

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Jet Propulsion Laboratory

ADDRESS

Jet Propulsion Laboratory
Mail Stop 82-105
4800 Oak Grove Dr.
Pasadena, CA 911090

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Operation of AS 800B Blimp UAS at Southern California Logistics Airport (VCV), Victorville, CA Class "D" airspace within a three-quarter (3/4) SM diameter centered at 34° 35'31.91" N, 117° 23' 32.27" W, from the surface to 800' AGL under the jurisdiction of Southern California Logistics Airport Air Traffic Control Tower (ATCT). See Special Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

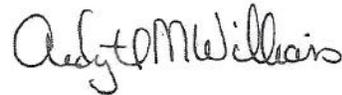
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2007-AHQ-1 is effective from April 28, 2008 through April 27, 2009, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR



FAA Headquarters, AJR-36
(Region)

Ardyth Williams
(Signature)

April 28, 2008
(Date)

Air Traffic Manager, Unmanned Aircraft Systems
(Title)

ATTACHMENT to FAA FORM 7711-1**ISSUED TO:** Jet Propulsion Laboratory**ADDRESS:** Jet Propulsion Laboratory
Mail Stop 82-105
4800 Oak Grove Dr.
Pasadena, CA 911090**NAME:** Federal Aviation Administration (FAA) Certificate of Authorization (COA) for AS 800B Blimp Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) outside of restricted/warning area airspace.**ACTIVITY:** Operation of AS 800B Blimp UAS at Southern California Logistics Airport (VCV), Victorville, CA Class "D" airspace within a three-quarter (3/4) SM diameter centered at 34° 35'31.91" N, 117° 23' 32.27" W, from the surface to 800' AGL (see attachment 1) under the jurisdiction of Southern California Logistics Airport Air Traffic Control Tower (ATCT).**PURPOSE:** To prescribe operating requirements in the NAS (outside of restricted and/or warning area airspace) for the purpose of training and/or operational flights.**DATES OF USE:** This COA (2007-AHQ-1) is valid from April 28, 2008, through April 27, 2009. Should a renewal become necessary, the proponent shall advise the FAA, in writing, no later than 60 days prior to the requested effective date.**GENERAL PROVISIONS:**

- The review of this activity is based on our current understanding of the UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its special provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

SAFETY PROVISIONS:

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted/warning/Class A airspace areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, General Operating and Flight Rules, Subpart J-Waivers, 91.903, Policy and

Procedures, the following provisions provide acceptable mitigation of 14 CFR Part 91.113 and must be complied with:

- Visual Observers, either ground-based or airborne, must be used.
- The applicant and/or its representatives are responsible for collision avoidance with all aircraft, other aviation operations, and the safety of persons or property on the surface.

AIRWORTHINESS CERTIFICATION PROVISIONS:

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft applications must contain one of the following:
 - A civil airworthiness certification from the FAA, or
 - A statement specifying that the Department of Defense Handbook "Airworthiness Certification Criteria" (MIL-HDBK-516), as amended, was used to certify the aircraft or equivalent method of certification.

PILOT / OBSERVER PROVISIONS:

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UAS will operate. Pilots must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.
- **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Observers must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.
- **Pilot-in-Command (PIC) – Visual Flight Rules (VFR):**
 - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
 - The PIC must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105, and must keep their aeronautical knowledge up to date.

- There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.

Pilot Proficiency – VFR:

- Pilots will not act as a PIC unless they have had three qualified proficiency events within the preceding 90 days.
 - The term “qualified proficiency event” is a UAS-specific term necessary due to the diversity of UAS types and control systems.
 - A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots flying UA on other than instrument flight plans must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105.

PIC Responsibilities:

- Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR 91.7, Civil Aircraft Airworthiness, or the military equivalent, apply.
- One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
- The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, *Careless and Reckless Operation*, apply to UAS pilots.

Pilot/ATC Instructions: The PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions as applicable.

SPECIAL PROVISIONS:

The FAA recognizes that, by nature, UAS have no on-board pilot to perform see-and-avoid responsibilities. Therefore, when operating outside of Restricted Airspace, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. Listed below are the special provisions that must be complied with. All personnel connected with this UAS operation shall comply with the contents of this authorization and its special provisions.

1. All UAS operations shall be conducted under Visual Flight Rules (VFR) in Visual Meteorological Conditions (VMC) in accordance with CFR 14 Part 91.
2. All UA operations will be in accordance with the Letter of Agreement (attached) between Victorville Airport Traffic Control Tower, Global Access Southern California Logistics Airport, and Jet Propulsion Laboratory dated April 21, 2008.

