Cyberdeck: Part Five

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Build day one. Enough pieces and parts have arrived that I can start to at least put together some of the sub-assemblies. The overall design is made up of four modules (plus some misc LCD screens, etc).

- The main panel — an aluminum milled panel that the whole system builds on the back of and then mounts into the Pelican case.
- The power board — holds the power supplies and relay and mounts on the right side of the panel behind the power inlets and switch.
- The USB panel — contains all the radios, router, and USB hubs / Gigabit Ethernet ports.
- The CPU tray — contains two Raspberry Pi 5 SBCs and mounts in the 10" rack.

The Pelican Case

The panel mounts to the case using the Pelican 1500 Special Application Frame. While the instructions say to drive the brass threads in with a screwdriver, I found a brass drift to be a much better method.

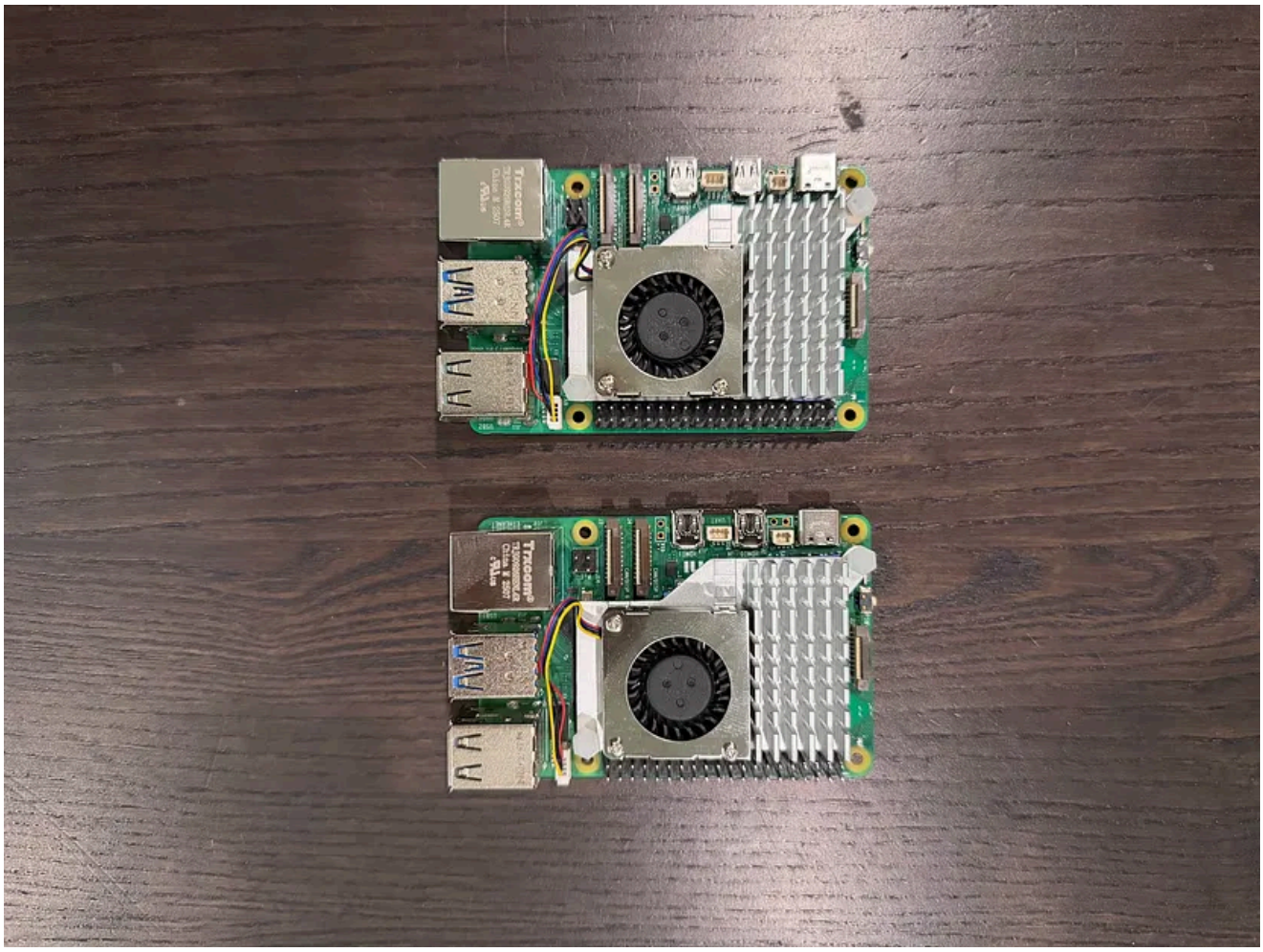
Pelican 1500 Special Application Frame.

Once the frame is installed and fixed in place with the four self-tapping screws, a gasket is added.

