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

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

July 28, 2015

Exemption No. 12193
Regulatory Docket No. FAA–2015–1605

Mr. Caleb Alan McDow
Caleb Alan McDow, LLC
203 Ruby Lake Lane
Winter Haven, FL 33884

Dear Mr. McDow:

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 5, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Caleb Alan McDow, LLC (hereinafter petitioner or operator) 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 are the DJI Phantom 2 Vision+ and DJI Inspire 1.

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 collection[1]. 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, Caleb Alan McDow, 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, Caleb Alan McDow, 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 Vision+ and DJI Inspire 1 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.ntsb.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

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May 5, 2015

U.S. Department of Transportation, Docket Operations
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: Request for exemption under Section 333 from 14 CFR Part 21, Subpart H; 14 CFR 61.113 (a) and (b); 14 CFR 61.23(a); 14 CFR 91.109; 14 CFR 91.119(c); 14 CFR 91.121; 14 CFR 91.151(a); 14 CFR 91.405(a); 14 CFR 91.407(a)(1); 14 CFR 91.409(a)(1) and (2); 14 CFR 91.417 (a) and (b); 14 CFR 91.7(a) and (b)

Dear Sir or Madam:

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 CFR Part 11, Caleb Alan McDow, LLC hereby applies for an exemption from the listed Federal Aviation Regulations (FARs) to allow commercial use of its Small Unmanned Aircraft Systems (SUASs), so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

An exemption is being requested because (1) existing regulations will burden Caleb Alan McDow, LLC (2) Caleb Alan McDow, LLC can provide a level of safety that is equal to (or greater than) those provided by existing rules, and (3) the request is in the public interest. The FAA's authority to issue exemptions from operating rules, and the Secretary's authority granted by Section 333 of P.L. 112-95, Special Rules for Certain Unmanned Aircraft Systems, provide an opportunity to authorize certain SUAS operations in the National Airspace System (NAS) prior to implementation of the SUAS rule. This incremental step will allow Caleb Alan McDow, LLC to safely and legally enter into the NAS.

As described in detail below, the requested exemption would permit Caleb Alan McDow, LLC to operate SUASs under controlled conditions in airspace that is (1) limited (2) predetermined (3) controlled as to access, and (4) would provide safety enhancements to the already safe operations of those aircraft of similar size, weight, speed, and operating capability that have been granted entry into the NAS via the rules in Academy of Model Aeronautics (AMA) National Aircraft Safety Code.[1] Approval of this exemption would thereby greatly enhance safety and fulfill the Secretary of Transportation's (the Secretary) responsibilities to "…establish requirements for the safe operation of such aircraft systems in the national airspace system" per Section 333 (c) of the Reform Act.

Caleb Alan McDow, LLC is requesting exemption from the following regulations:

14 CFR Part 21, Subpart H
14 CFR 61.23 (a)
14 CFR 61.113 (a) and (b)
14 CFR 91.109
14 CFR 91.121
14 CFR 91.151 (a)
14 CFR 91.405 (a)
14 CFR 91.407 (a)(1)
14 CFR 91.409 (a)(1)
14 CFR 91.409 (a)(2)
14 CFR 91.417 (a) and (b)

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333 (a) through (c) of the Reform Act. This law directs the Secretary to consider whether certain unmanned aircraft systems may operate safely in the NAS before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UASs do not create a hazard to users of the NAS, to the public, or pose a threat to national security.

Section 333 of the Reform Act grants the Secretary authority to determine (1) if an unmanned aircraft system, as a result of its size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight (VLOS) does not create a hazard to users of the NAS or the public or pose a threat to national security, and (2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under 49 USC 44704 is required for the operation of civil (non-

[1] See the attached "AmaSafetyCode.pdf" document.

governmental) UASs. Therefore, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system".[2]

Overview of the petitioner

Caleb Alan McDow is the sole member and manager of Caleb Alan McDow, LLC. Mr. McDow is a licensed real estate agent in the state of Florida and a member of the National Association of Realtors (NAR), the Florida Association of Realtors (FAR), the Florida Gulf Coast Association of Realtors (FGCAR), the Realtors Land Institute (RLI), and the National and Florida Chapters of Certified Commercial Investment Members (CCIM / FLCCIM). Mr. McDow serves on various committees within several of these organizations and is actively involved in all of them.

