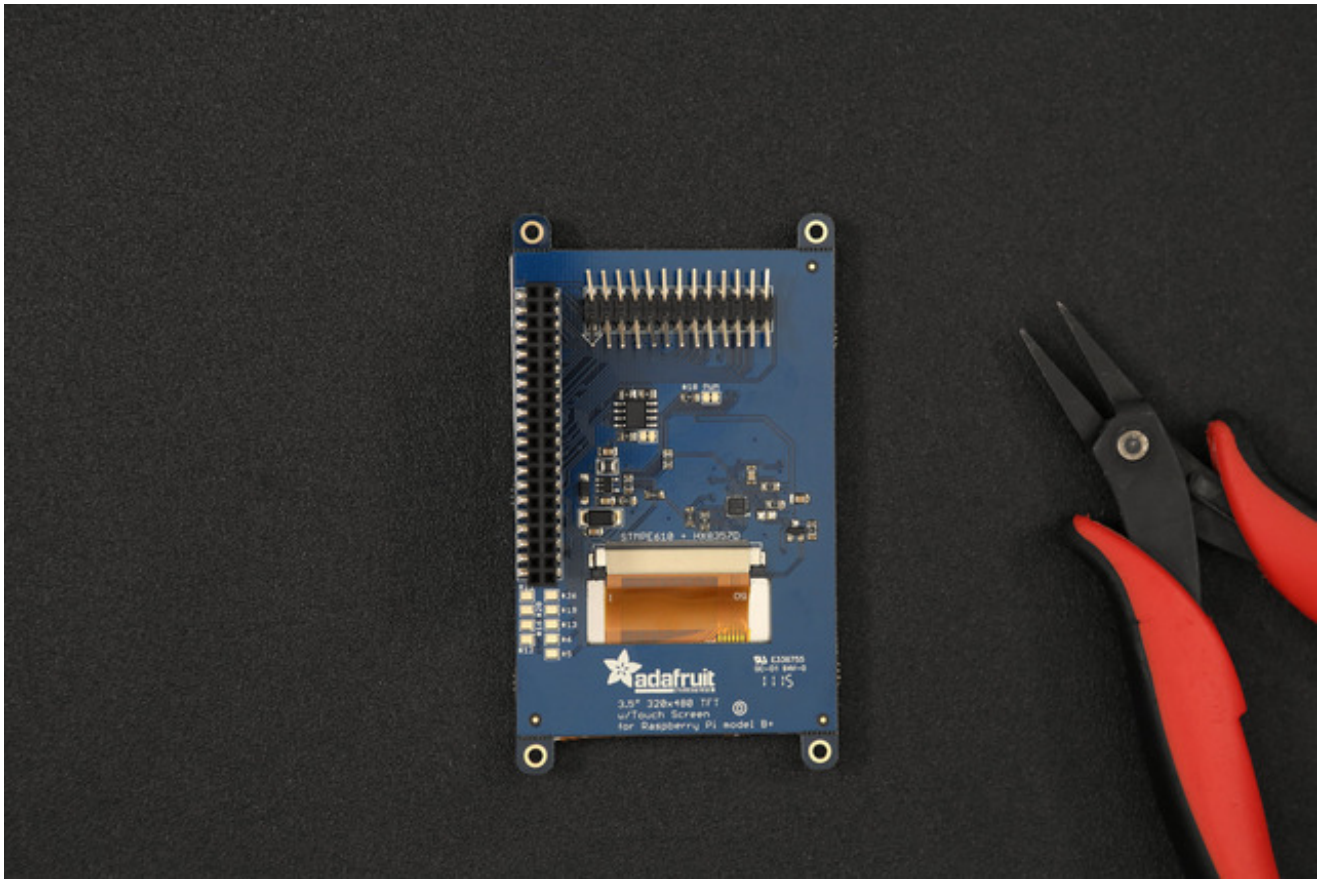
Battery connects to the JST port next to the USB port on the Powerboost 1000C.

Assembly

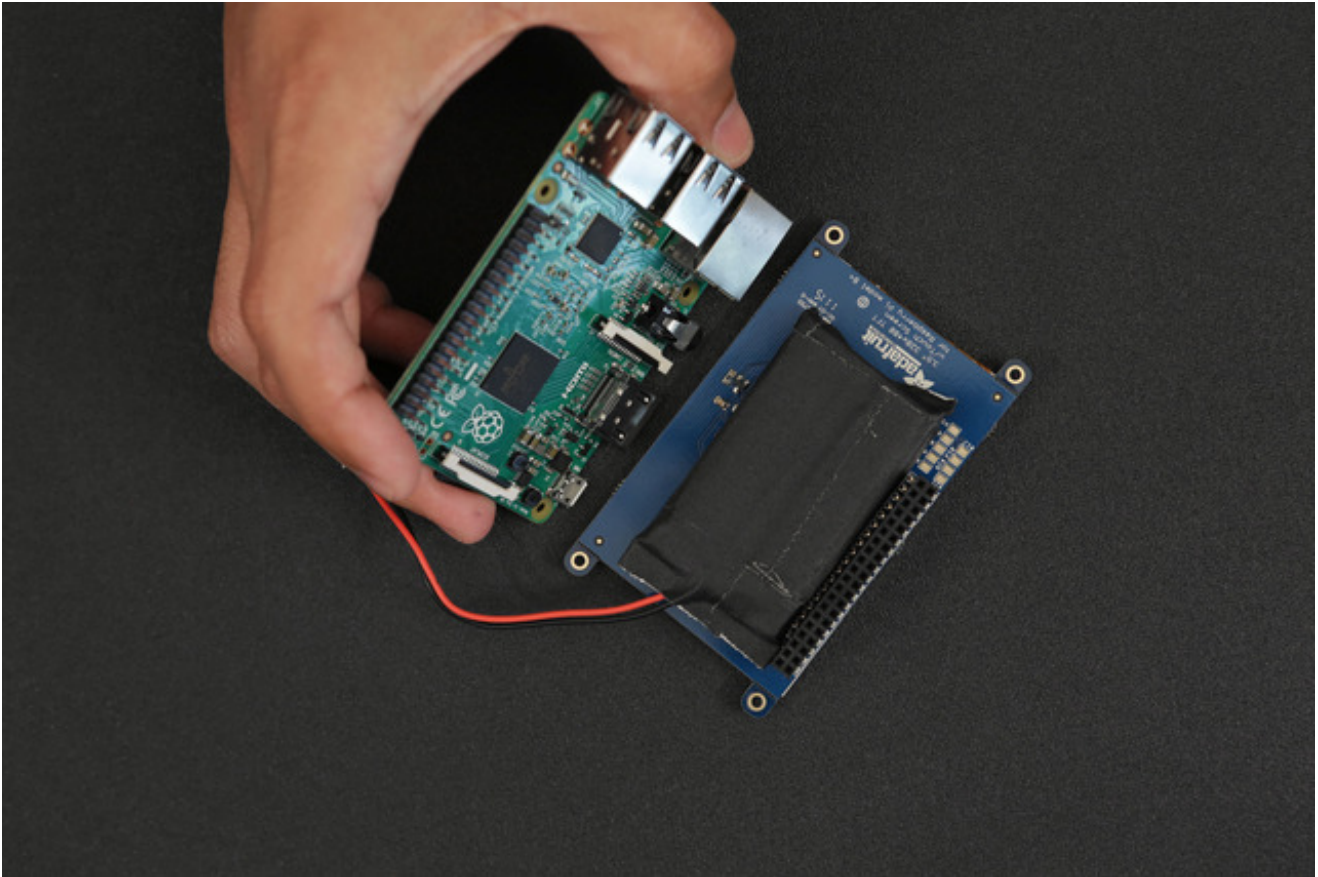


Making the battery fit

To fit the battery in between the screen and the Pi 2, we'll need to make room by bending the header pins on the PiTFT display.

