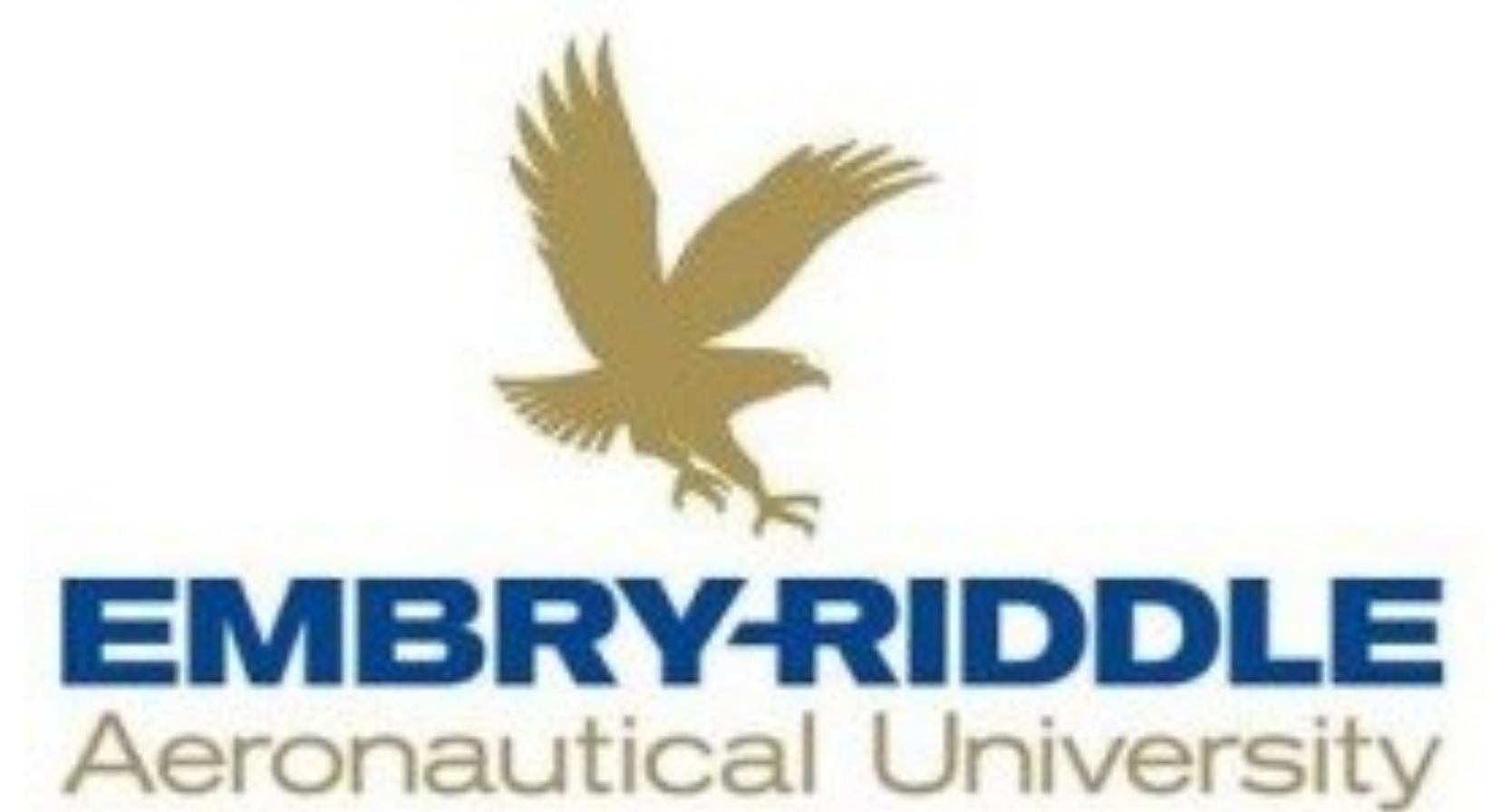


Atmospheric Weather Balloon for Near Space Research



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Abstract

The Society 4 S.P.A.C.E. Club at Embry-Riddle has been working on the development of a weather balloon that will reach a height of 80 to 100 thousand feet and will collect data from the atmosphere. The weather balloon is attached to a Styrofoam box that contains an Arduino board controlling a set of sensors that will measure: temperature, humidity, atmospheric pressure, wind speed and direction. In order to reach space we need to travel through Earth's atmosphere. This research will provide information necessary for further exploration and means of travel even further.