Mr. McDow is an instrument-rated private pilot and has logged over 125 hours of flight time as a civilian pilot. He is also a former US Navy F/A-18F Weapon Systems Officer (WSO) and has logged over 1300 hours of flight time as a military flight officer. Mr. McDow has been flying remotely piloted aircraft for several years including the products manufactured and sold by DJI referenced herein.

Overview of the request for exemption

In an effort to reduce the time burden for this request and in hopes of streamlining the exemption process, Caleb Alan McDow, LLC has reviewed numerous requests and grants of exemption under Section 333. Caleb Alan McDow, LLC has used much of the language of these documents to create this request – especially, 1.) where the grants note that the petitioner neglected to address an important item, 2.) where relief was not necessary, and 3.) where relief was not granted. By synthesizing all of these elements, Caleb Alan McDow, LLC has attempted to craft an exemption request that will address every concern and meet every guideline and mandate previously set forth. This exemption should be granted on the basis of the precedent set by the FAA in granting similar Section 333 petitions, as well as on its own merit with regard to safety and intended operations.

Operation Overview

Caleb Alan McDow, LLC's SUASs are quadcopters, manufactured by DJI and weighing 10 or fewer lbs. (including payload). The SUASs have the capability to hover and move in the

[2]Caleb Alan McDow, LLC interprets this provision to place the duty on the Secretary to not only process applications for exemptions under section 333 of the Reform Act, but for the Secretary to craft conditions for safe operations of SUAS, if it should be determined that the conditions set forth herein do not fulfill the statutory requirements for approval.

vertical and horizontal planes simultaneously. They will operate only in visual line of slight (VLOS) and will operate only in controlled and limited airspace. They are capable of operating at speeds of up to 42 knots, but will be routinely operated at much lower speeds. They will routinely be operated below 200 feet AGL, and never above 400 feet AGL.
Caleb Alan McDow, LLC's exemption request would permit its commercial operation of SUAS for aerial photography and videography in controlled and limited airspace. Aerial photography and videography services will be offered to homeowners, Realtors®, community event organizers, homebuilders, home contractors, and/or home inspectors for use in, but not limited to, promotional videos, real estate marketing for agricultural, residential and commercial property, and inspections of building exteriors. All operations will be conducted with the written and/or oral permission of the property owner(s) or his/her agent(s).

Operations will always be conducted in such a manner as to minimize hazards to persons or property on the ground. Such operations will ensure that the SUAS will "not create a hazard to users of the national airspace system or the public".[3]

Aircraft

Caleb Alan McDow, LLC operates the Phantom 2 Vision+[4] (Phantom) and the Inspire 1[5] (Inspire) SUASs manufactured by DJI, a well-known leader in quadcopter technology. DJI strives to bring new perspectives to aerial work and help companies accomplish operations safer, faster, and with greater efficiency.

DJI has an unparalleled commitment to R&D, a culture of constant innovation, and a focus on transforming complex technology into easy-to-use devices.

The standard Phantom quadcopter package includes the Phantom itself, camera, gimbal, propulsion system, flight control system, 5.8 GHz remote controller, and 2.4 GHz Wi-Fi communication system. The remote uses a 5.8 GHz frequency to prevent interference with the video/telemetry channel. This second channel allows for a constant connection with the Phantom to monitor it via a smartphone or tablet that is attached to the remote controller. The Phantom is about 1 foot square in size. It has a maximum ascent speed of 11 knots, a maximum descent speed of 3 knots, and a maximum flight speed of 29 knots. While

[3] Reform Act Section 333 (b)
[4] http://www.dji.com/product/phantom-2-vision-plus
[5] http://www.dji.com/product/inspire-1

operating within VLOS, the remote control has a range of 2,624 feet. The total weight (including the payload) is 2.55 lbs.[6]

The Phantom is equipped with an advanced flight control system. This provides for incredible ease of use and stability. Pilots can control the Phantom's movements in many directions – including pitch (forward and backward), roll (left and right), elevator (up and down), and yaw (turn left or right). The flight control system can also provide Intelligent Orientation Control (IOC), failsafe, battery level warnings, and show the aircraft's current heading, direction, and approximate distance from home on the on-screen radar. The built-in GPS system aids in stabilizing the aircraft and automatically and safely returns it back to its home point in the event that communication between the remote control and quadcopter are lost.