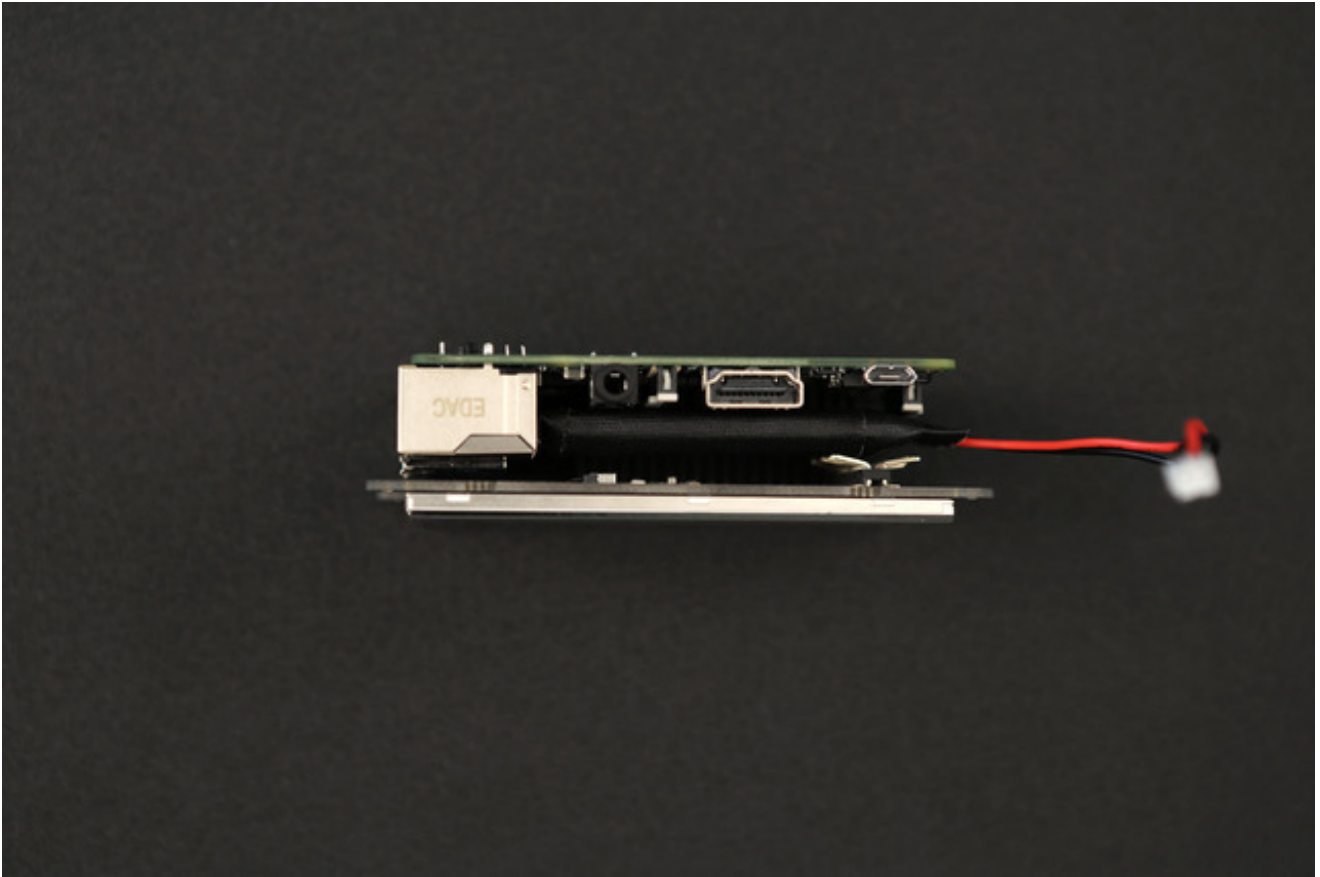


Use a pair of flat pliers to carefully bend each header pin down, so they're parted like in the photo.



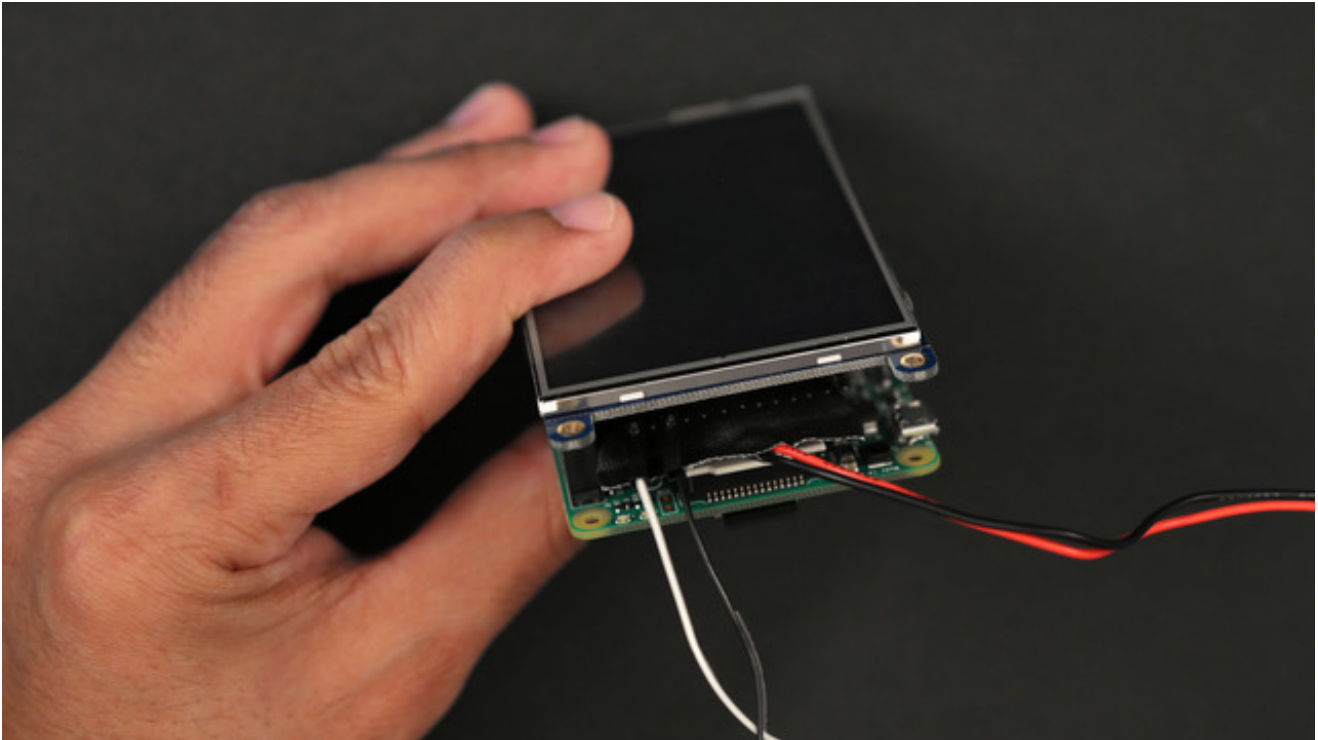
Prepare battery

Wrap a layer of gaffers tape around the battery to protect it. This will also give it a nice cushion against any of the pins.



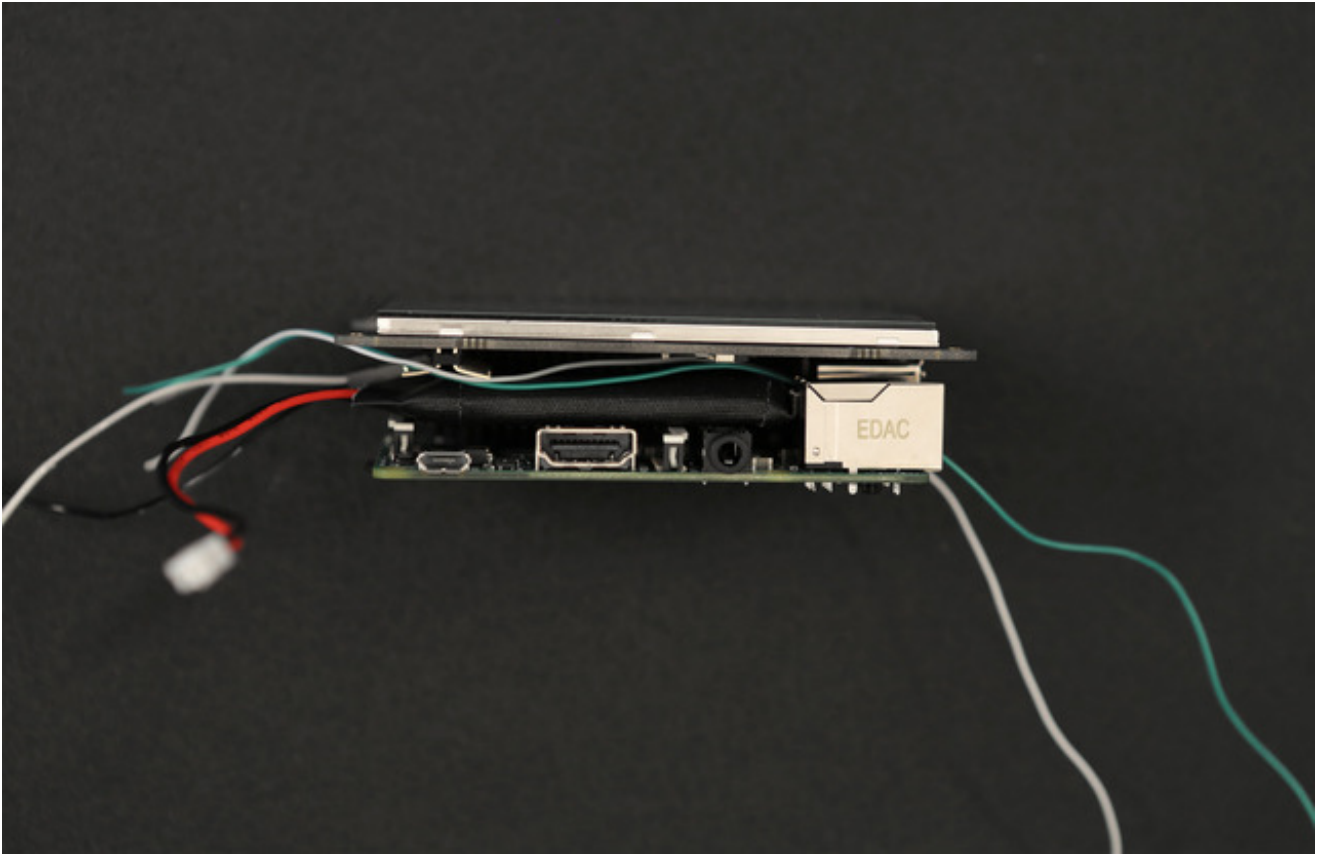
Battery Sandwich

Carefully mount the PiTFT on top of the Pi. Make sure to position the battery wire on the opposite side of the USB ports.



