



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

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

July 15, 2015

Exemption No. 12053
Regulatory Docket No. FAA-2015-1561

Mr. Robert P. Woolverton
10509 NE 187th Street
Bothell, WA 98011

Dear Mr. Woolverton:

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 dated May 2, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and videography.

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 Phantom2 Vision+.

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, Mr. Robert P. Woolverton 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.

Conditions and Limitations

In this grant of exemption, Mr. Robert P. Woolverton is hereafter referred to as the operator.

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.

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 Phantom2 Vision+ 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 July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

Enclosures

May 2, 2015

U.S. Department of Transportation, Docket Operations
West Building Ground Floor, Room w12-140
1200 New Jersey Avenue, SE Washington, DC 20590

Subj: *Petition for Exemption to Operate a DJI Phantom 2 Vision+ v3.0 Quad-Copter Unmanned Aerial System for Real Estate Aerial Video Purposes*

Dear Sir or Madam:

The purpose of this letter is to petition the Federal Aviation Administration for an exemption from certain Federal Aviation Regulations in order for the petitioner, Robert P. Woolverton, to operate an Unmanned Aerial System (UAS) within the Seattle metropolitan area of the National Airspace System, in furtherance of his spouse's business as a real estate broker. Mr. Woolverton is well acquainted with the risks that come with the privilege of operating an aircraft in the United States, but is also familiar with the opportunities available via new unmanned flight technology. He has flown radio-controlled model aircraft recreationally for more than ten years, flying electric powered model airplanes and helicopters as well as flight simulators for such recreational model aircraft. He also has more than twenty hours of flight time with the DJI Phantom 2 Vision+ v3.0 that is the subject of this Petition.

The petitioner desires to use the Phantom2 Vision+ v3.0 UAS to record low altitude video of residential real estate to supplement real estate listing videos he creates for his wife's business who is a real estate broker. Granting this exemption will benefit the public interest in the following ways:

- Ultra-Small electric-powered unmanned aerial systems can obtain low altitude video footage with far less risk of injury or property damage, and far less noise disturbance than a manned helicopter flight. This UAS weighs less than 3 pounds, carries no fuel or crew, therefore the risk of fire following an incident or accident due to fuel spillage is eliminated, and risk to onboard crew is also eliminated, and
- The addition of aerial video published on the internet provides the consumer with greater detailed information which may terminate their interest in a property- thereby preventing needless travel to view a property, resulting in lower vehicle emissions, less traffic congestion, and time savings for the consumer, and
- Residential properties with listing videos sell faster and for more money, thereby increasing commerce, and
- Will allow more home sellers and more home buyers to enjoy the benefits (listed above) of aerial real estate video as manned helicopter services are cost-prohibitive for most consumers.

Precedence for granting such an exemption request can be found in FAA exemption # 11138.

Pursuant to 14 CFR §§ 11.61-.103 and Section 333 of the FAA Modernization and Reform Act of 2012, PL 112-95 (Feb. 14, 2012), the petitioner is submitting the following information with this request:

Identity of Petitioner.

Petitioner: Robert P. Woolverton
10509 NE 187th St
Bothell, WA 98011
206-794-6302
bobwoolverton@gmail.com

Description of Operations.

A. The UAS that is the Subject of this Petition.

Mr. Woolverton is the owner of a DJI Phantom 2, Vision+ v3.0 Quadcopter with a 3-axis gimbal and HD video camera, serial number of PH645419244, and its associated portable ground station controller (together the "Subject UAS"). The Subject UAS is a quad-copter with a camera mounted beneath it, piloted via a portable ground station. It weighs less than 3 pounds (1,242 grams). He purchased the Subject UAS on November 30, 2014, from CopterShop in Woodinville, WA. (www.coptershop.com). The Phantom 2 is a widely known unmanned aircraft, and is the same type of aircraft that was recently the subject of the approval of an exemption by the FAA. *See In re Douglas Trudeau*, FAA Exemption No. 11138 (Jan. 5, 2015).

The portable ground station used by Mr. Woolverton to pilot the unmanned aircraft is a two-channel, wireless communication device using an FCC-compliant 5.8GHz frequency band for controlling the aircraft, and a 2.4 MHz data link for video and flight data. The Subject UAS is equipped with lost-link capability, which enables the Phantom 2 to enter a fail-safe Return-to-Home Mode in the event that the link between the aircraft and the ground station is lost. The Subject UAS can operate for a total of approximately 20 minutes on one battery charge. It has a maximum range from the ground station of 2,300 feet. However, it also has programmable height and radius limits to establish an operations area. Without programming the Subject UAS, it has a default height limit of 393 feet AGL.

