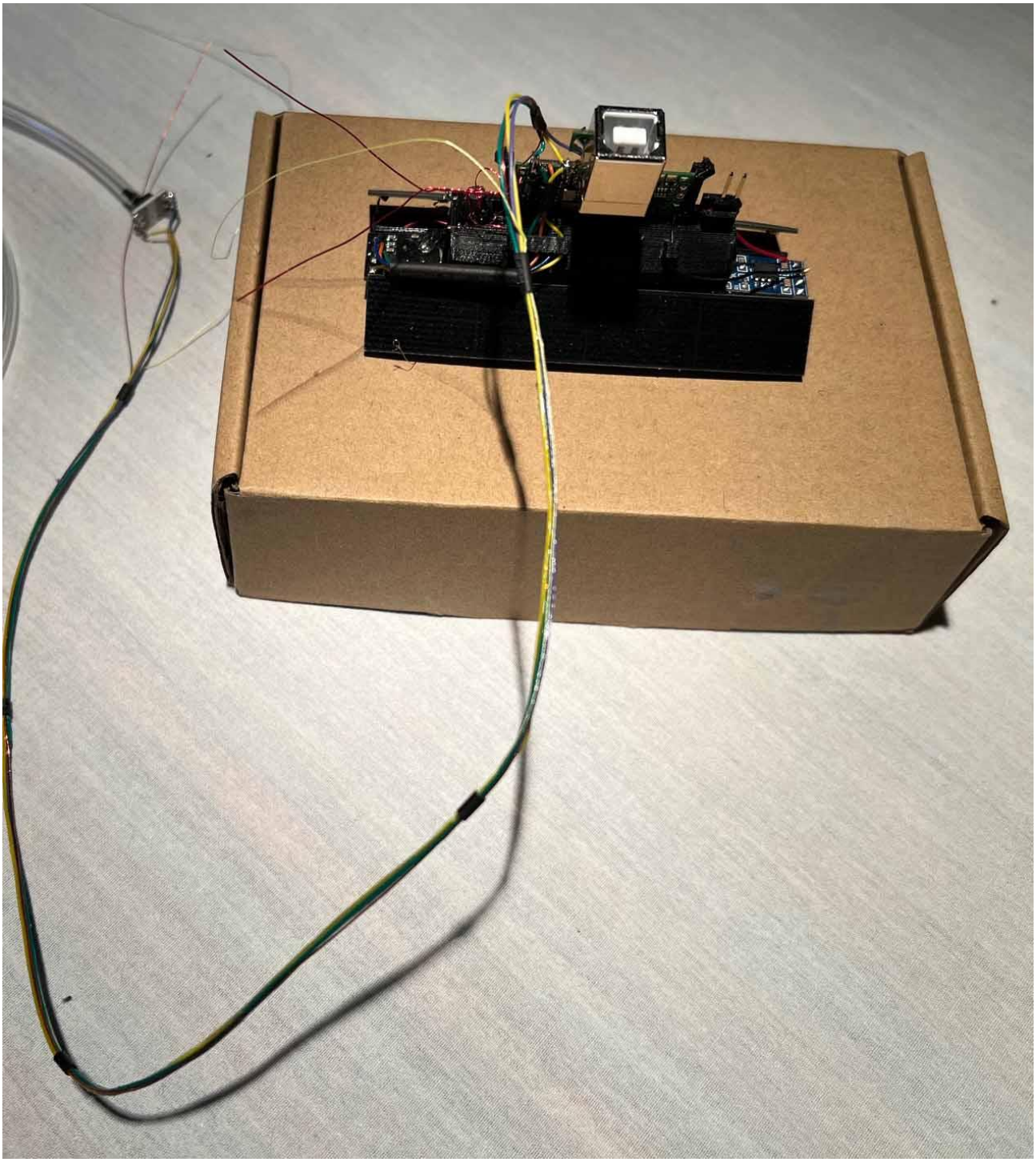
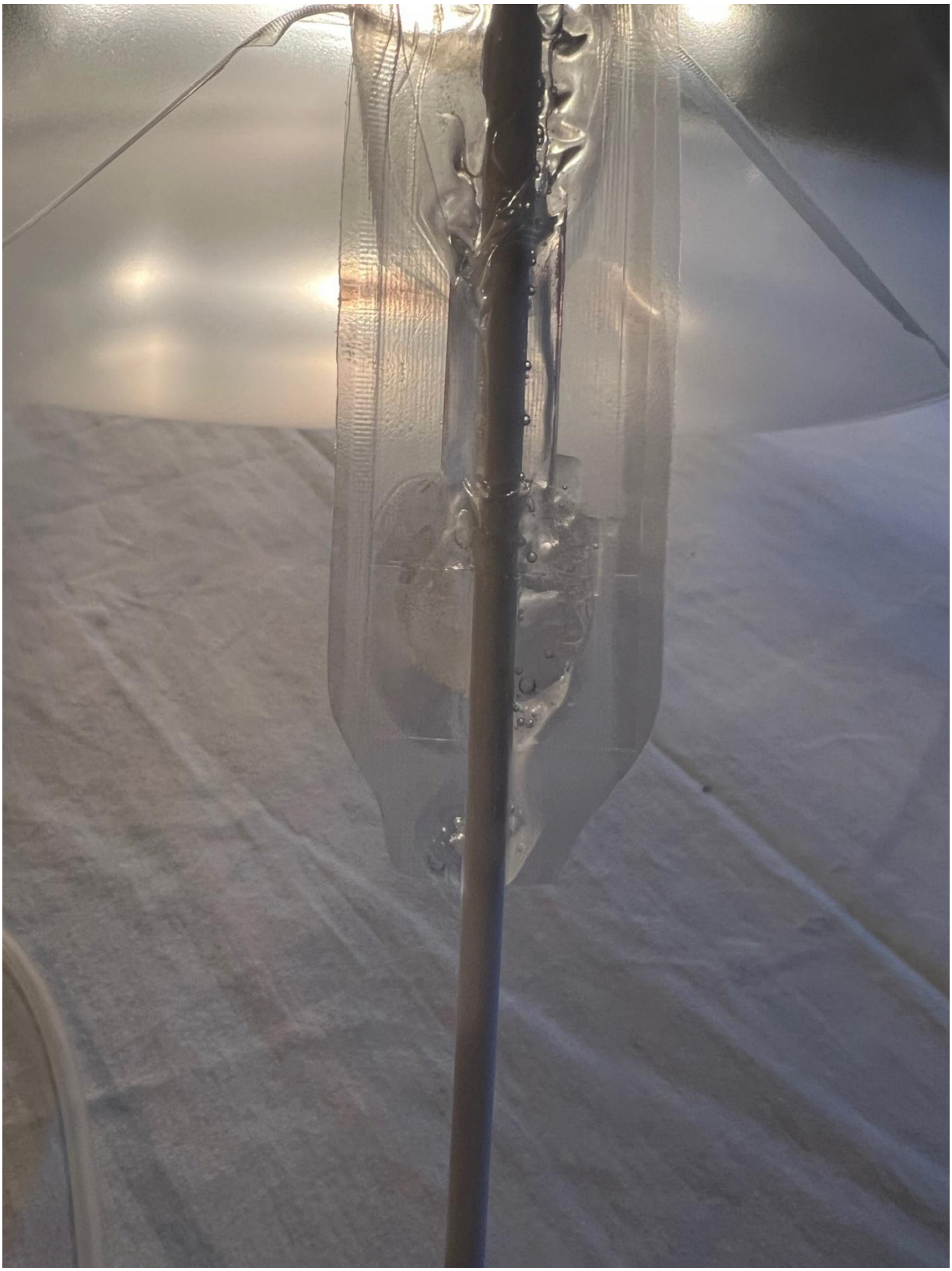
TALARC AlP40J – Design and Construction (Launch in April)



