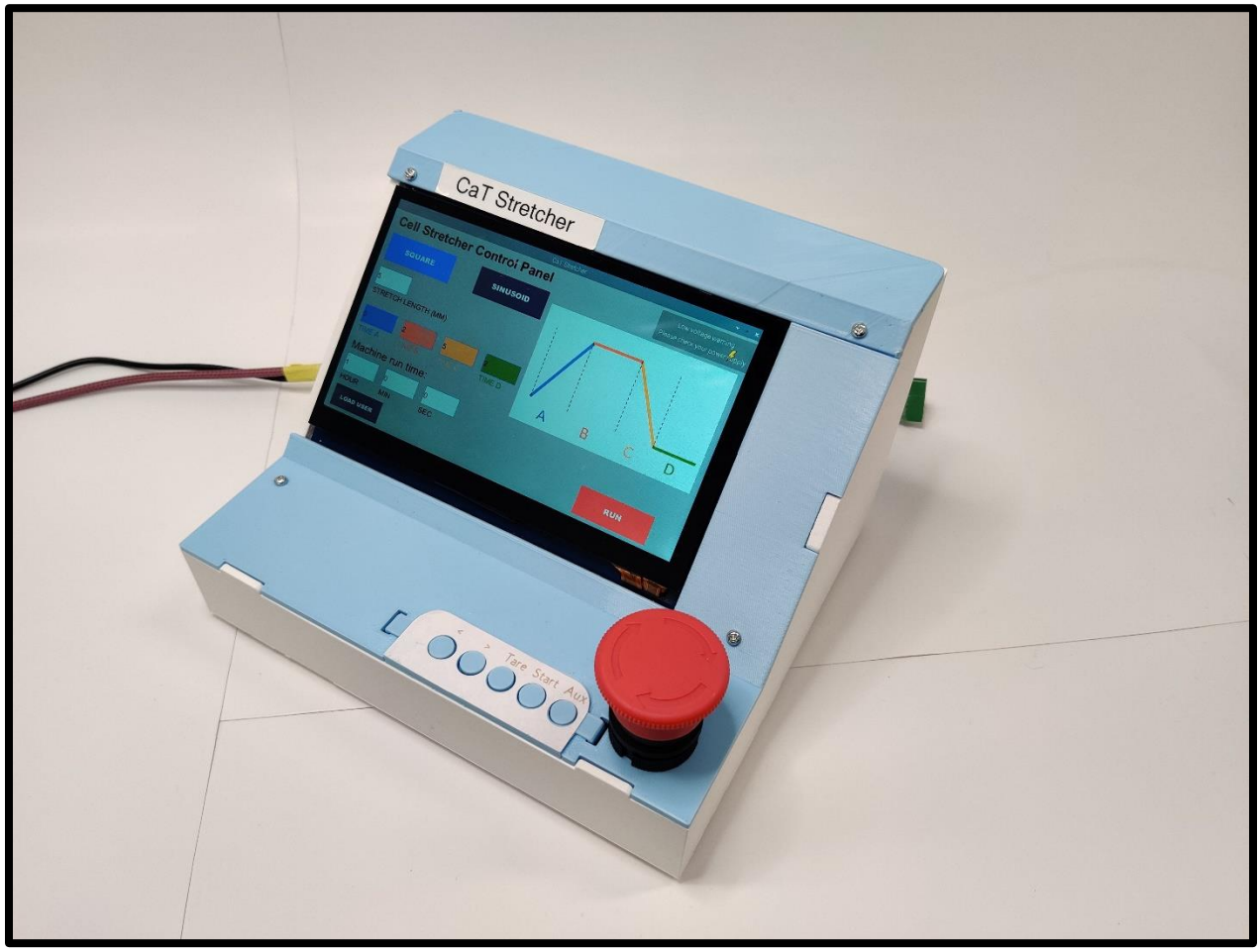
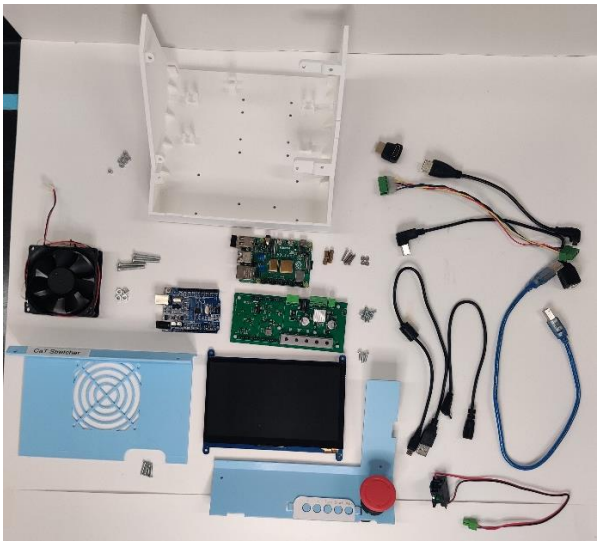
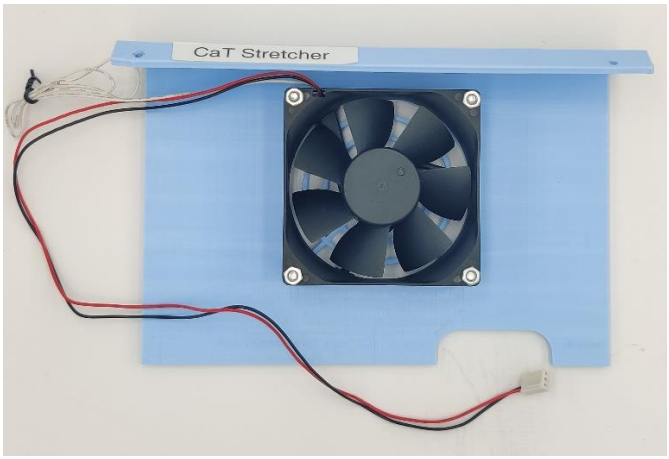
CaT Controller Assembly Manual

