

Exemption No. 11174

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

In the matter of the petition of

CAPITAL AERIAL VIDEO, LLC

for an exemption from part 21; §§ 45.23;
45.29; 61.113; 61.133; 91.9; 91.109;
91.119; 91.121; 91.151;
91.203(a) and (b); and 91.401–91.417
of Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2014-0844

GRANT OF EXEMPTION

By letter dated October 14, 2014, Mr. Alston Boyd, Partner, Capital Aerial Video, LLC (hereinafter Petitioner or Operator), 14607 Bear Creek Pass, Austin, TX 78737, petitioned the Federal Aviation Administration (FAA) for an exemption from part 21, §§ 45.23, 45.29, 61.113, 61.133, 91.9, 91.109, 91.119, 91.121, 91.151, 91.203(a) and (b), and 91.401–91.417 of Title 14, Code of Federal Regulations (14 CFR). The petitioner also asked for an exemption from FAA Notice 8900.227 Unmanned Aircraft Systems (UAS) Operational Approval, paragraphs 16(c)(4) and 16(e)(1). The exemption would allow the petitioner to operate the DJI Model F550 UAS to conduct aerial photography and video of real property. of not less than 2 acres in area.

The petitioner requests relief from the following regulations:

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

Section 45.23 prescribes, in pertinent part, 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 45.29(b)(iii) prescribes, in pertinent part, that marks at least 3 inches high may be displayed on an aircraft for which the FAA has issued an experimental certificate under §21.191(d), § 21.191 (g), or § 21.191(i) of this chapter to operate as an exhibition aircraft, an amateur-built aircraft, or a light-sport aircraft when the maximum cruising speed of the aircraft does not exceed 180 knots calibrated airspeed.

Section 61.113(a) and (b) prescribe 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 61.133 prescribes, in pertinent part, that a person who holds a commercial pilot certificate may act as pilot in command of an aircraft: (i) Carrying persons or property for compensation or hire, provided the person is qualified in accordance with this part and with the applicable parts of this chapter that apply to the operation; and (ii) For compensation or hire, provided the person is qualified in accordance with this part and with the applicable parts of this chapter that apply to the operation.

Section 91.9 prescribes, in pertinent part, that operation of U.S.-registered civil aircraft is prohibited 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 91.109 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 prescribes, in pertinent part, that each person operating an aircraft shall maintain the cruising altitude by reference to an altimeter that is set when operating below 18,000 feet mean sea level (MSL) to the elevation of the departure airport or an appropriate altimeter setting available before departure.

Section 91.151 prescribes, in pertinent part, that -

- (a) 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; or
 - (2) At night, to fly after that for at least 45 minutes.
- (b) No person may begin a flight in a rotorcraft 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, to fly after that for at least 20 minutes.

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)(1)(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.

FAA Notice 8900.227, paragraph 16.c.(4), *PIC Medical*, states that the PIC must maintain, at a minimum, a valid FAA second-class medical certificate issued under 14 CFR part 67, Medical Standards and Certification, or the FAA-recognized equivalent.

Paragraph 16.e.(1), *Medical*, states that all observers must have a valid FAA second-class medical certificate issued under part 67; an FAA-recognized equivalent is an acceptable means of demonstrating compliance with this requirement.

The FAA notes that the notice referenced above is now incorporated into FAA Order 8900.1, Volume 16.

The petitioner supports its request with the following information:

The petitioner proposes to operate the DJI FlameWheel550 UAS to conduct aerial photography and video of real property. See Appendix A for the petition submitted to the FAA describing the proposed operations.

The petitioner has provided the following information to support its request for an exemption:

- 1) Addendum to Capital Aerial Video Petition
- 2) Appendix A – Flight Manual
- 3) Diagram of UA Flight Controls
- 4) FlameWheel550 User Manual V 1.9

The FAA evaluated Capital Aerial Video, LLC's petition and determined it was not precedent-setting. Therefore, a summary of the petition was not published in the Federal Register for public comment.

The FAA's analysis is as follows:

The FAA has organized its analysis into four sections: (1) UAS, (2) the UAS pilot in command (PIC), (3) the UAS operating parameters, and (4) the public interest.

UAS

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts*. In accordance with the statutory criteria provided in Section 333 of P.L. 112-95 in reference to 49 USC § 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, and any associated noise certification and testing requirements of part 36, is not necessary.

