**STATEMENT ACCOMPANYING REQUEST TO MODIFY EXPERIMENTAL AUTHORIZATION WG2XVN OF AEROVIRONMENT, INC.**

1. **Introduction**

By this application, AeroVironment, Inc. (AeroVironment), requests that the Commission grant a modification to call sign WG2XVN to operate facilities within the 1670-1675 MHz band at 2 additional sites.

We also request that the following sites be deleted from WG2XVN or that we be permitted to file a modification to do so. The sites where experiments are complete and should be deleted are:

- Sites (29/30) Santa Ynez, CA-1.5 km centered on NL 34-35-00; WL 120-03-15
- Sites (49/50) Coalinga, CA- 18.52 km centered on NL 36-10-23; WL 120-23-08

The proposed new sites, detailed in the attached Form 442 are:

- Reno Stead Airport, NV
- Playas, NM

There are no modifications to the technical elements of the technology. In this statement, we explain the purpose of the modification and why this application is within the Commission's experimental authorization rules.

2. **Purpose**

*Background*

- Reno-Stead Airport, NV- AeroVironment has been selected to participate in the National Aeronautics and Space Administration's (NASA) Unmanned Traffic Management (UTM) Technology Capability Levels (TCL) 2 project at Reno-Stead Airport. The project involves critical experiments addressing coordinating small unmanned aircraft systems (SUAS) in the national airspace (NAS). How radio transmissions of multiple SUAS can co-exist safely in airspace deliberately populated with SUAS is a prime objective. AeroVironment will test how use of the 1670-1675 MHz band for command and control and video downlink can navigate safely in such an environment. The experiments are part of NASA's UTM TCL2 research platform for an integrated SUAS in the NAS.

- Playas, NM- These experiments support the Federal Aviation Administration's (FAA) Unmanned Aircraft System (UAS) Focus Area Pathfinder initiative. Pathfinder is exploring next steps in unmanned aircraft operations beyond the operations proposed in the FAA's pending rulemaking. The tests will address radio transmission comportment in beyond line of sight environments related to railway and related purposes. The tests will provide analysis as to the functioning of aircraft and aerial surveillance using the

1670-1675 MHz frequency segment in beyond line of sight operations in an arid climate with flat and rolling terrain.

As noted previously, the research and information that result from this work is provided to the FAA and is critical to the FAA's congressionally mandated project to integrate SUAS into civilian airspace. These experiments contribute to the research portfolio surrounding SUAS radio technology. A facet of this research is the effectiveness of the SUAS datalink behavior and performance in varied environments while engaging in representative mission sets. The work remains critical to AeroVironment's investment in a platform of SUAS commercial uses and upon which future investment relies.

*The details of sites are:*

- Reno-Stead Airport, NV- N 39 42 41/ W 119 53 11- 6 km radius of operation, 121.92 m AGL. .
- Playas, NM- N 31 56 11/ W 108 31 27- 30 km radius of operations, 121.92 m AGL.

*Technology Use and Coexistence with Other Users of the Radio Spectrum*

The experiments embrace a model using a band segment aligning with technology and equipment currently available. AeroVironment reiterates its commitment to operations respecting other users of the band and those in adjacent segments. The limited power levels proposed are part of this commitment. The 1670-1675 MHz channels provide SUAS command and control and video and telemetry transmission from the SUAS to the ground. Slots are dedicated for uplink data and a downlink. Operations will be limited to 121.92 meters AGL and below. The SUAS will remain within the radius of the exercise center points, which range from to 6 km to 30 km.

4. N**ature of Operations**

*Surface Based and Airborne Transmission*

As noted in our original application, AeroVironment's communications module, Digital Data Link (DDL), will use 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. AeroVironment's DDL system is the US Army's standard for communications architecture for all small unmanned systems, including ground robots.

5. **Stop Buzzer**

Andy Thurling, Chief Test Pilot, Director, Product Safety and Mission Assurance, will be available by telephone at 805.581.2198, extension 1892, Cell 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 unchanged. It is AeroVironment Transreceiver Model 50280, with 2 units at each location. It is not experimental.

7. **Antenna**

The Antenna details have not changed from the current authorization and 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**

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 requests 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)**

AeroVironment has or will file applications for a Certificate of Waiver or Authorization with the FAA detailing the areas where the SUAS will be flying during the proposed operations. AeroVironment 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 and referenced maps of the proposed operations are provided in the Attachment.