The Inertial Measurement Unit (IMU) has a built-in inertial sensor and a barometric altimeter that measures both attitude (ATTI) and altitude. The inertial measurement tells the Phantom how it's tilted. And the gyros tell it if it's rotating in any particular direction.

The Phantom's compass read geomagnetic information and assist the Global Positioning System (GPS) to accurately calculate the position and height of the aircraft. The vertical hover accuracy is +/- 2.6 ft. The horizontal hover accuracy is +/- 8.2 ft.

The Phantom has LED flight indicators beneath each of its four rotor arms. The LEDs illuminate to indicate the status of the flight control system and alert the PIC of any possible issues.

Such highly advanced capabilities will ensure that the SUASs can be safely operated and"not create a hazard to users of the national airspace system or the public."[6]

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[6] http://www.dji.com/product/phantom-2-vision/spec

The standard Inspire quadcopter package includes the Inspire itself, camera, gimbal, propulsion system, flight control system, 5.8 GHz remote controller, and 2.4 GHz Wi-Fi communication system. The remote uses a 5.8 GHz frequency to prevent interference with the video/telemetry channel. This second channel allows for a constant connection with the Inspire to monitor it via a smartphone or tablet that is attached to the remote controller.

The Inspire is about 1 foot 10 inches square in size. It has a maximum ascent speed of 21 knots, a maximum descent speed of 7.7 knots, and a maximum flight speed of 42 knots. While operating within VLOS, the remote control has a range of 2,624 feet. The total weight (including the payload) is 6.47 lbs.[7]

The Inspire is equipped with an advanced flight control system. This provides for incredible ease of use and stability. Pilots can control the Inspire's movements in many directions – including pitch (forward and backward), roll (left and right), elevator (up and down), and yaw (turn left or right). The flight control system can also provide Intelligent Orientation Control (IOC), failsafe, battery level warnings, and show the aircraft's current heading, direction, and approximate distance from home on the on-screen radar. The built-in GPS system aids in stabilizing the aircraft and automatically and safely returns it back to its home point in the event that communication between the remote control and quadcopter are lost.

The Inertial Measurement Unit (IMU) has a built-in inertial sensor and a barometric altimeter that measures both attitude (ATTI) and altitude. The inertial measurement tells the Inspire how it's tilted. And the gyros tell it if it's rotating in any particular direction.

The Inspire's compass reads geomagnetic information and assists the Global Positioning System (GPS) to accurately calculate the position and height of the aircraft. The vertical hover accuracy is +/- 1.65 ft. The horizontal hover accuracy is +/- 8.2 ft.

The Inspire has LED flight indicators beneath each of its four rotor arms. The LEDs illuminate to indicate the status of the flight control system and alert the PIC of any possible issues.

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[7] http://www.dji.com/product/inspire-1/spec

Equivalent Level of Safety

In an effort to join the FAA in its mission to provide the safest, most efficient airspace system in the world and to minimize the risk to the NAS or to persons and property on the ground, Caleb Alan McDow, LLC agrees to be bound by the following limitations and conditions when conducting commercial operations under an FAA issued exemption:

A. For the purposes of ensuring SUASs will be operated within the standards that the FAA has allowed in the AMA National Model Aircraft Safety Code:

1. SUASs will not be flown:

    a. In a careless or reckless manner.

    b. At a location where SUAS activities are prohibited.