Manned aircraft conducting aerial photography can weigh 5,000 lbs. or more, are operated by an onboard pilot and may carry other onboard crewmembers, as well as 100 gallons or more of fuel. The petitioner's unmanned aircraft (UA) weighs 5.5 lbs. or less. The pilot and crew will be remotely located from the aircraft. The limited weight reduces the potential for harm to persons or damage to property in the event of an incident or accident. The risk to an onboard pilot and crew during an incident or accident is eliminated with the use of a UAS for the proposed operation.

Manned aircraft are at risk of fuel spillage and fire in the event of an incident or accident. The UA carries no fuel, and therefore the risk of fire following an incident or accident due to fuel spillage is eliminated.

This exemption does not require an electronic means to monitor and communicate with other aircraft, such as transponders or sense and avoid technology. Rather the FAA is mitigating the risk of these operations by placing limits on altitude, requiring stand-off distance from clouds, permitting daytime operations only, and requiring that the UA be operated within visual line of sight (VLOS) and yield right of way to all manned operations. Additionally, the exemption provides that the operator will request a notice to airmen (NOTAM) prior to operations to alert other users of the NAS.

The petitioner's UAS has the capability to operate safely after experiencing certain in-flight contingencies or failures and uses an auto-pilot system to maintain UAS stability and control. The UAS is also able to respond to a lost-link event with pre-coordinated automated flight maneuvers. These safety features provide an equivalent level of safety compared to a manned aircraft holding a restricted airworthiness certificate performing a similar operation.

Regarding the petitioner's requested relief from 14 CFR §§ 45.23, *Display of marks* and 45.29, *Size of marks*, the petitioner requests this relief under the assumption that marking with the word "experimental" will be required as a condition of a grant of exemption. However, this marking is reserved for aircraft that are issued experimental certificates under 14 CFR § 21.191. The petitioner's UAS will not be certificated under § 21.191, and therefore the "experimental" marking is not required. Since the petitioner's UAS will not be certificated under § 21.191, a grant of exemption for §§ 45.23(b) and 45.29 is not necessary.

Regarding the petitioner's requested relief from 14 CFR 91 subpart E (§§ 91.401-417), the FAA has determined that relief from the following sections is required: 14 CFR 91.405 (a) *Maintenance required*, 91.407(a) (1) *Operation after maintenance, preventive maintenance, rebuilding, or alteration*, 91.409(a) (1) and (2) *Inspections*, and 91.417(a) and (b) *Maintenance records*. The FAA has carefully evaluated the petitioner's request and determined that cause for granting the exemption is warranted. The FAA notes that the petitioner's operating documents contain sufficient information for the preparation and care of the UAS equipment in the form of preflight checks performed by the PIC every two hours of flight. The FAA finds that adherence to these documents, as required by the conditions and limitations below, is sufficient to ensure that safety is not adversely affected. In accordance with the petitioner's UAS maintenance, inspection, and recordkeeping requirements, the FAA finds that exemption from 14 CFR §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) is warranted subject to the conditions and limitations below.

Pilot in Command (PIC) of the UAS

The petitioner states that its PICs will hold a commercial pilot certificate issued by the FAA, or meet the requirements of 8900.227 para 16(c)(2)(c), *Operations without a pilot certificate*. Regarding the petitioners request for relief from 14 § CFR 61.133, *Commercial pilot privileges and limitations*, the FAA finds that relief is not necessary when the PIC will be a commercially rated pilot, and, in accordance with 14 § CFR 61.23, hold a current second-class medical certificate, along with appropriate flight currency. The PIC must complete all training requirements in the operating documents and other training requirements in the conditions and limitations below.

Regarding the petitioner's requested relief from 14 CFR § 61.113, *Private pilot privileges and limitations*, the petitioner requested regulatory relief to operate its UAS without an FAA-certificated pilot. In support of its request, the petitioner states its proposed operations will meet the requirements of 8900.227 paragraph 16(c)(2)(c), *Operations without a pilot certificate*, in which the PIC is required to complete FAA private pilot ground instruction and pass the FAA Private Pilot written examination. The petitioner further states that since there are currently no means available for the pilot of a UAS to gain the experience in an equivalent category and class in order to apply for a commercial pilot's license, it proposes to generate an equivalent level of safety by requiring its pilots to complete, at a minimum, FAA commercial pilot ground instruction and pass the FAA Commercial Pilot written examination in addition to completing the private pilot requirements. The petitioner further states that because the aircraft cannot carry passengers or property, its proposal meets the intent of § 61.113(b) even though the intent of this application is to conduct a business.

