



U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

July 15, 2015

Exemption No. 12064
Regulatory Docket No. FAA-2015-0153

Mr. Scott Eveld
Aerial Information Technologies
27543 Ethan Allen Way
Menifee, CA 92585

Dear Mr. Eveld:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letters posted to the docket on January 23 and May 20, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Aerial Information Technologies (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct collecting data for mapping and GIS applications, as well as remote sensing.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

Airworthiness Certification

The UAS proposed by the petitioner is the 3D Robotics X-8.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112–95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection¹. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA–2014–0352), 11109 to Clayco, Inc. (*see* Docket No. FAA–2014–0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA–2014–0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA–2014–0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Aerial Information Technologies is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and

¹ Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Aerial Information Technologies is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the 3D Robotics X-8 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.
2. Operations for the purpose of closed-set motion picture and television filming are not permitted.
3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.
4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.
5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.
6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.
7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating

documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed.

Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS-80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.
9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.
10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g. inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.
11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.
12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.
13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Colombia, Puerto Rico, a territory, a possession, or the Federal

government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.
16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.
17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.
18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.
19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.
20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.
21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The

exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
24. The UA must remain clear and give way to all manned aviation operations and activities at all times.
25. The UAS may not be operated by the PIC from any moving device or vehicle.
26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
 - a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
 - b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.
28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be

reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.
30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
 - a. Dates and times for all flights;
 - b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
 - c. Name and phone number of the person responsible for the on-scene operation of the UAS;
 - d. Make, model, and serial or N-Number of UAS to be used;
 - e. Name and certificate number of UAS PICs involved in the aerial filming;
 - f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
 - g. Signature of exemption holder or representative; and
 - h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.
31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

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I am seeking relief from the following regulations:

Part 21 prescribes the procedural requirements for issuing and changing design approvals, production approvals, airworthiness certificates, and airworthiness approvals.

Section 45.23(b) prescribes that when marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Section 61.113(a) and (b) prescribes that—

(a) no person who holds a private pilot certificate may act as a pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

(b) a private pilot may, for compensation or hire, act as pilot in command of an aircraft in connection with any business or employment if:

(1) The flight is only incidental to that business or employment; and

(2) The aircraft does not carry passengers or property for compensation or hire.

Section 91.7(a) prescribes that no person may operate a civil aircraft unless it is in an airworthy condition.

Section 91.7(b) prescribes that the pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight and that the PIC shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

Section 91.9(b)(2) prohibits operation of U.S.-registered civil aircraft unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Section 91.103(b) prescribes that a pilot shall for any flight, become familiar with runway lengths at airports of intended use, and takeoff and landing distance information.

Section 91.109(a) prescribes, in pertinent part, that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

Section 91.119 prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over

any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface—

(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

Section 91.121 requires, in pertinent part, each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure."

Section 91.151(a) prescribes that no person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, (1) during the day, to fly after that for at least 30 minutes [emphasis added].

Section 91.203(a) prohibits, in pertinent part, any person from operating a civil aircraft unless it has within it (1) an appropriate and current airworthiness certificate; and (2) an effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft registration Application as provided for in § 47.31(c).

Section 91.203(b) prescribes, in pertinent part, that no person may operate a civil aircraft unless the airworthiness certificate or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

Section 91.405(a) requires, in pertinent part, that an aircraft operator or owner shall have that aircraft inspected as prescribed in subpart E of the same part and shall, between required inspections, except as provided in paragraph (c) of the same section, have discrepancies repaired as prescribed in part 43 of the chapter.

Section 91.407(a)(1) prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter.

Section 91.409(a)(2) prescribes, in pertinent part, that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

Section 91.417(a) and (b) prescribes, in pertinent part, that—

(a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

(1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each

engine, propeller, rotor, and appliance of an aircraft. The records must include—

- (i) A description (or reference to data acceptable to the Administrator) of the work performed; and
- (ii) The date of completion of the work performed; and
- (iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

- (i) The total time in service of the airframe, each engine, each propeller, and each rotor.
 - (ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.
 - (iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.
 - (iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.
 - (v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revision date. If the AD or safety directive involves recurring action, the time and date when the next action is required.
 - (vi) Copies of the forms prescribed by § 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.
- (b) The owner or operator shall retain the following records for the periods prescribed:
- (1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed.
 - (2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.
 - (3) A list of defects furnished to a registered owner or operator under § 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

My UAV is an X-8 from 3D robotics

The X8+ includes

- Controller with live on-screen flight data
- Flight battery and charger

- Operation Manual and Flight Checklist
- Ground station radio with USB and Android adapters

Specs:

- Battery: 4S 14.8V 6,000 mAh 10C
- Battery Dimensions: 6.6 in x 2.6 in x 1.4 in (16.7 cm x 6.5 cm x 3.5 cm)
- Battery Weight: 803 g
- Autopilot hardware: Pixhawk v2.4.5
- Autopilot firmware: ArduCopter 3.2
- GPS: 3DR u-blox GPS with Compass (LEA-6H module, 5 Hz update)
- Ground Station Radio: 3DR Radio v2 (915 MHz or 433 MHz)
- Motors: SunnySky V2216-12 KV800 II
- Controller: FlySky FS-TH9X with FrSky telemetry module
- Frame Type: X
- Propellers: APC Propeller 11x4.7 SF (4), APC Propeller 11x4.7 SFP (4)
- Vehicle Dimensions: 13.7 in x 20.1 in x 11.8 in (35 cm x 51 cm x 20 cm)
- Payload Capacity: 800 g (1.7 lbs). Additional payload possible up to over 1kg with reduced flight time.
- Vehicle Weight with Battery: 2.56 kg (5.6 lbs)
- Maximum Estimated Flight Time: 15 min
- 915 MHz ground station radios allow communication with the aircraft wirelessly in flight.

I am wanting to use this UAV for the purpose of collecting data for mapping and GIS applications, as well as remote sensing. The X8 is fitted with a gyro stabilized gimbal that will accept a gopro camera. Flight times are limited to no longer than 10 minutes and at an altitude of no more than 400 feet. Because of the precision, of the maps, we hope to achieve, our flights are usually less than 200 feet. We will never exceed 400 feet. There may be times that we will need to be closer than the 5 mile radius of an airport, if the need arises, we would first check with the airport, and apprise them of our intent and accommodate them in anyway necessary.

I have more than 50 hours UAV flight time and 16 hours course study of UAV safety, theory, and maintenance and I have been certified through UVU (Unmanned Vehicle University). I realize that there is no officially recognized training for UAV's in the United States at this time, however, I feel that the training that I received from UVU was invaluable. I have 25 years experience as a land survey professional, as well as an OSHA 30 Safety certificate.

This UAV would be used to fly in areas that conventional aircraft cannot fly. We use the information to turn out maps that have more, and better information than is possible through traditional means. I would be the PIC and always have a spotter with me that would also have

the ability to initiate the auto land or return to launch sequence(RTL). The X8 has a standard flight mode, GPS assisted mode, and an autonomous flight mode. During autonomous flight, corrections can be give directly to the UAV for course change (altitude or directional) as well as loiter, auto land and RTL. All flights for the collection of data will be done through the autonomous mode. If communication is lost with the UAV it will stop and loiter in position for one minute while trying to reacquire communication. If it is unable to establish communication it will RTL and land. GPS is also required for autonomous flight, if the gps signal is lost , the UAV will loiter in position and try to establish a GPS signal. If a GPS signal can not be acquired, it will land at that position. If the GPS signal is lost the UAV can also be controlled safely through the RC controller.

The X8 is powered by a 6000MaH battery, there would be no chance of fuel spillage, and reduces the chance of igniting fires.

All safety and maintenance is always strictly adhered to following guidelines that will be included in this application.

Copter Safety

Copters can be hazardous if operated incorrectly. Make safety your first priority, and always follow these best practices.

Handling

Spinning propellers can cause serious injury. Become familiar with your copter's arming procedure, and always disarm before handling the propellers. On 3DR RTF and other Pixhawk-powered vehicles, the safety button provides an additional safety measure by blocking power to the motors while the button is disabled (blinking red), allowing you to handle the copter safely.

When flying, always make sure to keep a safe distance between yourself and the copter. Don't take off with the copter facing towards you or fly directly over your head. It is your job to ensure

the safety of the people around you; make sure that spectators maintain a safe distance from your copter at all times.

Visual line of sight

Maintaining visual contact with your aircraft is the best assurance of a safe flight. Don't let the copter get too far away from you; keep it where you can easily see its orientation from the ground. This is called your visual line of sight and prevents a situation where you cannot recover the copter safely.

Flying within visual line of sight is also a good way to ensure that your radio signals (from the RC and telemetry radio systems) aren't blocked by buildings or other obstructions. If you can't see through it, it's likely that your radio signal can't either.

Under 400 feet

Keep your copter flying below 400 feet (120 meters) altitude to avoid conflict with full-scale, manned aircraft and maintain visual line of sight. To give you an idea of how high that is, the Statue of Liberty is 300 feet (93 meters) tall.

At least 100 feet from people, vehicles, and property

Always maintain at least 100 feet (30 meters) between your copter and people, vehicles, and buildings. This rule is important for flying near crowds, buildings, and roads due to potential hazards from unplanned landings.

At least 5 miles from airports

To prevent conflict between your copter and manned aircraft, always fly at least five miles (eight kilometers) away from all airports and other locations where manned aircraft are in use. Research your area to find all areas of restricted airspace near you.