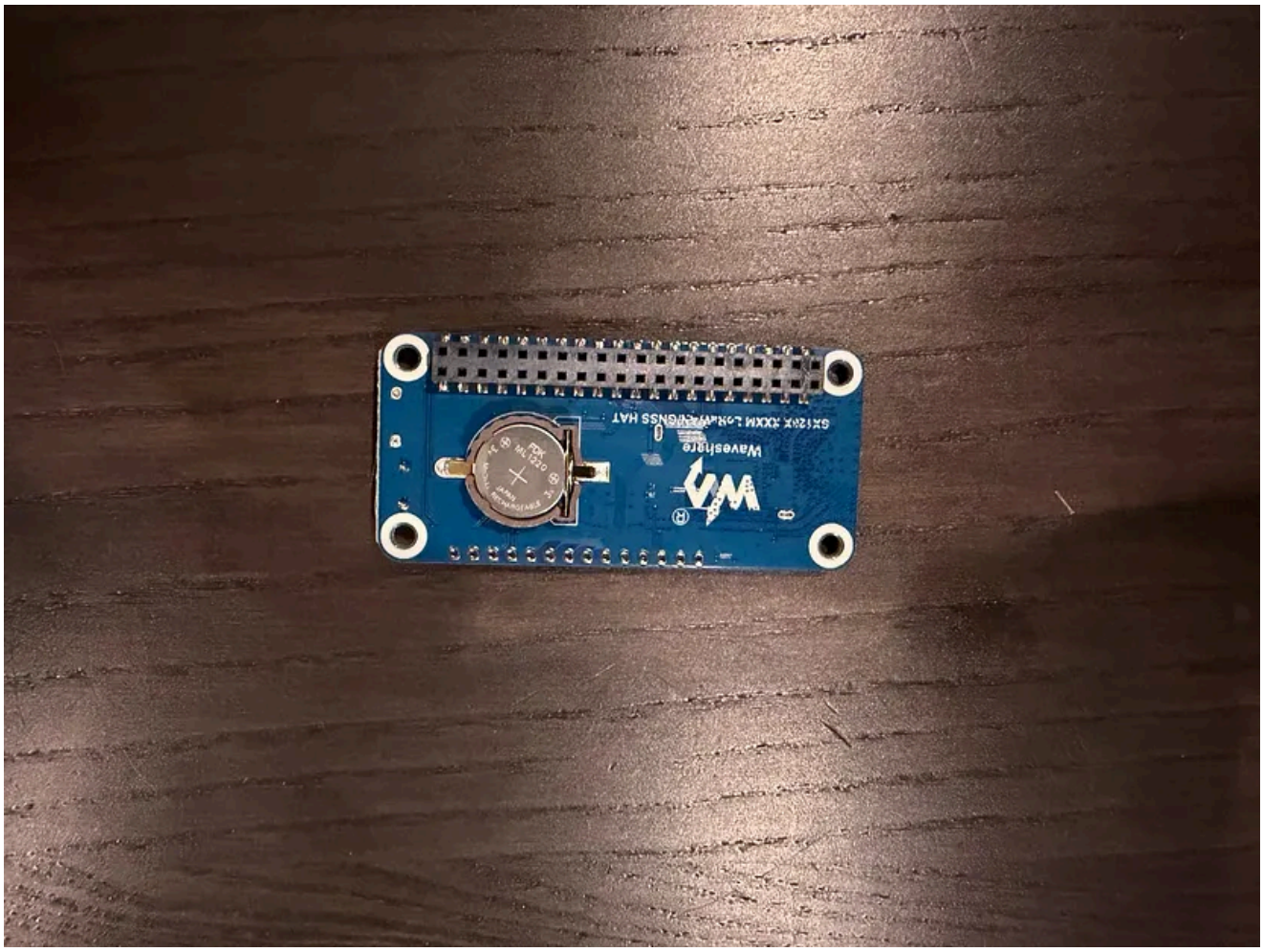
Pelican frame gasket.