The FAA does not possess the authority to exempt the petitioner from the statutory requirement to hold an airman certificate, as prescribed in 49 USC § 44711.¹ Although Section 333 provides limited statutory flexibility relative to 49 USC § 44704 for the purposes of airworthiness certification, it does not provide similar flexibility relative to other sections of Title 49. For further information see Exemption No. 11110 (Trimble Navigation, Ltd).

The FAA is also requiring a pilot certificate for UAS operations because pilots holding an FAA issued private or commercial pilot certificate are subject to the security screening by the Department of Homeland Security that certificated airmen undergo. As previously determined by the Secretary of Transportation, the requirement to have an airman certificate ameliorates security concerns over civil UAS operations conducted in accordance with Section 333.

¹ 49 USC § 44711 prohibits a person from serving "in any capacity as an airman with respect to a civil aircraft, aircraft engine, propeller, or appliance used, or intended for use, in air commerce...without an airman certificate authorizing the airman to serve in the capacity for which the certificate was issued . . .".

Under current regulations, civil operations for compensation or hire require a PIC holding a commercial pilot certificate per 14 CFR part 61. Based on the private pilot limitations in accordance with pertinent parts of 14 CFR § 61.113(a) and (b), a pilot holding a private pilot certificate cannot act as a PIC of an aircraft for compensation or hire unless the flight is only incidental to a business or employment. However, in Grant of Exemption No. 11062 to Astraeus Aerial (Astraeus), the FAA determined that a PIC with a private pilot certificate operating the Astraeus UAS would not adversely affect operations in the NAS or present a hazard to persons or property on the ground.

The FAA has analyzed the petitioner's proposed operation and determined it does not differ significantly from the situation described in Grant of Exemption No. 11062 (Astraeus). The petitioner plans to operate in the NAS over private property while also limiting access to the property at times it is operating the UA. Given: 1) the similar nature of the petitioner's proposed operating environment to that of Astraeus, 2) the parallel nature of private pilot aeronautical knowledge requirements to those of commercial requirements [ref: Exemption No. 11062], and 3) the airmanship skills necessary to operate the UAS, the FAA finds that the additional manned airmanship experience of a commercially certificated pilot would not correlate to the airmanship skills necessary for the petitioner's proposed operations. Therefore, the FAA finds that the petition may elect to use a PIC holding a private pilot certificate and a third-class airman medical certificate in its proposed operations.

With regard to the airmanship skills necessary to operate the UAS, the petitioner has provided no training program or test standards to demonstrate his capability to meet some of the conditions and limitations below including avoiding hazards, reacting to emergencies, or maintaining specific distances from persons or property.

Since the petitioner provides no information regarding a training program or test standards to demonstrate his capability to operate safely, the FAA reviewed the minimum requirements for providing a waiver to manned operations under 14 CFR § 91.119. While this process applies to an operator seeking a waiver rather than an exemption, the exemption process is similar. Manned operations that require relief from 14 CFR § 91.119 in the form of a waiver have established minimum requirements for pilot personnel (PIC).²

- 1) at least 500 hours logged as the PIC and at least 20 hours logged as the PIC in the aircraft type;
- 2) a minimum of 25 hours (or 100 hours in the case of motion picture operations) in the same category and class of aircraft to be used; and
- 3) a minimum of 5 hours in the make and model aircraft to be used under the waiver.

² FAA Order 8900.1, Volume 3, Chapter 7, Section 1 *Issue a Certificate of Waiver or Authorization: § 91.119(b) and/or (c) (Minimum Safe Altitudes)* and FAA Order 8900.1, Volume 3, Chapter 8, Section 1, *Issue a Certificate of Waiver for Motion Picture and Television Filming*.

