## Goal
To design a Pico-Balloon that could operate 24 hours a day.

Design
After doing research on groups.io pico-ballooning and other mixed media, it became evident that to be successful, it would require a battery that could handle the cold temperatures encountered at high altitudes. After a lot of searching, I found and selected a Tadiran Lithium battery TLI-1550ES. Though not perfect, it provides the best operating temperature range, capacity and mass of any I found. Additionally, I would use a similar platform to what was used for ALP40-A, which circled the globe over 6 times in 74 days.

ALP40-D
After learning the lesson about the insulating box from ALP40-B, I went back to the drawing board to do a redesign without one. I made the structure much like that of ALP40-A, but with a battery holder. I wanted to make the design lighter, but with all of the same hardware, less the outside air temperature sensor. My thought being that due to the black casing for the battery, the PCB and the battery during the day would be the same temperature. At night the temperatures of the two would be close to the same temperature as well. As with ALP40-B, I added a resistor network to two A/D channels of the U4B to read the solar panel voltage to determine, if it was day or night.
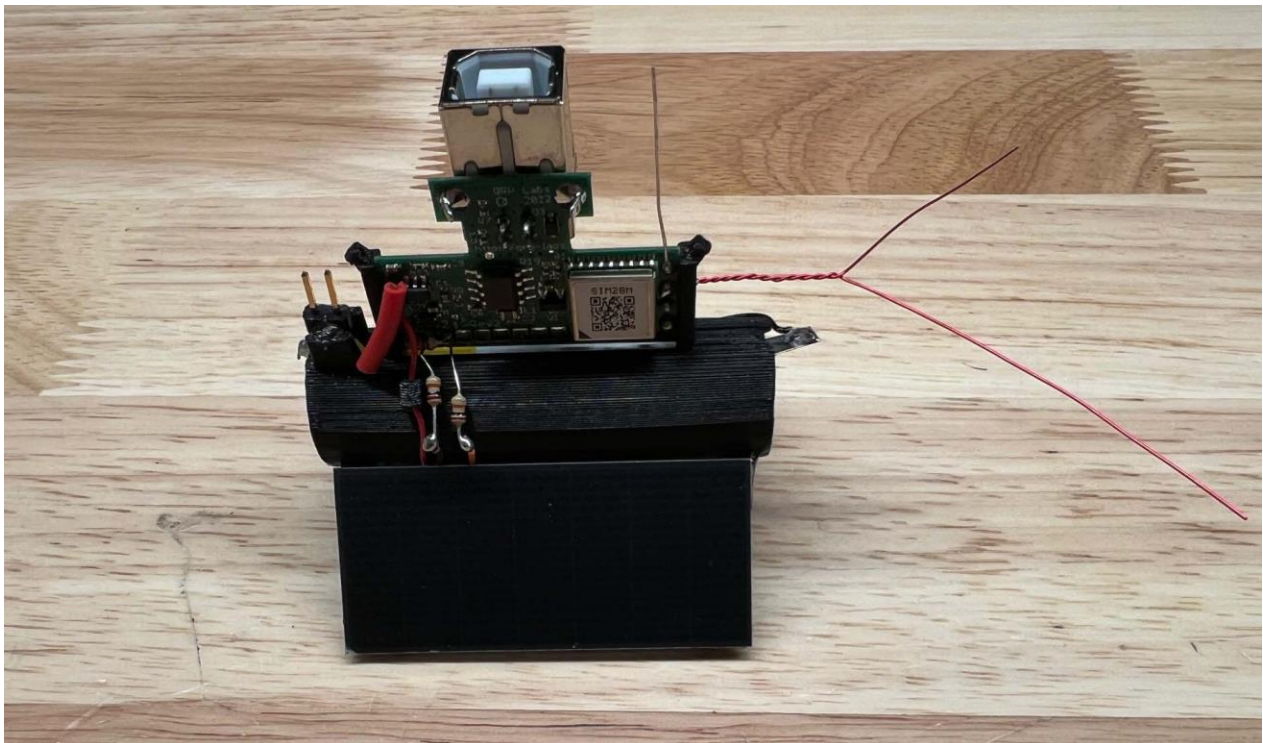
The design did include a trapped dipole antenna for both the 10 and 20 m band designed by Rudi, K7RAW – The Antenna Whisperer.

A Yokohama balloon was used and stretched to 97" (size reduced to prevent popping), the payload had a mass 36.4 grams, with a float of 6 grams and inflated with Hydrogen.