The CPU Tray

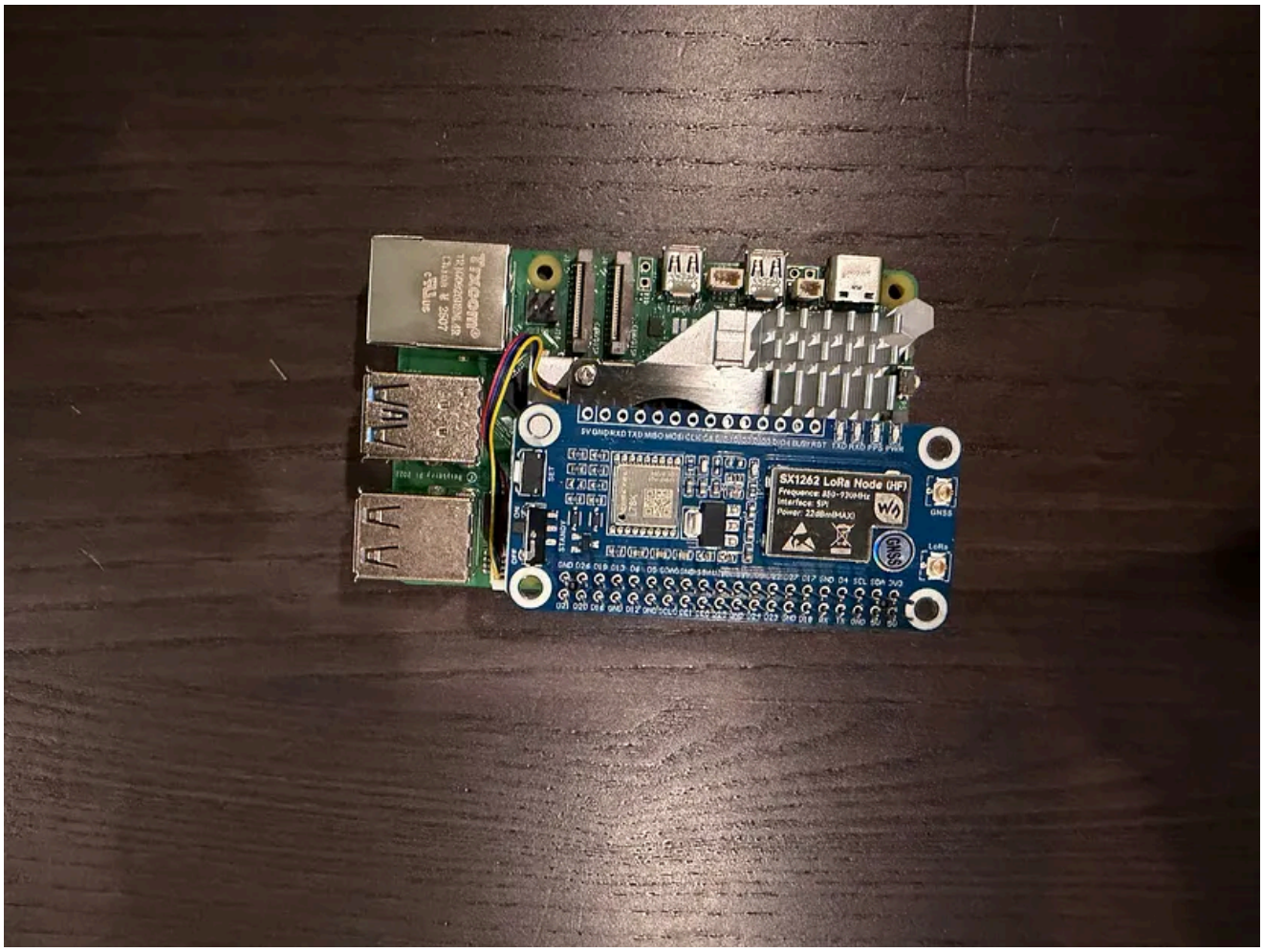
Two Raspberry Pi SBCs arrived today, so I got started building out the CPU tray.



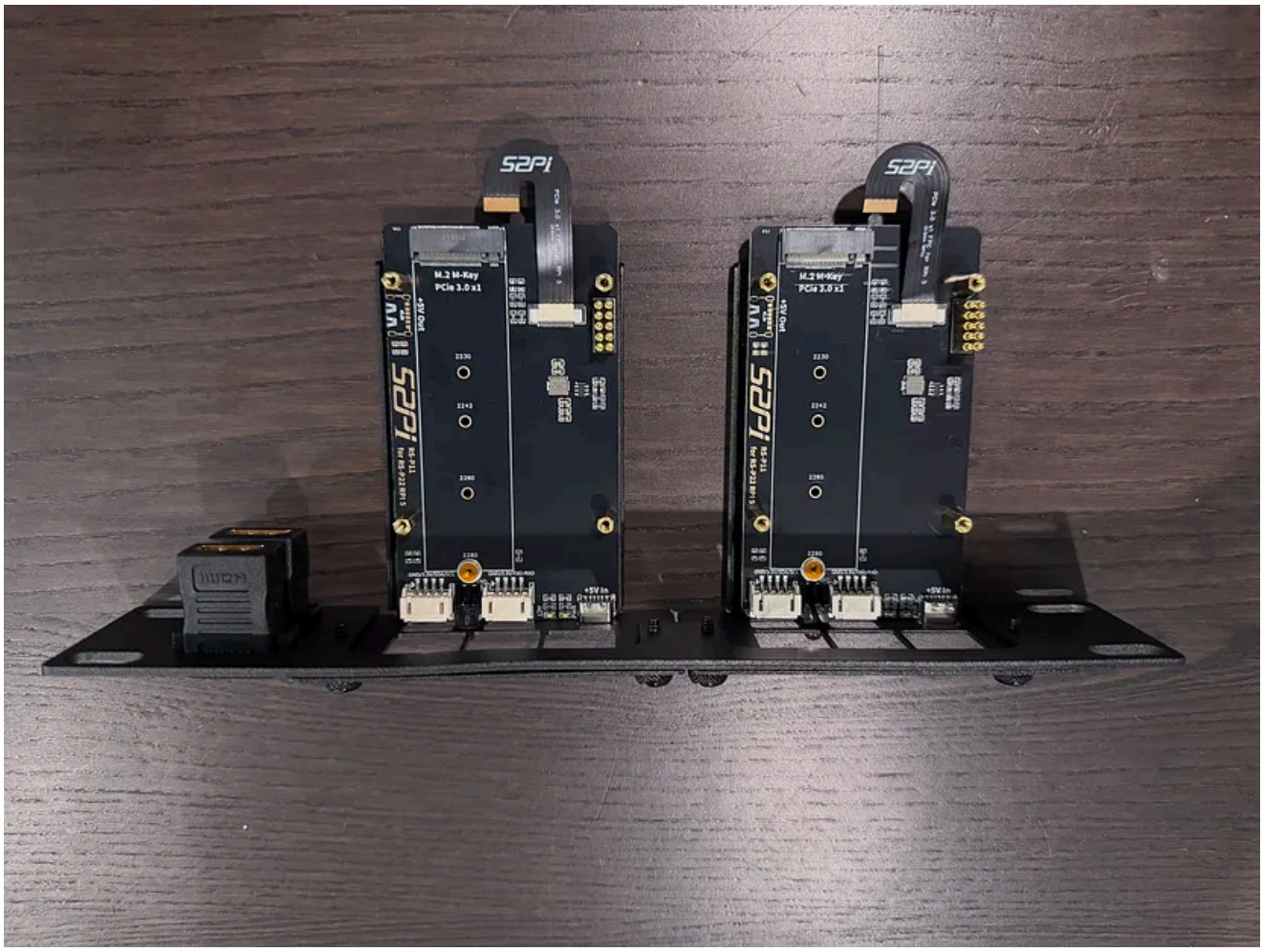
Optional heatsink and fan installed.



