

Cyberdeck: Part Nine

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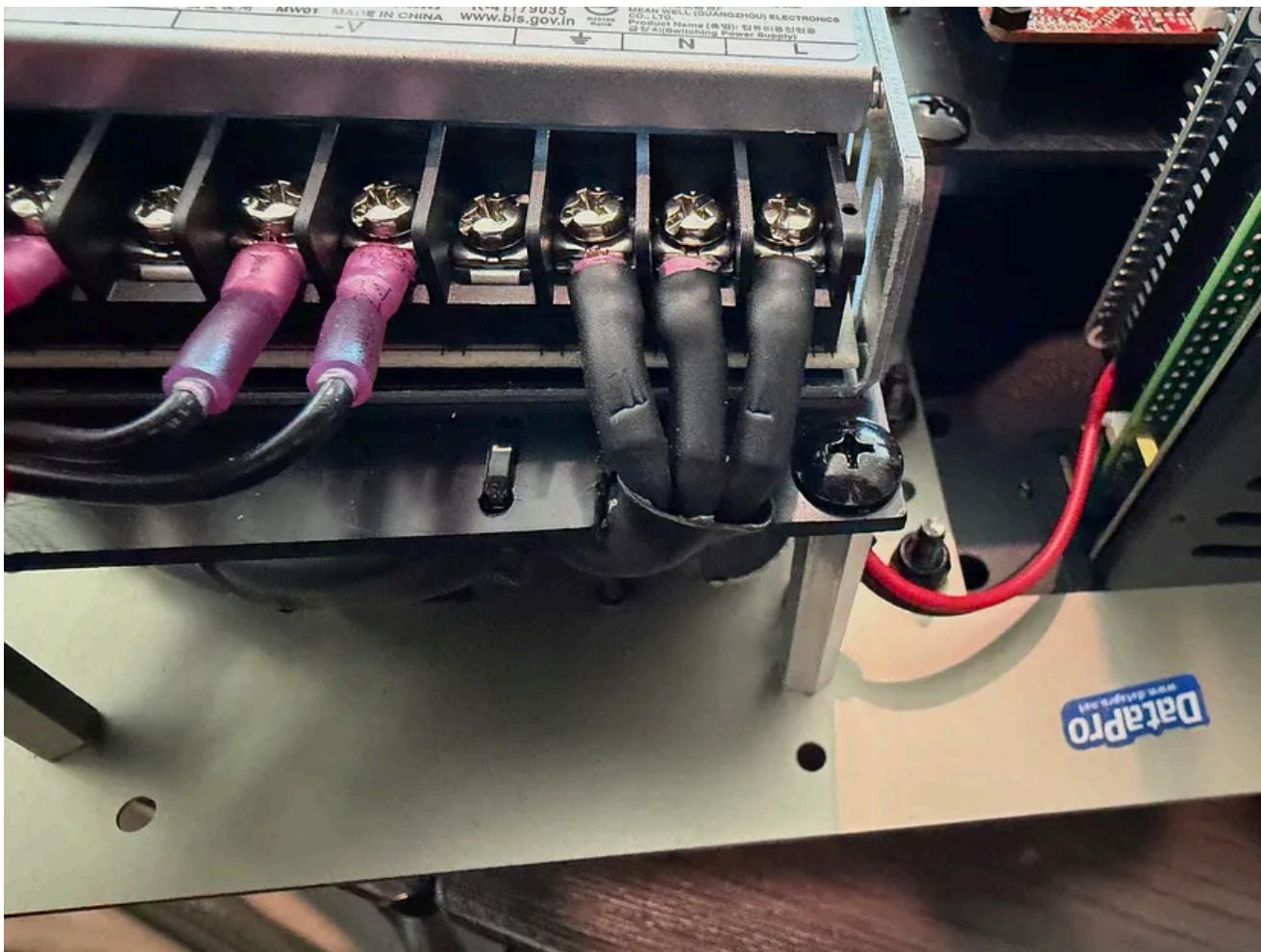
The build phase of the project is almost complete. Just a few parts are still on order — the GeeekPi 1U LCD has been backordered, but should ship soon. Also some clearance issues came up with the N-type connector and the power supplies, so a custom cable had to be ordered.