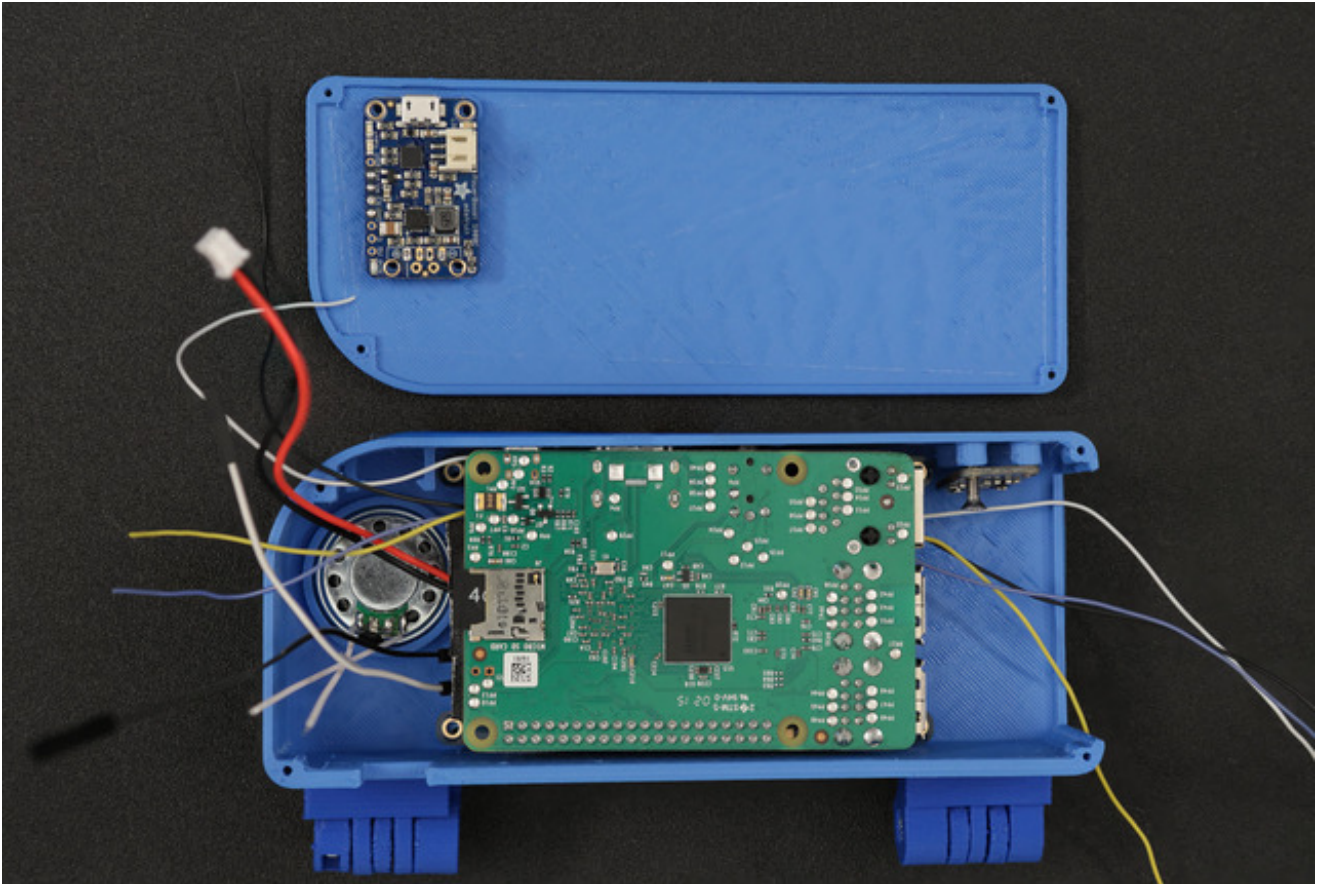
Wire Power

Use two short jumper cables to easily connect power and ground to the Pi. Power is **GPIO2**. Ground is **GPIO6**.



Route wires

Neatly nest each wire for the speaker, amp and PowerBoost between the screen and Pi.



Insert Pi and PiTFT

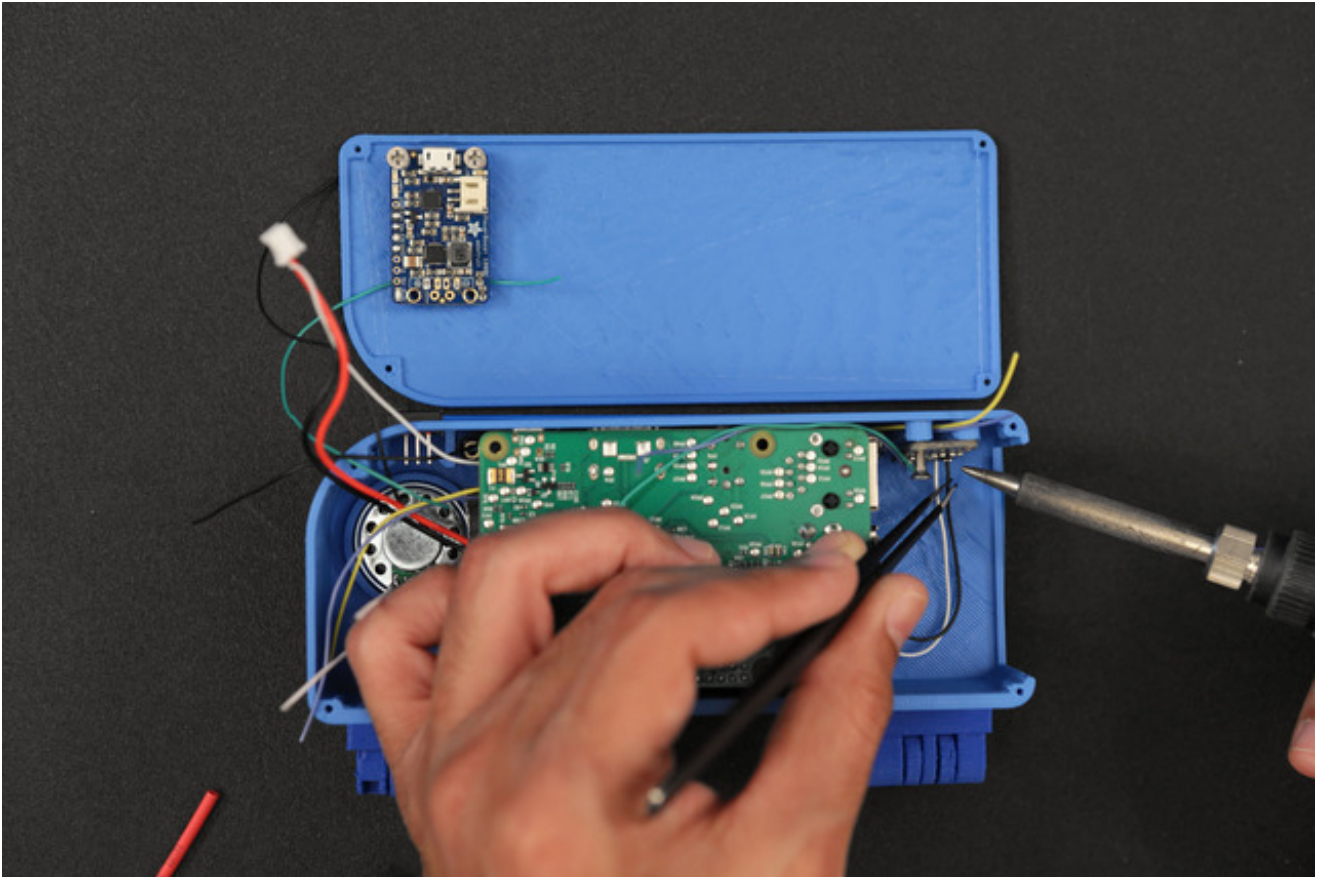
Place the Pi 2 and 3.5" PiTFT into the enclosure. The ports should line up with the cut outs on the enclosure. The mounting tabs on the display should line up with the standoffs in the enclosure.

Add Speaker

Insert the mini metal speaker into the enclosure. The speaker fits into the area with sound cutouts and a circular cavity. The speaker will have tight fit, so just press it down to snap it into place.

Measure each wire

With each wire nested, measure how long you'll need for all of the componets. Make sure to leave a little bit of slack, this will make it easy to open.