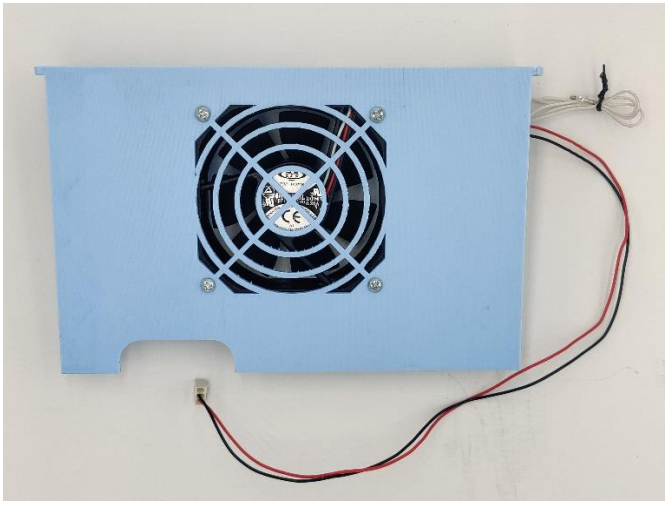


Components list

Part Number	Description	Quantity
406	Emergency stop	1
408	Electronics housing Front cover	1
409	Electronics housing back cover	1
411	80mm Cooler Fan	1
311	M4 X 30 Screws	4
312	M4 nuts	4
407	Electronics Housing Base	1
401	Arduino Uno	1
402	Custom PCB	1
403	Raspberry Pi 4	1
309	M3x5 screws	9
308	M2.5 8mm female-female Raspberry Pi Standoffs	4
310	M2.5 screws	8
404	USB A to micro USB cable (should come with screen)	1
909	Male to female barrel connector (5.5mm OD, 2.1mm ID)	1
904	USB A to B cable	1
905	USB B female to male right angle adaptor	1
906	Angled micro HDMI to standard HDMI cable	1
908	Male to female standard HDMI angled adaptor	1
	4-pin male to female stepper motor extension cable	1
404	Raspberry Pi 7” screen	1
902	Keyboard and mouse peripherals for Raspberry Pi 4. ** Wireless peripherals recommended	1
306	M3 nuts	7
307	M3X14 screws (for front and back panel)	4

	**Preparing all required parts** - Refer to components list
	**Install emergency stop button** Components: - 406: Emergency Stop (Red button, yellow plate, green switch - 408: Electronics Housing Front Cover Procedures: - Install the emergency stop on the electronics housing front cover as shown, by putting the EMERGENCY STOP plate on the red button side, under the plastic ring, and push the switch on from the other side of the housing cover until they click and lock - Turn the black plastic ring on the estop button side until it secures the estop in place - Ensure that the estop button is on the correct side of the housing cover