Progress update below... thanks for following along!

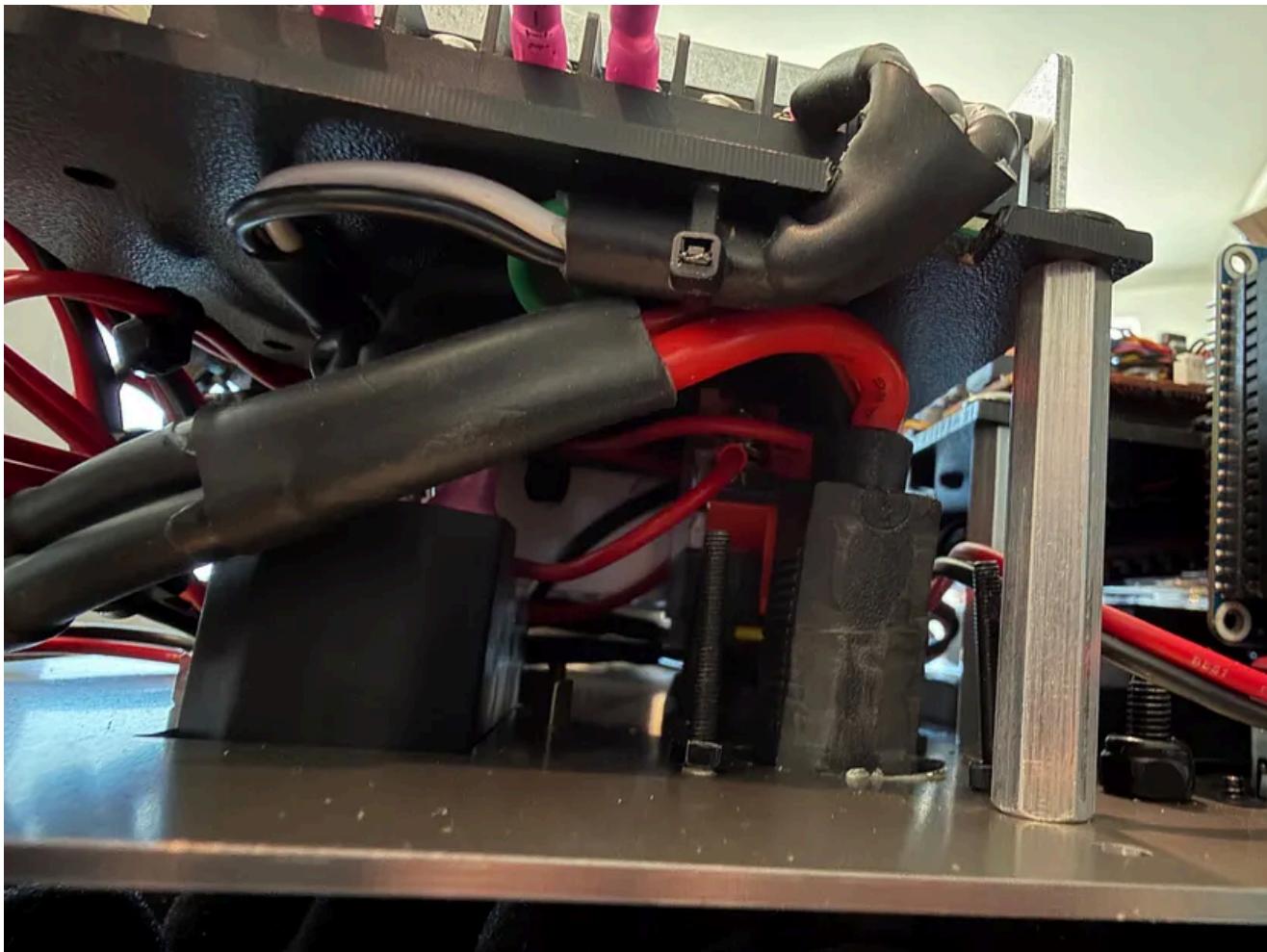
Power Board Mods

Between build days I've been storing the assembled system in the Pelican case to keep it safe. As I've now put it in and out of the case a few times, I noticed the original design was a bit tight on the top and bottom edge of the right hand side.

