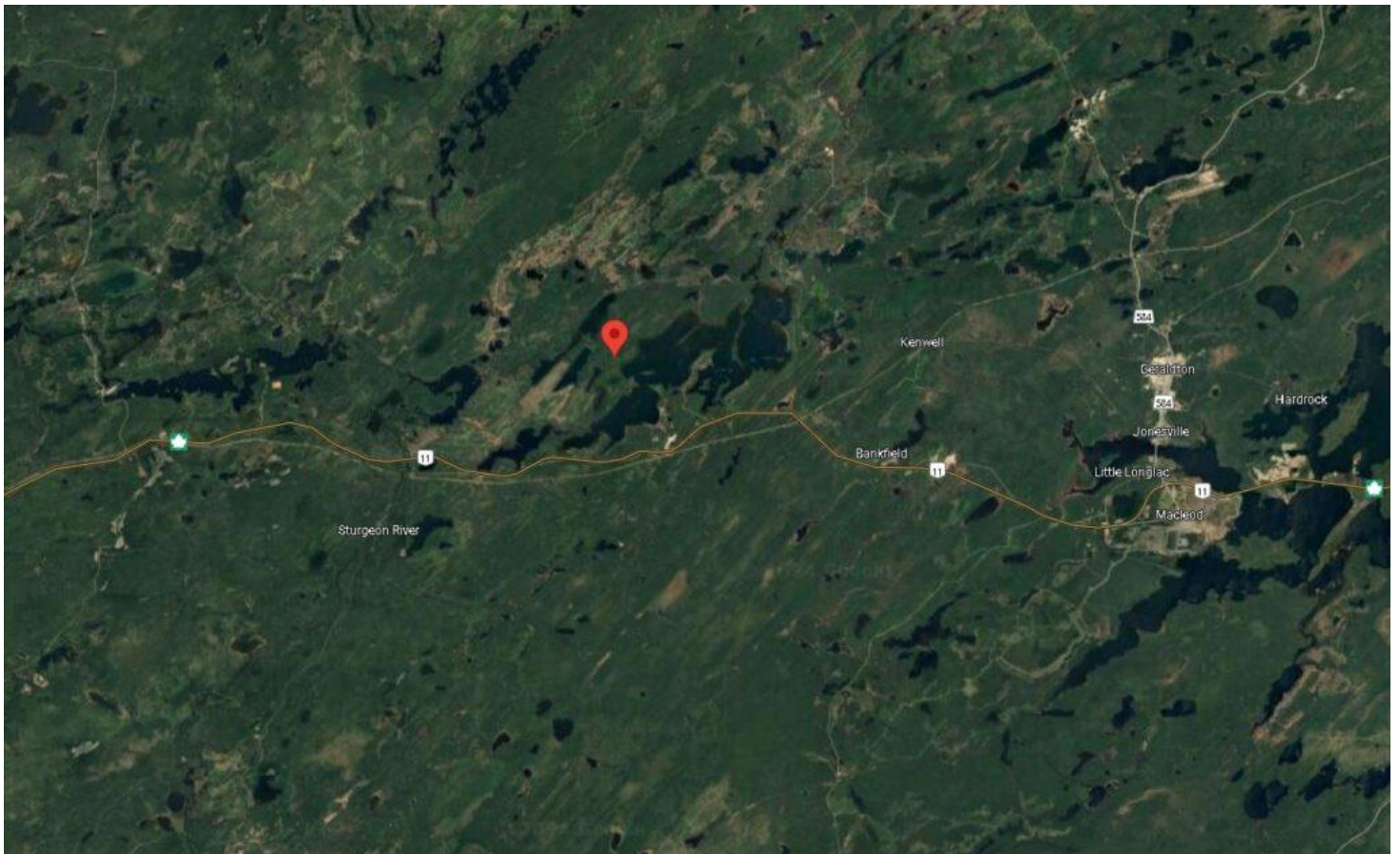


Flight Information for ALP40-D

November 9, 2024: TALARC ALP40-D came down at about 19:36 PST this evening North of Lake Superior near Lake Nipigon and the city Nipigon, Ontario. My goal was for a 48 hour flight to collect enough telemetry to properly characterize how well the battery and the trapped dipole antenna functioned. In the past 36 hours, I have gathered a lot of data, which will help make the next flight of this type in February a success.