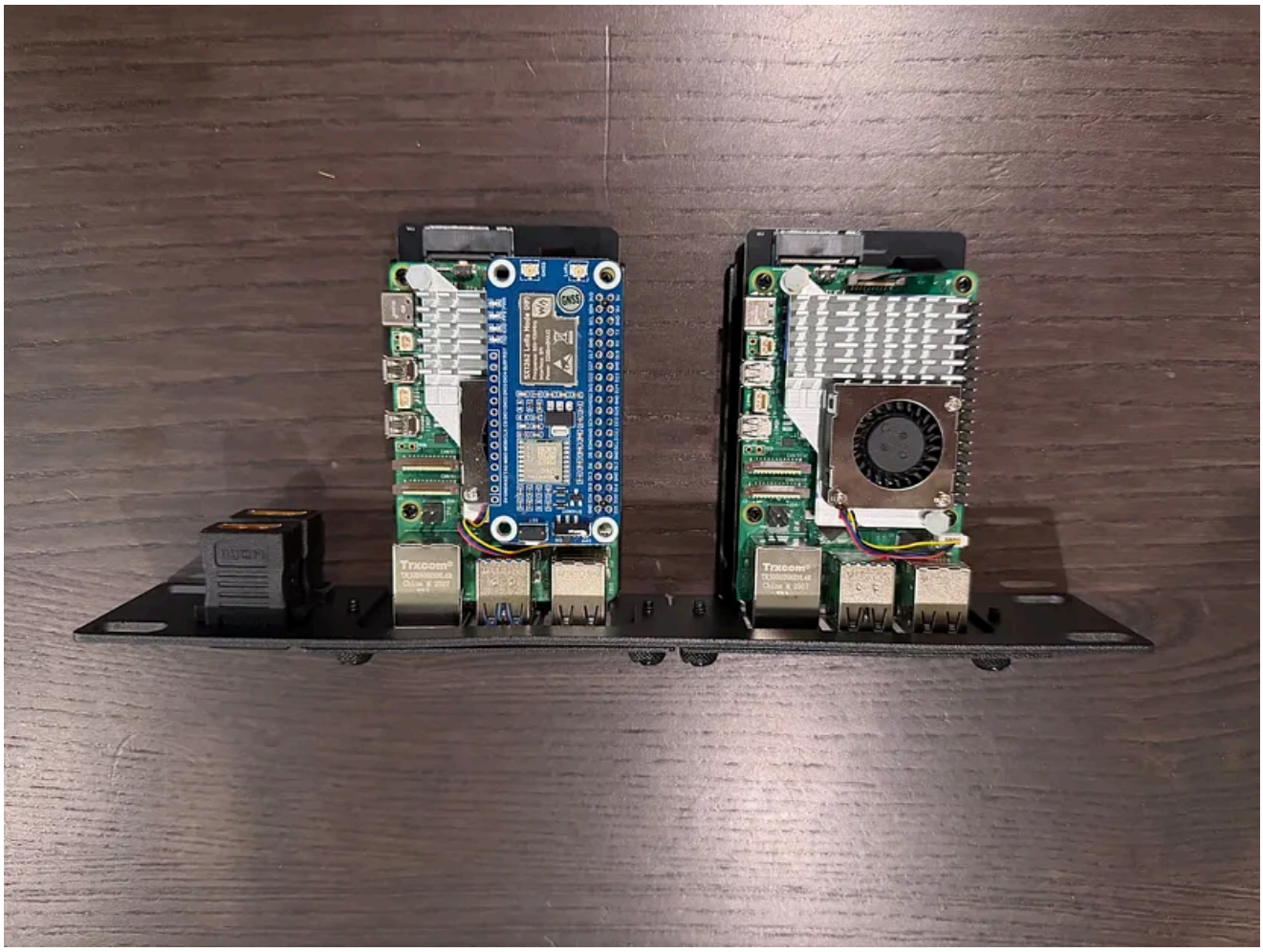
Waveshare SX1262 LoRaWAN radio Pi hat with rechargeable battery.



LoRa radio installed.



SSD base board for Transcend 256GB M.2 modules.



CPU module assembled.