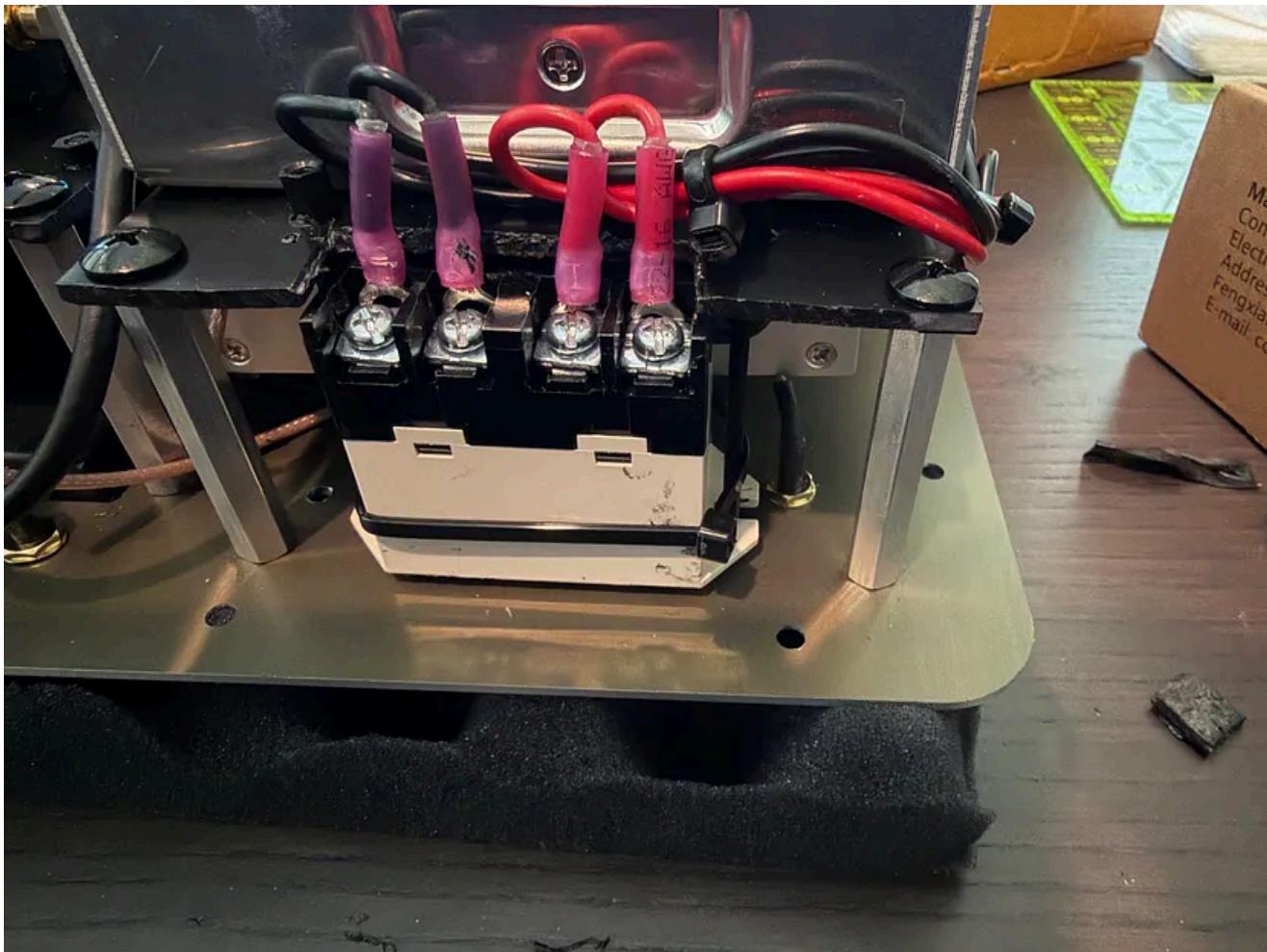
To make more room, I notched the power supply board so I could recess the relay contacts, and did the same for the 120vac input. That makes sure the wires stay flush with the edge of the board and it can slide into the case without getting hung up on the case frame.



