



7" Mini PC

Created by Ruiz Brothers



<https://learn.adafruit.com/7-mini-pc>

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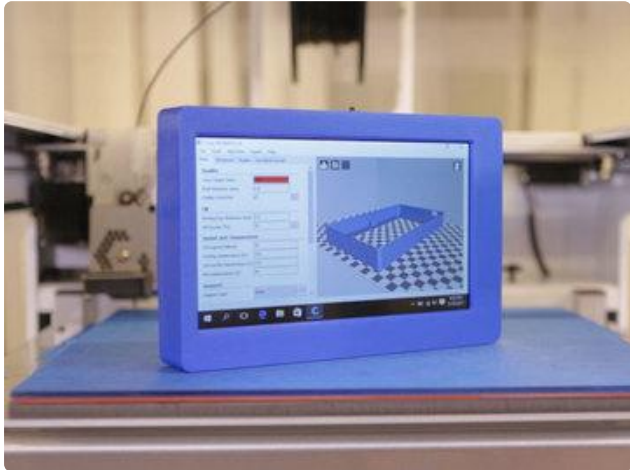
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Overview

This 7 inch display has a built-in battery and works with any HDMI device.

3D Printer Host control



While Octoprint running on a Raspberry Pi works excellent, occasionally we'll need to maintenance printer by updating the firmware. This when we need a full blown windows pc for uploading the files.

So we built this project to easily control some of the printers we use.



We like this because it's actually a lot smaller to bring this over to a printer then it is to bring over a MacBook Air. So much smaller that we can fit the display right inside the printer and configure printers that can only use windows software.

This design is an update to our previous 7 inch design. This time around we made the build easier to assemble by using snap fit nubs to hold the lid onto the case instead of screws.

Attach a PC or Raspberry PI

Mounts are easy to add in the model or just make threads right on to the lid to attach your favorite tiny computer!



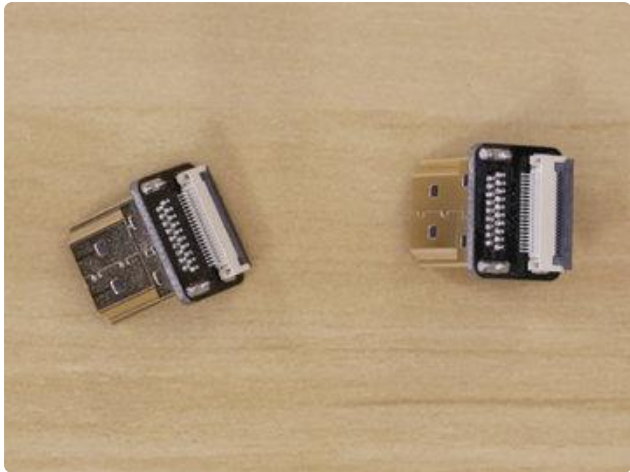
Rechargeable circuit

We used a PowerBoost 1000c to easily power the circuit, so its easy to recharge it from the USB port on the side.



Tripod compatible

We even included geometry on the case for adding a tripod compatible screw to make it easy to mount the entire enclosure to a tripod. The tripod screw fits flush against the enclosure so it can stand upright on its side when the tripod isn't needed.