3. For the purpose of see-and-avoid, visual observers must be utilized at all times. The visual observers must remain within .6 NM mile laterally and/or 800 feet vertically of the UAS during all operations. Pilot/observers must not operate the AS 800B Blimp at a distance beyond that at which see-and-avoid responsibilities can be exercised. The visual observers may be either ground based or in a chase aircraft. The observer(s) must keep the UAS in sight at all times.
4. Flight operations will not be conducted unless the UA pilot has two-way radio contact with VCV ATCT.
5. Operations may only be conducted during daylight hours.
6. The UAS transponder and position/navigation/anti-collision strobe lights shall be activated at all times during flight, if equipped.
7. Lost Link Procedures will be in accordance with paragraph 5a(6) of the LOA referenced in paragraph 2 of this COA.
8. Operations (to include lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.
9. Special VFR operations are not authorized.

NOTAM: A distance (D) Notice to Airman shall be issued when UA operations are being conducted. Contact the Automated Flight Service Station at 1-800-WX-BRIEF (992-7433) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

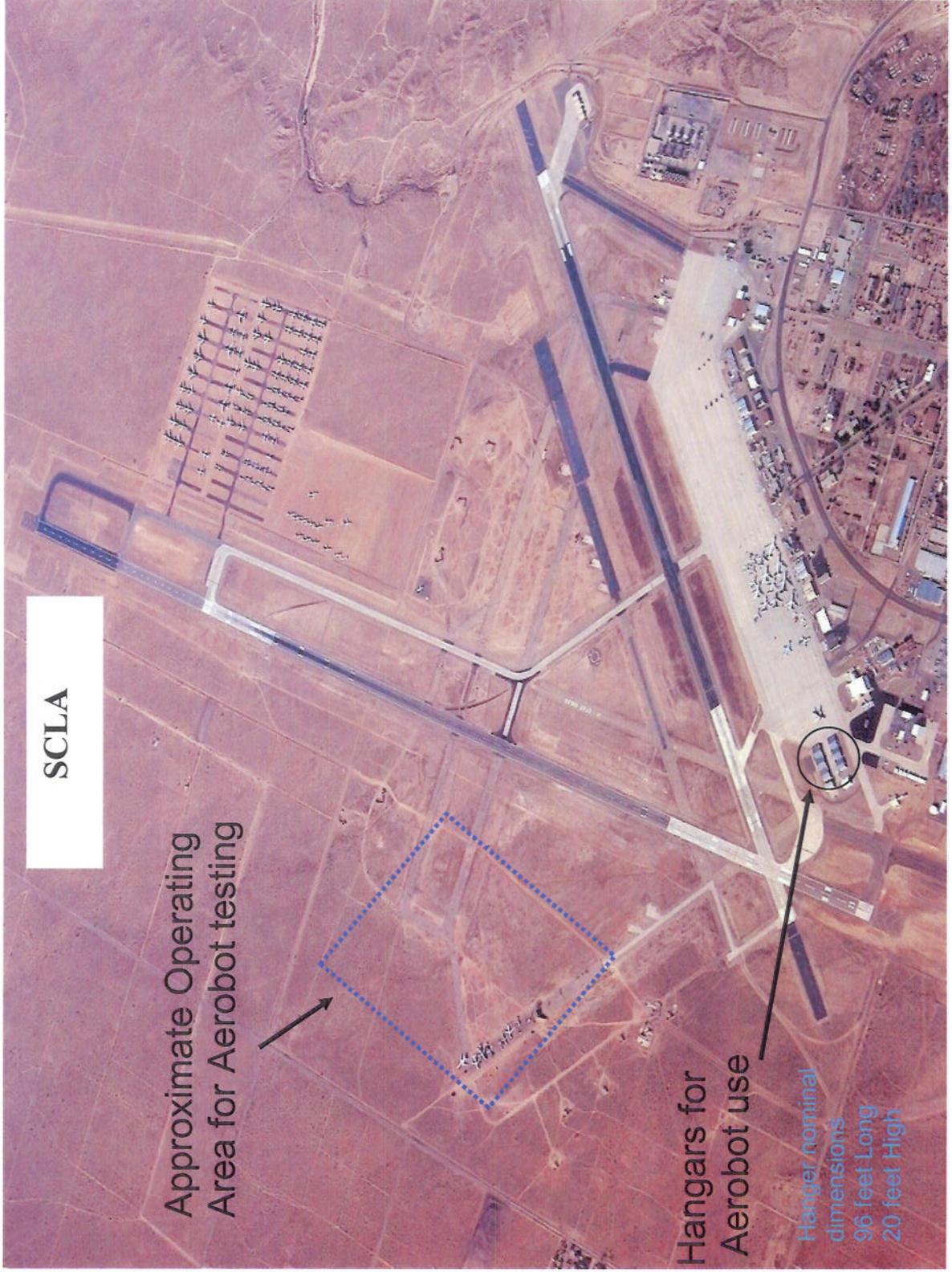
- Name and Address of the Using Facility
- Location, Altitude or the operating Area
- Time and nature of the activity

INCIDENT / ACCIDENT REPORTING: The following information is required to document unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to Donald.E.Grampp@faa.gov on a monthly/annual basis:
 - Number of flights conducted under this COA.
 - Pilot duty time per flight.
 - Unusual equipment malfunctions (hardware/software).
 - Deviations from ATC instructions.
 - Operational/coordination issues.
 - All periods of Loss of Communications.
- The following shall be submitted to Donald.E.Grampp@faa.gov within 24 hours:
 - Deviations from the "Special Provisions" contained in the COA.