A notch and multiple layers of heat shrink keep the 120vac input from snagging on the case frame.



Two small holes and a cable tie pull the power wires tightly under the panel.

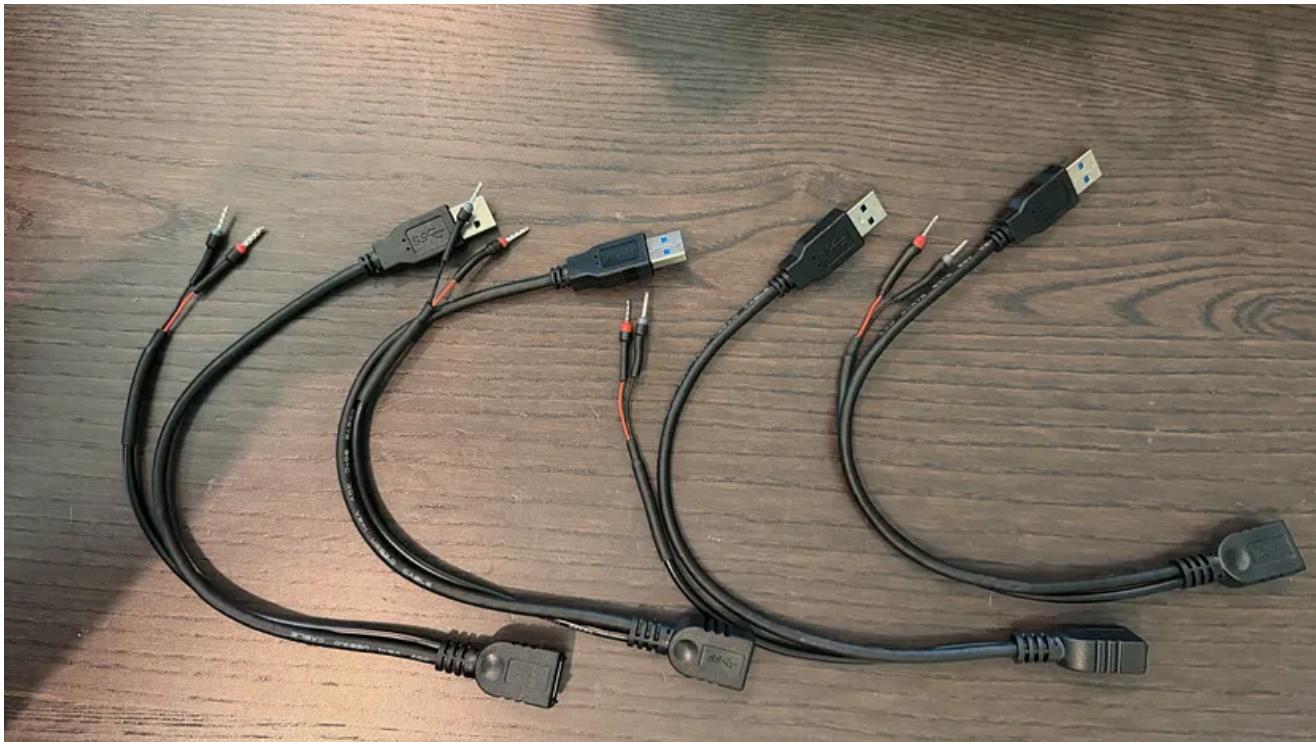


In addition to inverting the relay, I notched the power supply board and reversed the terminals so the wires would be above the board and face inward.