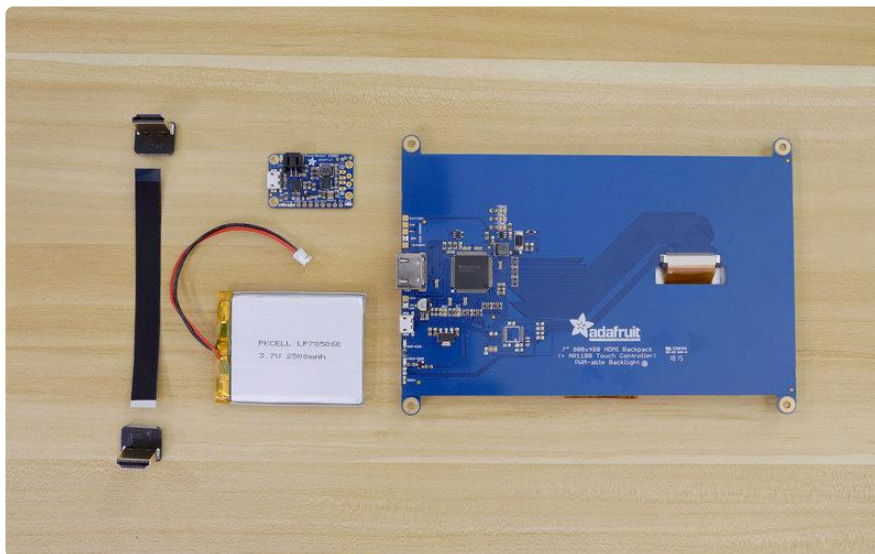


Interchangeable HDMI Connectors

We used these small interchangeable [DIY HDMI Cable Parts - Right Angle \(R bend\) HDMI Plug Adapter](#) connectors. They feature a latching mechanism to connect to flat flexible ribbon cables.



The connectors are available in different angle configurations, so it's easy to mix and match them based on the type of project. Think of them like lego for HDMI connections!



Prerequisite Guides

- [7" HDMI Monitor Backpack](#) ()

Parts

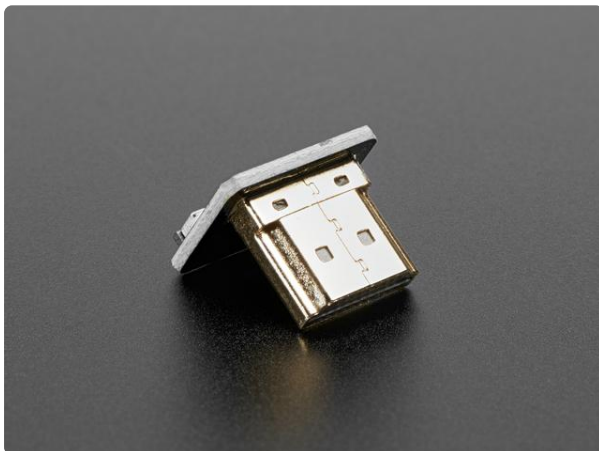
We have all the lovely components and tools to build this project. Be sure to check out the featured products on the right sidebar.

- [Kangaroo Desktop \(\)](#)
- [HDMI 7" Display Backpack \(http://adafru.it/2406\)](http://adafru.it/2406)
- [SPDT Slide Switch \(\)](#)
- [1/4" to 3/8" Convert Screw Adapter for Tripod \(\)](#)
- [M3 x 6mm \(\)](#) for the Display
- [M2.5 x 5mm \(\)](#) for the PowerBoost
- [M2 x 4mm \(\)](#) for Brackets
- [2500mAh lipo battery \(\)](#)
- [PowerBoost 1000C \(\)](#)
- [Kano Keyboard \(\)](#)
- [DIY HDMI Cable Parts - Right Angle \(R bend\) HDMI Plug Adapter \(\)](#)
- [DIY HDMI Cable Parts - 10 cm HDMI Ribbon Cable \(\)](#)

Tools & Supplies

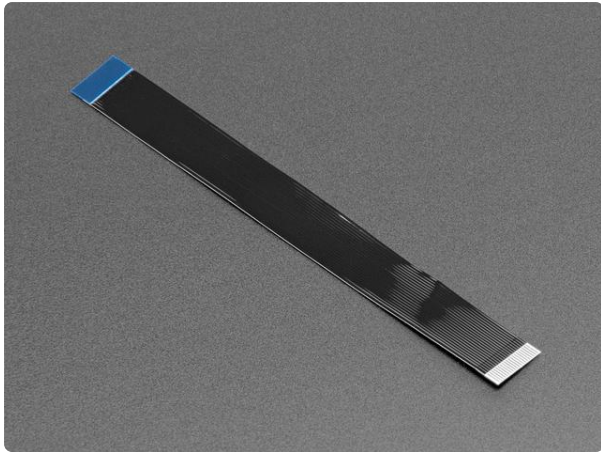
You'll also need a couple of hand tools and accessories to assist you in the build.