However, given the relative size, weight, speed and operating parameters of the proposed UAS operations and its accompanying reduction in risk to persons and property when compared to manned operations, these minimum requirements should be reduced, but not eliminated. UAS operators still need to establish airmanship skills in order to meet the conditions and limitations listed below such as the ability to maneuver near but maintain specific distances from persons and property, respond to unexpected emergencies, or avoid objects as well as the ability to avoid potential conflicts with manned aircraft. The FAA has considered minimum skills and associated flight-hours necessary to practice and build proficiency in these skills. The petitioner is responsible for assessing its operations and identifying any additional skills required to operate safely under normal and abnormal conditions. Normal condition skills may include the ability to maintain altitude, maintain VLOS, and navigational skills. Abnormal condition skills may include the ability to avoid obstacles, avoid air traffic, and respond to loss of link.

In making its determination the FAA considered the requirements proposed by Astraeus in Exemption No. 11062. The FAA notes that the petitioner's proposed operation is similar to that authorized in Exemption No. 11062 because both include operations closer than 500 feet from persons, vessels, vehicles, and structures. In Exemption No. 11062, the FAA required that prior to conducting operations for the purpose of motion picture filming (or similar operations), the PIC must have accumulated and logged, in a manner consistent with 14 CFR § 61.51(b), 25 hours of total time as a UAS rotorcraft pilot including at least 10 hours logged as a UAS pilot with a multi-rotor UAS. The FAA notes that both of these qualifications are equal to what is proposed in the petitioners operating documents.

However, prior to operations under Exemption No. 11062, the PIC must also have accumulated and logged a minimum of 5 hours as a UAS pilot operating the same make and model of UAS to be used for operations under the exemption. The FAA finds that adding this additional qualification to the petitioners proposed requirements establishes a level of safety consistent with previous grants of exemption. For clarification, the FAA considers these minimum hour requirements to be inclusive rather than additive; i.e. 5 hours make and model time may be included in the 10 hours of multi-rotor time and the 10 hours may be included in the total 25 hours of UAS rotorcraft time.

In addition to the hour requirements, the PIC must accomplish 3 take-offs and landings in the preceding 90 days (for currency purposes). The FAA finds that at a minimum, the flight-hour requirements in Exemption No. 11062 are appropriate to practice and build proficiency in the skills necessary to safely conduct the petitioner's proposed operations. The FAA also finds that prior documented flight experience that was obtained in compliance with applicable regulations would satisfy this requirement. Training, proficiency, and experience-building flights can also be conducted under the grant of exemption to accomplish the required flight time. During training, proficiency, and experience-building flights the PIC is required to operate the UA with appropriate distances in accordance with 14 CFR § 91.119.

The flight-hours above are considered appropriate given the circumstances of the proposed operation and the description provided by the petitioner of the preparations undertaken to conduct the UAS operation safely. The petitioner may determine through its safety assessment that additional hours are necessary to address all potential flight hazards and requisite airmanship skills. Consequently, the FAA has included in the conditions and limitations below that the petitioner may not permit any PIC to operate unless that PIC is able 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.

The petitioner also requested an exemption from FAA Notice 8900.227 *Unmanned Aircraft Systems (UAS) Operational Approval*, paragraph 16.c.(4) and 16.e.(1). The FAA does not grant exemptions from its Orders such as 8900.227.

In conclusion, the FAA finds that prior to operations the PIC must hold either: 1) a private pilot certificate, a current third-class airman medical certificate, and completed the minimum flight hour and currency requirements as stated in the conditions and limitations below, or 2) a commercial pilot certificate, a current second-class medical certificate, and completed the minimum flight hour and currency requirements as stated in the conditions and limitations below. Thus, the FAA finds relief from 14 CFR § 61.113(a) and (b) is warranted and relief from 14 CFR § 61.133 is not necessary.

The petitioner has also indicated it will supplement his proposed operation(s) with a visual observer (VO). The conditions and limitations below stipulate that the PIC must ensure that the VO can perform the functions prescribed in the operating documents. Additionally, as discussed in Exemption No. 11109 to Clayco, Inc., there are no regulatory requirements for visual observer medical certificates. Although a medical certificate is not required for a VO, the UA must never be operated beyond the actual visual capabilities of the VO, and the VO and PIC must have the ability to maintain visual line of sight (VLOS) with the UA at all times. It is the responsibility of the PIC to be aware of the VO's visual limitations and limit operations of the UA to distances within the visual capabilities of both the PIC and VO. Moreover, the VO will not be operating the aircraft. Therefore, as in Grant of Exemption No. 11062 to Astraeus, the FAA does not consider a medical certificate necessary for the VO.