5V Power Problems

The Raspberry Pi is a power hungry board, which is why I included dual 60w power supplies in the design. However, on first startup I also realized that the Pi is very picky about the load on the USB ports. This led to two changes:

- The Pi by default expects to negotiate with a real USB-C “PD” power supply, and if it can't, will limit the usage to 600ma. A change to the `/boot/firmware/config.txt` disabled this check and lets the board run full power on standard power supplies (see Github for details).
- Even with the power supply configured to run wide open, plugging in a lot of USB devices leads to issues. You will start to see errors about the Bluetooth radio in `dmesg` as an indicator. To solve this, I modified the devices to pull their power directly from the 5V supply, and only connect to the power for data.



USB power and data “Y cables” to power the USB gigabit ethernet / hubs direct from the 5V supplies.

RF Connector Fit Issues

The power supply panel has about 1" of space between it and the main panel. This has been plenty of room for SMA bulkheads and cables to pass through. Unfortunately, with the LoRa radio upgraded to an N-connector, that has not been the case. The soldered coax cable was being smashed by the power supply.

It has also been extremely difficult to find a source for a 90 degree N-type panel mount connector. I tried a standard female — female bulkhead, with a 90 degree male connector on the cable, but this was still about 1/4" too tall.

Fortunately I was able to locate a custom N-type cable from Custom Cable Group that is a direct 90 degree design. It will take a few days to arrive from California, but should resolve the clearance issues.



90 degree bulkhead cable from Custom Cable Group.