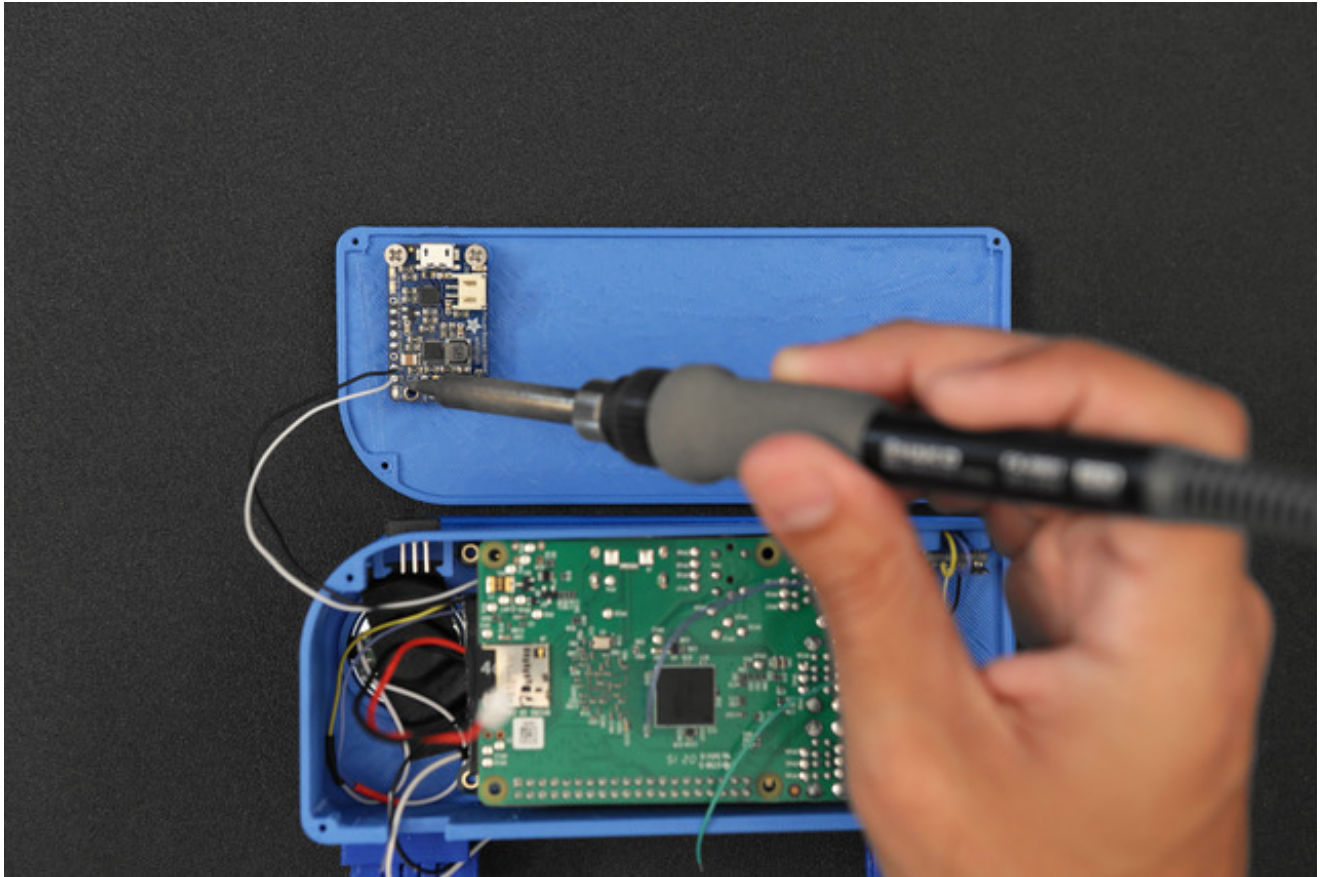


Mount Powerboost 1000C

Secure the Powerboost 1000c to the back cover with two #4-40 3/8 flat phillips machine screws.

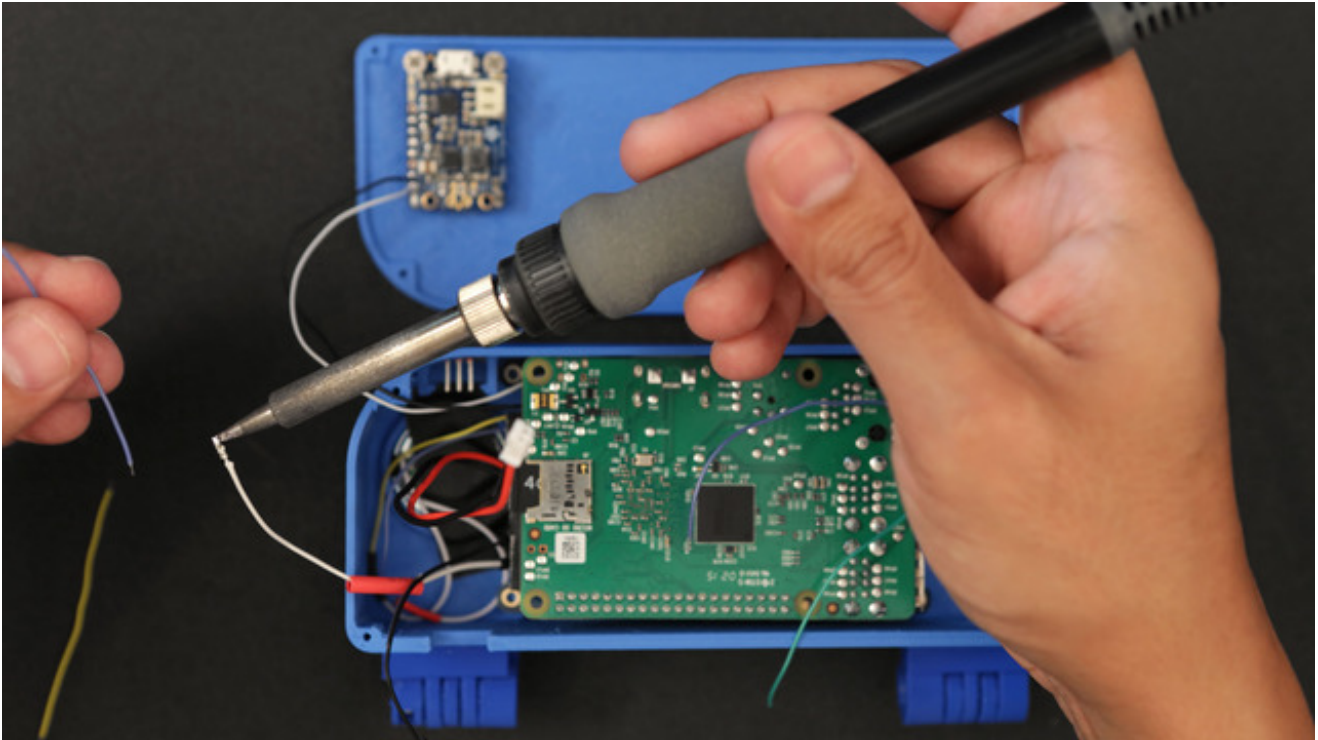
PAM8302 amp

Mount the PAM8302 amp to the side of the enclosure using #4-40 screws. You can solder wires to each pin using a tweezer or solder before mounting.