- All periods of Loss Link, including duration.
- All incidents involving the UAS as defined in 49 CFR 830.
- All accidents involving the UAS as defined in 49 CFR 830.

This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Jet Propulsion Laboratory to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The Jet Propulsion Laboratory is hereby authorized to operate the AS 800B Blimp UAS in the operations area depicted in "Activity" above and Attachment 1 below.



SCLA

Approximate Operating Area for Aerobot testing

Hangars for Aerobot use

Hangar nominal dimensions
96 feet Long
20 feet High

LETTER OF AGREEMENT
BETWEEN
VICTORVILLE AIRPORT TRAFFIC CONTROL TOWER, GLOBAL ACCESS
SOUTHERN CALIFORNIA LOGISTICS AIRPORT, AND THE JET PROPULSION
LABORATORY

EFFECTIVE: 21 APRIL 2008

SUBJECT: Unmanned Aircraft Systems (UAS): UAS operations at the Southern California Logistical Airport (VCV) Class "D" airspace.

1. Purpose: To establish procedures for operations of the AS 800B Blimp UAS within VCV Class "D" airspace.
2. Scope: The procedures herein apply to VCV Airport Traffic Control Tower (ATCT), Global Access, and the Jet Propulsion Laboratory (JPL).
3. Responsibilities: Parties of this Letter of Agreement (LOA) shall ensure their respective personnel comply with its provisions.
4. Scheduling/Cancellation:
 - a. JPL UAS operators will submit a request for issuance of a Notice to Airman (NOTAM) to VCV Airport Operations no later than one business day prior to UAS flight within VCV Class "D" airspace.
 - b. A current Letter of Agreement and FAA 7711-1 on file with ATCT and airport operations is the prerequisite for NOTAM consideration.
 - c. This letter of agreement is valid until May 1, 2009, unless otherwise agreed upon by all signatories.
5. Procedures:
 - a. General:
 - (1) All UAS operations will be conducted within a three-quarter (3/4) SM diameter centered at 34° 35'31.91" N, 117° 23' 32.27" W from the surface to 800' AGL. See attachment "A."
 - (2) It is the responsibility of the Pilot in Command (PIC) or Mission Commander (MC) to ensure VCV ATCT is informed of completion of UAS flight operations.
 - (3) It is the responsibility of JPL to deconflict operation schedules with other UAS operators. VCV ATCT will not be involved with deconfliction of proposed flight schedules.
 - (4) All flight communications for launch and recovery in VCV Class "D" airspace shall be accomplished on VCV ATCT assigned frequencies.

- (5) If voice communications between the PIC and VCV ATCT are lost, VCV ATCT will be notified immediately via telephone line. The UAS can continue to operate as originally cleared, as long as alternate direct two-way radio communications are maintained between VCV ATCT and the PIC.
- (6) Lost link procedures. In the event of lost link the UAS on-board controller will automatically enter a safe mode consisting of a rudder down and over command to put the blimp into a downward spiral flight path. The PIC will attempt to regain control by moving towards the blimp, thereby reducing the transmitter range. The autonomous flight operator will attempt to control the blimp through the 900 MHz telemetry and control link. If control is achieved, the operator will command the blimp to return to base. If the return to base command is not accepted, the operator will command an engine shut down and a vent valve open to discharge helium gas and force the blimp to descend.
- (7) Ground observers shall maintain visual contact with the UAS during all phases of flight.
- (8) In the event of an UAS emergency, the PIC shall contact VCV ATCT immediately of the situation and intentions. Manned aircraft emergencies shall take priority over unmanned aircraft emergencies. The UAS PIC shall comply with all VCV ATCT instructions that may include returning to a predetermined point, holding, or land now to accommodate a manned aircraft emergency.
- (9) All UAS flights shall be conducted in visual flight rules (VFR) conditions.
- (10) JPL UAS operator will notify VCV ATCT 15 minutes prior to beginning launch activity.

NOTE: The Airport Director is the final authority for all ground based operations onboard Southern California Logistics Airport.

(b) (6)
[Redacted]
Southern California Logistics Airport

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Victorville Airport

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Jet Propulsion Laboratory, California Institute of Technology