- [Solder Iron \(http://adafru.it/1204\)](http://adafru.it/1204) + [Solder \(http://adafru.it/734\)](http://adafru.it/734)
- [Silicone Wire \(http://adafru.it/1877\)](http://adafru.it/1877)
- [PLA Filament \(\)](#)
- [3D Printer \(\)](#)



[DIY HDMI Cable Parts - Right Angle \(R bend\) HDMI Plug Adapter](#)

If you love DIY cable-rigging, then these HDMI adapters are right up your alley! Making custom HDMI cables has never been easier. Just grab one of our <https://www.adafruit.com/product/3549>

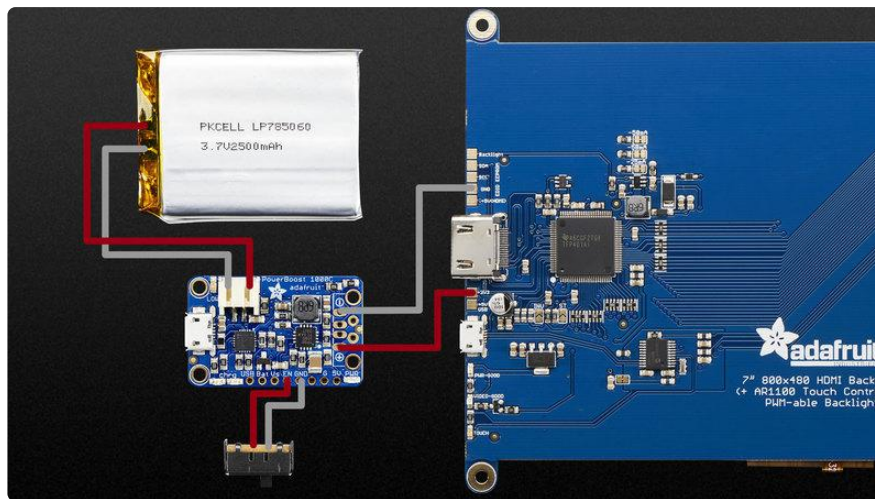


DIY USB or HDMI Cable Parts - 10 cm Ribbon Cable

If you're looking to make a custom cable with any two of our USB or HDMI adapters, then you'll need to have these flex cables handy! Making custom cables has never been...

<https://www.adafruit.com/product/3560>

Circuit Diagram



The Circuit Diagram

The slide switch connects to the EN and GND pins on the PowerBoost 1000C.

The Battery plugs into the JST connection on the PowerBoost

+ and - pins connect to +5V and GND on the monitor.

You can charge the battery by connecting a cable to the USB port on the PowerBoost.

3D Printing

Download and 3D Print

You can 3D print the parts using PLA for the case and lid on desktop FDM style 3D printers. The parts can be downloaded using the link below. If you don't have a 3D printer, the files are free to download so you can send them to a [3D printing service](#) ().

The parts were 3D printed using the [Type A Machines Series 1 Pro](#) ().

Download the files from Thingiverse

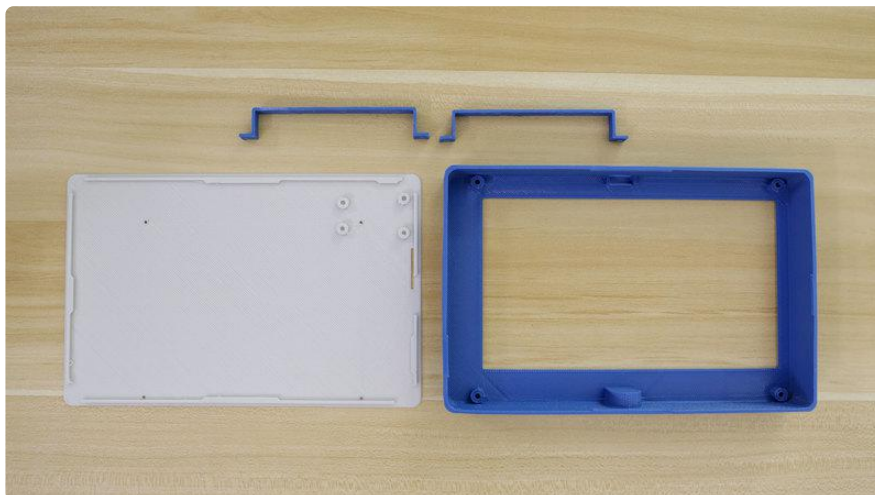
Download the files from Youmagine

Download the files from Pinshape

Edit Design

The design is modeled in Autodesk Fusion 360 and available to edit. We can modify the sketches or adjust features in the parametric timeline.

Edit Design



3D Printed Parts

The case is held together using snap fit nubs on the inside of case and lid.

We'll use screws to mount the display to standoffs inside the case with four M3x6mm machine screws.