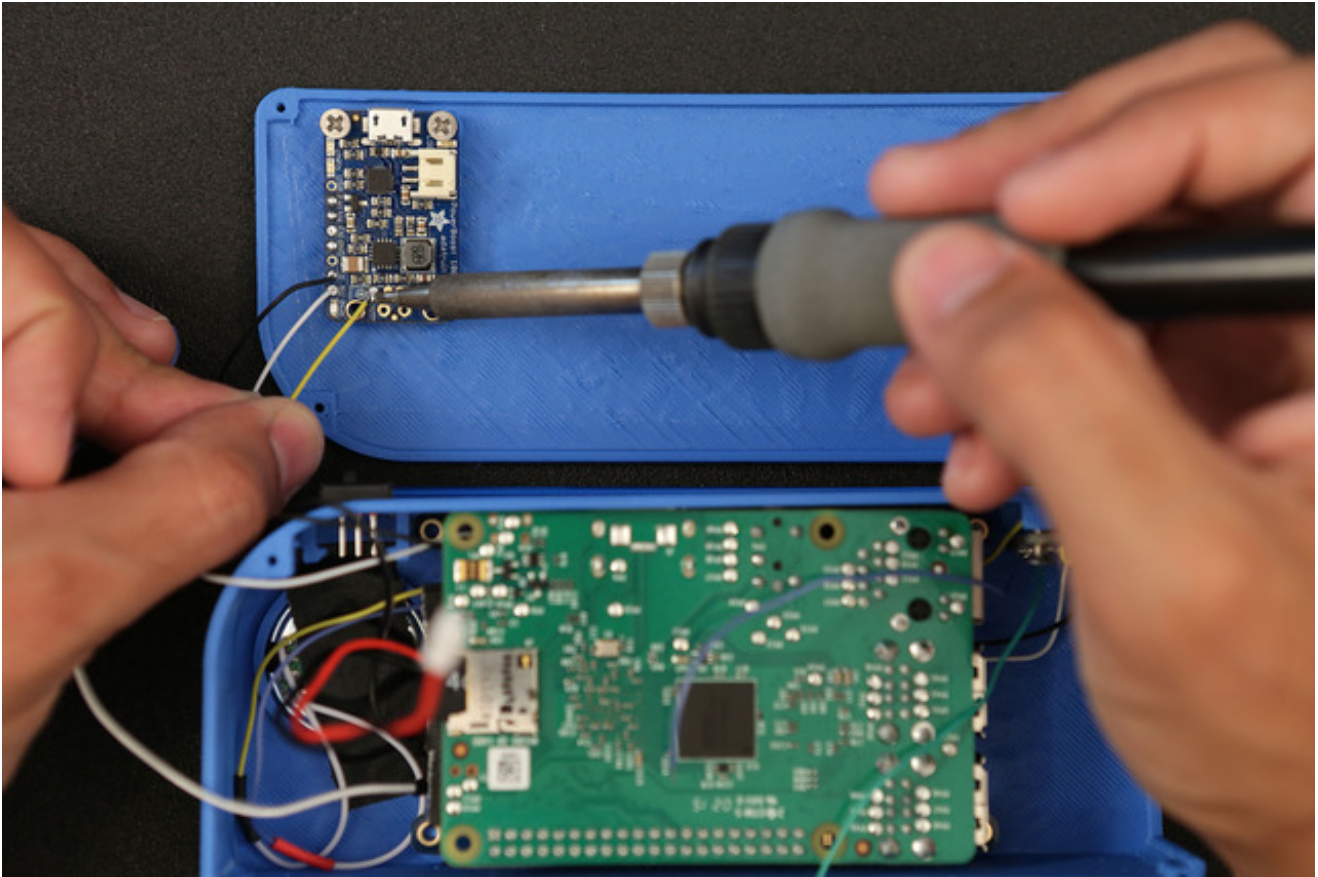
PowerBoost 1000C

Solder the PAM8302 amp pins to the PowerBoost 1000C according to the circuit diagram. Positive to **5V**, negative to **ground**.

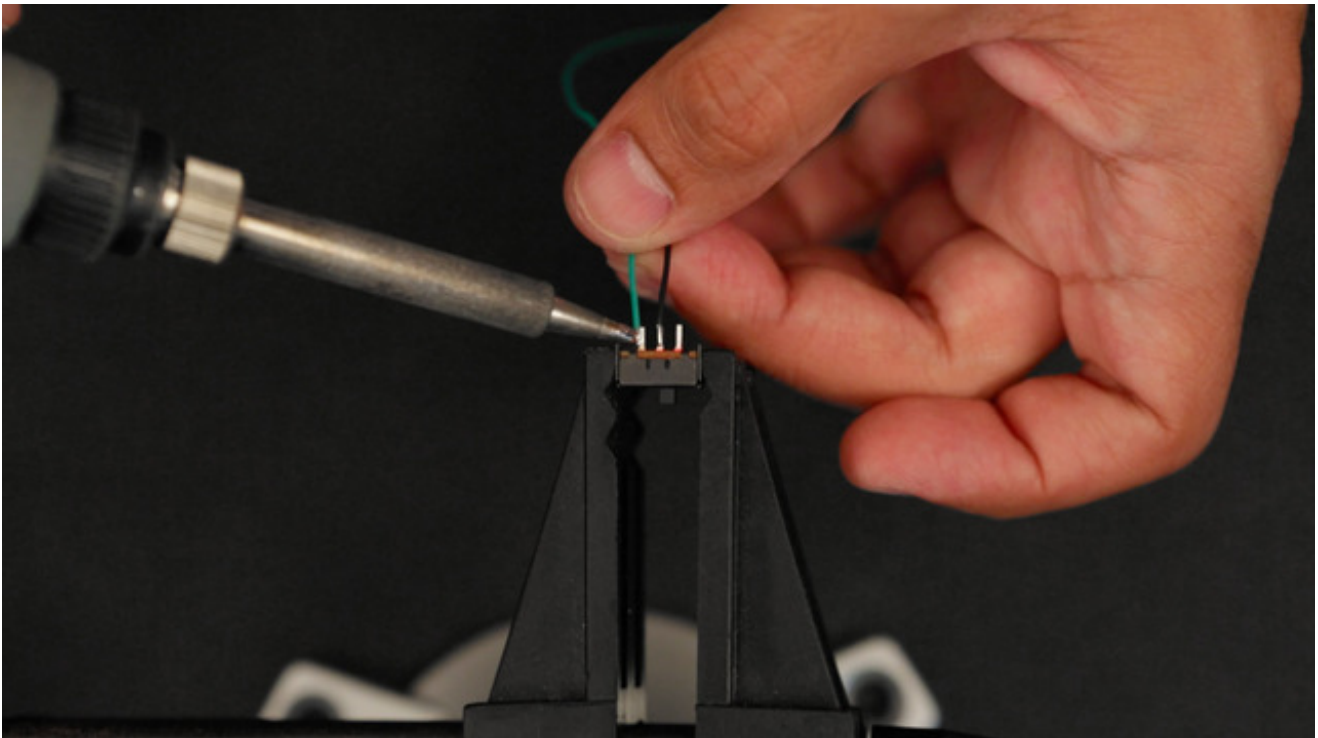


Pi Power

If the jumper cables are not long enough, use silicon wires to extend them to the Pi. Leave a bit of slack like before.

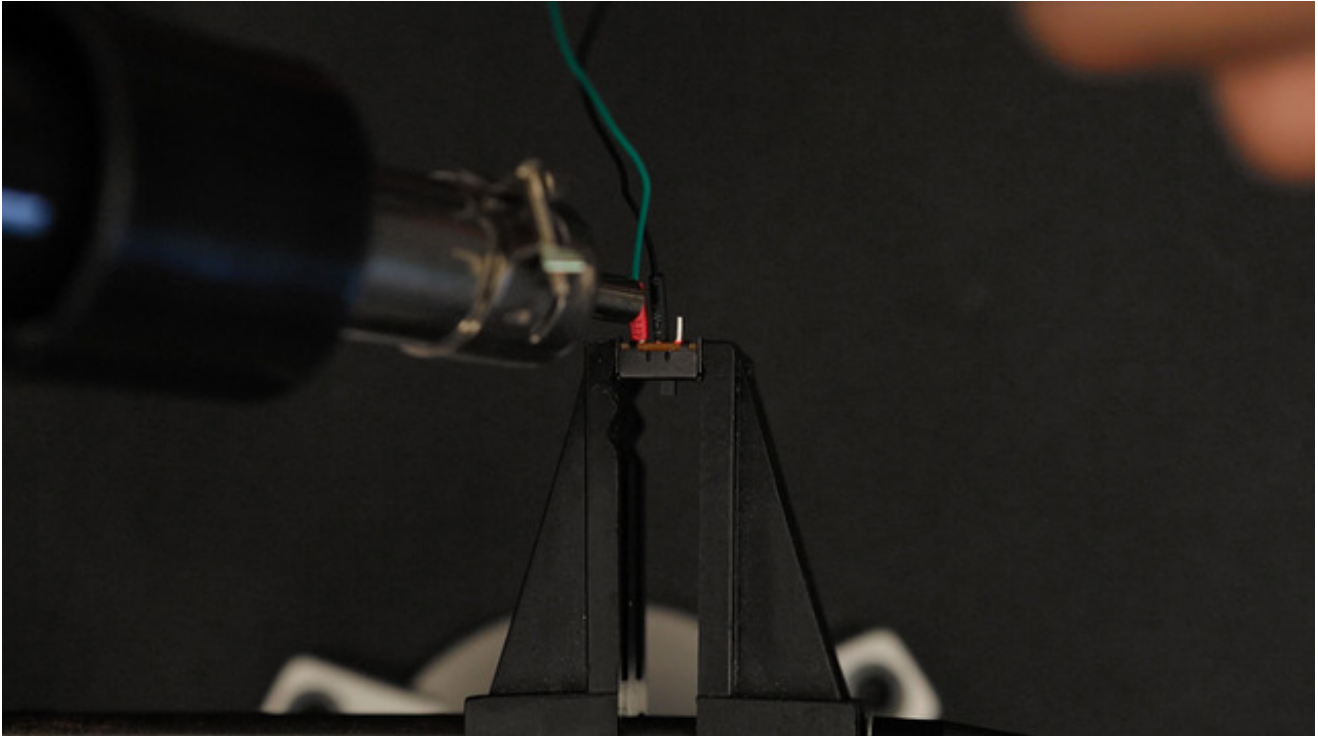


Solder the jumper cables to the ground and positive pins on PowerBoost 1000C like shown in the circuit diagram.