Operating parameters of the UAS

Although the petitioner did not seek relief from 14 CFR § 91.7(a) *Civil aircraft airworthiness*, the FAA finds that relief from § 91.7(a) is necessary. While the petitioner's UAS will not require an airworthiness certificate in accordance with 14 CFR part 21, Subpart H, the FAA considers the petitioner's compliance with its operating documents to be a sufficient means for determining an airworthy condition. The petitioner is still required to ensure that its

aircraft is in an airworthy condition – based on compliance with the operating documents prior to every flight, and as stated in the conditions and limitations below.

Additionally, in accordance with 14 CFR § 91.7(b), the PIC of the UAS is responsible for determining whether the aircraft is in a condition for safe flight. The FAA finds that the PIC can comply with this requirement.

Regarding the petitioner's requested relief from 14 CFR § 91.9 *Civil aircraft flight manual, marking, and placard requirements* and 14 CFR § 91.203(a) and (b) *Civil aircraft: Certifications required*, the FAA has previously determined in Grant of Exemption 11062, Astraeus Aerial, that relief from these sections is not necessary. Relevant materials may be kept in a location accessible to the PIC in compliance with the regulations.

Regarding the petitioner's requested relief from 14 CFR § 91.109, *Flight instruction; Simulated instrument flight and certain flight tests*, the petitioner did not describe training scenarios in which a dual set of controls would be utilized or required, i.e. dual flight instruction, provided by a flight instructor or other company-designated individual, that would require that individual to have fully functioning dual controls. But, as outlined above, the FAA is requiring that the petitioner's PIC possess at least a private pilot's certificate. Also, the currency requirements expressed in the conditions and limitations below will help ensure that a PIC training on the UAS has the authority to operate the UAS during training flights as PIC in accordance with § 61.31(l). The FAA will impose a limitation that those training operations are only conducted during dedicated training sessions. As such, the FAA finds that the petitioner can conduct his operations without the requested relief from § 91.109.

The petitioner requested relief from 14 CFR § 91.119, *Minimum safe altitude*. Relief from § 91.119(a), which requires operating at an altitude that allows a safe emergency landing if a power unit fails, is not granted. The FAA expects the petitioner to be able to perform an emergency landing without undue hazard to persons or property on the surface if a power unit fails. Relief from 14 CFR § 91.119(b), operation over congested areas, is not applicable, because the petitioner states that operations will only be conducted over private property with permission of the owner of the property and the aircraft will not be operated over congested areas or over any open air assembly of persons described in the operating documents.

Relief from § 91.119(c) is necessary because the aircraft will be operated at altitudes 400 feet above ground level (AGL) and below. Section 91.119(c) states that no person may operate an aircraft below the following altitudes: *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. The petitioner states that it will operate pursuant to the following, self-imposed restrictions related to § 91.119:

- Operate in reasonably safe environment that are strictly controlled, are private property with a size of at least two acres with the permission of the owner of the property, and not operated over congested areas or over any open air assembly of persons;
- The property owner will be briefed on the expected route of flight and the associated risks to persons and property on the ground;
- The aircraft will be operated at a low altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

The petitioner proposes to avoid “actively populated areas” but does not explain how these areas are determined. Pilots may obtain information regarding congested areas from the local Flight Standards District Office (FSDO). Therefore, operations over congested, actively, or densely populated areas are prohibited as stated in the conditions and limitations below.

The petitioner did not describe stand-off distances from persons, vessels, vehicles and structures. Section 91.119(c) requires that aircraft operate no closer than 500 feet to these persons or objects. As discussed in Exemption No. 11109 (Clayco, Inc.), operations conducted closer than 500 feet to the ground may require that the UA be operated closer than 500 feet to essential persons, or objects that would not be possible without additional relief. Therefore, the FAA is requiring that prior to conducting UAS operations, all persons not essential to flight operations (nonparticipating persons) must remain at appropriate distances. In open areas, this requires the UA to remain 500 feet from all persons other than essential flight personnel (i.e. PIC, VO, operator trainees or essential persons). The FAA has also considered the UA’s maximum gross weight of approximately 5.5 pounds. If barriers or structures are present that can sufficiently protect nonparticipating persons from the UA or debris in the event of an accident, then the UA may operate closer than 500 feet to persons afforded such protection. The operator must also 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. When considering how to immediately cease operations, the primary concern is the safety of those nonparticipating persons. In addition, the FAA finds that operations may be conducted closer than 500 feet to vessels, vehicles and structures when the owner/controller of any such vessels, vehicles or structures grants permission for the operation and the PIC makes a safety assessment of the risk of operating closer to those objects and determines that it does not present an undue hazard.