Characteristics

Diameter Balloon: 8 feet
Volume: 261 cubic feet of Helium
Lifting Characteristics: 36 lbs.
Total Weight: 8 Lbs.
2 GoPro Cameras
AVG 180° Remote Control Camera
ARDUINO Mega
8 Different Sensors
Parachute Deployment System

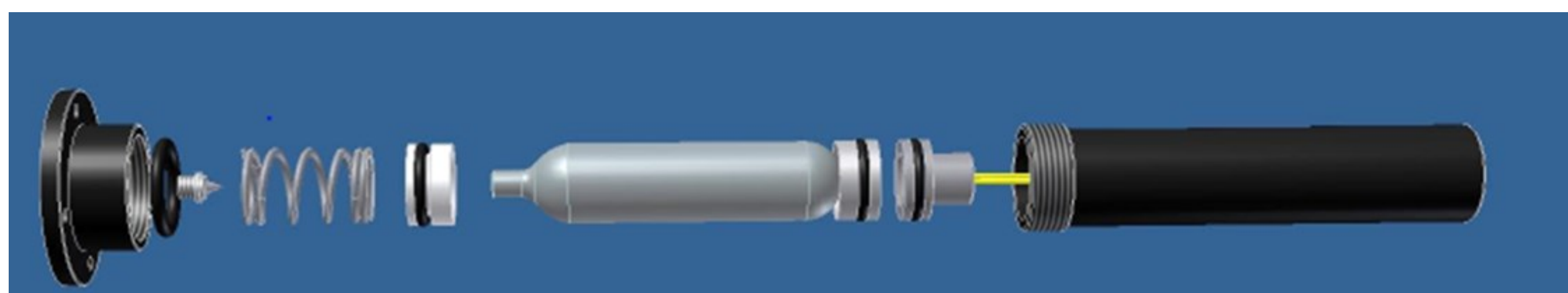


Introduction

The data from all the sensors will be collected and transmitted through an Xbee antenna that will provide us with remote monitoring capabilities. The data and images gathered will aid understanding of the characteristics and environment that govern our atmosphere. This balloon will burst once it has reached its maximum volume. A deployment apparatus will eject a parachute for safe recovery.

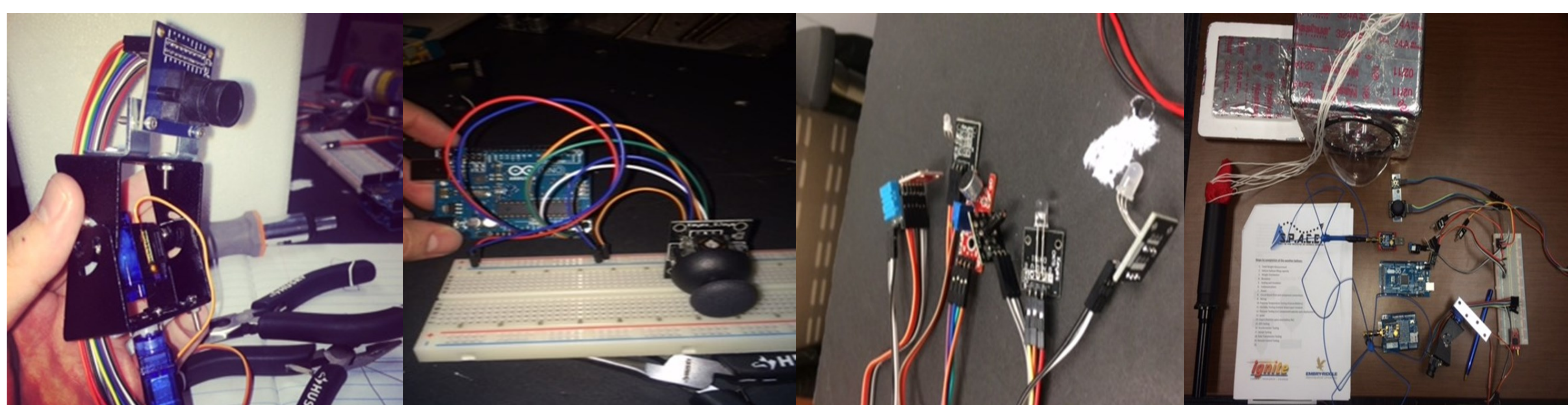
Parachute Deployment System

- Deploy by remote control from the ground.
- Controlled by a relay actuated by ARDUINO Mega.