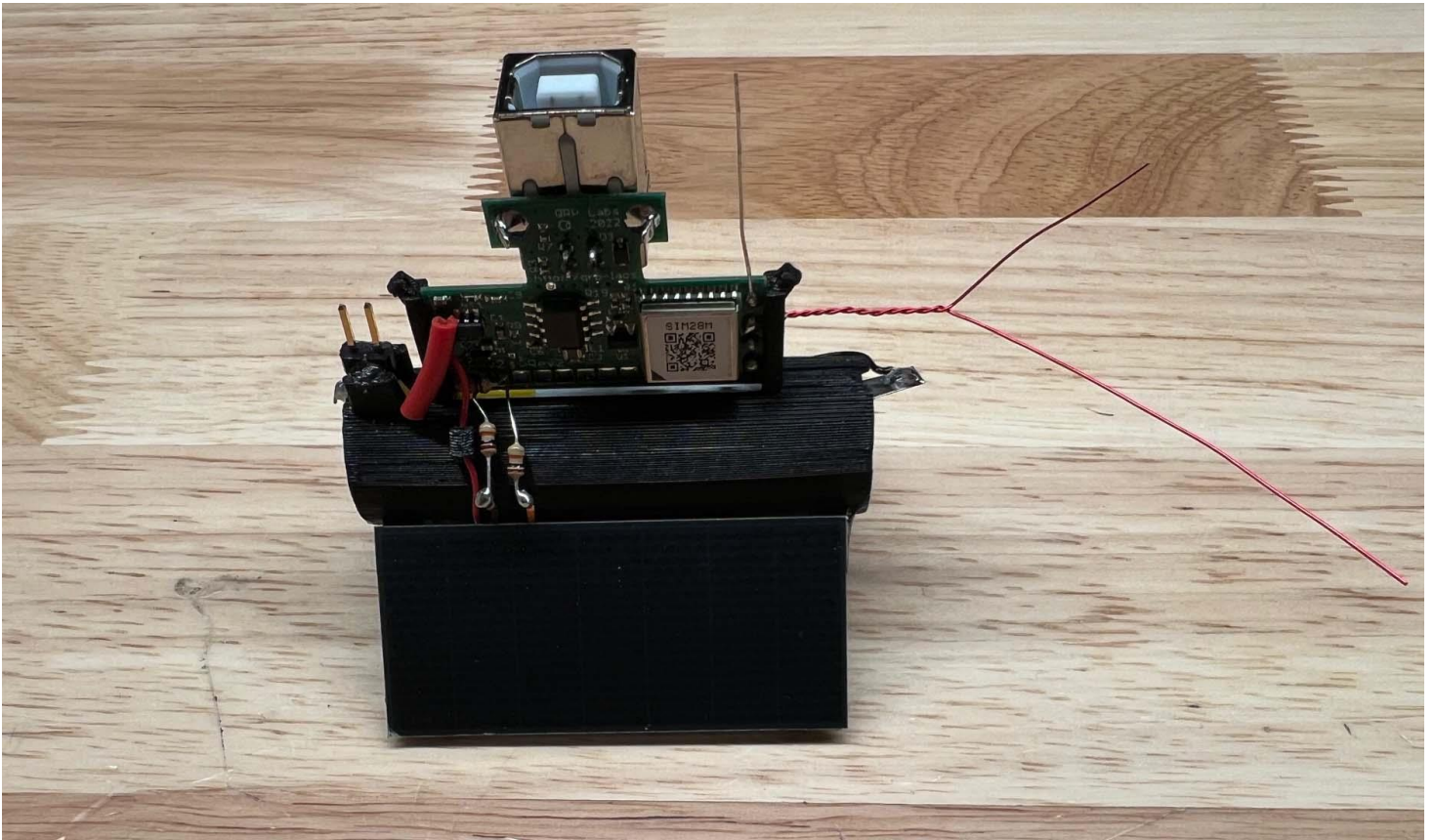
The balloon most likely popped at altitude bringing it down. It was very similar to the way ALP40-B failed; it popped (I got the balloon/payload back). That said, there was a lot of weather in the area with some cloud tops in excess of the balloon's altitude, which could have been the cause. Considering the balloon's location, recovery is not likely; even though the payload is transmitting on 146.585 MHz for T-Hunters, until the battery is exhausted. The balloon's approximate location is shown below.



November 9, 2024: TALARC balloon ALP40-D made it through the night transmitting WSPR telemetry every 20 minutes. At sunrise the battery voltage was 3.3 volts; and at the time of this writing the voltage had already recovered to 3.45 volts. The balloon will have to pass over some weather today; fingers crossed. Also, the forecast track is headed well north, which means shorter days, longer nights and lower sun angles. We will see how well that works.

Analysis of Flight 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](#).