Thus, the FAA finds that relief from § 91.119(c) is warranted provided adherence to the procedures in the operating documents and the FAA’s additional conditions and limitations outlined below. Relief from § 91.119(a) is unwarranted as the FAA expects the petitioner to be able to perform an emergency landing without undue hazard to persons or property on the surface. Relief from §§ 91.119(b) is not granted and 91.119(d) is not applicable.

Regarding the petitioner's requested relief from 14 CFR § 91.121 *Altimeter Settings*, the petitioner has GPS altimeter capabilities transmitted from the UA to the PIC on the ground providing a constantly updated AGL readout during the entirety of the flight. As stated in the conditions and limitations below, the FAA requires any altitude reported to ATC to be in feet AGL. The petitioner may choose to set the altimeter to zero feet AGL rather than local barometric pressure or field altitude before flight. Considering the limited altitude of the proposed operations, relief from 14 CFR § 91.121 is granted to the extent necessary to comply with the applicable conditions and limitations stated below.

Regarding the petitioner's requested relief from § 91.151 (a) *Fuel requirements for flight in VFR conditions*, prior relief has been granted for manned aircraft to operate at less than prescribed minimums, including Exemption Nos. 2689, 5745, and 10650. In addition, similar UAS-specific relief has been granted in Exemption Nos. 8811, 10808, and 10673 for daytime, VFR conditions. The petitioner states that its interpretation of 14 CFR § 91.151 is to provide energy reserve as a safety buffer for delays in landing. The petitioner states that the maximum duration of flight from a single battery charge of its UA is 12 minutes with a reserve of 20% (15 minutes maximum aircraft flight time minus a 3 minute reserve). The petitioner's flight operations will never exceed ¾ nautical miles from the point of intended landing. The petitioner requests an exemption to the word "fuel" and asks for an equivalent interpretation with the word "energy". These factors provide the FAA with sufficient reason to grant the relief from 14 CFR § 91.151(a) as requested in accordance with the conditions and limitations below. The PIC will be prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UA with 20% battery power remaining -- limiting flights to a maximum of 12 minutes in accordance with the operating documents.

Regarding an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA), the majority of current UAS operations occurring in the NAS are being coordinated through Air Traffic Control (ATC) by the issuance of a COA. This is an existing process that not only makes local ATC facilities aware of UAS operations, but also provides ATC the ability to consider airspace issues that are unique to UAS operations. The COA will require the operator to request a NOTAM, which is the mechanism for alerting other users of the NAS to the UAS activities being conducted. The conditions and limitations below prescribe the requirement for the petitioner to obtain an ATO-issued COA.

Public Interest

The FAA finds that a grant of exemption is in the public interest. The enhanced safety and reduced environmental impact achieved using a 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.

The following table summarizes the FAA's determinations regarding the relief sought by the petitioner:

Relief considered (14 CFR)	FAA determination (14 CFR)
Part 21	Relief not necessary
45.23(b)	Relief not necessary
45.29	Relief not necessary
61.113(a) and (b)	Relief granted with conditions and limitations
61.133	Relief not necessary
91.7(a)	Relief granted with conditions and limitations
91.9	Relief not necessary
91.109	Relief not necessary
91.119	Paragraphs (a) and (b) relief are not granted; paragraph (c) relief granted with conditions and limitations; paragraph (d) relief is not warranted
91.121	Relief granted with conditions and limitations
91.151(a)	Relief granted from § 91.151(a)(1), day, with conditions and limitations
91.203(a) and (b)	Relief not necessary
91.405(a)	Relief granted with conditions and limitations
91.407(a)(1)	Relief granted with conditions and limitations
91.409(a)(1) and (2)	Relief Granted with conditions and limitations
91.417(a) and (b)	Relief granted with conditions and limitations

The FAA's 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, Capital Aerial Video, LLC is granted an exemption from 14 CFR part 21, §§ 61.113(a) and (b), 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 91.417(a) and (b) to the extent necessary to allow the petitioner to operate a UAS for the purpose of aerial photography and video of real property at least 2 acres in size. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

Relative to this grant of exemption, Capital Aerial Video, LLC is hereafter referred to as the operator.