2. SUAS pilots will:

    a. Yield the right of way to all human-carrying aircraft.

    b. See and avoid all aircraft and a spotter must be used when appropriate[8].

    c. Not fly higher than 400 feet above ground level or within three (3) miles of an airport without notifying the airport operator.

    d. Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed-use agreement.

    e. Not exceed a takeoff weight of 55 pounds (including payload).

    f. Ensure the aircraft is identified by affixing the owner's contact information to the outside of the SUAS.

    g. Not operate SUASs while under the influence of alcohol or while using any drug that could adversely affect the PIC's ability to safely control the aircraft.

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[8] AMA Document #540-D

h. Not operate SUASs carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

3. SUASs will not be flown unless:

   a. The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.

   b. An inexperienced pilot is assisted by an experienced pilot.

4. All pilots shall, to the max extent practical, avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.

5. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.

6. SUASs must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC).

7. SUASs will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement.[8]

8. Excluding takeoff and landing, no SUASs may be flown outdoors closer than 25 feet to any individual, except for the PIC and the PIC's helper(s) located at the takeoff site

9. Under no circumstances may a pilot or other person interfere with a SUAS in flight while it is still under power, except to divert it from striking an individual.

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[8] AMA Documents #922 and #923

10. The PIC of the SUAS shall:

    a. Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.

    b. Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.

    c. Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

11. The flying area must be clear of all utility wires or poles and an SUAV will not be flown closer than 50 feet to any above-ground electric utility lines.

12. The flying area must be clear before the engine is started, except for PIC and the PIC's helper(s).

B. In addition to the above rules outlined by the AMA National Model Aircraft Safety Code and in an effort to enhance the safety offered by the already safe operations mentioned above, Caleb Alan McDow, LLC also agrees to be bound by the following limitations and conditions:

    1. Flights will be operated within the VLOS ability of the PIC.

    2. Maximum total flight time for each operational flight will be 25 minutes. Flights will be terminated at 25% battery power reserve should that occur prior to the 25 minute limit.

    3. The SUAS will only operate in controlled and limited airspace.

    4. A briefing will be conducted in regard to the planned SUAS operations prior to each flight. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.

    5. The PIC and the PIC's helper(s) will have been trained in operation of SUAS and received up-to-date information on the particular SUAS to be operated.

6. The PIC and the PIC's helper(s) will at all times be able to communicate by voice.

7. If the SUAS loses communications or loses its GPS signal, the SUAS will have capability to return to a pre-determined location within the security perimeter and safely land.

8. The SUAS will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

9. Flights will only be conducted on property for which the written and/or oral permission of the property owner(s) or his/her agents(s) has been granted.

10. Flights will always be conducted in areas that are clear of all people, except for the PIC and the PIC's helper(s).

11. All flights will be conducted in daytime visual meteorological conditions (VMC) only and never during severe weather conditions.

12. Flights will not occur in weather conditions that prevent the PIC from operating within visual line-of-sight (VLOS) at all times or in weather conditions that dramatically affect the UAS's flight (e.g. high winds).

13. If an operation occurs in an area where people could inadvertently enter the area, an operational border will be established. The PIC's helper(s) will be responsible for keeping a safe perimeter around the operation. The operation will cease immediately and be rescheduled if it's impossible to establish a safe perimeter around the operation.

14. The PIC will be responsible for logging all flights to ensure the comprehensive preventative maintenance plan can be followed, as described in the "Preventative Maintenance" section below.

15. The SUAS will not be routinely operated in the proximity of any airports. In any cases where the SUAS must be operated within three (3) miles of an airport, the airport operator will be notified before the operation commences.

The operation of SUASs, weighing less than 10 lbs., conducted in the strict conditions as outlined above, will provide an equivalent level of safety supporting the grant ofexemptions requested herein, including exempting the applicant from the requirements ofPart 21 and allowing commercial operations.

These lightweight aircraft operate at slow speeds, close to the ground, and in a small, controlled environment. As a result, they offer a much safer way to capture aerial photography and videography. Furthermore, the proposed operations represent a safety enhancement to the already safe operations that have been granted by the FAA for the establishment of the AMA National Model Aircraft Safety Code.