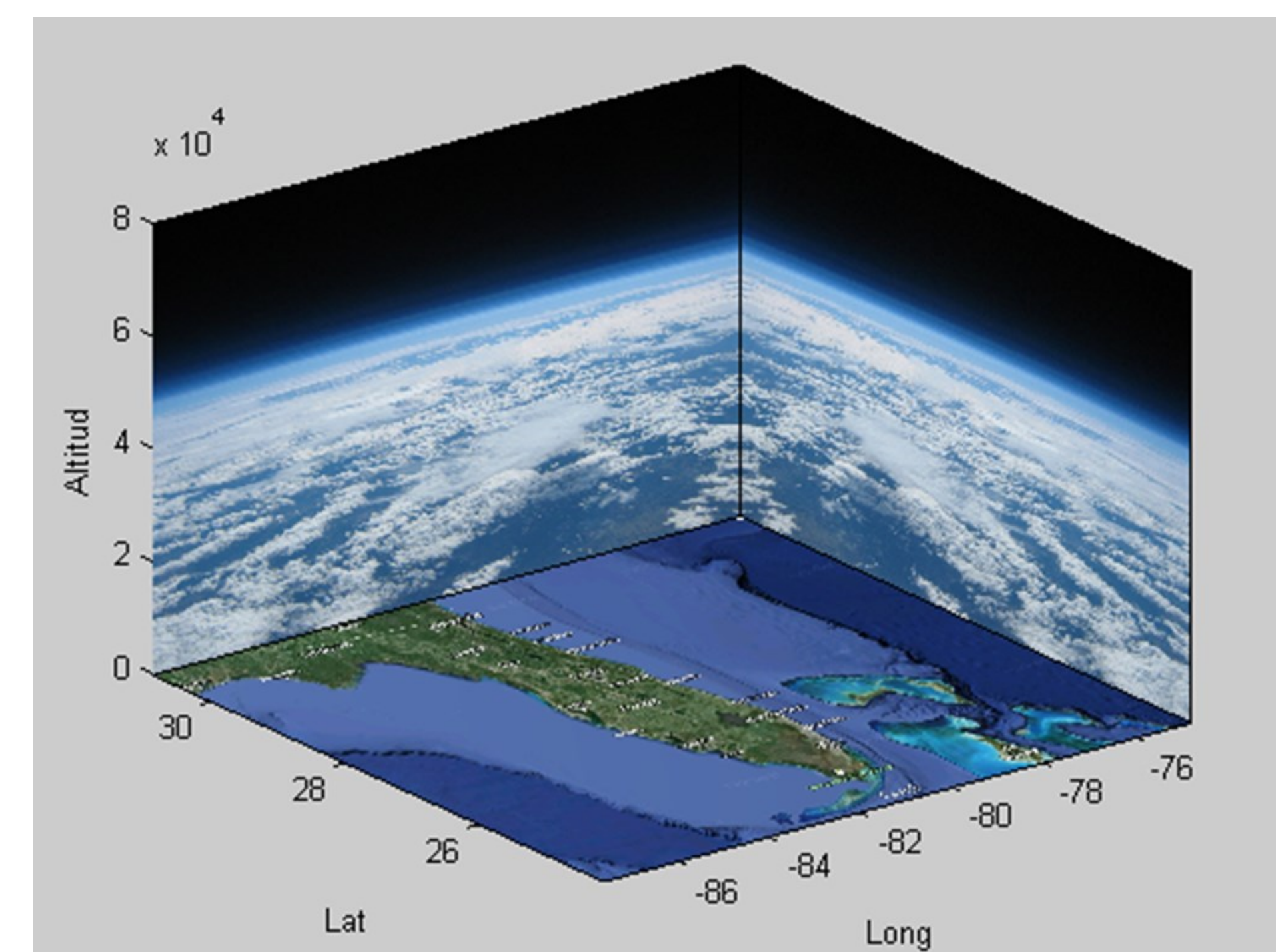


Sensors Controlled by ARDUINO:

- Temperature, humidity, atmospheric pressure, wind speed, wind direction, tilt, longitude and latitude.
- AVG 180 degree Remote Controlled Camera.



MATLAB Trajectory Simulation



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FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
EYN	0812	1108+15	1507+09	9900+01	2927-13	2627-26	262241	263246	284047
JAX	2811	3316+12	3219+07	3122+00	2917-13	2820-26	272142	262352	302358
MIA	9900	0207+15	3206+09	3209+01	2608-14	2725-25	232441	233050	273548
MLB	3509	3412+14	3116+07	3015+01	2807-13	9900-27	252241	231851	282755
PFN	9900	2106+13	2608+07	2710+01	2815-13	2821-26	302741	303151	316356
PIE	0806	3205+14	2810+08	2911+01	2908-13	9900-27	291741	281551	314052
TLH	9900	9900+13	2911+07	2816+00	2816-13	2819-26	292141	302751	304257
ATL	2307	2913+11	2918+05	2927-01	2717-14	2727-26	273142	273752	274462
CSG	2307	2812+12	2817+05	2825+00	2821-14	2725-26	272842	283552	284360
SAV	3008	3216+10	3218+06	3120+00	2923-13	2828-26	282342	282652	303262

Conclusion

As a team everybody has contributed to the final production within the different aspects of the weather balloon. Cooperation and teamwork has been our main objective making sure we utilize each team members' skills. An ethics code as well as respect to members has always been our priority. We have promote diversity and international cooperation because members of team hold different nationalities. Conclusions will be reached when we receive the data. We hope to apply our findings to future weather balloons as well as projects for space commerce.

How we are to communicate the data will be based largely on the type of data we receive and how we plan on using it. This data will allow us to evaluate, prove, and discover different characteristics of our atmosphere. Allowing space club members to gain knowledge and experience in research and development.

Acknowledgment to:

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