

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Mesa County Sheriff's Office

215 Rice Street

Grand Junction, CO 81501

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 the CLMax Engineering *Falcon* Unmanned Aircraft System (UAS) in Mesa County, Colorado (depicted in Attachment 1) within Class G airspace, at or below 400 feet Above Ground Level (AGL). The Mesa County Sheriff's Office (MCSO) will not fly in Class D airspace without the approval of the Grand Junction Regional Airport Tower (GJT). For each flight, the MCSO will define an incident perimeter, and operations will launch and remain (b) (7)(A), (b) (7)(E)

. See Special Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

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 of Authorization (COA) 2011-WSA-65 is valid from September 12, 2011 through September 11, 2012 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, AJV-13

(Region)

Dean E. Fulmer

Dean E. Fulmer

(Signature)

September 12, 2011

(Date)

Acting Manager, Unmanned Aircraft Systems

(Title)

ATTACHMENT to FAA FORM 7711-1

Issued To: Mesa County Sheriff's Office

Address: 215 Rice Street
Grand Junction, CO 81501

Activity: Operation of the CLMax Engineering *Falcon* Unmanned Aircraft System (UAS) in Mesa County, Colorado (as depicted in Attachment 1) within Class G airspace, at or below 400 feet Above Ground Level (AGL). The Mesa County Sheriff's Office (MCSO) will not fly in Class D airspace without the approval of the Grand Junction Regional Airport Tower (GJT). For each flight, the MCSO will define an incident perimeter, and operations will launch and remain (b) (7)(A), (b) (7)(E)

Purpose: To prescribe UAS operating requirements (outside of restricted and/or warning area airspace) in the National Airspace System (NAS) for the purpose of training and/or operational flights.

Dates of Use: This Certificate of Authorization (COA) 2011-WSA-65 is valid from September 12, 2011 through September 11, 2012. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (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 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 provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

Safety Provisions:

Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations. Adherence to 14 CFR part 91 §91.111, §91.113, and §91.115, is required.

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The proponent and/or delegated representative is responsible at all times for collision avoidance with all aviation activities and the safety of persons or property on the surface with respect to the UAS.

- a. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft at all times.
 - b. Any crew members responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the pilot flying.
 - c. UA operations will only be conducted within Reduced Vertical Separation Minimum (RVSM) altitudes, when appropriately equipped or having received a clearance under an FAA deviation. NOTE: UA operations should not plan on receiving an Enroute clearance in RVSM altitudes, without being RVSM equipped.
 - d. Visual observers must be used at all times except in Class A airspace, active Restricted Areas, and Warning areas designated for aviation activities.
 - i. The observers may either be ground-based or in a chase aircraft.
 - ii. If the chase aircraft is operating more than 100 feet above/below and/or ½ NM laterally of the unmanned aircraft, the chase aircraft PIC will advise the controlling ATC facility.
 - e. The PIC is responsible to ensure the visual observer is:
 - i. Able to see the aircraft and the surrounding airspace throughout the entire flight, and
 - ii. Able to determine the UA's altitude, flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:
 - 1. Comply with CFR 91.111, 91.113, and 91.115, and
 - 2. Prevent the UA from creating a collision hazard.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Cloud clearances and VFR visibilities for Class E airspace will be used regardless of class of airspace. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
 - The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of this COA.

Airworthiness Certification Provisions:

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft 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 UA will operate. Pilots must have in their possession a current second 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.
- Aircraft and Operations Requirements:
 - Flight Below 18,000 Feet Mean Sea Level (MSL).
 - UA operations below 18,000 feet MSL in any airspace generally accessible to aircraft flying in accordance with visual flight rules (VFR) require visual observers, either airborne or ground-based. Use of ATC radar alone does not constitute sufficient collision risk mitigation in airspace where uncooperative airborne operations may be conducted.
 - Flights At or Above 18,000 Feet Mean Sea Level (MSL)
 - When operating on an instrument ATC clearance, the UA pilot-in-command must ensure the following:
 1. An ATC clearance has been filed, obtained and followed.
 2. Positional information shall be provided in reference to established NAS fixes, NAVAIDS, and waypoints. Use of Latitude/Longitude is not authorized.
- **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*, 14 CFR 91.113, *Right-of-Way Rules*, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. Observers must have in their possession a current second 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.