The petition and the following supporting documentation are hereinafter referred to as the operating documents:

- 1) Addendum
- 2) Appendix A – Flight Manual
- 3) Diagram of UA Flight Controls
- 4) FlameWheel550 User Manual V 1.9

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 following aircraft described in the operating documents, which is a 6-motor rotorcraft in the form of a hexacopter and weighs no more than 5.5 pounds: DJI Model F550 Unmanned Aircraft System. Proposed operations of any other aircraft will require a new petition or a petition to amend this grant.
2. UAS operations under this exemption are limited to conducting operations for the purpose of aerial photography and inspection of real property no less than 2 acres in size.
3. The UA may not be flown at an indicated airspeed exceeding 25 knots.
4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL), as indicated by the procedures specified in the operating documents. All altitudes reported to ATC must be 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.
6. The use of first person view (FPV) by the PIC or VO is not permitted.
7. 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 functions prescribed in the operating documents.

8. The VO must not perform any other duties beyond assisting the PIC with seeing and avoiding other air traffic and other ground based obstacles/obstructions and is not permitted to operate the camera or other instruments.
9. The operating documents and this grant of exemption 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 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 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.
10. Prior to each flight the PIC must inspect the UAS to ensure it is in a condition for safe flight. 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. The Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.
11. 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. The PIC who conducts the functional test flight must make an entry in the aircraft records.
12. The pre-flight inspection must account for all potential discrepancies, e.g. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.
13. The operator must follow the UAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.
14. The operator must carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection,

alterations, and status of replacement/overhaul component parts must be noted in the aircraft records, including total time in service, description of work accomplished, and the signature of the authorized person returning the UAS to service.

15. Each UAS operated under this exemption must comply with all manufacturer Safety Bulletins.
16. The authorized person must make an entry in the aircraft record of the corrective action taken against discrepancies discovered between inspections.
17. The PIC must possess: 1) at least a private pilot certificate and at least a current third-class medical certificate, or 2) at least a commercial pilot certificate and at least a second-class medical certificate. In both cases, 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.
18. The operator may not permit any PIC to operate unless the PIC meets the operator's qualification criteria (25 hours of total time as a UA rotorcraft pilot and at least ten hours logged as a UA pilot with a similar UA type), 5 hours in the make and model authorized under this grant, and 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 must be logged in a manner consistent with 14 CFR § 61.51(b). The VO is also required to complete the operator's training requirements (Note: Operating Documents require VO to complete training required by FAA Notice N8900.227. This document has been cancelled and incorporated into FAA Handbook 8900.1, Volume 16, Chapter 4, Section 4. The operator shall update its operating documents accordingly). A record of training must be documented and made available upon request by the Administrator. Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building), 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.
19. 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.
20. The UA may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless a letter of agreement

with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.

21. 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.
22. If the UA loses communications or loses its GPS signal, it must immediately return to a pre-determined location within the planned operating area and land or be recovered in accordance with the operating documents.
23. The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.
24. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UA with 20% battery power (or not less than 3 minutes of flight reserve) remaining.
25. The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under this grant of exemption. This COA will also require the operator to request a Notice to Airman (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation. All operations shall be conducted in accordance with airspace requirements in the ATO issued COA including class of airspace, altitude level and potential transponder requirements.
26. 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.
27. Before conducting operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.
28. The 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 UAS is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

29. The UA must remain clear and yield the right of way to all manned aviation operations and activities at all times.
30. The UAS may not be operated by the PIC from any moving device or vehicle.
31. The UA may not be operated over congested or densely populated areas.
32. Flight operations must be conducted at least 500 feet from all nonparticipating persons (persons other than the PIC, VO, operator trainees or essential 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 and/or;
 - b. The aircraft is operated near vessels, vehicles or structures where the owner/controller of such vessels, vehicles or structures has granted permission 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, and;
 - c. Operations nearer to the PIC, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).
33. All operations shall be conducted over private or controlled-access property with permission from the land owner/controller or authorized representative. Permission from land owner/controller or authorized representative will be obtained for each flight to be conducted.
34. 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.ntsb.gov.

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 February 28, 2017, unless sooner superseded or rescinded.

Issued in Washington, D.C., on February 13, 2014.

/s/

Michael J. Zenkovich
Deputy Director, Flight Standards Service