

STATEMENT ACCOMPANYING REQUEST TO EXPERIMENTAL AUTHORIZATION OF AEROVIRONMENT, INC.

1. Introduction

AeroVironment, Inc. (AeroVironment) requests that the Commission grant a two-year experimental authorization to operate facilities in the 2030-2035 MHz, 2065-2070 MHz and 2096-2101 MHz band segments at its operations center in Simi Valley, CA and at Edwards Air Force Base (AFB), Kern County, CA. The testing and experiments are for US Department of Defense (DoD) and Military Services and are made necessary by the military's transition from current frequency locations. AeroVironment has several contractual agreements with the US Military Services.

The following summarizes the testing AeroVironment proposes to pursue, the reasons underlying this effort and the technical parameters of the intended operations.

2. Purpose and Technology

AeroVironment designs and manufactures small unmanned aircraft systems (SUAS) in support of US and allied Armed Forces. These systems are used extensively by US military and allied forces to help establish intelligence, surveillance and reconnaissance superiority.

AeroVironment's SUAS DDL™ is a lightweight, low power, bi-directional, digital wireless video link. Compliant with the Small Unmanned Airborne Systems Digital Data Link (SUAS DDL) waveform, it enables enhanced command and control of small UAS. DDL is IP-based to enable flexibility and interoperability between small airborne and ground systems with limited power availability and bandwidth to maximize the systems operating within an area. The frequency band supporting US DoD and Military Services has been the 1755-1804 MHz segment.

With DoD transitioning many operations to the 2025-2110 MHz band,¹ AeroVironment seeks to test the SUAS in this band. Radio performance and functional flight tests will be pursued. The experiments will replicate scenario-based environments to discern operational effectiveness and degree refinements are needed to transceivers, antenna, emission designators, power source and overall system. The testing will evaluate the technology's effectiveness in this different spectrum environment.

¹ In the Matter of the Commission's rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz Bands, *Report and Order*, FCC 14-31, GN Docket No. 13-185 (March 31, 2014) at ¶¶ 12-13, 210-212. 47 CFR § 2.106 footnote US92.

3. Simi Valley and Edwards AFB Locations -Coexistence with and Deference to Licensed Users

AeroVironment's Simi Valley facility is surrounded by mountains and hills of Ventura County. It is literally an enclosed hidden valley. Simi Valley borders the Santa Susana Mountains to the north and Simi Hills to the east and south. Mountainous terrain of South Mountain and Oak Ridge characterizes the northern and central area. Elevation within this quadrangle ranges from 250 feet along the arroyo bottoms to over 2200 feet. Steep, highly dissected slopes form much of the area's boundary. These geographic obstacles, combining with the low power levels proposed, temper signal path distance significantly.

Edwards AFB, the second largest Air Force facility, is located in the western portion of the Mojave Desert, and 100 miles northeast of Los Angeles. It encompasses 380,000 acres/12 square miles. Its large expanse, including its extensive flight test and development facilities, within the secure environment, provides optimal circumstance to coexist with other users.

AeroVironment commits to operations respecting other users of the band and those in adjacent segments. The limited power levels are part of this commitment. The channels provide SUAS control and video and telemetry transmission from the SUAS to the ground. Slots are dedicated for uplink data and a downlink.

At either location, only one SUAS will be airborne at any time and will be operated intermittently.

AeroVironment commits to coordinating operations with the Society of Broadcast Engineers (SBE).

4. Nature of Operations

Surface Based and Airborne Transmission

The DDL communications module will use band segments 2030-2035, 2065-2070 and 2096-2101 MHz band segments 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 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, console or tablet. AeroVironment's DDL system has been adopted by the US Army as the standard communications architecture for all small unmanned systems, including ground robots.

5. Stop Buzzer

Andy Thurling, Chief Test Pilot, Director, Product Safety and Mission Assurance, is available by telephone at 805.581.2198, extension 1892, Mobile Phone 805.368.6351 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 6 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
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

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

9. Waiver of Station Identification Requirements

AeroVironment ask that its waiver of the station identification requirements stated in Section 5.115 of the Commission's rules remain in place.

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

AeroVironment has obtained a Certificate of Waiver or Authorization with the FAA detailing within the Simi Valley area where the SUAS will be flying. AeroVironment understands that no operations will be pursued without an FAA approved COA and that any operations will be within COA parameters. Operations at Edwards AFB will be authorized and coordinated with flight, spectrum and operations commands.

11. Diagram

A diagram of the operations is provided in the Attachment as is the location.