(The DJI Phantom2 Vision+ owner's manual, v1.8, updated 1-30-2015, is included as Exhibit A. Pre-flight checklist is located on p.25, Flight Limits on p.30, Failsafe Function on p.27. The manual could not be combined into this document because it is password protected. The manual can also be located at: <http://www.dji.com/product/phantom-2-vision-plus/download>)

B. The UAS Pilot in Command.

Mr. Woolverton asserts that under § 61.113 (a) and (b) private pilots are limited to non-commercial operations, however, he can achieve an equivalent level of safety as achieved by current regulations because his UAS does not carry any pilots or passengers. Further, while helpful, a pilot license will not ensure remote control piloting skills. He further indicates that the risks of operating a UAS are far less than the risk levels inherent in the commercial activities

outlined in 14 CFR part 61, et seq., thus he requests an exemption from § 61.113 *Private Pilot Privileges and Limitations: Pilot in Command*.

Regarding UAS operational training, Mr. Woolverton has flown numerous practice flights in remote areas as a hobbyist simulating flights for future commercial use to gain familiarization with the characteristics of his UAS' performance under different temperature and weather conditions. He further states that he practices computerized simulated flights to maintain adequate skills and response reflex time. Additionally, Mr. Woolverton agrees to abide by the UAS Operating Parameters listed in the next section.

UAS Operating Parameters

Mr. Woolverton states he will abide by the following additional operating conditions under the exemption for which he is making application:

- Operate his UAS below 300 feet and within a radius of 1,000 feet from the controller to aid in direct line of sight visual observation;
- Operate the UAS for 15-20 minutes or less, per flight
- Land his UAS prior to the manufacturer's recommended minimum level of battery power;
- Operate his UAS only within visual line of sight (VLOS), and during hours of daylight;
- Use the UAS' global positioning system (GPS) flight safety feature whereby it hovers and then slowly lands if communication with the remote control pilot is lost;
- Conduct all operations under his own personal and flight safety protocols (including posting a warning sign reading: "Attention Aerial Photography in Progress – Remain Back 150 feet") contained in the operating documents and will actively analyze flight data and other sources of information to constantly update and enhance his safety protocols;
- Contact respective airports if operations will be within 5 miles to advise them of his estimated flight time, flight duration, elevation of flight, and other pertinent information;
- Always obtain all necessary permissions prior to operation; and
- Have procedures in place to abort flights in the event of safety breaches or potential danger.

Specific Sections of 14 CFR From Which Petitioner Seeks an Exemption

Mr. Woolverton seeks an exemption from the following FARs:

14 CFR Part 21, Subpart H	Certification procedures for products and parts, Airworthiness Certificates
14 CFR Part 36	Noise standards: Type and airworthiness
14 CFR § 45.23	Display of marks; general
14 CFR Part 61	Certification: Pilots, flight instructors, and ground instructors
14 CFR § 91.7	Civil aircraft airworthiness
14 CFR § 91.9	Civil aircraft flight manual, marking, and placard requirements

14 CFR § 91.103	Preflight action
14 CFR § 91.105	Flight crewmember stations
14 CFR § 91.109	Flight instruction
14 CFR § 91.119	Minimum safe altitudes
14 CFR § 91.121	Altimeter settings
14 CFR § 91.151	Fuel requirements for flights in VFR conditions
14 CFR § 91.173	ATC clearance and flight plan in IFR conditions
14 CFR § 91.203	Civil aircraft: Certifications required
14 CFR § 91.207	Emergency locator transmitters
14 CFR Part 91, Subpart E	Maintenance

The Extent of Relief Sought, and Reasons for Seeking the Exemption.

14 CFR Part 21, Subpart H. Part 21 establishes the procedures for issuance of certificates of airworthiness, as mandated by 49 U.S.C. § 44704. Under Section 333 and 49 U.S.C. § 44701(b), the FAA may exempt aircraft from airworthiness certification. The petitioner requests an exemption from the requirements of this Part because the size, weight, speed, operational capability and proximity to airports in which the Subject UAS pose significantly less risk than the risks posed by conventional aircraft. Manned aircraft pose risks to the life and safety of the crew; that is not a consideration with the Subject UAS. Risks to third parties are also minimized given the lightweight and slow speed at which the Subject UAS would operate. Nor are there risks of fuel spillage or fire in the event of an accident. Thus Mr. Woolverton requests that the FAA waive the requirement that the Subject UAS, particularly the aircraft portion, require an airworthiness certificate.

