



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

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

September 25, 2015

Exemption No. 13010
Regulatory Docket No. FAA-2015-2614

Mr. Jay Thierfelder
President
Air Imaging, LLC
3778 Kay Drive
Stow, OH 44224

Dear Mr. Thierfelder:

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 letter posted to the docket on July 7, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Air Imaging, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography for real estate operations.

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 a DJI Phantom 2.

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, Air Imaging, LLC 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 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.

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.

Conditions and Limitations

In this grant of exemption, Air Imaging, LLC 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 DJI Phantom 2 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 Columbia, 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 October 31, 2017, unless sooner superseded or rescinded.

Sincerely,

John S. Duncan
Director, Flight Standards Service

Enclosures

U.S. Department of Transportation, Docket Operations
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DEPARTMENT OF
TRANSPORTATION
DOCKET OPERATIONS

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Subj: Petition for Exemption to Operate the DJI Phantom 2 sUAS for the Purpose of Real Estate Photography.

Dear Sir or Madam,

Air Imaging LLC (AI) is requesting exemption from the Federal Aviation Administration for certain Federal Aviation Regulations so that (AI) may use a sUAS in conducting the business of providing aerial photography in the real estate market. (AI) intends to offer aerial photography services to any concern where a sUAS can replace putting a human in dangerous situations.

The sUAS that (AI) will be using is the DJI Phantom 2 Quadcopter. The DJI Phantom 2 has safety features that include Return Home Automatically if the sUAS should exceed its control range and a No Fly Zone warning feature that alerts the PIC and VO if the sUAS gets too close to an airport. The sUAS will return to its launch point automatically when it determines the battery levels are too low. The Phantom 2 has a take-off weight of 1250g and operates at 5.8 GHz. Ascend/descent speed is 6m/s. Maximum flight speed is 10m/s.

RE: Request for Exemptions Pursuant to Section 333.

Part 11, 14 CFR –Part 21-Subpart H ; Part 36 ; 45.23 ; Part 61.113(a)&(b) ; 91.7(a) ; 91.9 ; 91.103 ; 91.109 ; 91.119 ; 91.121 ; 91.151(a)-(1) ; 91.203 ; 91.405(a).

- 14 CFR-Part 21 Subpart H –Airworthiness Certificate, Certification Procedures.
- 14 CFR-Part 36 – Noise Regulations.
- 14 CFR-45.23 – Display Markings.
- 14 CFR-Part 61.113(a)&(b) – Certifications for Instructors and Pilots.
- 14 CFR-91.7 – Civil Air Worthiness.
- 14 CFR-91.9 – Flight Manuals and Marking Requirements.
- 14 CFR-91.103 – Preflight Actions.
- 14 CFR-91.109 – Flight Instruction.
- 14 CFR-91.119 – Minimum Safe Altitudes.
- 14 CFR-91.121 – Altimeter Settings.
- 14 CFR-91.151 – VFR Requirements for Fuel.
- 14 CFR-91.203 – Certificates Required for Civil Aircraft.
- 14 CFR-91.405(a) – Maintenance Required.

14 CFR Part 21-Subpart H – (AI) asks for exemption from an Airworthiness Certificate because of the size, weight and speed of the sUAS in comparison to manned aircraft makes the risks involved negligible in comparison.

14 CFR Part 36 – (AI) asks for exemption from noise standards due to the sUAS size and low noise impact.

14 CFR 45.23 – (AI) asks for exemption from the marking requirements for aircraft. The size of the sUAS will not accommodate the minimum 2” letters.

14 CFR Part 61.113(a)&(b) – (AI) asks for exemption from the certification requirements for pilots. While the sUAS will only be operated over private property with the consent of that property owner it is our belief that the 40 plus hours of operating the sUAS by the PIC and the VO with the full understanding of the FAA Rules and Regulations governing the use of sUAS is sufficient to operate it safely in the NAS.

14 CFR 91.7 – (AI) asks for exemption from this FAR for the same reasons being requested for Part 21-Subpart H.

14CFR 91.9 – (AI) asks for exemption from this FAR for the same reasons being requested for Part 21-Subpart H, as placards and on-board flight manuals are impractical on a sUAS.

14 CFR 91.103 – (AI) asks for exemption from this FAR as it pertains to manned aircraft. All appropriate pre-flight actions will be taken with the sUAS.

14CFR 91.109 – (AI) asks for exemption from this FAR as the sUAS uses a single ground controller.

14 CFR 91.119 – (AI) asks for exemption from Minimum Safe Altitudes over various areas in order to accomplish the intended mission.

14 CFR 91.121 – (AI) asks for exemption from this FAR as the sUAS does not have an altimeter that this FAR refers to. Our sUAS has a flight ceiling of 300' AGL and will be monitored by the PIC.

14 CFR 91.151 – (AI) asks for exemption from the VFR-Flight Fuel carrying requirements as our sUAS is battery powered.

14 CFR 91.203 – (AI) asks for exemption from this FAR as it requires an Airworthiness Certificate. (AI) requested relief from an Airworthiness Certificate in Part 21-Subpart H.

14 CFR 91.207 – (AI) asks for exemption from operating our sUAS with an Emergency Locator Transmitter. Our sUAS will always be flown within VLOS rules.

14CFR 91.405 – (AI) asks for exemption from this FAR as all maintenance will be done by the PIC and VO as recommended by the manufacturer.

Our mission for safe operation in the NAS will be to always stay below the 300' ceiling, operate only within VLOS by the PIC and the VO and to end all flights when battery capacity reaches 25%. Additionally (AI) will not operate the sUAS in public places or above crowded areas. Before we deploy the sUAS we will stand signs at each end of the operating area to alert the public that aerial photography is taking place. Prior to each flight the PIC and the VO will examine the flight area for overhead power lines, trees,

and any other obstacles that could threaten public safety. Weather conditions would be the final determining factor before each flight.

I will be the PIC. I have over 40 hours flying time with the DJI Phantom 2. The VO has over 20 hours of flying time with the Phantom 2. Our sUAS will be flown only during daylight hours and only under VLOS rules. (AI)'s goal is to provide a quality service while adhering to all FAA rules for safe flight.

Before and after each flight the PIC and the VO will visually inspect all rotor blades, electrical connections, battery conditions and levels and test the link between the sUAS and the controller.

It is our belief that by using a sUAS in place of manned aircraft greatly increases the safety of the general public. Our sUAS is compact, lightweight, carries no flammable fuel and has no humans on board. Coupled with the sUAS relatively slow air speeds and that it is being operated within VLOS and under 300' AGL by a qualified PIC and VO we feel that the risks of using a sUAS to conduct aerial photography have been greatly reduced.

Thank you for your consideration,

Respectfully,



Jay Thierfelder
President
Air Imaging LLC