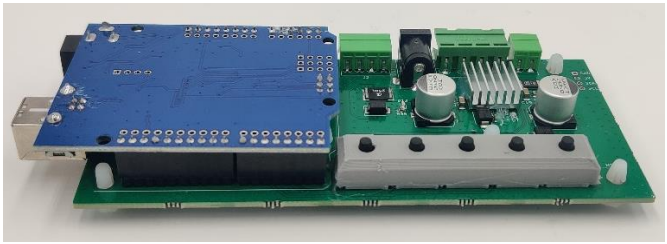
Install Cooler Fan

Components:

- 409: Electronics Housing Back Cover
- 411: 80mm Cooler Fan
- 4X 311: M4 X 30 Screws
- 4X 312: M4 Nuts

Procedure

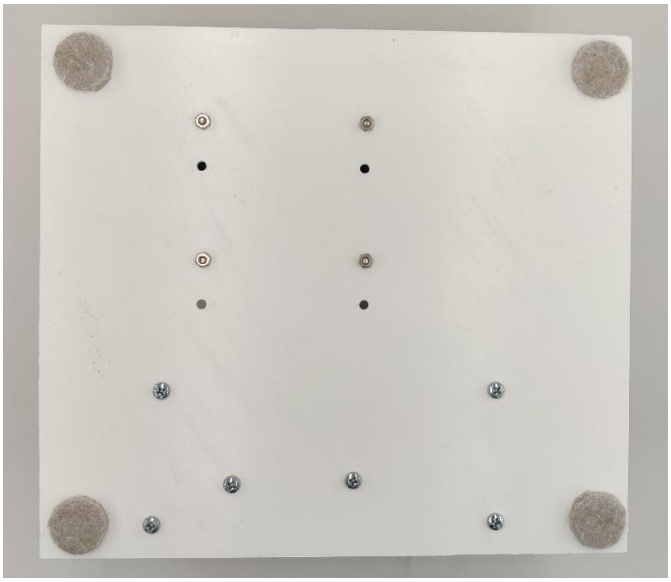
- Check the direction of airflow by locating the arrow shown on the side of the fan. Face the side pointed to by the arrow towards the housing back cover so that air flows out of the housing.
- Fix the fan in place using the four M4X30 screws and nuts.



Install Circuit boards

Components:

- 407: Electronics Housing Base
- 401: Arduino Uno
- 402: Custom PCB
- 403: Raspberry Pi 4
- 6X 309: M3x5 screws
- 4X 308: M2.5 8mm female-female Raspberry Pi Standoffs
- 8X 310: M2.5 screws



Procedure:

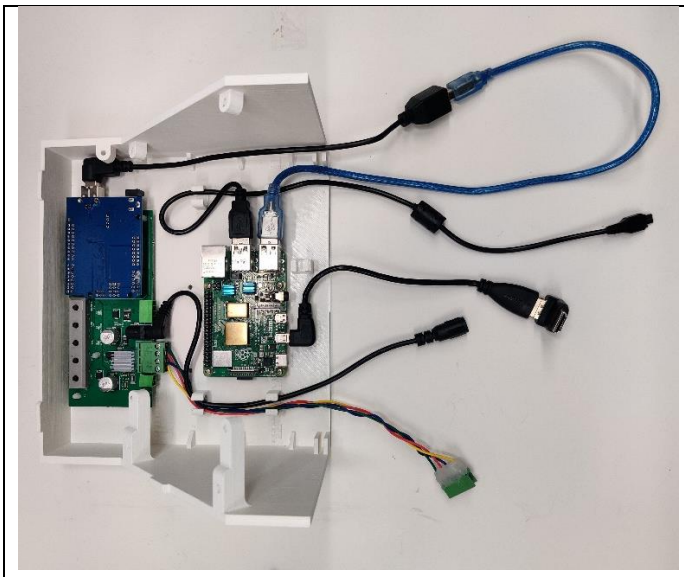
- Install the Arduino Uno onto the custom PCB my matching and pressing together the pins.
- Install 4 standoffs onto the underside of the Raspberry Pi 4 using M2.5 screws
- Screw the custom PCB onto the housing base using M3 screws.
- Install the Raspberry Pi 4 onto the housing base by threading in 4 additional M2.5 screws through the housing underside into the standoffs.