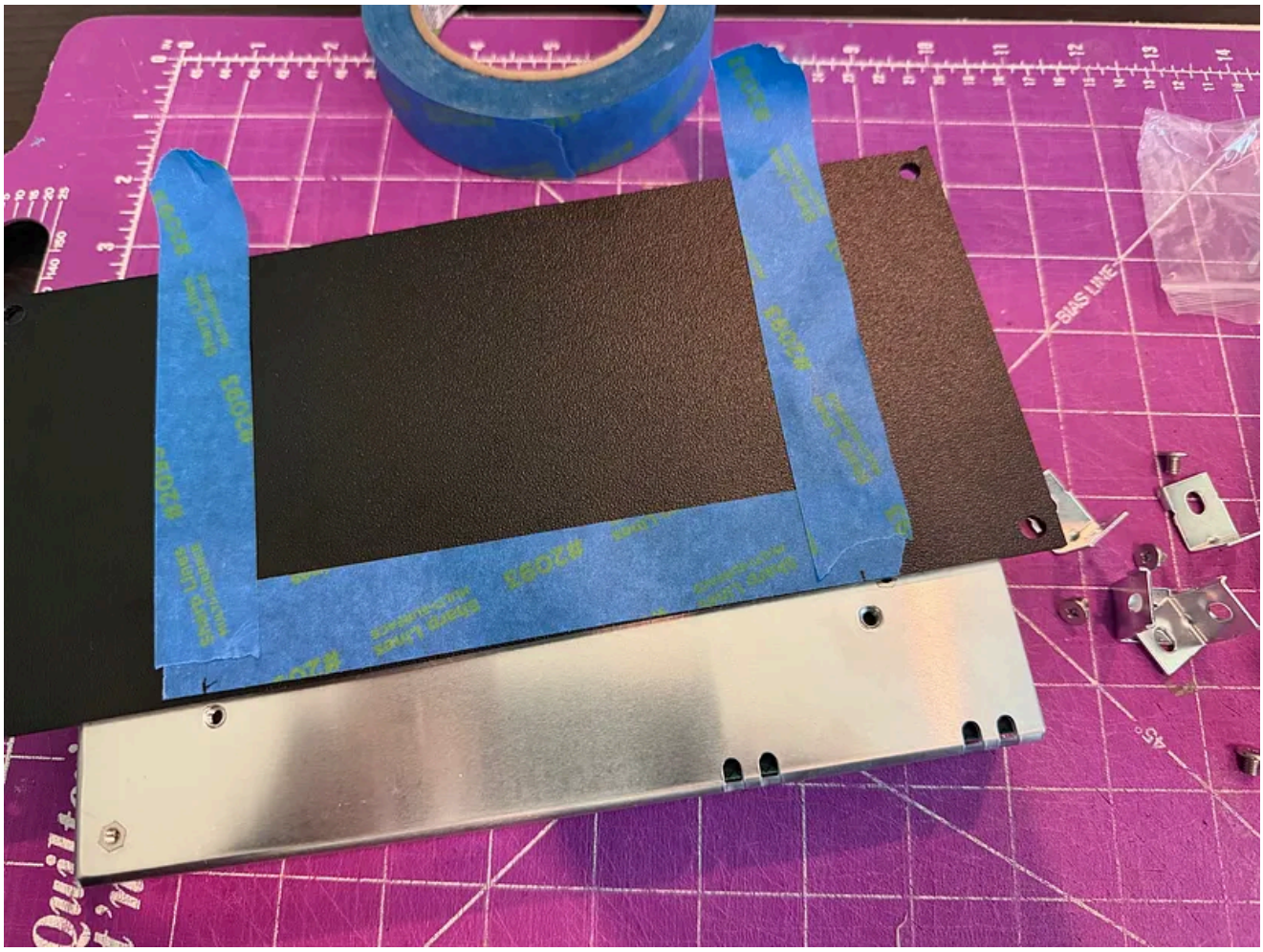
In a later article I'll show the wiring of the CPU tray, including right angle USB cables to route one of the front USB 3.0 ports to the rear for an extra Gigabit Ethernet port.