**Conclusion**

AeroVironment appreciates very much the Commission's consideration of this modification 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*

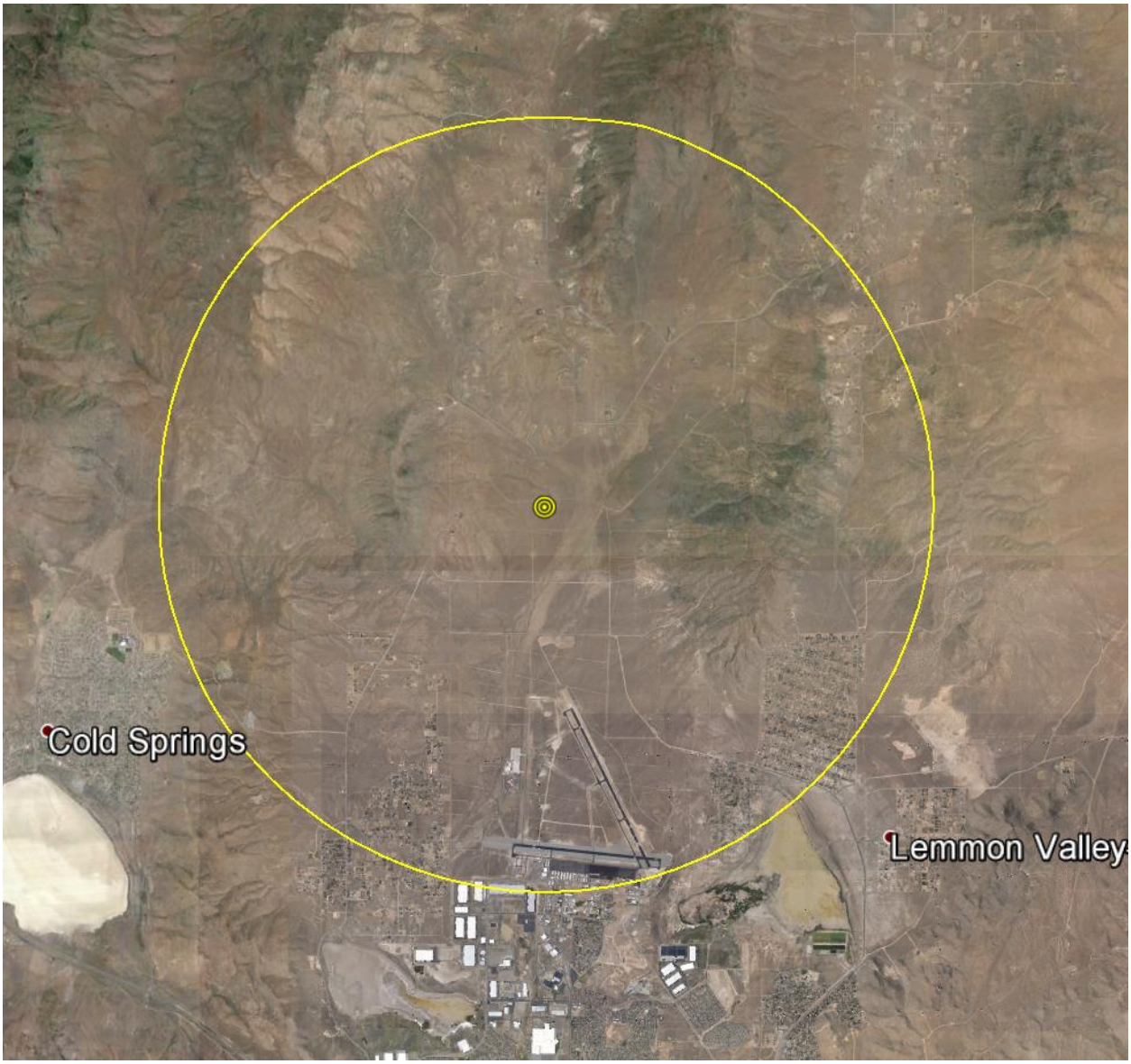
*Aircraft Command and Control Main and*

*1670-1675 MHz*

OPERATIONAL CONTOURS

RENO-STEAD AIRPORT, NV

Center Point: N 39 42 41/ W 119 53 11



PLAYAS, NM

N 31 56 11/ W 108 31 27