Preflight Action Plan

The PIC will follow a comprehensive pre-flight checklist to ensure that the SUAS is in a condition for safe flight. This plan will be improved as needed in order to ensure all known safety precautions and/or safety precautions suggested by the manufacturer are being accounted for.

A. Pre-flight Inspection

1. Check that the remote control, Phantom battery, range extender, and smartphone are all fully charged.

2. Verify that the Phantom battery is not swollen or damaged in any way. Clean the contact needles and pads if necessary.

3. Turn the motor shafts with your fingers and verify they are smooth without excessive play or binding.

4. Verify that the propellers are mounted correctly. Propellers with a black top should be mounted on the mount shafts that have a black dot. Propellers with a silver top should be mounted on the mount shafts that have a silver dot. Each propeller should spin all the way down onto the motor shaft.

5. Run finger along the edge of edge blade to check for any rough edges.

6. Flex both side of the propellers' blades to check for hairline cracks where the blades connect in the center of the propeller.

7. Verify that the landing gear is secure (not cracked/broken/loose).

8. Verify that the compass and compass cable are firmly attached to the landing gear.

9. Verify that the Micro-SD card has been inserted and formatted.

10. Verify that the damping absorbers are not broken and/or worn.

11. Verify that the anti-drop pins are in place and locked.

12. Remove the Gimbal guard and camera lens cap.

13. Verify that the camera is secure and clean. Inspect the camera ribbon cables for tears and/or signs of wear.

14. Verify that the smartphone's GPS is enabled.

15. Set the smartphone to do-not-disturb mode to prevent distractions while flying.

16. Set the smartphone to forget any Wi-Fi networks in range in order to prevent the Wi-Fi connection from changing mid-flight.

17. Verify that the smartphone's audio is on to ensure the low battery warning and other alarms can be heard.

B. Power Up

1. Verify that S1 and S2 are in the top position on the remote control.

2. Power on the equipment in the following sequential order:

    a. Range Extender ("System" is blinking green; "Power" is solid green)

    b. Remote Control (2 beeps to indicate it's in FCC mode)

    c. Insert and start the Phantom battery.

3. Watch the Phantom LED startup sequence for abnormal indications. The rear LEDs should blink green for at least 10-15 seconds to indicate that it locked onto 6+ satellites and has marked the home point (for use by the failsafe feature).

4. Calibrate the Phantom's compass.

5. Place the Phantom on an open, flat ground with the battery indicators facing towards the PIC at least 10 feet away.

C. DJI Vision Application

1. Connect the smartphone Wi-Fi to the range extender.

2. Launch the "DJI Vision" application on the smartphone.

    a. Verify that the Wi-Fi connection is "Phantom-#####" and is marked with a green dot.

    b. Verify the number of satellites is 6+.

    c. Verify the Wi-Fi signal strength.

    d. Verify that the Phantom and range extender batteries are reporting a full charge.

    e. Verify that both the PIC's and Phantom's location is the same before taking off to ensure the home point has been accurately marked.

    f. Verify the location of the Phantom in the "Flight Radar". If it's not in the correct position/direction and/or shows a distance of "N/A", it did not mark the home point.

    g. Use the "Find my Phantom" feature to ensure the blue (home point location) and red (Phantom location) dots are in the same location on the screen.

D. Ready to Fly

1. Verify that the remote control antenna is perpendicular to the ground (pointing skyward).

2. Verify that the front, flat face of the range extender is pointed toward the Phantom.

3. Verify that the rear LEDs are still slowly blinking green and still connected to 6+ satellites.

4. Start the Phantom motors using the CSC command on the remote control.

5. Verify that the motors are functioning normally, are not making any unusual noises, and are all spinning at the same speed.

6. Verify that the area is still clear of obstructions, people, power lines, etc.

7. Take off and hover at about 6-8 feet above the takeoff point to verify that the Phantom has a solid GPS lock. If any abnormalities are noticed (drifting, flying in circles, etc.), land immediately and repeat the "Pre-flight Inspection" and "Power Up" sequences.