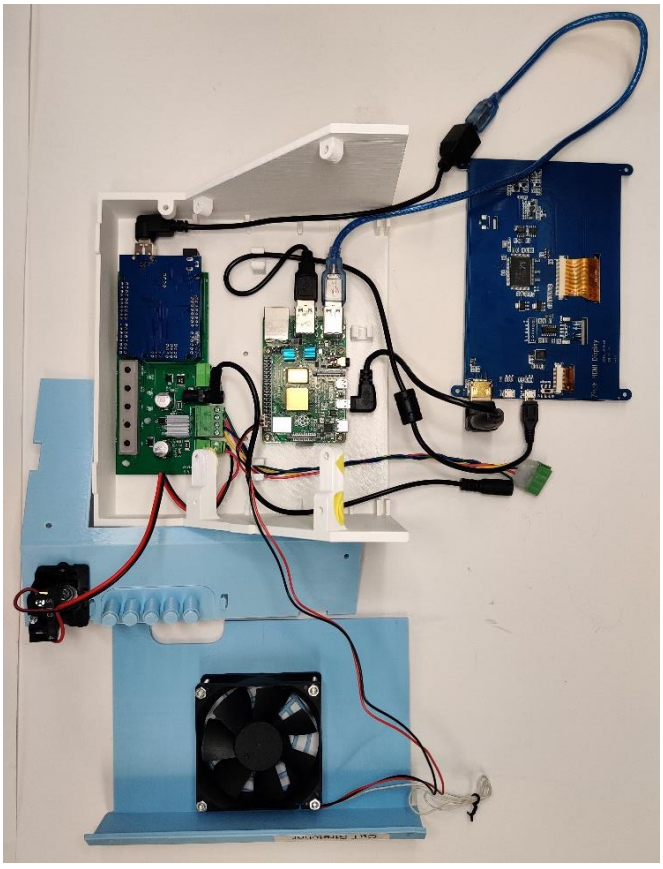
**Recommended: add soft furniture pads onto the bottom of the housing

Make All Wired Connections

Components:

- 404: USB A to micro USB cable (should come with screen)
- 909: Male to female barrel connector (5.5mm OD, 2.1mm ID)
- 904: USB A to B cable
- 905: USB B female to male right angle adaptor
- 906: Angled micro-HDMI to standard HDMI cable
- 908: Male to female standard HDMI angled adaptor





- # 4-pin male to female stepper motor extension cable
- 404: Raspberry Pi 7” screen
- Assembled housing front panel with estop
- Assembled housing back panel with 80mm fan
- 902: Keyboard and mouse peripherals for Raspberry Pi 4. ** Wireless peripherals recommended

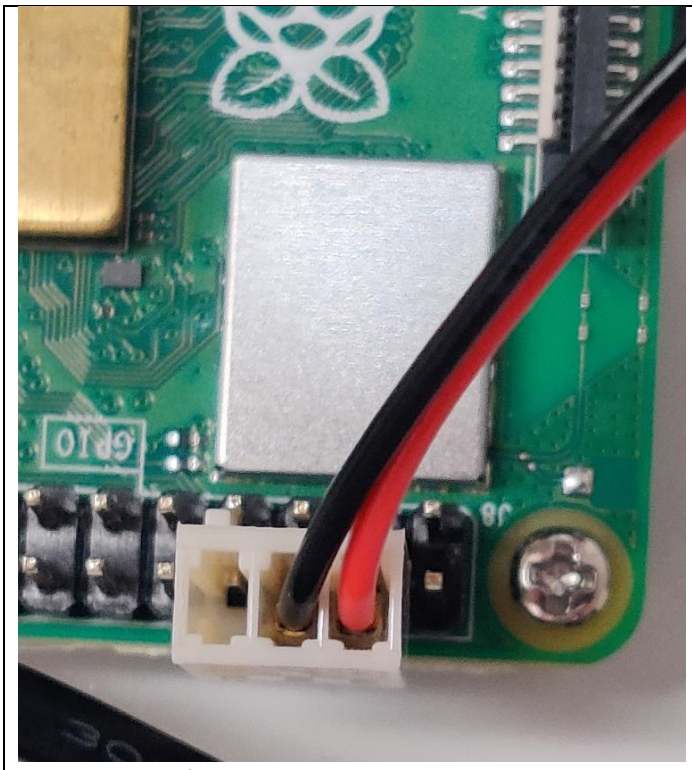
Procedures:

Custom PCB and Arduino connections:

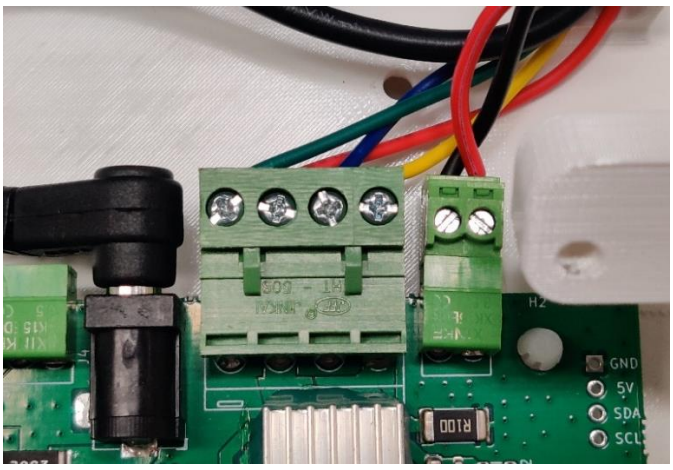
- connect the angled male end of the barrel connector cable to the PCB
- connect the male end of the 4-pin stepper motor cable to the PCB. This connection can only be made in one orientation
- connect the male end of the angled USB B cable to the Arduino. Then, connect the USB B end of the USB A to B cable to the female end of the angled USB B cable.
- connect the 2-pin estop to the PCB. This connection can only be made in one orientation

Raspberry Pi 4 connections:

- connect the USB A end of the USB A to B cable to the Pi 4
- connect the USB B end of the USB A to micro USB cable to the Pi 4
- connect the micro HDMI end of the angled micro HDMI to standard HDMI cable to the Pi 4
- connect the 80mm fan to the 5V (red) and ground (black) pins on the Pi 4
- connect the keyboard and mouse peripherals to the Pi 4



80mm cooler fan connector

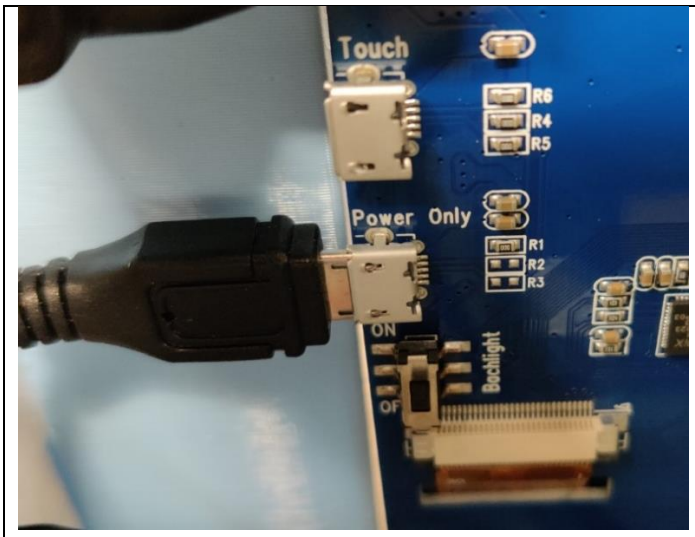


From left to right: barrel connector, 4-pin stepper motor connector, 2-pin estop connector

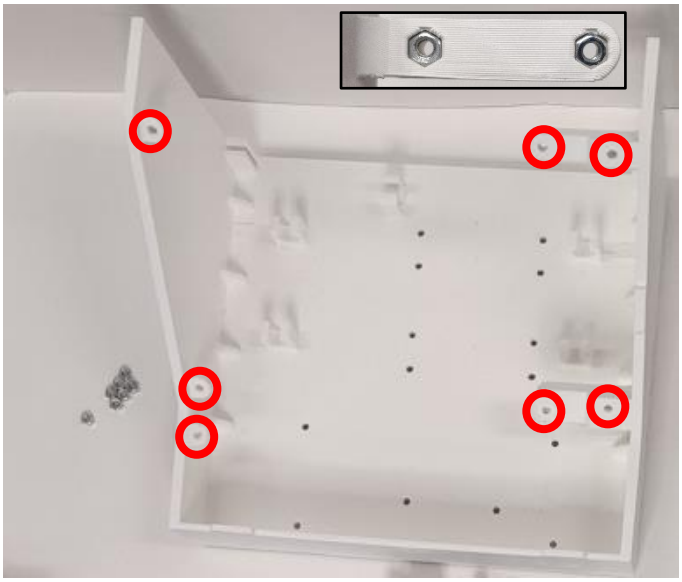
7” screen connections:

- connect the standard HDMI end of the Angled micro HDMI to standard HDMI cable to the screen
- connect the micro USB end of the USB-a to micro USB cable to the screen port labeled “Power Only”

** Make sure the switch directly below the port is toggled to “ON”



Connect the micro USB cable to the screen port labeled “Power Only”. Make sure the switch directly below the port is toggled to “ON”



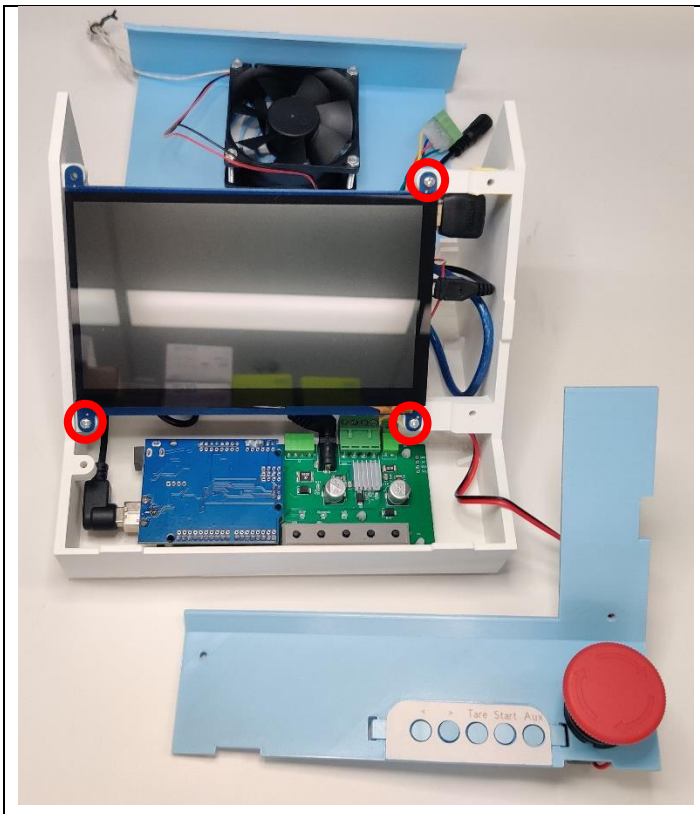
Assemble the housing

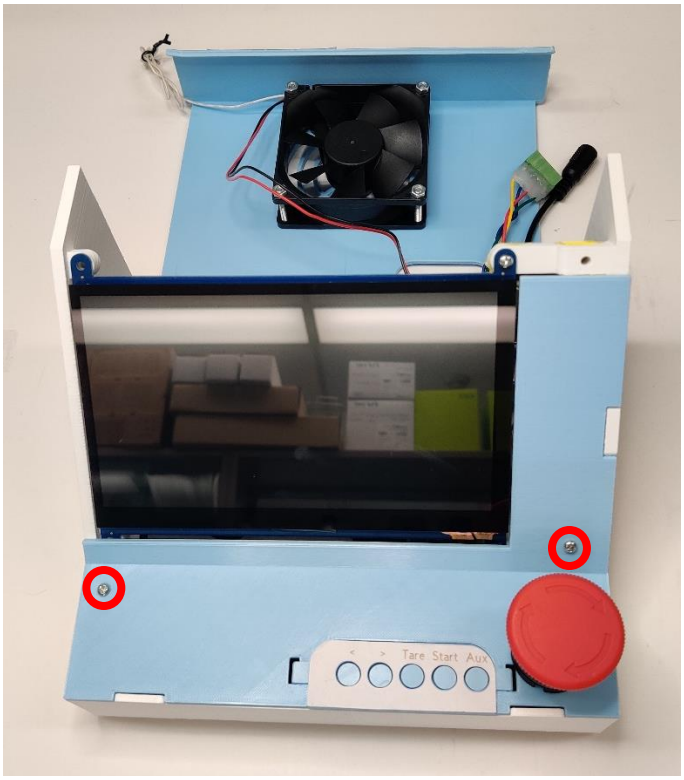
Components:

- 7X 306: M3 nuts
- 4X 307: M3X14 screws (for front and back panel)
- 3X 309: M3X5 screws (for screen)

Procedure:

- Install M3 nuts into slots on the underside of the marked locations (7 in total).
- Install the screen using three M3X5 screws. Do not thread in the fourth screw yet.
- Install the front panel with two M3X14 screws
- Slide the back panel through the grooves on the housing base. Install the two remaining M3X14 screws on the front of the housing to secure the back panel in place.