14 CFR Part 36. FAR Part 36, Subparts A, F, and O, establish certain noise standards for certification of various aircraft types. Because the Subject UAS would not have an airworthiness certificate, and given its small size and negligible noise impact, the petitioner requests an exemption from FAR Part 36.

14 CFR § 45.23. FAR Part 45.23 establishes marking requirements for aircraft; paragraph (b) mandates that the registration number be displayed in letters not less than two inches in height. The Subject UAS is small enough that it cannot accommodate the type-size requirement. Accordingly, Mr. Woolverton requests an exemption from this part.

14 CFR Part 61. FAR Part 61 sets forth the certification requirements for pilots. Subpart E establishes the privileges and limitations for holders of a private pilot certificate. The petitioner requests an exemption that would allow him to operate the Subject UAS for compensation or hire as part of his aerial photography business for the reasons articulated in *In re Trudeau*, FAA Exemption No. 11138, and *In re Astraesus*, FAA Exemption No. 11062. Mr. Woolverton will operate the Subject UAS over property where the owner or owner's representative has requested that the operation occur. Furthermore, possession of a pilot certificate does not ensure remote control piloting skills. He thus request exemption from this section.

14 CFR § 91.7. Under FAR 91.7, no person may operate an aircraft unless it is in an airworthy condition. To the extent that "airworthy" is defined as requiring an airworthiness certificate, the petitioner would request an exemption from this FAR for the same reasons identified in his request for an exemption of 14 CFR Part 21, Subpart H. He will not, however, operate the Subject UAS if it is not in a condition for safe flight, as required under FAR 91.7(b).

14 CFR § 91.9. Petitioner requests exemption from the requirement of FAR 91.9, which requires that all aircraft have certain markings, placards and on-board flight manuals for the same reasons as stated in his request for exemption under 14 CFR Part 21, Subpart H, and for a deviation from the marking requirements of 14 CFR Part 36, Subparts A, F, and O. Additionally, relevant materials will be kept in a location accessible to the PIC in compliance with the regulations.

14 CFR § 91.103. FAR 91.103 mandates certain pre-flight action. Petitioner will take all necessary pre-flight action, but requests an exemption from this requirement insofar as it is interpreted as requiring pre-flight actions appropriate to manned aircraft only (e.g., that flights be from an airport, etc.).

14 CFR § 91.105. FAR 91.105 mandates that crewmembers be at designated stations, have safety belts fastened, etc. Petitioner would be at a designated ground station for each mission, but requests an exemption to accommodate the fact that the Subject UAS is unmanned.

14 CFR § 91.109. This FAR requires that all flight instruction be conducted in aircraft that have dual controls, or throw-over controls, with an instructor. From time to time the petitioner will conduct his own refresher training, but requests an exemption insofar as this FAR would be interpreted to require that the ground control station have a second controller or dual control capability.

14 CFR § 91.119. FAR 91.119 sets forth the minimum safe altitudes over various areas. Petitioner requests an exemption from this FAR in order to accomplish the intended function of the mission for which he seeks an exemption.

14 CFR § 91.121. FAR 91.121 mandates various altimeter settings in order to maintain level flight. Petitioner requests an exemption from this FAR as the Subject UAV will not have an altimeter that matches the requirements of this FAR. Operations with the Subject UAV will, however, maintain altitude below the 300' AGL ceiling by the petitioner monitoring the altitude of the UAS and through the Subject UAS's ability to establish a flight zone that cannot exceed the ceiling.

14 CFR § 91.151. Petitioner requests an exemption from the VFR-flight fuel carrying requirements because the Subject UAS will operate on battery power. Operations with the Subject UAS will, however, maintain a five-minute reserve battery time.

19 CFR § 91.173. Petitioner requests an exemption from the IFR-clearance requirement for flights into controlled airspace. It is possible Mr. Woolverton may operate the Subject UAS in conditions that are IFR within controlled airspace (e.g., a flight on a day with less than three

miles visibility in a neighborhood that falls within the Class D airspace of KBFI). He would request that, after contacting ATC for the controlled airspace, he would be allowed to operate in what might be IFR conditions, but where he still has complete and unfettered line of sight visibility with the Subject UAS.