Failsafes

A failsafe is a pre-programmed behavior designed to prevent a crash in the event of an unsafe situation. All ArduCopter vehicles include a GPS failsafe activated by default. 3DR RTF copters are also preset with radio control (RC) and low battery failsafe behaviors.

Loss of GPS signal

If the copter loses GPS signal in a flight mode that requires GPS (loiter, auto, return-to-launch, guided), it will land automatically, indicated by a blinking blue and yellow status LED and a high-high-high-low tone. Always fly outside in an open area to improve GPS signal strength.

Loss of RC signal

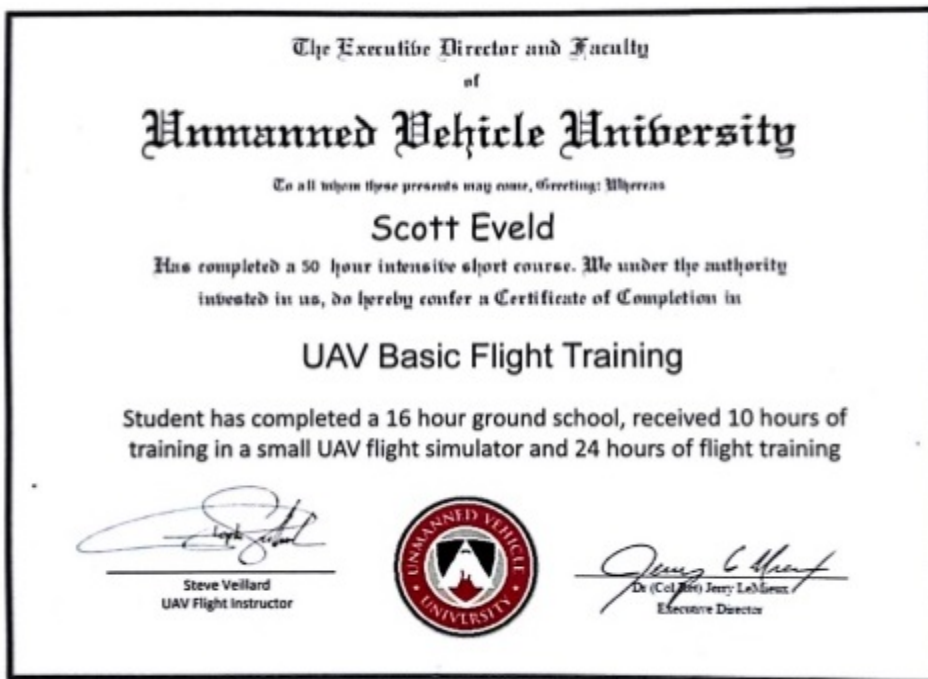
If the copter loses contact with the RC transmitter, it will land automatically, indicated by a blinking yellow status LED. If it loses RC signal during a mission, it will return to the launch point before landing.

Low battery

If the battery reaches 25% charge, the copter will land automatically, indicated by a blinking yellow status LED and a quick repeating tone. If the battery runs low during a mission, the copter will return to the launch point before landing.

Common sense

Your common sense is the best failsafe. Always be ready to regain manual control of the copter in the event of an unsafe situation. Before you fly, determine the boundaries of your safe flying area. If the copter moves outside the designated area or exhibits instability in flight, switch to stabilize mode and land the copter manually. Remember that, despite specific regulations, flying recklessly or creating an unsafe situation for the public is always illegal. As the operator, you take responsibility for the behavior of your drone at all times.



Thank you for your consideration, Scott Evelt.

Scott Eveld
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(951)249-4530
Docket # FAA-2015-0153-0001

In response to requirements to comply 11.81
Please attach to Docket FAA-2015-0153

1. Personnel Safety

a. Capital assets, such as quarries, dams, pipelines, and bridges often times span over areas where terrain is unstable, vertical, or simply too dangerous for foot travel. Field inspections leave employees vulnerable to environmental hazards such as stream crossing, seasonal water runoff, risk of falls and blocked paths; biological hazards, such as snakes, and natural predators; and extreme temperature changes which may cause altitude sickness, or heat stroke. The utilization of our UAV will ensure access to these areas while minimizing risk of serious injury or issue to personnel assigned to conduct these surveys.

2. Access to remote or impassable areas

a. Segments of quarries, dams, pipelines, and bridges may currently be or become unreachable, partially obscured, or impracticable for inspection by conventional means, such as physically walking the line, or utilizing airplane or helicopters for inspections. Access to assets can also be partially or completely blocked by environmental singularities, such as storm events, felled trees, or vegetation growth, or blocked by mechanical means such as vehicle accidents, new construction, or road maintenance. The use of our UAV will ensure access to remote or impassable areas on an as-needed basis as well as during or after uncontrolled singular events.

3. Protection of natural resources

The use of UAV's along with NIR (near infrared) photography make it possible to quickly and efficiently monitor the use and possible loss of water to crops due to over saturation, thereby increasing efficiency of water use as well as increasing crop yield.