Tare Start Aux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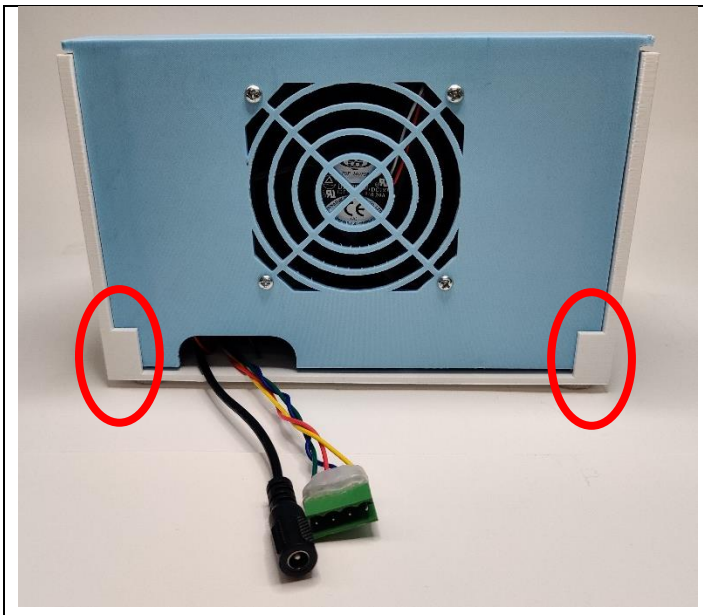


CaT Stretcher
Tare
Start
Aux

Troubleshooting

1. If the CaT does not turn on

- Connect the 12V barrel connector to the PCB.
- Connect the USB-C cable to the Raspberry Pi.
- If the screen does not light up, try unplugging and re-inserting the USB-C cable.
- If this does not work, take the back panel off (there are two M3 screws above the screen) to check if the Pi is booting properly.
- When the USB-C cable is plugged in, do any of the lights shown below turn on/blink? If not, unplug the Pi and try to remove and reinsert the SD card. Sometimes the connection with the SD card may be problematic and prevents it from booting.

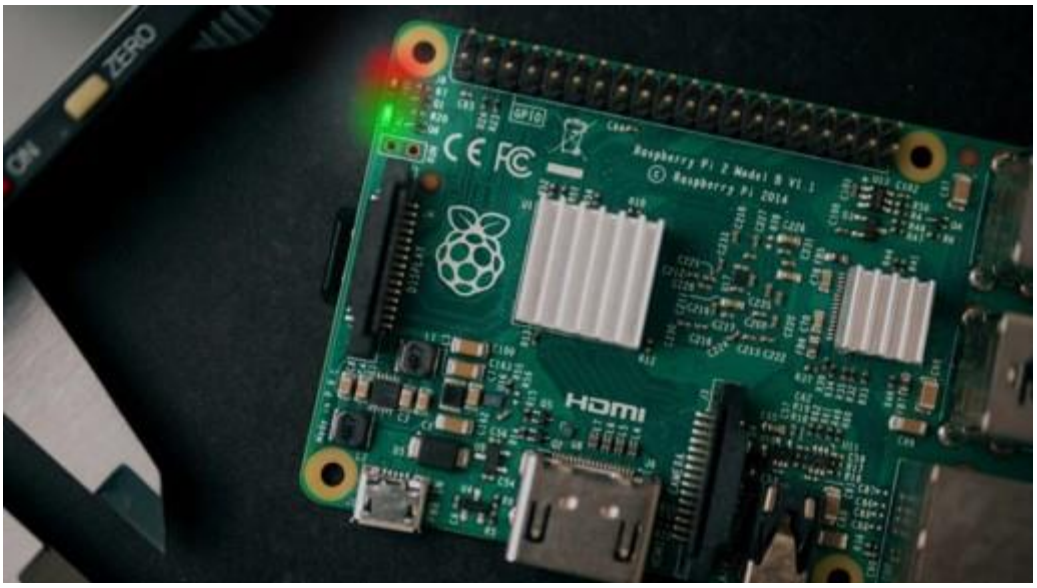

Photo source: https://howtoraspberrypi.com/controler-led-verte-raspberry-pi-2/