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- **Pilot-in-Command (PIC) –**
 - **Visual Flight Rules (VFR) as applicable:**
 - 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 operating a UA in line of sight must pass at a minimum 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.
 - Pilots flying a UA on other than instrument flight plans beyond line of sight of the PIC must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR 61.105.
 - **Instrument Flight Rules (IFR) as applicable:**
 - 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 be a certified pilot (minimum of private pilot) of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
 - The PIC must also have a current/appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.
- **Pilot Proficiency – VFR/IFR as applicable:**
 - Pilots will not act as a VFR/ IFR 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 will not act as an IFR PIC unless they have had six instrument qualifying events in the preceding six calendar months (an event that requires the PIC to exercise instrument flight skills unique to the UAS).
- **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.

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- **Pilot/Observer Task Limitations:**

- Pilots and observers must not perform crew duties for more than one UA at a time.
- Chase aircraft pilots must not concurrently perform either observer or UA pilot duties along with chase pilot duties.
- Pilots are not allowed to perform concurrent duties both as pilot and observer.
- Observers are not allowed to perform concurrent duties both as pilot and observer.

Standard Provisions: These provisions are applicable to all operations unless indicated otherwise in the Special Provisions section.

- The UA PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions, unless specified otherwise in the Special Provisions section. The PIC shall comply with all ATC instructions and/or clearances.
- If equipped, the UA shall operate with an operational mode 3/A transponder, with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk.
- If equipped, the UA shall operate with position/navigation lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.
- VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in, except when operating in Class A airspace where 14 CFR Part 91.155 will apply.
- Special VFR is not authorized.
- Operations (including lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.
- Operations outside of restricted areas, warning areas, prohibited areas (designated for aviation use) and/or Class A airspace may only be conducted during daylight hours, unless authorized in the Special Provisions section.
- Operations shall not loiter on Victor airways, Jet Routes, Q Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159).
- The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- All operators that use GPS as a sole source, must check all NOTAM's and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited without specific approval in the special provisions.
- At no time will TCAS be used in any mode while operating an unmanned aircraft.
- Only one UA will be flown in the operating area unless indicated otherwise in the Special Provisions.

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- A copy of this COA will be maintained on site by the PIC or designated representative.
- The Mesa County Sheriff's Office and/or its representatives, is responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to the UAS.

Special Provisions:

1. In the event of a lost link, the UAS PIC will immediately notify Grand Junction Regional (GJT) Tower if lost link occurs within GJT Class D airspace or Denver TRACON at (303) 342-1590 if lost link occurs in Class G airspace. The UAS PIC will state pilot intentions and comply with the following provisions:
 - A. In the event of lost link or the Pilot in Command (PIC) loses communication and subsequent control of the aircraft, the aircraft autopilot will enter a fail-safe mode within a predetermined period of the condition being detected and follow one or all of the procedures described below.
 - 1). The vehicle will navigate to and orbit around its home position at either the minimum home altitude or the UAVs altitude when communications were interrupted, whichever is higher.
 - 2). The vehicle will continue to orbit at its present position indefinitely. This will eventually result in a spiraling descent to landing once the battery or fuel is expended.
 - 3). The vehicle will execute a spiraling descent about its current position to a flared landing immediately when this failsafe triggers.
 - 4). The vehicle will proceed to its Rally point from its present position. Upon reaching the Rally point, the vehicle will descend to the "Break height" at which time it will depart the Rally point along a user defined heading, descending along a user defined glide slope to the GPS "Land Point".
 - B. The UA lost link mission will not transit or orbit over populated areas.
 - C. Lost link points must not coincide with the centerline of Victor airways.
 - D. Lost link programmed procedures will avoid unexpected turn-arounds and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.
2. Notice to Airmen (NOTAM) Requirement: A distance (D) Notice to Airmen shall be issued 48 to 72 hours prior to normal unmanned aircraft operations being conducted. Due to the immediacy of some tactical operations, it is understood by

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the Federal Aviation Administration that this NOTAM notification may be reduced to no less than one hour prior to these operations.