8. Verify that the Phantom holds a steady position while yawing 360 degrees.

9. Verify that the Phantom response appropriately to all controls – yaw left/right, pitch forward/backward, roll left/right, and throttle up/down.

Preventative Maintenance

A comprehensive preventative maintenance plan will be followed in order to ensure the SUAS's software is up-to-date, the batteries are in good health, and the aircraft itself is always ready for safe flight[9].

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[9] See the "Preventative Maintenance Checklist" on page 41 of the attached "PhantomGuide.pdf" document.

Pilot in Command (PIC) Qualifications

All PICs for Caleb Alan McDow, LLC will hold, at a minimum, a private pilot license and a third-class medical certificate. Although the SUAS is similar in size, weight, speed, and operating capability as those currently allowed to beflown for hobby/recreation, holding the PIC to the same certification standards as for manned flight will provide an equivalent level of safety. Since there are current no established standards for either private or commercial SUAS pilot certificates, requiring a private pilot certificate and a third-class medical will ensure knowledge of airspace regulations and hazards to flight. Additionally, in order to ensure that PICs for Caleb Alan McDow, LLC possess the necessary familiarity and experience with the SUASs to be flown, we propose that our PICs be required to complete the following prior to the first commercial operation:

E. Perform 20 flights or log 10 hours of flight time (the greater of the two) with the DJI Phantom 2 Vision+.

F. Successfully learn and demonstrate all flight maneuvers in the "Phantom Pilot Training Guide".[10]

G. Study and be familiar with all sections of the "Phantom 2 Vision+ User Manual".[11] and the "Guide to the Phantom 2 Vision & Vision+".[12]

Public Interest

Granting this exemption would benefit the public as a whole. SUASs offer a strong equivalent level of safety, a reduction in environmental impacts, and are free from the harmful emissions associated with the manned aircraft that are currently used for aerial photography and videography. Due to the size of the SUAS and the controlled andlimited airspace in which the SUASs will operate, approval of this application presents no risk to the public. Furthermore, the public will be able to legally acquire aerial photography and videography to use in, but not limited to, advertising homes for sale, advertising uninhabited home lots, use of photos and video as an aid when researching homes for sale on the market, or safely accessing high and/or awkward areas of a home's exterior to assess damage that needs to be repaired.

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[10] See the attached "PhantomTrainingGuide.pdf" document.

[11] See the attached "PhantomUserManual.pdf" document.

[12] See the attached "PhantomGuide.pdf" document.

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National Security

By requiring it's PICs to hold a private pilot license, Caleb Alan McDow, LLC can ensure that national security concerns are addressed and mitigated. Pilots holding an FAA issued private or commercial pilot certificate are subject to security screening by the Department of Homeland Security. As previously determined by the Secretary, the requirement to have an airman certificate ameliorates security concerns over civil SUAS operations conducted in accordance with Section 333.

Requested Exemptions

Caleb Alan McDow, LLC requests exemption from the following regulations:

Airworthiness Certificates
14 CFR Part 21, Subpart H

Subpart H establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR 91.203 (a) (1). Given the size and limited operating area associated with the aircraft to be utilized by Caleb Alan McDow, LLC, an exemptionfrom Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 USC44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular SUAS. In all cases, an analysis of these criteria demonstrates that the SUAS operated without an airworthiness certificate, in therestricted environment and under the conditions proposed, will be at least as safe, or safer, than a conventional aircraft operating with an airworthiness certificate without the restrictions and conditions proposed.