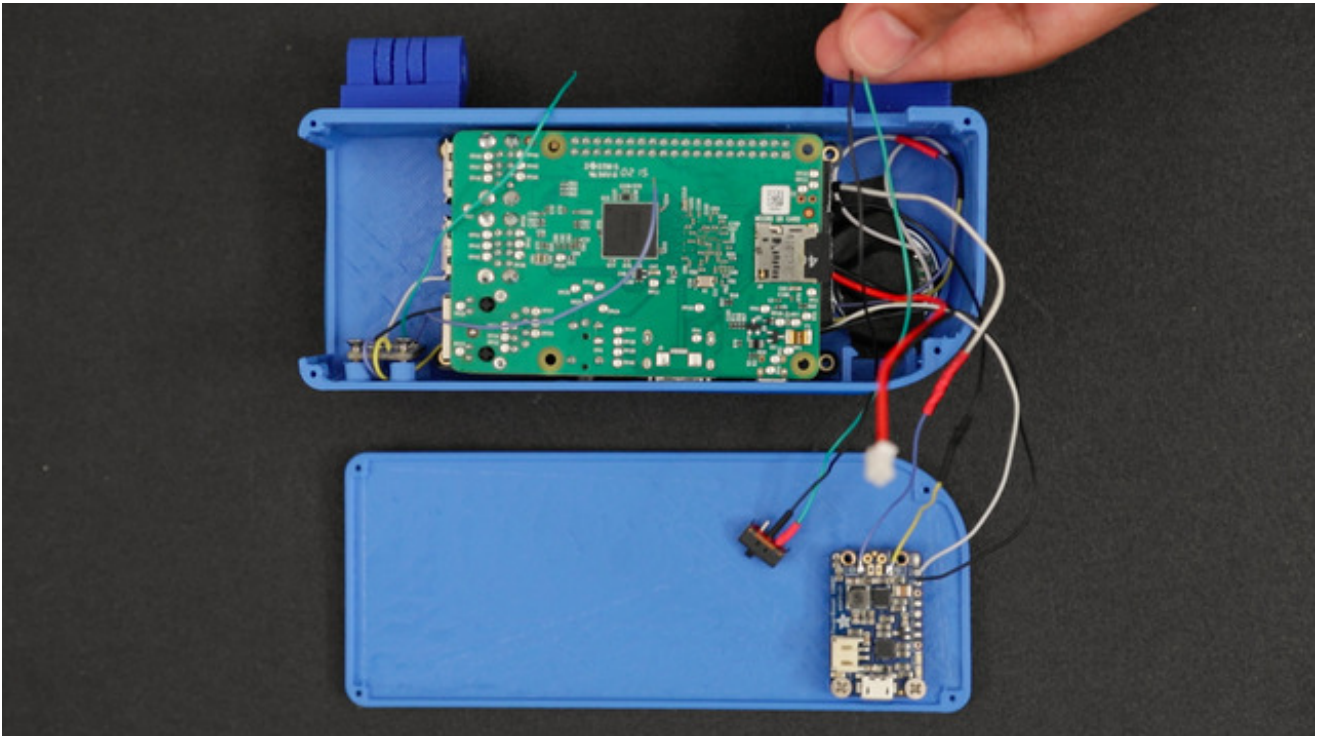


Slide Switch

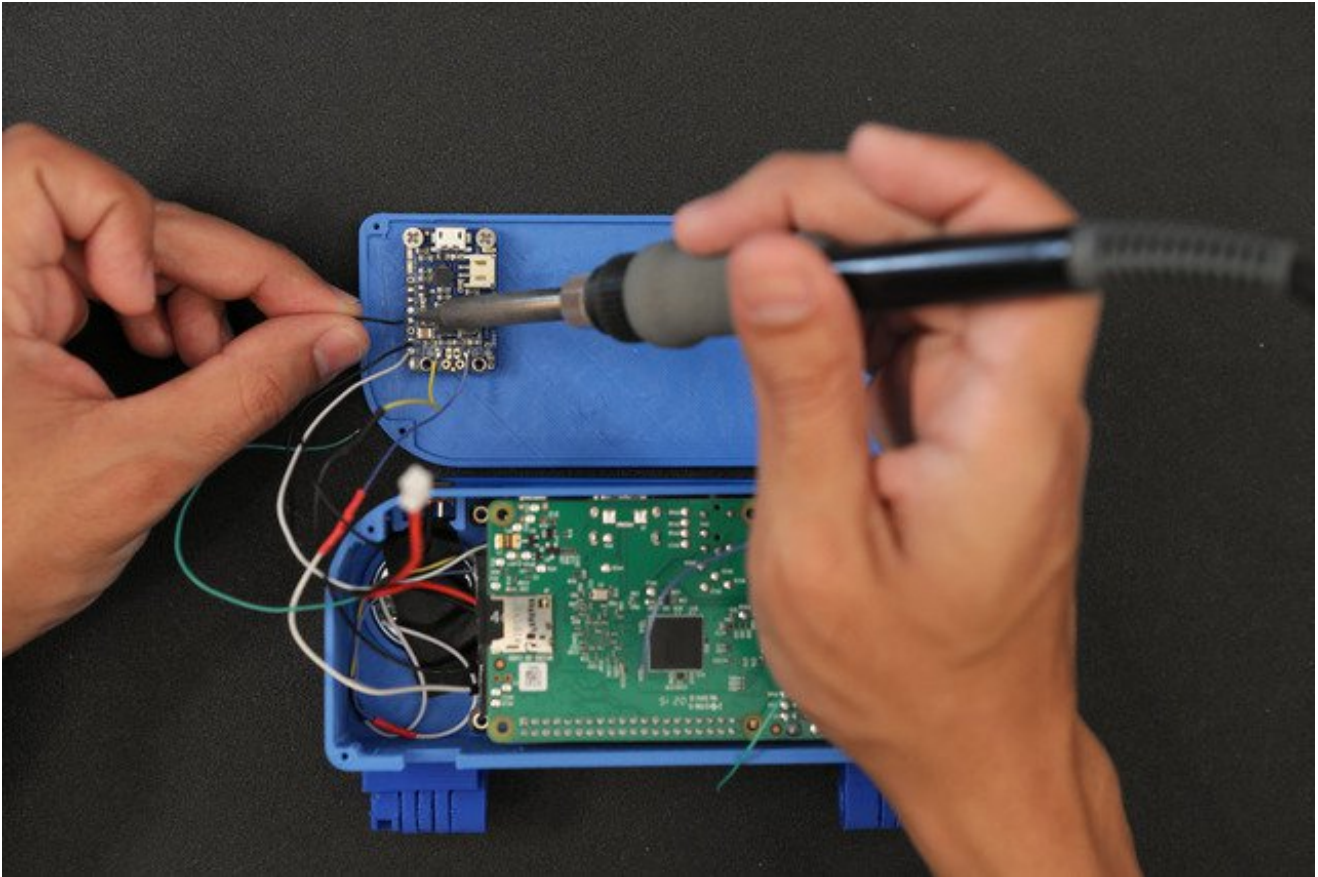
Mount the slide switch and then take measurements for the length of wires we'll need.



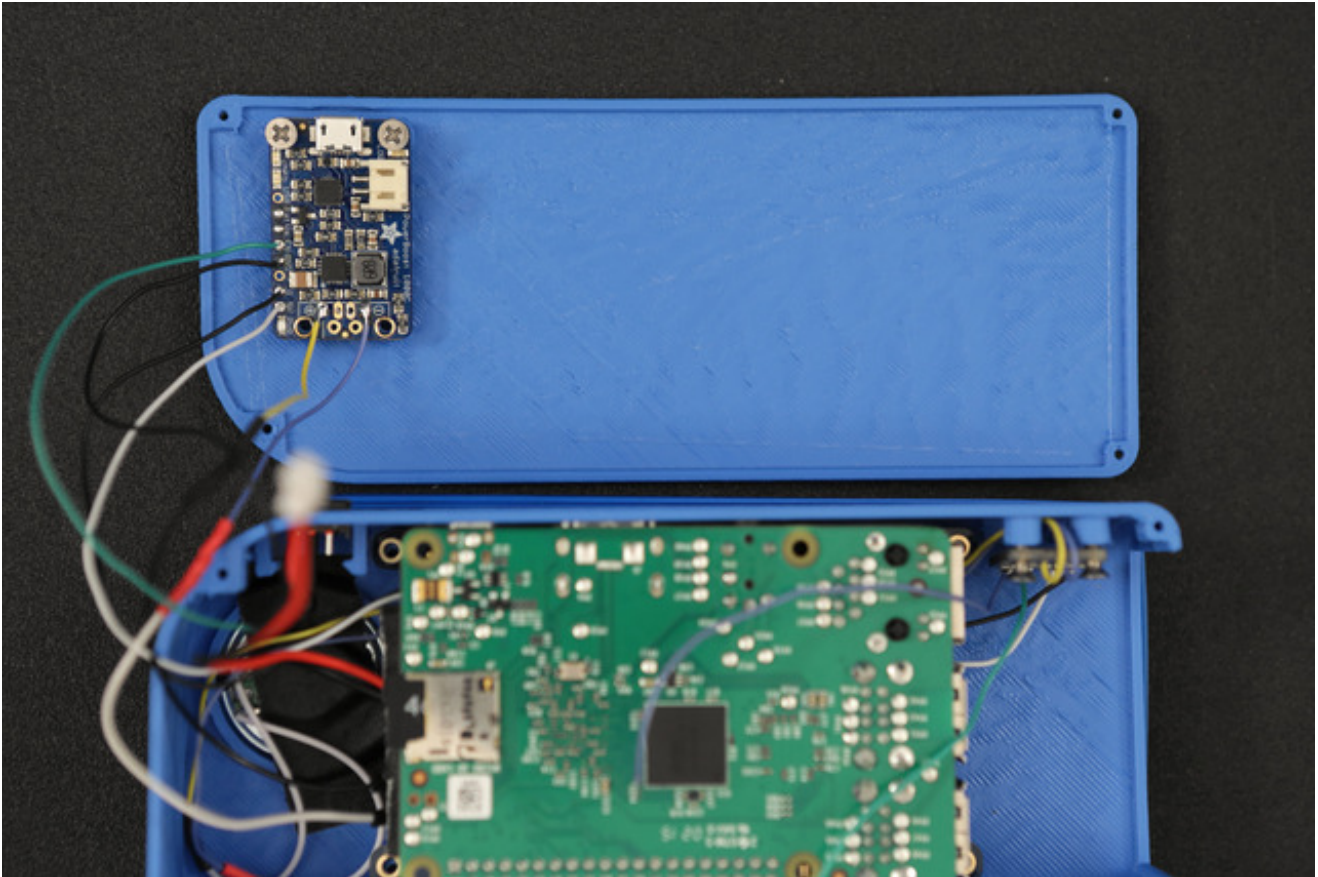
Solder wires to the slide switch and use heat shrink tubing to insulate the connections.



