



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Raul Lopez	Project Number J0120
Project Title Effects of Altitude on Drones	
Abstract Objectives/Goals After designing a capsule to carry an RC (Radio Control) drone into the stratosphere, I compared the affects of different altitudes on the signal, power and stability of drone planes. Methods/Materials . I constructed a capsule using balsa wood, foam board and wood glue. I then modified a RC plane. On both, the capsule and plane I mounted a camera and FPV system which allowed me to have live video feed on screen. I also constructed an antenna system for the long range of my experiment. To get the airplane and capsule into the stratosphere, I tied a weather balloon to the capsule that took my airplane into the stratosphere. I used telemetry to get all my data. I conducted two tests. One test went horribly wrong, the capsule came crashing down. After I constructed and innovated my capsule I conducted my test. Results All my results were compared. My plane started losing power at 116,160 feet which was my max altitude. My signal was also really weak at 116,160 feet. However my stability was good and the drone was flying great. After reviewing my results I found out that high altitudes do in fact effect drones power, signal and stability. My results strongly support my hypothesis. Conclusions/Discussion I learned many things from this project. I learned how the atmosphere affects major components in a drone. I was able to fly a model UAV drone 116,160 feet into the atmosphere. My hypothesis was correct because I said drones start to have problems at about 100,000 feet. I believe this may help real world applications. If I could do this again I would try using different airplane designs.	
Summary Statement I took a predator RC model plane into the stratosphere to test the effects of high altitude.	
Help Received my mom helped me complete my display board.	