Mayhem Powerpak

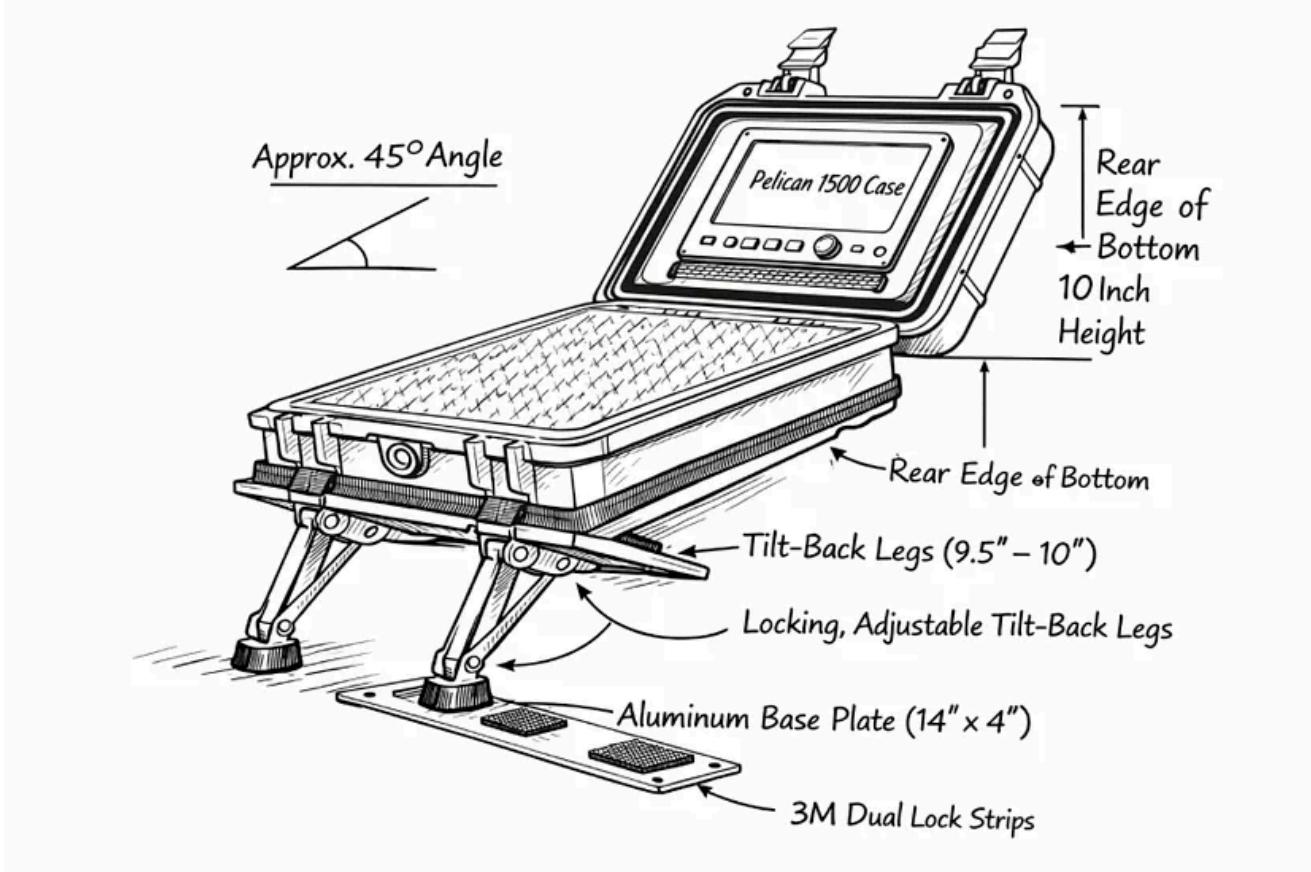
The Mayhem Powerpak finally arrived! I'll show more of it in the final build article, but here's a quick photo of the mounting. I removed the included screws from the front and back of the case and drilled out the threads of the internal standoffs. That allows me to pass a long M3 machine screw completely through the case and mount it to the aluminum faceplate.



M3 metal screws replace the stock screws.

Stand Design

I've been playing with ideas on how to hold the case up at an angle. After an amusing session with ChatGPT trying to design something...



Regardless of how many times I said the legs should go in the back, ChatGPT kept drawing this mess.

I began looking around to see what else was out there. Other than large tripod and desk stand for DJs, I didn't find much. However, one search result was promising. A small Eurorack manufacturer called Pulp Logic have a cool design for their case mounted audio modules.



The case is held by legs that attach to the padlock holes of the case.