Conclusion

AeroVironment 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
2030-2035 MHz
2065-2070 MHz
2096-2101 MHz

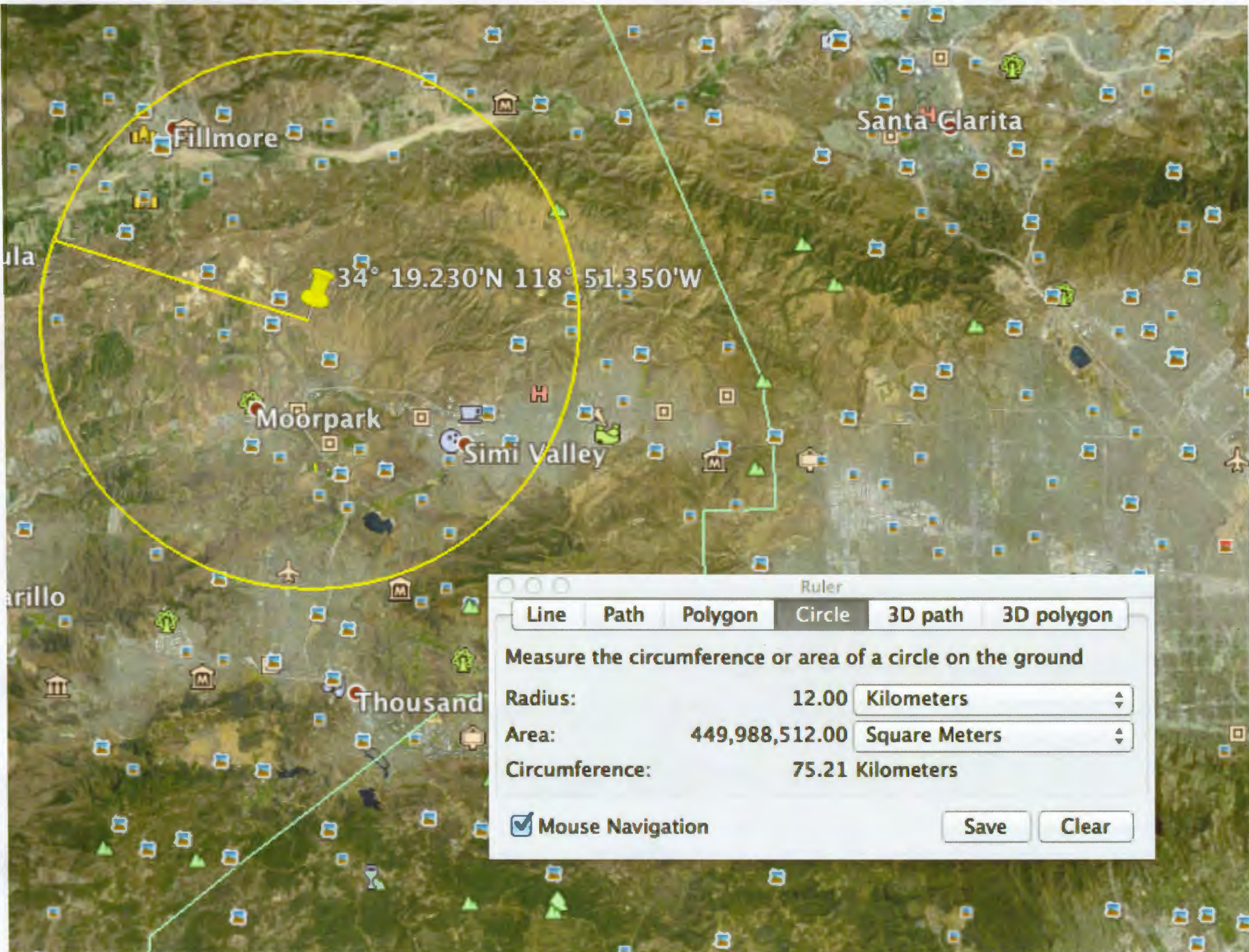
Aircraft Command and Control Main and Backup
2030-2035 MHz
2065-2070 MHz
2096-2101 MHz



Locations

I. Simi Valley, Ventura County, California

II. Edwards Air Force Base, Kern County, California



Fillmore

Santa Clarita

34° 19.230'N 118° 51.350'W

Moorpark

Simi Valley

Thousand

Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the circumference or area of a circle on the ground

Radius: 12.00 Kilometers

Area: 449,988,512.00 Square Meters


Circumference: 75.21 Kilometers

Mouse Navigation

Save

Clear



 N 34 52 07.8 W 118 04 40.2

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 1994

Imagery Date: 9/4/2015 34°52'07.80" N 118°04'40.20" W elev 695 m eye alt 1.70 km 