The PowerBoost is secured on the lid with four M2.5x5mm screws.

Brackets are held in place to the back of the lid with four M2x4mm screws.



Slice Settings

Depending on your 3D printer, you may need to adjust the slice settings. We printed all of the parts on a [Type A Machines Series Pro 1 \(\)](#). These parts were sliced with [Simplify3D \(\)](#).

- Nozzle: 0.34mm
- Extrusion Multiplier: 1.0
- Extrusion Width: 0.44mm
- Layer Height: 0.2mm
- Infill: 10%
- Nozzle Temperature: 230c
- Heated Glass Bed: 40c
- Print Speed: 80mm/s
- Vertical Lift / Retraction: 2mm

Perfect First Layer

Heat the bed to around 40c (optional) and make sure that it's absolutely leveled across the entire bed in order to properly 3D print these large parts. It's really

important to have a perfect first layer, so make sure the bed is cleaned to ensure the filament adheres to the bed.

While leveling the bed we need to find the sweet spot so that the first layer isn't too squished or too loose. If the bed's too close to the nozzle, the material may buckle. If it's too high the bottom, we won't have an even surface.

Tolerances

The parts were tested with common printing settings (listed above). There's only a few areas where tolerances really matter - the snap fit nubs and the mounting holes.

Test fit the parts by attaching lid to the enclosure. Also check to see if the cutouts fit over the USB ports.

Bed Leveling

Any parts with large surface require a well leveled build plate. If you're using a heated bed, you can minimize warping. Blue masking tape, build tak, and sticky adhesives can help keep your part flat and adhere to the bed.

Clean up

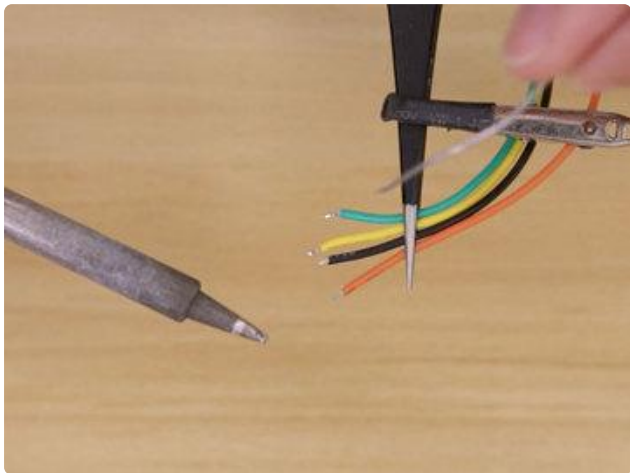
If there's any string or artifacts left over from retraction and oozing, clean up the part by trimming them off using a pair of flush diagonal cutters.

Assemble



Measure and Cut Wires

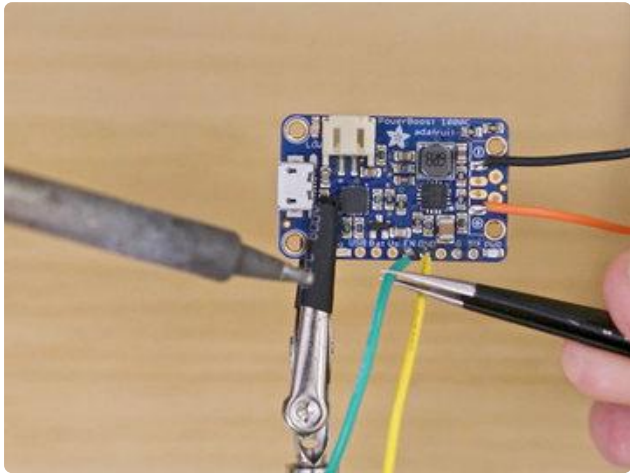
First we'll need to prepare the wires needed to connect the display to the PowerBoost. The PowerBoost will also need wires for the slide switch to turn the circuit on and off. We used [26 gauge silicone \(\)](#) wires for the connections.



The + and - pins that connect to the display will need to be 240mm long.