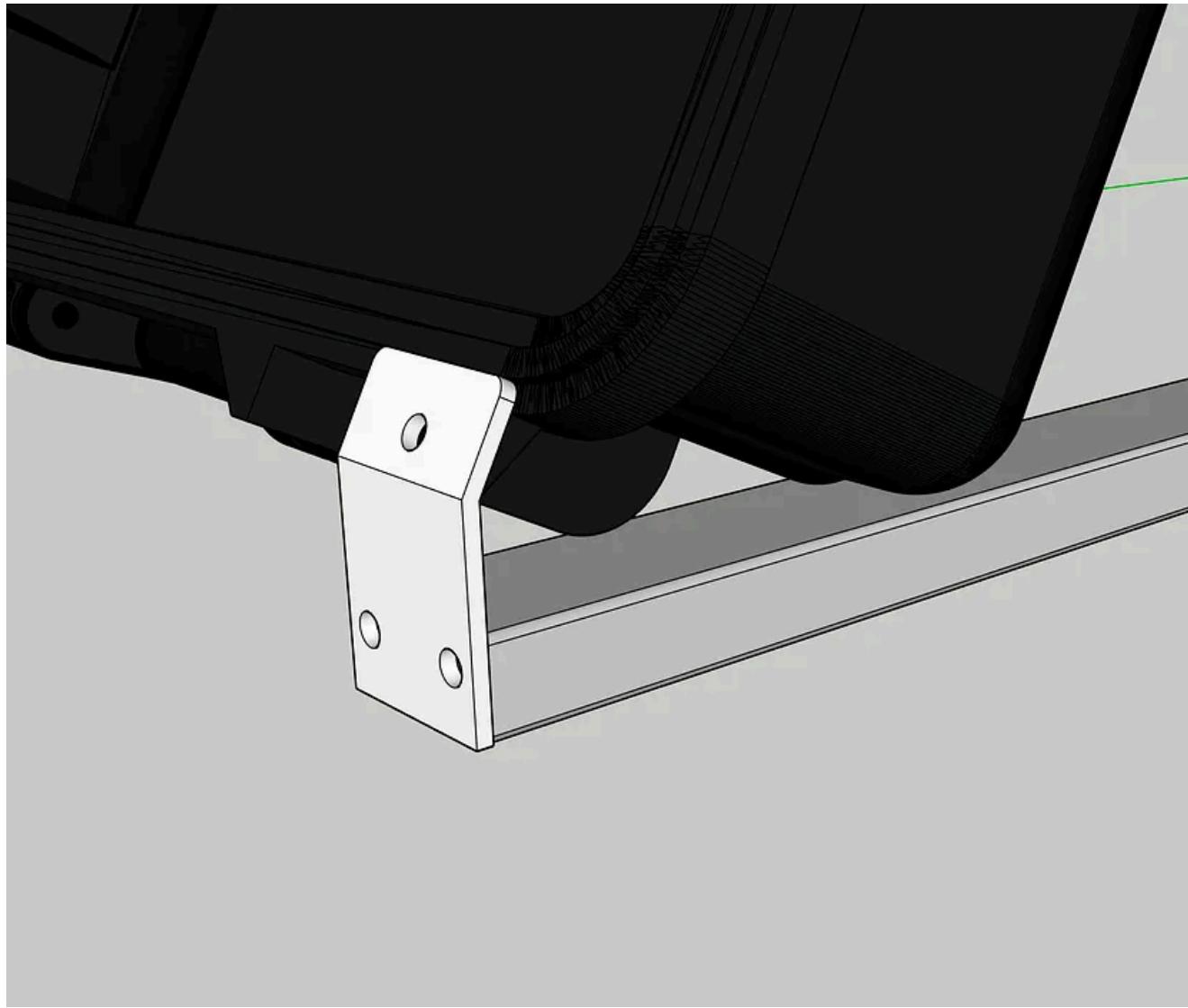
Unfortunately the brackets are custom made, and for a much small case.

The overall design would work well, but there were a few issues:

- The product is no longer available
- While most of it seems to be off the shelf half t-slot rail, the plates on the end are custom. The case they are made for is much smaller, and the angle of these plates won't work
- The smaller case is much lighter, and I was concerned with the heavier case being too much for these brackets

Inspiring none the less...

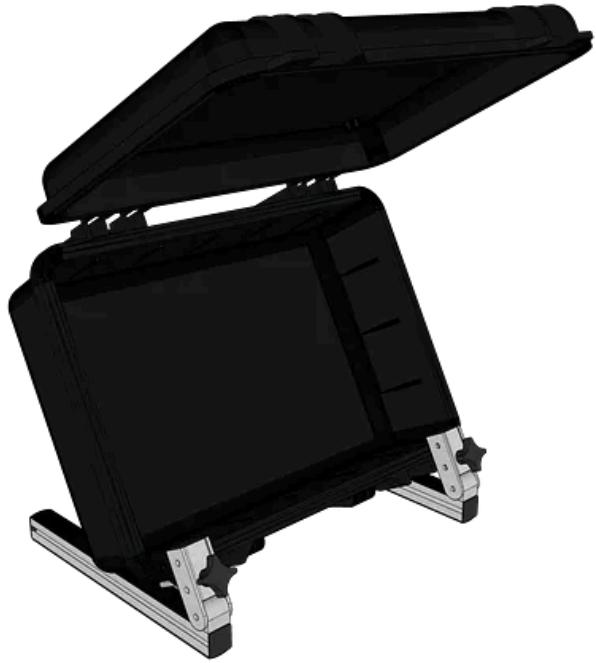
An few minute is Sketchup and I was able to produce an alternate bracket to re-create the overall design for my much larger case.