Sub-Assembly Panels

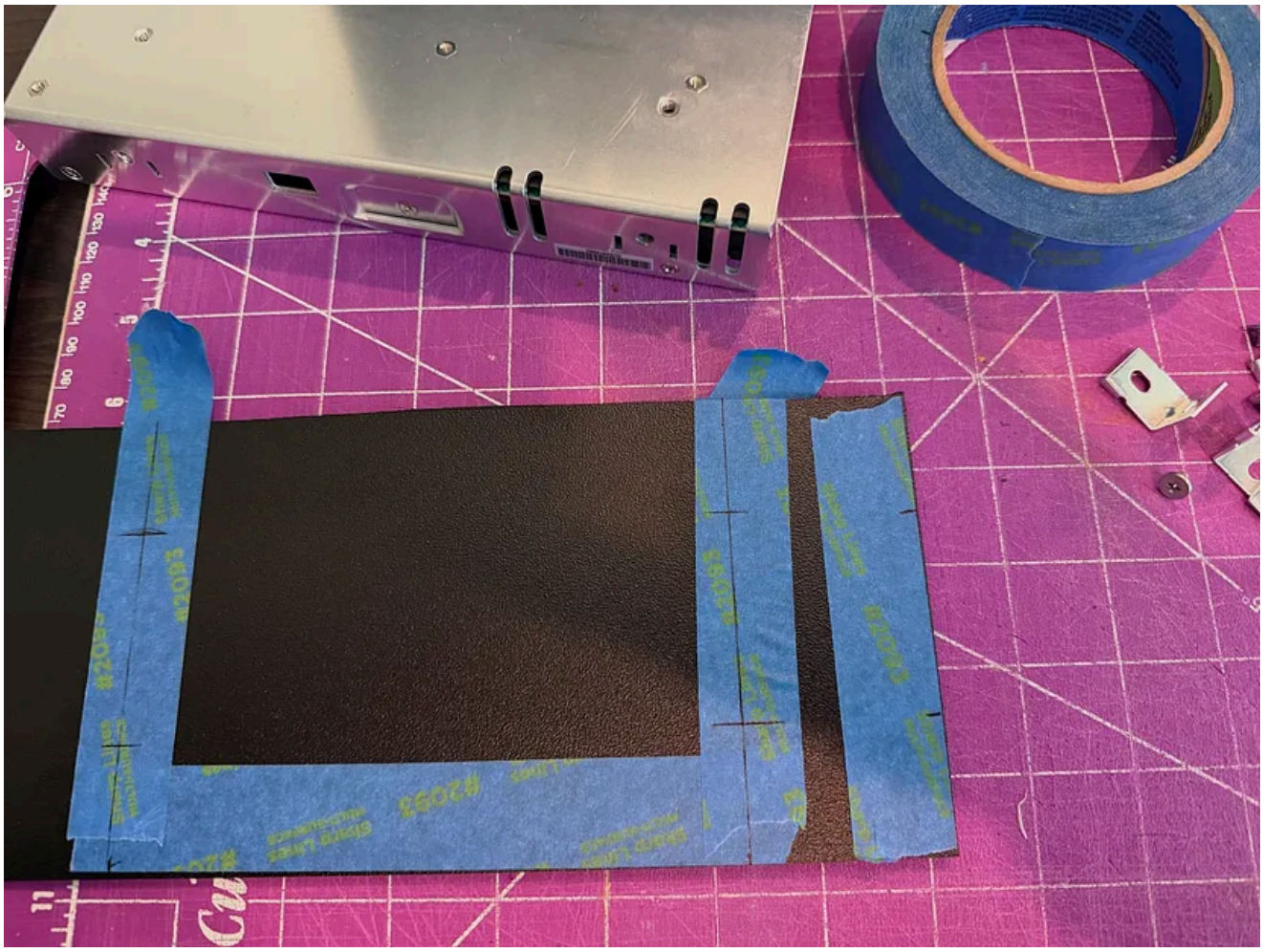
The panels are cut out of 1/8" ABS plastic, which has a very high tensile strength, so it wont crack when holes are placed close to the edge.

Power and USB panel templates.

Special PVC saw makes cutting the ABS much easier.