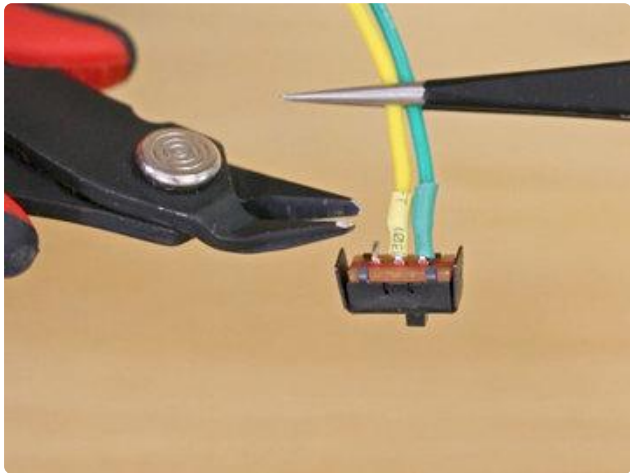
The Enable and Ground pin will need to be 270mm long to reach the slide switch.

Solder wires



We can use a third helping hand to secure the PowerBoost while we tin and solder the wires to the pins.

Solder the + and - wire so they are pointing away from board as shown in the picture.

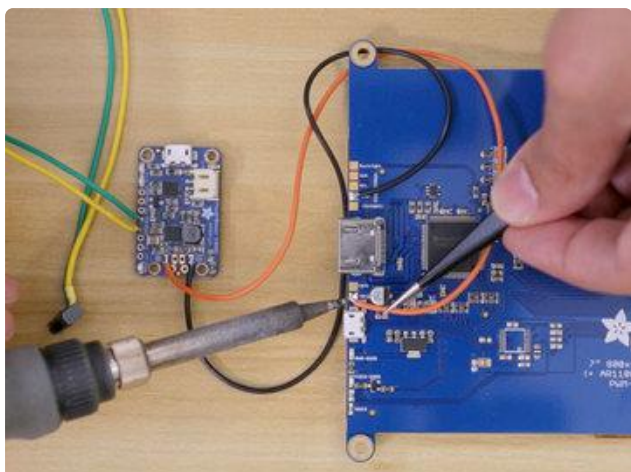


Solder the GND and EN pins with the wires angled straight up as shown in the picture.

Slide Switch

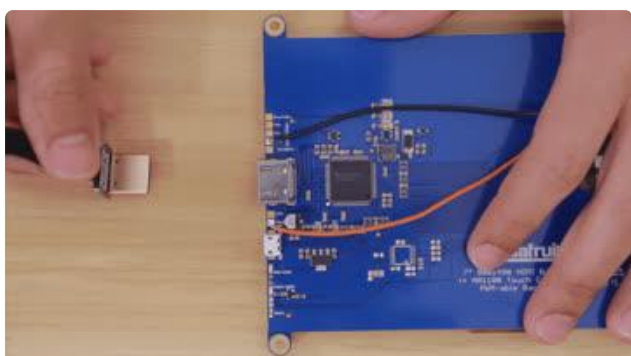
Solder the GND and EN wires to each of the two pins on the slide switch. We like to use heat shrink tube to insulate the connects. We can also trim off the unused pin. Just make sure not to cut the pin in the middle!

Connect Display



Now we can solder the + and - wires to the display. The + wire will connect to the 5v+ pad and the - wire will connect to the GND pad on display backpack.

Angle the wire so they are positioned to the center of the display as shown in the picture.



Plug in HDMI Connector

We can now plug in the HDMI connector into the display before we mount the screen into the case. We used the 90 Degree Up Angled HDMI Type A Male so the ribbon cable can plug in from the top.

Mount display



With the display soldered to each connection we can go ahead and insert it into the 3d printed case. Insert the display at an angle as shown in the gif.

Once inside we can look at the tabs on the display backpack and then slide it over slightly to align it to the standoffs on the case.

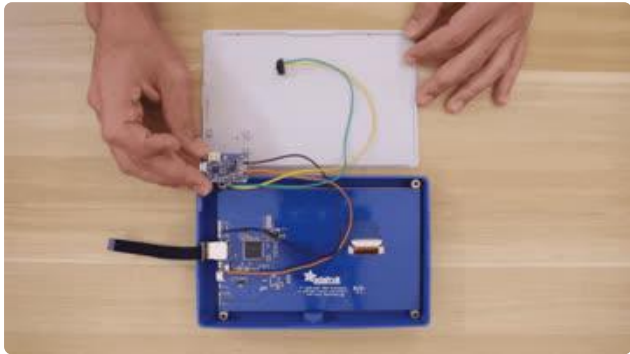


Slide Switch

Arrange the wires on the slide switch and insert the switch into the port cutout on the middle portion of the case. Insert the switch at an angle as shown in the gif.