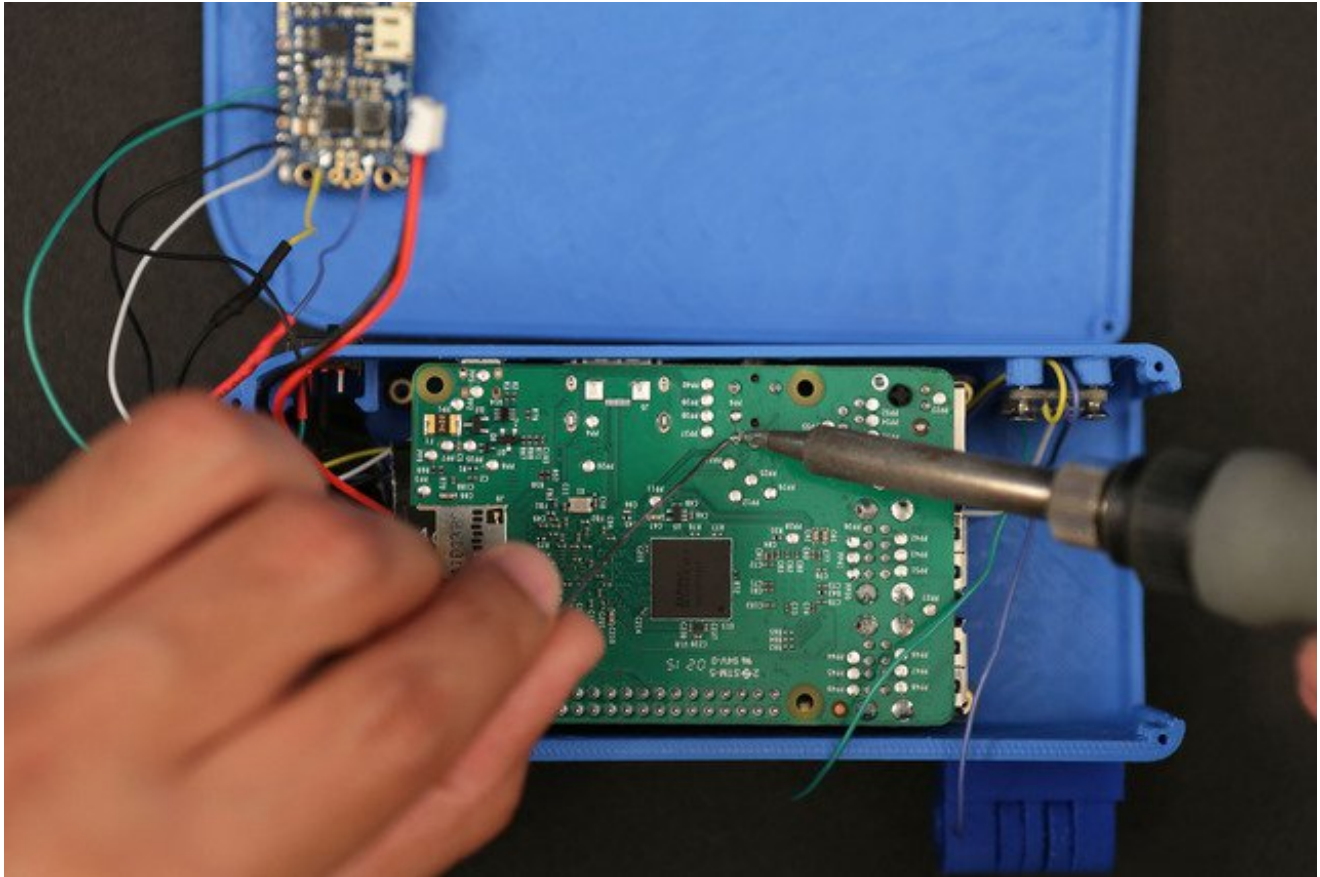
Route slide switch wires through the mounting clips on the enclosure before soldering to the PowerBoost 1000C



Solder these wires to the **enable** and **ground** pins on the Powerboost 1000C.

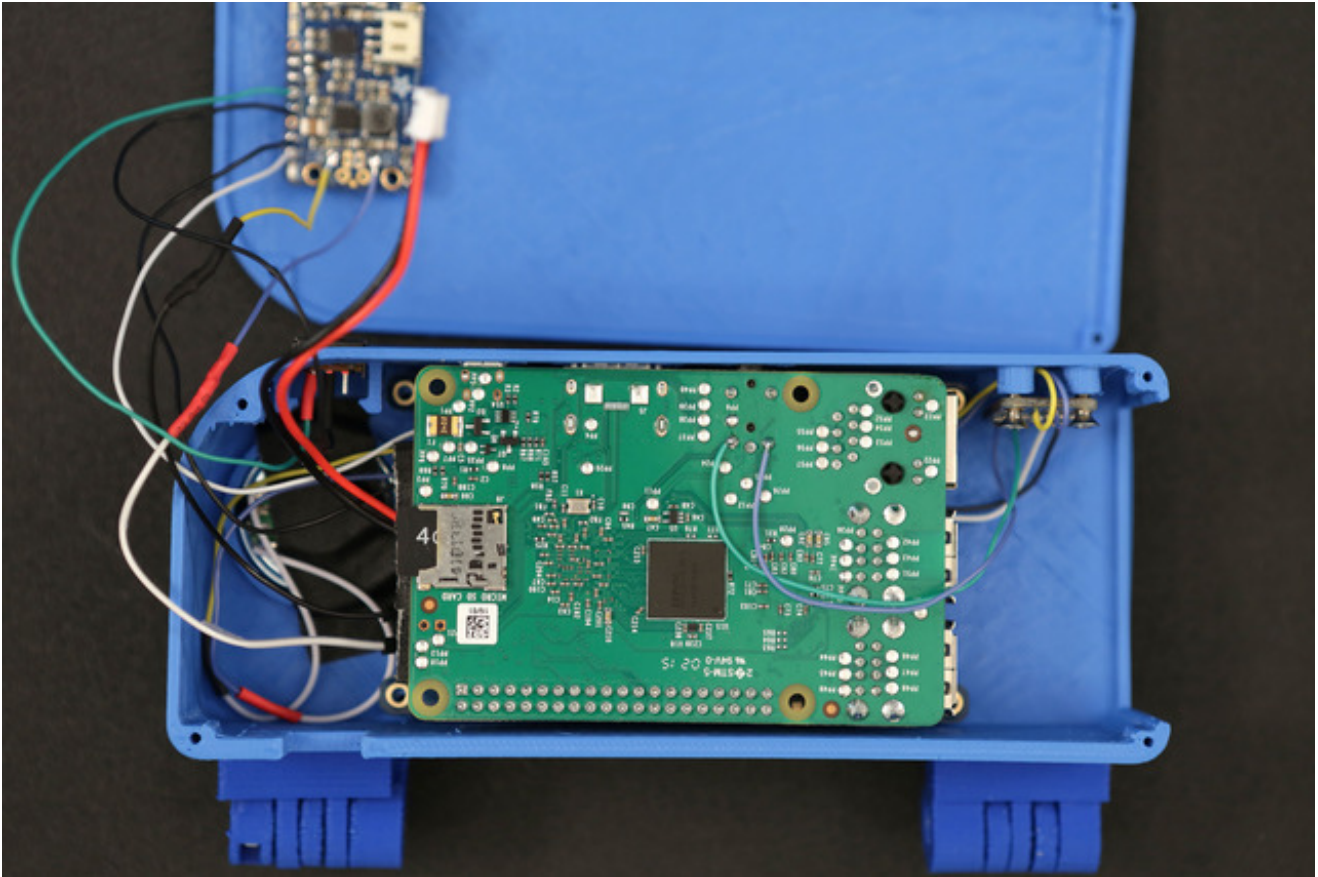


Almost there! Now we'll just need to route audio to the speaker.