Private pilot privileges and limitations: Pilot in command
14 CFR 61.113 (a) and (b)

These regulations limit private pilots to non-commercial operations. Because the SUAS will not carry a pilot or passengers; due to the SUAS's size, weight, speed, and operational capabilities; and since operations will occur in controlled and limited airspace, the proposed operations can achieve the equivalent level of safety of current operations that currently require a commercial pilot's license simply with the possession of a private pilot license. Furthermore, since there are no standards for

either private or commercial SUASpilot certificates, the best way to achieve this level of safety is to require all of our operators to be licensed private pilots. The FAA held in Exemption No. 11191 that "a PIC holding a private pilot license and a third-class medical certificate and who has completed the petitioner's UAS training and currency requirements can conduct the proposed UAS operations without adversely affecting the safety of the NAS or persons or property on the ground." Knowledge of airspace regulations, awareness of proximity to airports and a "vested interest" in the safety of manned aviation provide the best safety controls currently available to the SUAS industry. Obviously, practice in the control and operation of the SUAS acquired from actual operation of the aircraft will be a very important factor in establishing an equivalent level of safety. But the requirement of a private pilots license is an important prerequisite.

Additionally, the operator of the SUAS will always be assisted by a Visual Observer (VO). This will fulfill the requirement of operating the SUAS "within visual line-of-sight" as granted in Exemption 11191 and as proposed in the NPRM Part 107.

Medical certificates
14 CFR 61.23 (a)

This regulation requires pilots to hold a second-class medical certificate when exercising the privileges of a commercial pilot certificate. For reasons stated above, an equivalent level of safety can be achieved by requiring all PICs to hold a private pilot certificate and a third-class medical certificate.

Flight instruction
14 CFR 91.109

This regulation provides 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.

SUASs and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. The equivalent level of

safety is provided by the fact that we are not requesting relief from 61.113, insofar as all of our operators will be licensed private pilots. To the extent that flight instruction is required on the specific aircraft model is required, an equivalent level of safety is provided by 3 facts: 1.) The SUAS described herein hover in a fix position anytime the controls are released. 2.) The time required to transfer positive control from one operator to another is negligible when considering the myriad other safety features in place. 3.) The training qualifications described in the section entitled "Pilot in Command (PIC) Qualifications" above.

Minimum safe altitudes
14 CFR 91.119

This regulation provides: "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."

An equivalent level of safety can be achieved by maintaining altitudes no greater than 400 feet AGL. Additionally, the SUASs flown all have GPS-aided flight stability integrated into the flight control system. This allows the SUASs to maintain their position precisely when there are no inputs given through the remote controller. This allows the operator to make controlled, steady approaches to various obstacles for purposes of inspection.

While flying close to such large obstructions poses a risk to the aircraft, the risk to infrastructure is negligible due to the weight of the SUASs being less than 10 lbs. The PIC shall always assess the risks to people and property when conducting such operations, and either continue the mission or abort accordingly.

Additionally, prior to conducting UAS specific operations, all persons not essential to flight operations (nonparticipating persons) will be required to remain at appropriate distances. In open areas, the Operator and the Visual Observer will remain 500 feet from all other persons. At times, barriers or structures may be used (as stated above) to protect nonparticipating persons. This will allow the Operator to operate closer than 500 feet to persons afforded such protection. Additionally operations may be conducted closer than 500 feet to vessels, vehicles and structures when the land owner(s) or agent(s) grants such permission and the PIC makes a suitable safety assessment of the

risk of operating closer to those objects. The operator or visual observer must ensure that nonparticipating persons remain under appropriate protection at all times.

Altimeter settings
14 CFR 91.121

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "…to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the SUAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator by confirming the altitude of the launch site shown on the GPS altitude indicator before flight and by frequently referencing the AGL altitude readout on the screen via the telemetry link onboard the SUAS.

Fuel Requirements for Flight in VFR Conditions
14 CFR 91.151 (a)

This regulation prohibits an individual from beginning "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."

The battery powering the SUAS provides approximately 25 minutes of powered flight. That would make it impossible to meet the 30 minute reserve requirement. Given the limitations on the SUAS's proposed flight area and the location of its proposed operations within a predetermined area, the reserve requirements are not appropriate for these aircraft being used in these applications.