Custom bracket for the Pelican 1500

Unfortunately, every quote I received to have the brackets machined out of 7075 aluminum came back from \$220 — \$400 per bracket. Not going to work.

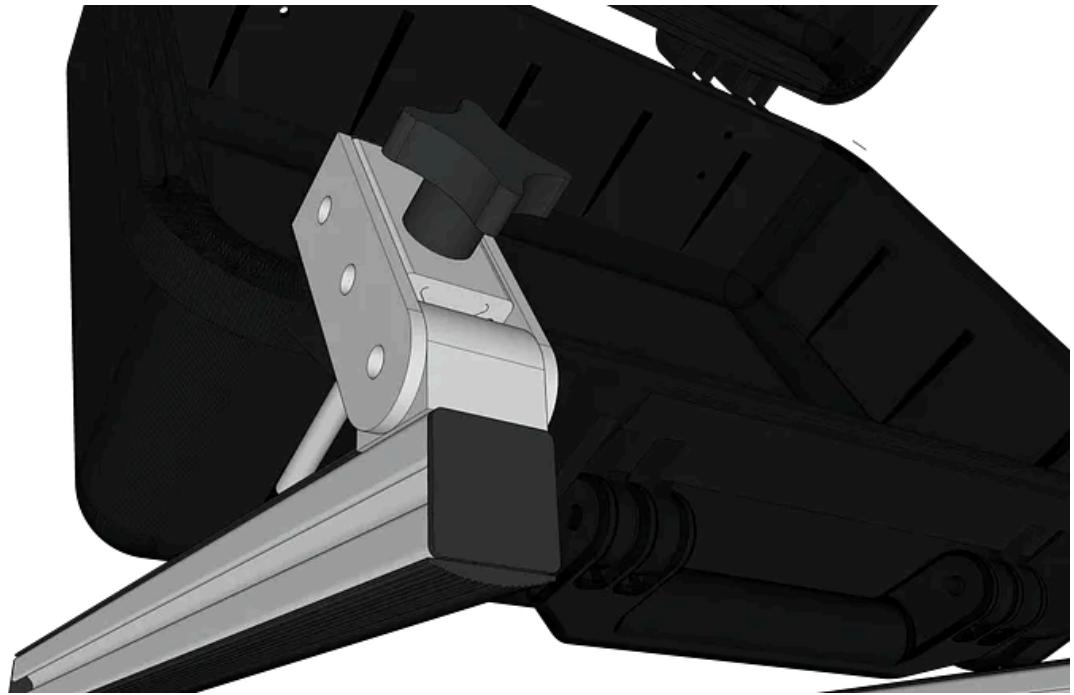
Back to Sketchup, with the McMaster-Carr catalog open, I started looking at what off the shelf t-slot parts could be used to recreate the overall idea. And I'm pretty pleased with what I came up with...



The brackets hold the case at about a 30 degree angle.



Using an off the shelf t-slot pivot, a 2" section of two-sided rail, and a thumb screw - no custom machining is required.



Anti-slip rubber strips on the top and bottom of the rail will keep the case and stand from sliding around.

The design is 100% off the shelf parts and nearly completely bolt together. As McMaster-Carr will cut the rail to length for you, the only modification required is drilling two 1/4" holes through the short upright sections of rail for the bolt to pass through. The entire bill of materials for the stand totaled up to \$180 with shipping and tax.