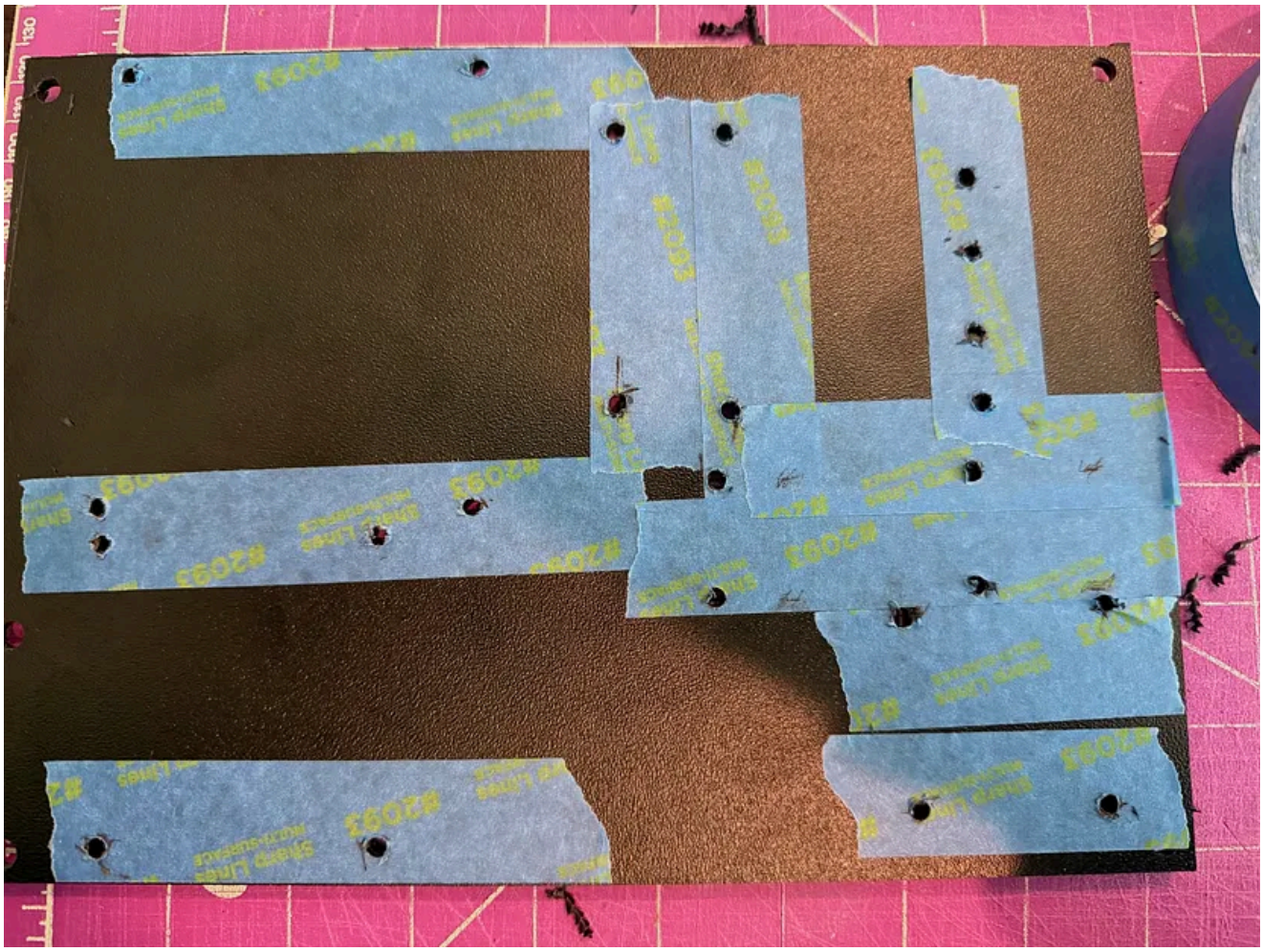


Locating the holes for the 24V DC power supply.



The 24V DC supply will mount with four M4 threaded holes on the bottom.

Locating the holes from the various USB hubs, router, and switch.

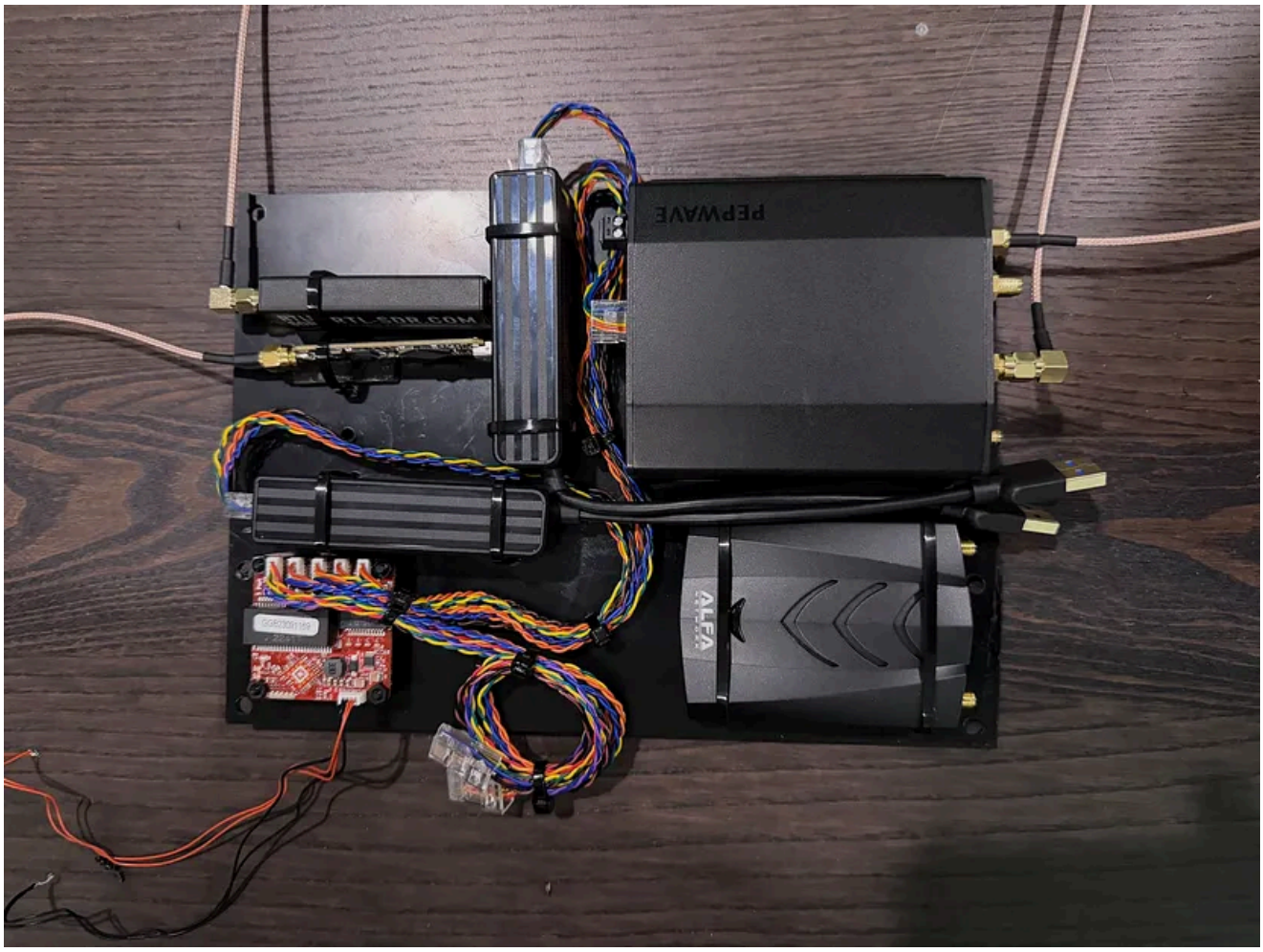


Some devices mount with screws, others with double side tape and zip ties.