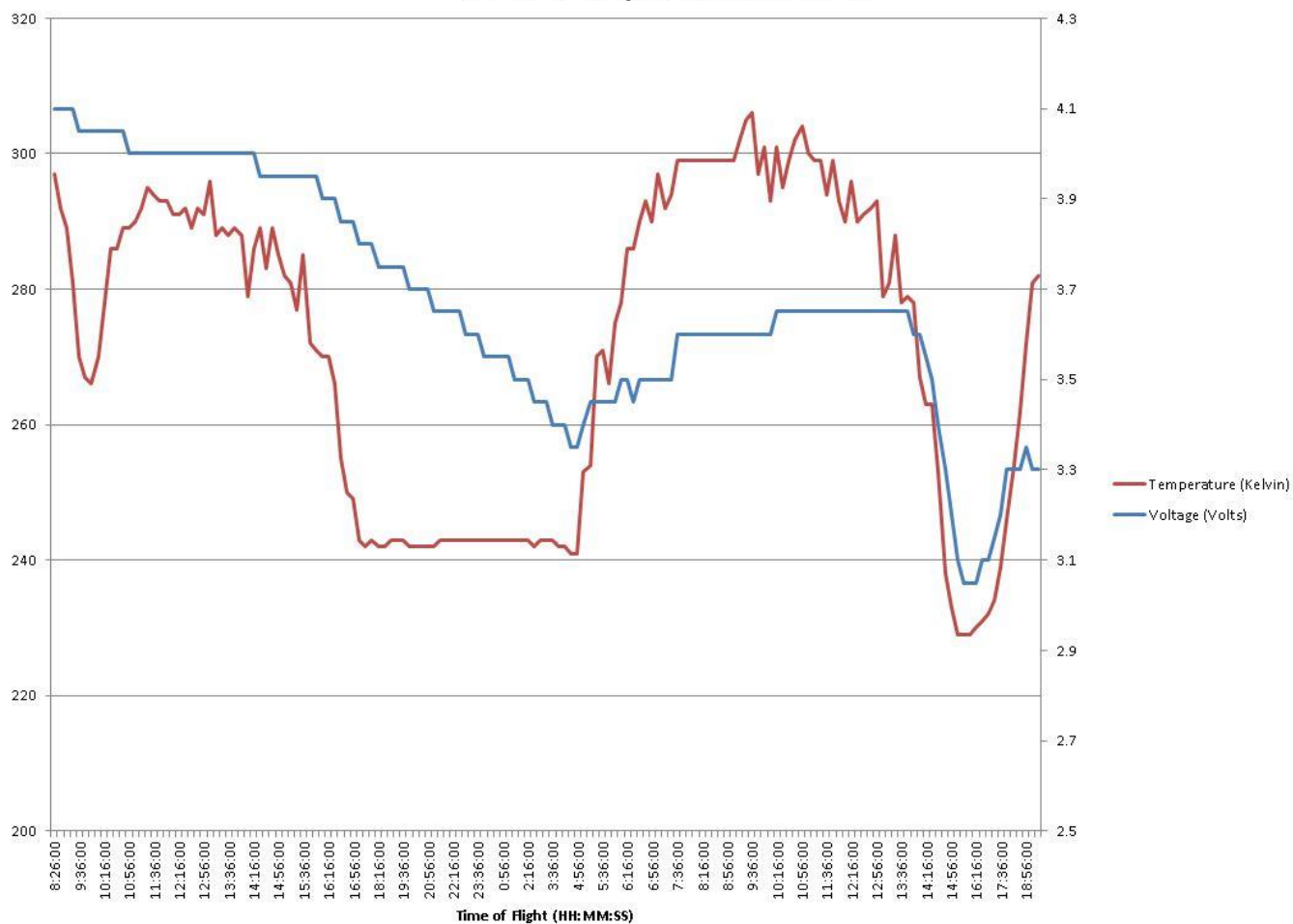


A Yokohama balloon was used and stretched to 97" (size reduced to prevent popping), the payload had a mass 36.4 grams, with a float of 6 grams and inflated with Hydrogen.

The balloon was launched on November 8, 2024 at 8:22 am PST from the Boulder City Dry Lakebed, Nevada and after the balloon popped (similar profile to ALP40-B), it came down at about 19:36 PST on November 9, 2024 North of Lake Superior near Lake Nipigon and the city Nipigon, Ontario; click [here for tracking](#). Due to the remoteness of the area, the balloon will not likely be recovered.