An equivalent level of safety can be achieved by limiting flights to 25 minutes or 25% of battery power (whichever occurs first). This restriction would be more than adequate to return the SUAS to its planned landing zone from anywhere in its limited operating area. Additionally, both SUAS proposed herein provide low battery warnings at 30% capacity that indicate the PIC must effect the SUAS's return to the launch point. The UAS also provides critical low battery warnings at 15% battery capacity indicating that the UA will begin to descend and land automatically. Finally,

similar relief from 14 CFR 91.151 (a) was granted in Exemption Nos. 8811, 10808, and 10673 for daytime VFR conditions.

Maintenance Inspections
14 CFR 91.405(a); 14 CFR 91.407(a)(1); 14 CFR 91.409(a)(1); 14 CFR 91.409(a)(2); 14 CFR 91.417(a) and (b)

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in Part 43 of this chapter...," and others shall inspect or maintain the aircraft in compliance with Part 43.

Given that these sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply. Maintenance will be accomplished by the operator pursuant to the aforementioned Phantom user manual and guide. An equivalent level of safety will be achieved because these small SUASs are very limited in size, will carry a small payload, and operate only in restricted areas for limited periods of time. If mechanical issues arise, the SUAS can land immediately and will be operating from no higher than 400 feet AGL. As outlined in the aforementioned Pre-flight Action Plan, the operator will ensure that the SUAS is in working order prior to initiating flight and perform maintenance as required. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

Civil Aircraft Airworthiness
14 CFR 91.7(a) and (b)

These regulations require that an "no person may operate a civil aircraft unless it is in an airworthy condition" and "the pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur."

Even though these aircraft will not require airworthiness certificates, the PIC of the SUASs will still be responsible for determining if they are in an airworthy condition prior to flight. An equivalent level of safety can be achieved by adherence to the operating documents contained herein in order to determine if the aircraft is in an airworthy condition in accordance with 91.7(a). Also, compliance with 91.7(b) can be accomplished

> in the same manner that any private pilot (as required herein) would comply if the aircraft in question did have an airworthiness certificate.

In accordance with 14 CFR Part 11, the following summary is provided for publication in the Federal Register:

> The applicant seeks an exemption from the following rules: 14 CFR Part 21, Subpart H; 14 CFR 61.113 (a) and (b); 14 CFR 91.109; 14 CFR 91.121; 14 CFR 91.151; (a); 14 CFR 91.405 (a); 14 CFR 91.407 (a)(1); 14 CFR 91.409 (a)(1); 14 CFR 91.409 (a)(2); 14 CFR 91.417 (a) and (b) to commercially operate small unmanned aircraft systems (55 lbs. or less) in order to safely and legally capture aerial photography and videography for homeowners, Realtors®, community event organizers, home builders, home contractors, and/or home inspectors for use in, but not limited to, promotional videos, real estate marketing for agricultural, residential and commercial property, and inspections of building exteriors.

The operation of SUASs conducted in the strict conditions outlined above, will provide an equivalent and/or greater level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment, and as a result, are far safer than existing operations conducted with helicopters operating in close proximity to the ground, people, or other buildings in the vicinity.

Given the small size of the SUASs involved, the slow speed at which they must be operated in order to capture photos and videos, and the restricted environment within which they will operate, Caleb Alan McDow, LLC demonstrates that its SUASs can be operated with an equivalent level of safety in which Congress envisioned that the FAA must, by exemption, allow commercial operations of SUASs to commence immediately. Also, due to the requirement that PICs hold at least a private pilot license and a third-class medical certificate, approval of this application presents no threat to national security. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, the strong equivalent level of safety surrounding the proposed operations, the significant public benefit – including enhanced safety, reduction in environmental impacts, no emissions, ability to legally obtain aerial photography and videography services – the grant of the requested exemptions is in the public interest. Accordingly, Caleb Alan McDow, LLC respectfully requests that the FAA grant the requested exemption without delay.

May 5, 2015

Satisfaction of the criteria provided in Section 333 of the Reform Act – size, weight, speed, operating capability, proximity to airports and populated areas, operation within visualline of sight, public safety, and national security – provide more than adequate justification to grant Caleb Alan McDow, LLC the requested exemption, allowing for commercial operations as described herewith.

Sincerely,

Caleb McDow
Manager, Caleb Alan McDow, LLC