STATEMENT ACCOMPANYING REQUEST FOR EXPERIMENTAL AUTHORIZATION OF CALIFORNIA POLYTECHNIC UNIVERSITY AEROSPACE ENGINEERING DEPARTMENT

1. **Introduction**

California Polytechnic State University Department of Aerospace Engineering (Cal Poly) requests that the Commission grant a two-year authorization to operate facilities within the 1670-1675 MHz band for purposes of testing Small Unmanned Aircraft Systems (SUAS).

The following summarizes the purpose of the testing Cal Poly proposes and its technical parameters and is submitted in support of this application.

2. **Purpose**

The experiments and testing proposed align with Cal Poly Department of Aerospace Engineering objective to provide students insight and experience addressing the technology supporting the, operation, maintenance, repair and operation of aircraft. In this circumstance the experiments relate to SUAS radio technology to provides hands on and learn by doing foundation.

The focus of the experiments is how the radio technology performs command and control functions, how surveillance is conducted and payload retrieved and overall flight and landing performance. The integration of the radio technology into the aircraft's aerodynamics, propulsion, stability and control and structure is a critical element of the purposes small unmanned aircraft can fulfill. The testing will pursue the fundamental interplay between theory and application.

3. **Technology Use**

The experiments embrace a model using a band segment aligning with technology and equipment currently available. Cal Poly commits to operations respecting other users of the band and those in adjacent segments. The limited power levels are part of this commitment. The 1670-1675 MHz channels provide SUAS control and video and telemetry transmission from the SUAS to the ground. Slots are dedicated for uplink data and a downlink.

Operations will be intermittent. There will only one SUAS airborne at any time.

4. N**ature of Operations**

Surface Based and Airborne Transmission

The AeroVironment communications module, Digital Data Link (DDL), will be used in the 1670-1675 MHz band segment for purposes of sending ground based command and control data to and from the SUAS and to transmit video and telemetry to the ground control station. The technology, capable of operating within 1625-2390 MHz, requires 4 MHz for full motion video and a 1 MHz channel for video at 15 frames per second. Emission Designators are 4M68G7W and 1M56G7W, respectively, with a transmit power at 10W. Transmission control will be from the surface control station to the SUAS via a laptop or console.

The proposed location is Cal Poly State University's Escuela/Walters Ranch and Educational Flight Range. The area encompasses a valley encircled by small hills and is comprised of grass fields with minimal visual obstruction. Flights will be restricted to the zone within the peaks of the hills.

5. **Stop Buzzer**

Professor Aaron G Drake is available by telephone at 805.756.2577, Mobile Phone-858.229.5809 and will act as a "stop buzzer" if any matters involving interference arise during the testing.

6. **Transmitting Equipment**

The transmitting equipment is AeroVironment Transreceiver Model 50280, with 2 units at the location. It is not experimental.

7. **Antenna**

The Antenna details are as follows:

Antenna	**Gain** (Nominal)	**Polarization**	Orientation in Vertical Plane	Oriental in Horizontal Plane
GCU Antenna ASY AeroVironment Stack Patch	9dbi*	Vertical	30	85
1670-1675 MHz Tailboom ASSY AeroVironment Dipole	2dbi	Vertical	78	360

*Major Side Lobe

- E-Plane
    - Gain: -2 dbi
    - 120 deg
- H- Plane
    - Gain: -2 dbi
    - 179 deg

8. **Restrictions on Operations and Interference Protection**

Cal Poly understands that experimental operations must not cause harmful interference to authorized facilities. Should any interference occur, Cal Poly will take immediate steps to resolve the interference, including, if necessary, discontinuing operations.

9. **Waiver of Station Identification Requirements**

Cal Poly asks for a waiver of the station identification requirements stated in Section 5.115 of the Commission's rules.

10. **Federal Aviation Administration (FAA) Certificate of Waiver Authorization (COA)**

Cal Poly has or will file applications, relating to a Certificate of Waiver or Authorization with the FAA detailing the areas where the SUAS will be flying. Cal Poly understands that no operations will be pursued until FAA approval of the COA and that any operations will be within the COA parameters.

11. **Diagram**

A diagram of the operations are provided in the Attachment. A contour indicating the radius of operations is also attached.

Conclusion

Cal Poly appreciates very much the Commission's consideration of this application for an Experimental Authorization. Please call upon us if we can respond to any questions.

Attachment

Operations Diagram

Small Unmanned Aircraft-

Video and Telemetry

1670-1675 MHz

Aircraft Command and Control Main and

1670-1675 MHz


1
Cabrillo Hwy
Walter Creek Rd
35 19 47.99N 120 45 0W
Cuesta College Rd
Chorro Valley Rd
© 2016 Google
Google earth
1989
Imagery Date: 8/23/2013
35°19'47.99" N 120°45'00.00" W elev 75 m eye alt 1.08 km