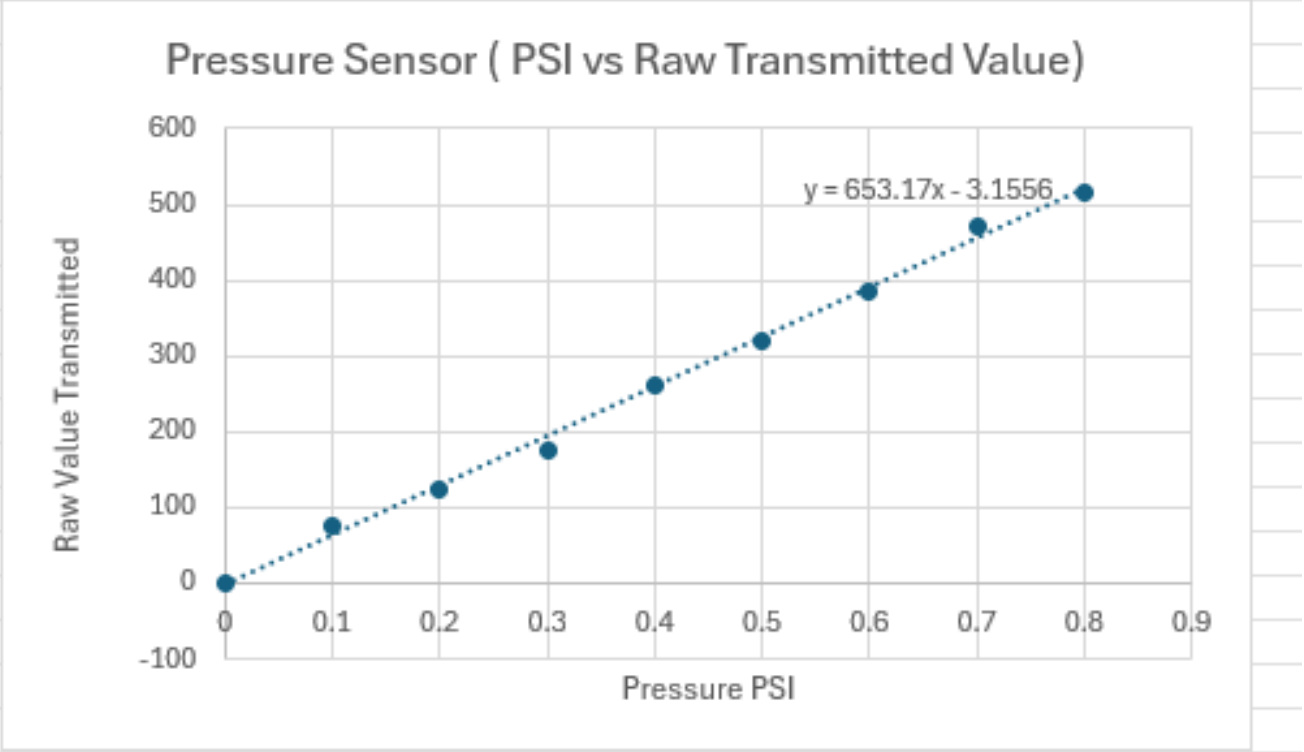
Current State of Construction – Moving from left to right you can see the balloon pressure sensor connected to the cable connected to the payload, the GPS dipole antenna wires, the IR sensor circuit board glued to the 3D printed frame, ¼" Unun toroid, U4B circuit board with USB-B connector, battery connection jumper and MPPT solar battery charger circuit board. Total mass of the payload is approximately 43.25 grams plus 5 grams float, and the balloon has a mass of 75 grams. The estimated float altitude is ~40,000'.