14 CFR § 91.203. FAR 91.203 requires that a civil aircraft have an airworthiness certificate and a registration certificate. Mr. Woolverton requests that he be exempt from complying with this FAR insofar as it mandates issuance of an airworthiness certificate, for the reasons stated in his request for an exemption under 14 CFR Part 21, Subpart H.

14 CFR § 91.207. FAR 91.207 prohibits operation of a US-registered aircraft unless it is equipped with an emergency locator transmitter. Given the limited distance of flights of the Subject UAS, Mr. Woolverton requests an exemption from this FAR.

14 CFR Part 91, Subpart E. FAR 91, Subpart E requires that owners or operators of aircraft have the aircraft inspected at certain intervals, and by certain mechanics. Petitioner requests an exemption from this Subpart because the Subject UAS has a trouble-shooting and maintenance program that is best executed by the owner/operator, and is simply different from the maintenance of manned aircraft. Petitioner will, however, maintain a maintenance log and any maintenance records of repair of the Subject UAS

Public Interest and Benefit Considerations.

Aerial imaging services generally require use of a manned platform. Close-proximity aerial photography is difficult to do, and usually requires the use of a helicopter or slow-moving aircraft at an appropriate distance over a populated area. The operation must be conducted in VFR conditions, and adds aircraft in congested airspace.

By using the Subject UAS, Mr. Woolverton aims to provide the public with quality aerial photography services at a fraction of the cost involved with manned flight. Furthermore, the risks inherent with manned flight are significantly reduced where the aircraft conducting the operation is less than five pounds, remains below 300' AGL, and can operate within a very confined cylinder on or directly over the location being photographed.

Publishing real estate listing videos on the internet that includes aerial video provides the consumer with greater detailed information which may terminate their interest in a prospective property- thereby preventing needless travel to view a property, resulting in lower vehicle emissions, less traffic congestion, and time savings for the consumer. Also, real estate with listing videos tend to sell faster and for more money, thereby increasing commerce.

Why the Exemptions Would Not Adversely Affect Safety.

The proposed operations will not adversely affect safety for four primary reasons.

First, the operations will be conducted in airspace where there is typically no activity among other users of the NAS. Flights are limited to property over which the owner has requested that the Subject UAS operate, so the owners will be aware of the flight operation. As

an experienced recreational pilot of radio controlled model aircraft Mr. Woolverton fully recognizes the dangers that a small UAV could pose to all types of manned aircraft. The operations he is proposing to undertake pending approval of this Exemption Request are operations where manned aircraft will not fly. There would be a rigid separation between where a manned aircraft can fly (particularly due to FAR 91.119 which establishes minimum safe altitudes, to include an absolute prohibition of operating an aircraft within 500' of any structure) and where Mr. Woolverton would operate the UAV.

Second, the Subject UAS is simply not a large aircraft. Weighing in at less than 3 pounds, the likelihood that it would damage property or injure a person is low, even in the event of a mishap. Furthermore, aerial imaging is still something done via manned aircraft, and the risk there is at least equal to the risk posed by the proposed operation.

Third, the Subject UAS has inherent lost-link capabilities to bring it back to its operating base for each mission. It is a redundant system for a more foreseeable problem that could arise.

Fourth, the Subject UAS will be operated only by the petitioner. Mr. Woolverton is an experienced radio controlled pilot with sufficient flight time and experience with the aircraft to conduct a reasonably safe operation.

Language for Inclusion in the Federal Register.

Mr. Woolverton proposes that the following language be included in the Federal Register:

Petition for Exemption.

Federal Aviation Regulations from which Petitioner seeks exemption: 14 CFR 14 CFR Part 21, Subpart H; Part 36; § 45.23; Part 61; §§ 91. 7; 91.9; 91.103; 91.105; 91.109; 91.119; 91.121; 91.151; 91.173; 91.203; 91.207; and 14 CFR Part 91, Subpart E.

Description of Relief Sought: The petitioner is seeking an exemption from the above-referenced Federal Aviation Regulations to conduct aerial photography using a light, unmanned aerial vehicle for homeowners and real estate brokers seeking to provide aerial images of homes being listed for sale in the Seattle metropolitan area.

Conclusion.

Mr. Woolverton would like to thank the FAA for considering this request. Please do not hesitate to contact him should there be a need for additional information. He looks forward to working with the FAA in its determination, and to being part of the discussion as the FAA considers how to expand, train, test, register, track and control commercial UAV use in the United States.

Respectfully Submitted,

Robert P. Woolverton
Petitioner