Mounting the PowerBoost

Now we can position the lid above the case as shown in the picture. We'll need to use four M2.5 x 5mm screws to secure the PowerBoost to the standoffs on the lid. Position the USB port on the PowerBoost so it faces away from the case.



Mounting the display

To secure the display to the standoffs inside the case, we'll need four M3 x 6mm screws.

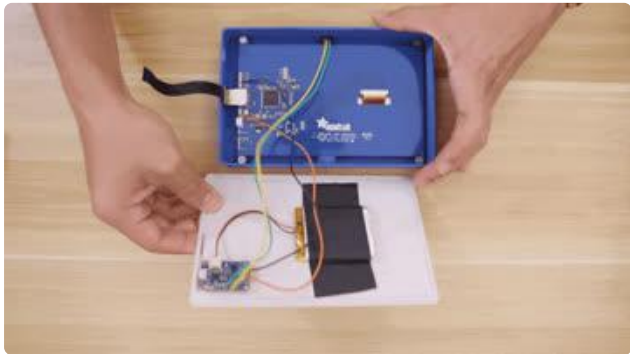


Position the display so the HDMI connector is on the same side of the port opening on the case. Now we can fasten the four screws to secure the display in place.

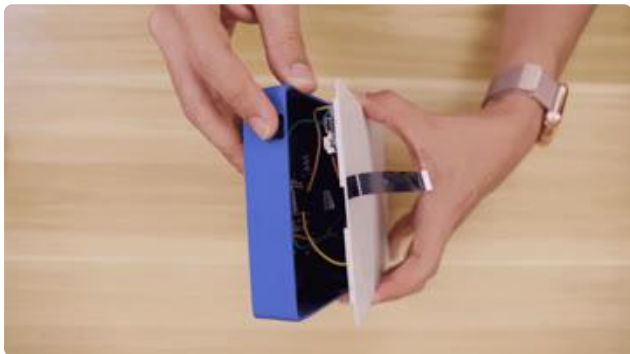
Mounting the battery



We can use gaffers tape to attach the lipo battery to the lid. Take note of where the mounting holes are located and position the battery in the middle of the four mounting holes.



Use a strip of gaffers tape and adhere it to the middle part of the battery and then tuck in both sides while attaching it to the lid part like shown in the picture.

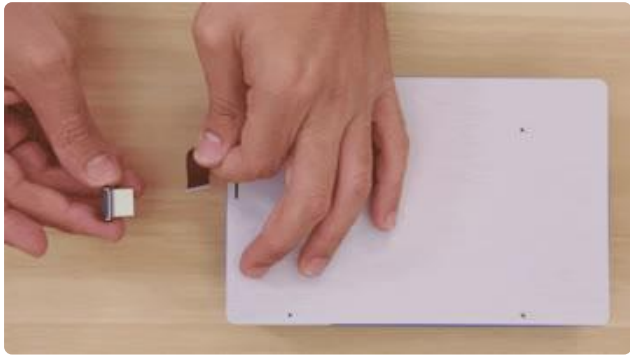


Closing the lid

Arrange the wires away from the sides of the case so we can safely snap fit the lid on top.

Before we completely snap the lid to the case, we'll need to slip the HDMI ribbon cable through the slit on the lid. Pull the ribbon cable through the slit as shown in the gif.

HDMI connector



Now we can connect the second HDMI connector to the ribbon cable. We used another 90 Degree Up Angled HDMI Type A Male connector. Lift the latch and then insert the ribbon cable to attach.



Brackets

The mini pc is held in place with two brackets that are secured onto the lid. We can use four M2 x 4mm screws to attach the brackets to the lid. First, fasten the screws to the lid to create threads for the screws. Now we can fasten the screws to the brackets and align them to the mounting holes on lid to attach the brackets.

Attach PC



Now we can slide in the mini pc. It should be a tight hold, but if the tolerances are too tight we can place the pc over the lid and then attach the brackets to the lid.



And now we can easily pair the pc with any keyboard. We used the orange keyboard included with the [Kano kit \(\)](#), but any wireless keyboard will work.

We can easily update the design to include a Raspberry Pi by adding standoffs to the lid part in the Fusion360 file or just drill them right on the lid.