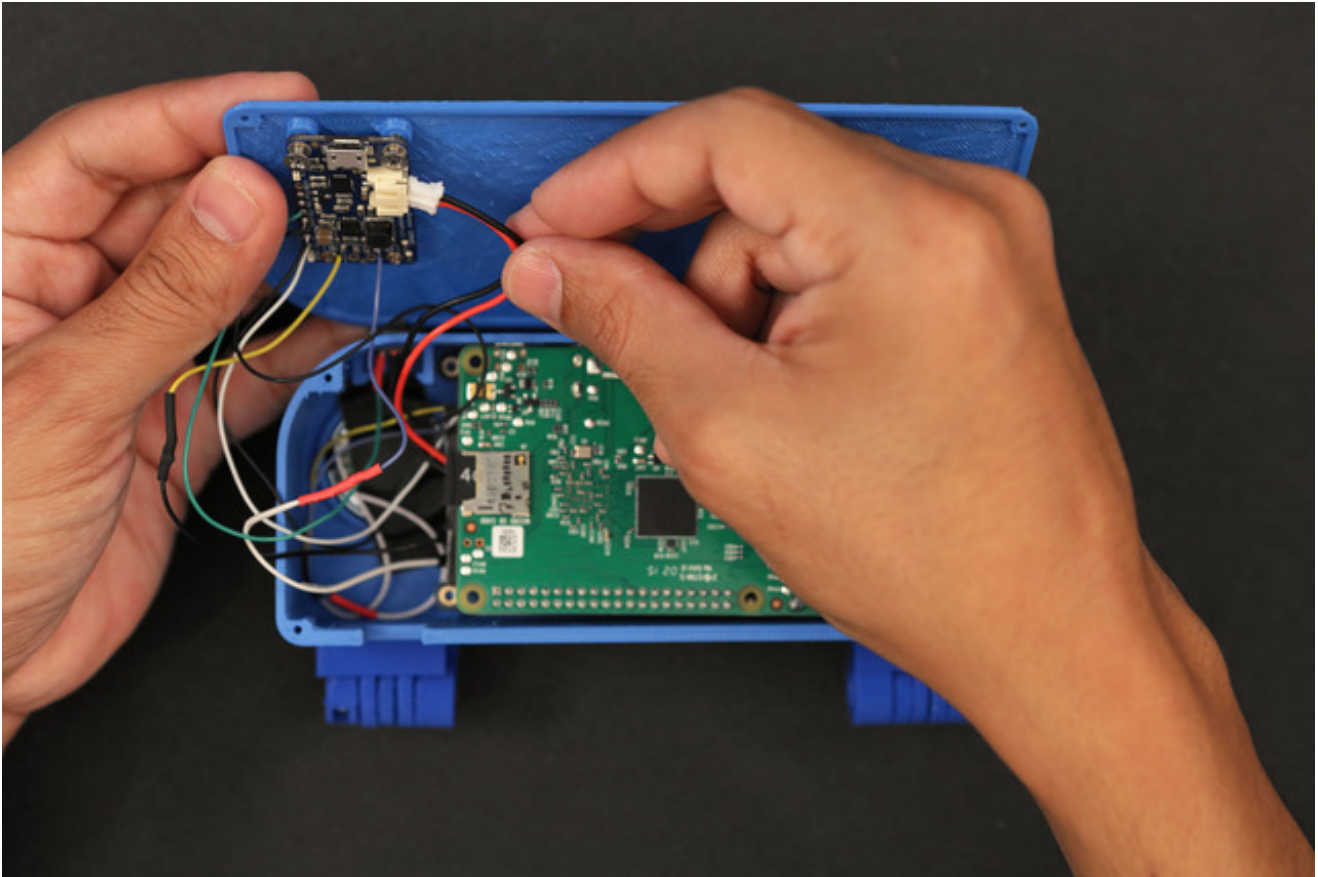
Pi Audio Input

We can route audio from the headphone jack by directly soldering to the pins on the bottom of the Pi 2. Use a small amount of solder to tin each pin.



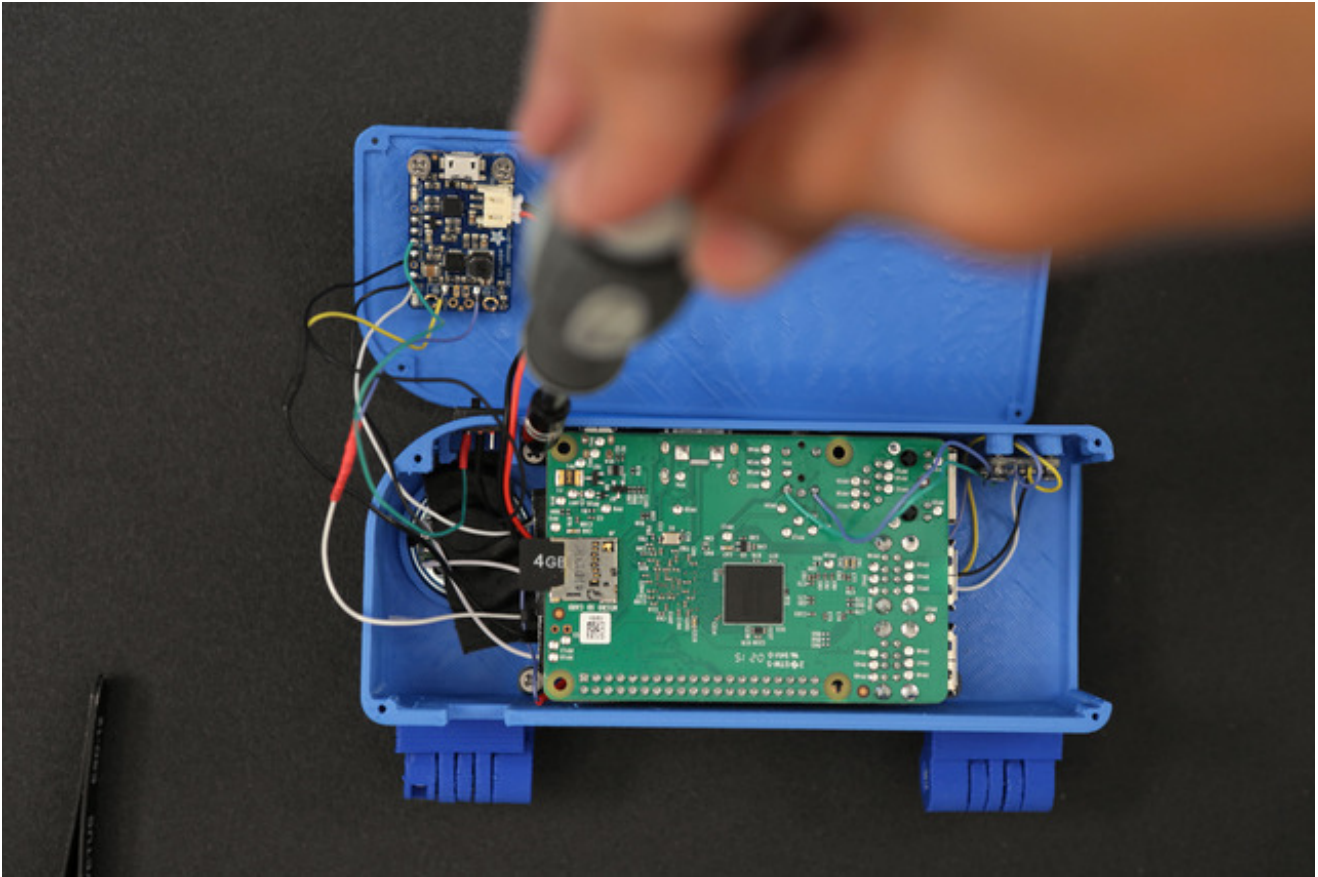
Audio wires

Nest the wiring along the side of the case to avoid covering up the USB ports.



Battery JST

Connect the 2000mAh lipo battery to the JST port on the PowerBoost 1000C. Turn on the slide switch to check power.



Mount PiTFT

Use four #4-40 screws to mount the Pi and PiTFT to the case. You may need to bend the side of the case (with the port openings) to allow the Pi to fit into the case.



Back Cover

Lay the back cover over the enclosure and fasten four #2-56 screws to mount the back cover to the enclosure.



The USB ports are tucked inside the enclosure, so your USB dongles are nicely hidden and out of the way.

The mini chiclet keyboard is both adorable and wireless. It features a trackpad, but you can also use the Touch screen on the PiTFT.

So now you can monitor your printers and remotely kick off a printer or check up on your baby and make sure they're OK.

You can even jam out for your favorite steam on soundcloud.

And if you're looking to play some games, you can easily turn this into a Z Machine and play your favorite retro text adventure games!