About 36 hours of telemetry was collected. So what was learned from the flight: The battery worked better than expected with the unit transmitting WSPR constantly every 20 minutes the first night. The next day, due to the low sun angles the battery didn't get the needed charge, before the next night. [A software modification could be made to compensate for this on the next flight.] The battery voltage only got to 3.65 Volts, not nearly enough. Surprisingly, the balloon transmitted, until it was completely down with a final voltage of 3.2 Volts. In the end, the balloon descending in altitude improved the battery voltage. At one time the U4B was transmitting WSPR, when the voltage was only 2.95 Volts. See the graph below and draw your own conclusions from the data presented.

ALP40-D Temperature vs Altitude



Also, the trapped dipole antenna worked very well sending standard balloon WSPR on 20 m, and WSPR type 1 and CW on 10 m. The VSWR of the antenna was measured somewhere around 2:1. The mass was 2.75 grams. See the captured WSPR data below. Note: I was using an IC-7100 with an MFJ 10m horizontal stick dipole antenna (MFJ-2210), so the signal listed in the table is higher for 10 m than that of the 20 m signal for that reason.

WSPR packets received from TALARC ALPP40-D balloon on November 8, 2024 at the QTH of KB7HTAs

TIME	SIGNAL	DIFF	Frequency		CALLSIGN	GRID SQ		
1724	-12	0.5	14.097199	-1	KN4UCR	DM06	23	347
1726	-19	0.0	14.097009	0	KT0N	DN70	30	1014
1726	-17	0.7	14.097019	0	KB7HTA	DM25	10	66
1726	-25	0.1	14.097021	0	AF7XZ	DM42	23	552
1726	-18	0.7	14.097049	0	Ww0WwV	DN70	30	1014
1726	-24	0.1	14.097067	-1	KE4TH	DN40	20	611
1726	-15	0.0	14.097098	0	VA7DGT	CN89	40	1620
1726	-16	0.6	14.097137	-2	AB0VZ	DM79	30	972
1726	-19	-0.1	14.097182	0	N0AD	DM79	23	972
1728	-17	0.7	14.097019	0	QI7HXZ	LH34	30	17123
1728	-25	0.1	14.097021	0	<AF7XZ>	DM42MF	23	576
1728	-14	0.5	14.097030	-1	KN4UCR	DM06	23	347
1728	-18	0.8	14.097049	0	Ww0WwV	DN70	30	1014
1728	-23	-0.7	14.097059	-3	N6DNU	CN80	10	842
1730	-10	0.7	28.126016	0	KB7HTA	DM25	10	66
1730	-22	0.1	28.126092	0	NN3C	FN20	0	3516
1730	-23	0.2	28.126098	0	VA6BKC	DO33	23	1943
1730	-12	0.2	28.126172	0	NN0F	EN32	33	2033
1732	-29	0.2	28.126024	0	W8MI	EN75	20	2731
1732	-25	0.0	28.126078	-2	KK4EOU	FM16	20	3405
1732	-26	0.2	28.126089	1	N5UTV	EM26	20	1808
1732	-11	0.0	28.126100	0	N0MPM	EN31	37	2010

CW signals were received on 10 m at my QTH in Las Vegas, when the balloon was just south of Kingman, Arizona. The Reverse Beacon Network received CW signals as well, see table below.

● Spotter (de)				● Spotted (dx)					
callsign				KB7HTA					
spotter	distance mi	freq	mode	type	snr	speed	time	seen	
ND7K	411 mi	28022.0	CW	CQ	3 dB	12 wpm	2102z 08 Nov	3 days ago	
ND7K	411 mi	28022.0	CW	CQ	6 dB	12 wpm	2042z 08 Nov	3 days ago	
ND7K	411 mi	28022.0	CW	CQ	9 dB	12 wpm	2032z 08 Nov	3 days ago	
ND7K	411 mi	28022.0	CW	CQ	11 dB	12 wpm	2012z 08 Nov	3 days ago	
ND7K	411 mi	28022.0	CW	CQ	8 dB	12 wpm	2002z 08 Nov	3 days ago	
K3PA-2	670 mi	28022.0	CW	CQ	14 dB	12 wpm	1812z 08 Nov	3 days ago	
WA7LNV	343 mi	28021.9	CW	CQ	4 dB	12 wpm	1802z 08 Nov	3 days ago	
K3PA-2	670 mi	28022.0	CW	CQ	6 dB	12 wpm	1802z 08 Nov	3 days ago	
K3PA-2	670 mi	28022.0	CW	CQ	11 dB	12 wpm	1652z 08 Nov	3 days ago	

Version: v2.2.5

Summary

I was very pleased with the flight and the data I gleamed from the telemetry during its 36 hours aloft. Would it have been better if it had stayed up longer? Yes. However, it did stay up long enough for me to realize a few tweaks need to be made before the next flight, which I plan for around February 2025. Let's get a little more sunshine up North first.