The pressure sensor tube has been inserted into the balloon and glued with UV activated glue.



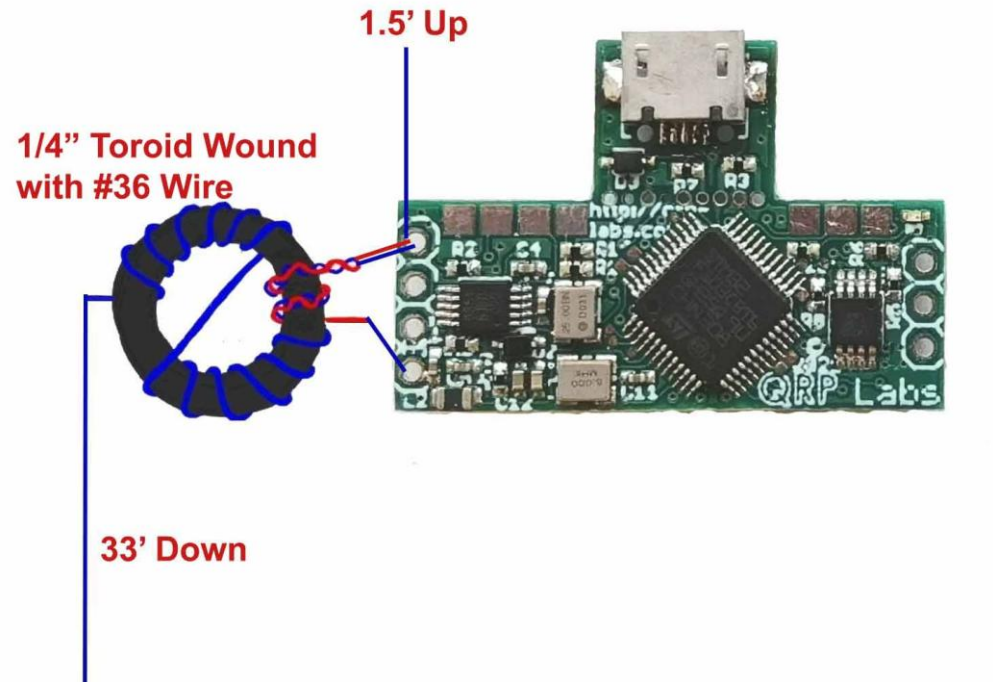
The pressure sensor has been calibrated, see the chart below. Using the formula Balloon Pressure (PSI) = Transmitted Pressure Sensor Value / 653 was tested with several different pressures around the expected value of 0.1 psi that resulted in accurate readings.

Pressure vs Raw Value Transmitted		
0	0	0
0.059619141	0.1	74
0.099902344	0.2	124
0.140991211	0.3	175
0.209472656	0.4	260
0.257006836	0.5	319
0.309375	0.6	384
0.379467773	0.7	471
OVER 512 Bit:	0.8	516



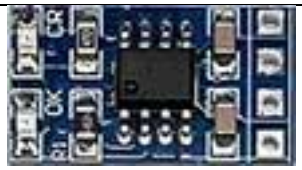
Experiments and Data to be Collected

U4B PCB Temperature
Battery Compartment Temperature
IR Temperature Sensor Pointed Toward Earth
Balloon Pressure
MPPT Solar Charging Circuit
Lithium Battery Viability
20m End Fed Antenna VSWR Tested at 1.5:1
CW Transmissions Reverse Beacon Net



Antenna Construction schematics above and Rudi, K7RAW, installing the Unun toroid below

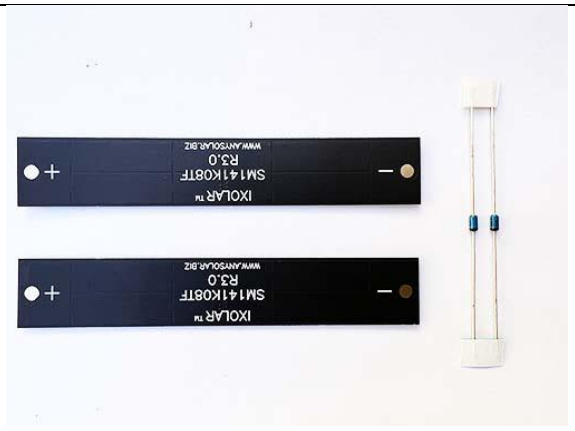
Honeywell ABP Series Pressure Sensor



MPPT Solar Charger

IR temperature sensor, TBP-I2C-H04

TLI-1550A/Z2/T



Solar Panels and Diodes