3. 30 minutes prior to operations in Class G airspace, and upon conclusion of operations, the proponent must notify Denver TRACON at (303) 342-1590 and advise of the defined incident perimeter/operation area in Lat/Long Coordinates, the NOTAM number (if known) and the time for commencing and terminating operations.
4. For operations within Class D Airspace, the following provisions apply:
 - A. When the GJT Tower is closed the airspace becomes Class E. The PIC will continue to monitor the tower frequency (118.1/257.8) for traffic advisories.
 - B. 30 minutes prior to commencing flight operations within Class D airspace, the PIC must coordinate with and establish and maintain two way radio communications with GJT Tower. The PIC must notify GJT Tower upon conclusion of flight operations.
 - C. GJT Tower may prohibit or terminate UAS operations when manned aircraft are operating in the airport traffic pattern, or any time manned aircraft are practicing or flying approaches into the airport.
5. Mesa County Sheriff Office has made its own determination on the Airworthiness and safety of the Falcon UAS. The UAS must be operated in strict compliance with all manufacturer's specifications and recommendations as well as provisions and conditions contained in the most recent Airworthiness Certification Statement dated June 22, 2011. Any changes or revisions to the current Airworthiness Certification Statement will be provided to the Unmanned Aircraft Systems Program Office (AFS-407) for review.
6. The PIC must conduct a pre-takeoff briefing which includes a briefing on the contents of the COA, the maximum altitudes to be flown, initial heading, frequencies to be used, lost link procedures, the parameters for the use of a ditch point, a risk analysis for the flight being flown, emergency procedures, communications with air traffic control (ATC), frequencies to be monitored for flight operations and a briefing on the expected duration of flight.
7. The PIC is responsible for ensuring the UA remains within the defined incident perimeter/operation area.
8. Sterile cockpit procedures must be observed during all critical phases of flight.
9. The use of cell phones or other telephonic communication is restricted to the operational control of the UA, and any required communications with Air Traffic

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Control (ATC). Battery powered communication modes shall be charged and tested prior to flight operations.

10. The PIC must control the aircraft (or override authority to assume control) during all UAS operations.
11. A configuration control program must be in place for hardware or software changes made to the UAS. If a new or revised Airworthiness Release is generated as a result of changes in the hardware or software affecting the operating characteristics of the UAS, no further flight is authorized until AFS-407 has reviewed these changes.
12. The PIC shall not engage in any activity not directly related to flying the aircraft.
13. Denver TRACON or Grand Junction Tower may terminate or delay the provisions of this COA at any time it deems a sufficient level of safety for operations is not met.
14. The holder of this COA, or delegated representative, is responsible for halting or cancelling activity in the operations area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this waiver.
15. Night operations are prohibited. UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (Note: this is equal to approximately 30 minutes after sunset until 30 minutes before sunrise.)
16. Special provision 1, 3, and 4 will be used in lieu of maintaining direct two-way communications with ATC (Standard Provisions, bullet one) when operating in Class G airspace.

NOTAM: A distance (D) Notice to Airmen shall be issued when UA operations are being conducted. This requirement may be accomplished through your local base operations or NOTAM issuing authority. You may also complete this requirement by contacting Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 1 hour prior to the operation and provide:

- Name and Address of pilot filing NOTAM request
- Location, Altitude or the operating Area
- Time and nature of the activity

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The proponent must place a notice in the Airport Facility Directory advising of the possibility of unmanned aircraft operations in the operational area during the period of time this COA is valid.

NOTE FOR PROPONENTS FILING THEIR NOTAM WITH DoD ONLY: This requirement to file with the AFSS is in addition to any local procedures/requirements for filing through DINS. The FAA Unmanned Aircraft Systems Office is working with the AFSS, and to eliminate the requirement to file a NOTAM with both the AFSS and DINS in the near future.

Incident / Accident and Normal Reporting Provisions: The following information is required to document routine and 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 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 link (telemetry, command and/or control)
- The following shall be submitted via email, COA online or phone (202-385-4542, cell 443-569-1732) to Donald.E.Grampp@faa.gov **within 24 hours and prior to any additional flight under this COA:**
 - All accidents or incidents involving UAS activities, including lost link.
 - Deviations from any provision contained in the COA.

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 Mesa County Sheriff's Office to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The Mesa County Sheriff's Office is hereby authorized to operate the Falcon Unmanned Aircraft System UAS in the operations area depicted in "Activity" above and Attachment 1 below.

(b) (7)(A), (b) (7)(E)