The USB Panel

The completed panel turned out nicely. It contains:

- Two USB hubs, one for each Raspberry Pi. Each also includes a Gigabit Ethernet port for connecting the two SBC together.
- AXE3000 WiFi connected to Pi number one.
- Ubertooth One and RTL-SDR connected to Pi number two. This Pi will also have the LoRa radio, and USB connection to the Mayhem Portapak.
- PepWave MAX BR1 cellular router.
- BotBlox micro 5 port Gigabit Ethernet switch.

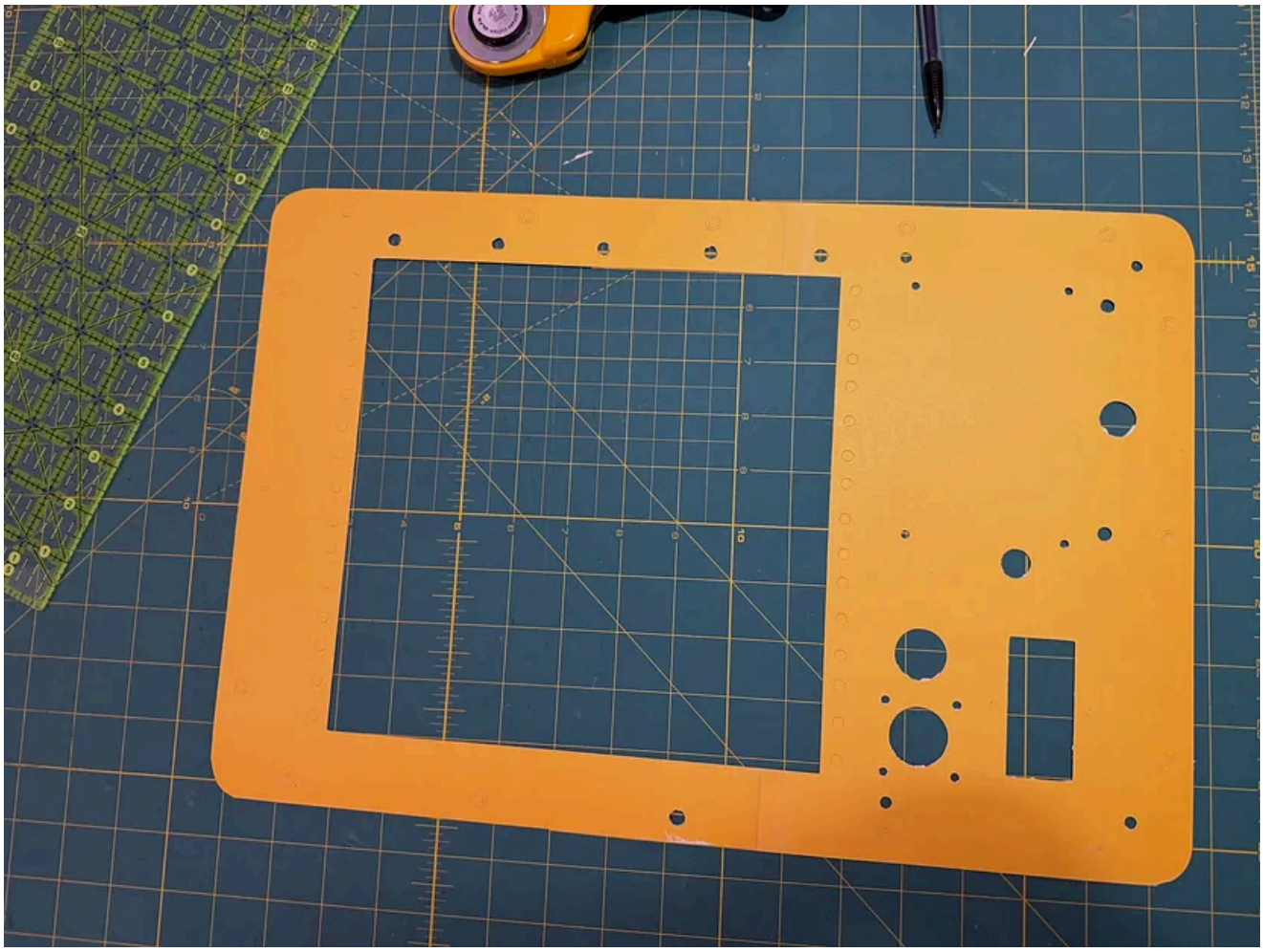


USB sub-assembly ready to mount behind 10" rack.

What's Next…

As more parts arrive over the next few days, I'll be working on wiring the Power panel, setting up the Pi operating system, and completing all the sub assemblies. Once the main aluminum panel arrives, I have a few holes to add, due to design modifications since the job was submitted to Data Pro, and then I can do the final assembly.

To make adding the new holes as accurate as possible to the CAD drawings, I used a die cutting machine to make a template to locate them. I'll use a punch to mark the hole, then a stepper bit to cut them out.



Template to help locate the new holes.